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OCTOBER 1950

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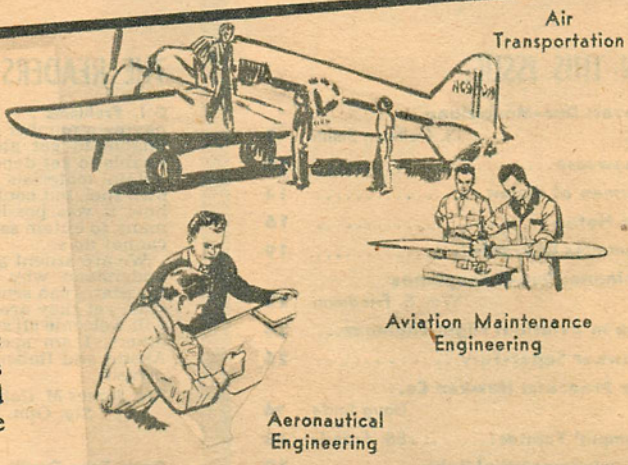

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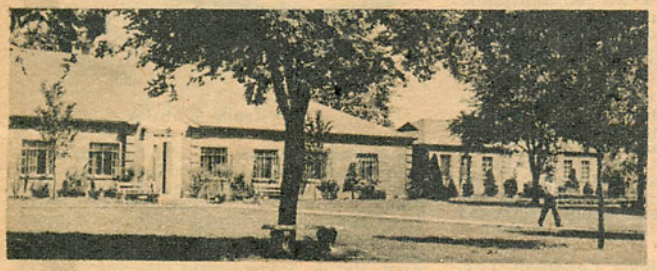

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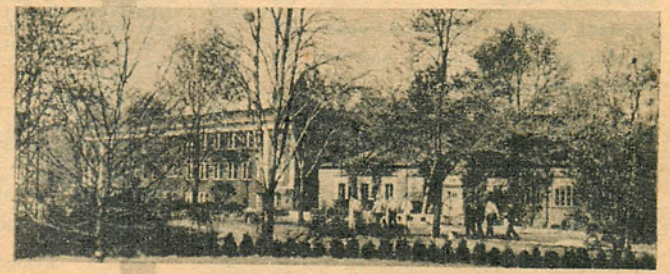

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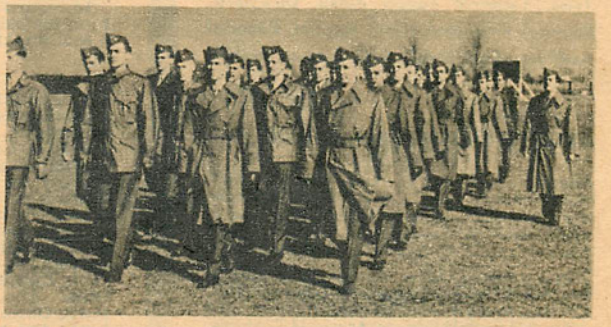

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AIR TRAILS

OCT., 1950 • VOL. XXXV, No. 1

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THE READERS WRITE:

G.I. Problems . . . We here in Austria are having a number of problems. First, we are unable to get glow fuel. Second, we are unable to get dope. We have been trying to obtain materials with which to mix our own fuel, but couldn't. We were wondering how it was possible for the G.I.s in Germany to obtain said fuel and dope while we cannot do so.

We are ardent glow-plug fans and cannot understand why the hobby companies in the States can send glue and No. 70 oil overseas, yet they are unable to send fuels. We will welcome all suggestions sent us. Among others, I am speaking for Pfcs. John W. Austin and Robert B. Carpenter as well as myself.

Pfc. James M. Cobrando, RAO Opn. Co., 63rd Sig. Opn. Bn., APO 541 U. S. Army, c/o PM, New York, N. Y.

Can't Take Credit . . . In reference to your recent article entitled "The Home-Bilts Are Back," I wish to inform you and especially the readers around Plainview and Crosbyton that my name was linked to the construction of a small low-winged lightplane (made of Cub parts) quite by error. Perhaps you were misinformed by the American Airmen's Association to whom I furnished the picture you printed.

I am not acquainted with the builder, nor do I even know his name, but I am sure it was based at Crosbyton, Tex. I merely happened to be at Plainview when I saw it. I snapped the picture and jotted down performance figures which were given me by a mechanic friend who worked there. . . . So the statement that I built the plane is not correct. I'm sure a lot of people in Texas would wonder what I was up to by such a claim.

Ernest A. Bode, Canadian, Tex.

First Airmail by Modelplane . . . I think your magazine has done a wonderful thing in making available to youngsters your full-size plans at a nominal cost. The one thing that is a waste of space for a majority of them, as far as building goes, is the plans presented in a magazine and then captioned "half size" or whatever it may be.

In regard to the first model airmail flight, I am inclosing a clipping and wish to make a few remarks. . . .

C. W. Millice, Hamilton, Ohio

• Friend Millice, a watchmaker and jeweler long interested in planes, takes issue with statements (made other than in AT) that the PAA-Load event at the 1949 Nationals at Olathe was the first time airmail was carried by modelplanes. The clipping he sends is from the Dayton Daily News which appeared in late September 1939. It shows a fellow launching a gas model with NAA gas model license numerals on the wing, and reproduces an envelope addressed to "Mr. Jack Hohne, Dayton Daily News, Dayton, Ohio." The letter is postmarked at Gettysburg, Ohio, September 25 at 10:30 a.m. and bears the notice, "First letters carried by gas model airplane, Sept. 24, 1939, 1:30 p.m., Lansdowne Airport, Greenville, O."

The clipping reads, "Ralph Snyder, a member of the NEWHIO Junior Flying club is shown above as he launched his Mercury gas model on what is believed to be first air mail flight by model plane.

"The model containing 20 air mail letters, took off from Lansdowne airport, Greenville, last Saturday afternoon. After flying out of sight, the model was found on a farm near Gettysburg, O., from which point the letters continued on their way. . . . Snyder is one of the most active model plane builders in Darke county and was one of the organizers of the Lansdowne Aeronauts club. In addition to placing among the winners at several contests this year, he has also done considerable experimenting in the model field."

Snyder, who manufactured Snyder S props in Colorado Springs and who is back in Greenville for awhile reports that on his mail flight the model was equipped with a larger gas tank and reached an altitude of about 3,000 ft. With a companion he followed the mail-model in a Porterfield and saw the Mercury land about 6 miles from its take-off point. The ship was retrieved and the letters mailed at the nearest post office, which was Gettysburg.

Okay, Ohio, until we receive other proof we'll credit you with the first model airmail flight. Any other contenders?

Word from Hong Kong . . . May I take this opportunity to commend you upon the excellence of your magazine of which I have been a subscriber for the last five years. Your magazine is always interesting reading and an excellent source of information for both air-minded and modeling enthusiasts.

K. C. Wong, c/o China Egg Produce Co., Hong Kong

Air Trails Clubster

The Lightplane Picture . . . The engineers at Cessna must have taken to heart your suggestions about the ideal lightplane as proposed in your design called the "Clubster." The Cessna 305 certainly looks pretty much like what the man ordered. High visibility cabin, steel strut landing gear, single wing strut, simple development tail cone and the like. Sorry about the tail surfaces, though, they're using 170 tooling on this one. Wouldn't that make a pretty AA job?

Earl Merrifield, Portland, Ore.

Cessna 305

First Jet to Fly? . . . There are still arguments who first invented the idea of the jet-propelled plane. I have a report that the first propelled flight was made in August 1940, but it does not mention by whom.

In 1944 or thereabouts the Associated Press news from London announced in our daily papers that an Italian had invented a jet plane. This is the first time any news had been published that such a plane had been invented. So if this report is not correct, it still remains an open question who was the inventor of the jet plane.

Hildore C. Ecklund, Great Falls, Mont.

• The first airplane powered by a turbo-jet engine to fly was a German Heinkel He-178, equipped with a Heinkel S3B jet engine. The date was August 27, 1939. Exactly one year later the Italian plane Caproni-Campini was flight-tested *for 10 minutes, and on* November 30, 1941, the Italian pilot Col. Mario de Bernardi with a passenger made the first cross-country flight in a jet plane from Milan to Rome with a stop at Pisa, a total distance of 300 miles at an average speed of 160 mph.

(*Continued on page 9*)

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America's Hobby Center does not buy or sell used engines. However, over the last few years we have acquired the assets of several motor manufacturers. Included in these assets were hundreds of assembled engines which were defective and returned by customers.

We do not guarantee these engines. They may have cracked castings, broken plugs, defective tanks or timers, etc. They are not sold for use, but only as an interesting display in your den or on your desk. As they come — no choices.

No. 12 — 75c each

A.H.C. INSTALLMENT PLAN

Buy your model engines, planes and supplies and pay for them over a six months period. Send 25c for complete details and application blank.

BURIED IN THIS AD are most of the new items. Sometimes there isn't time or space to include them. But, if available, we have it.

Tufty 24" AA-A	1.98
Waco 33" B-C	4.98
Warrior 36" A-B-C	3.98
Wee Willie 18" AA-A	1.95
Whirlaway A-B	3.95
Whirlwind Sr. 30" B-C-E	7.96
Wildfire 23" B-C-D	1.98
Wing Ding 16" AA-A-B	2.00
Wing Dingus 16" AA	2.00

ACCESSORIES

FUELS (Continental U.S.A. Only)

For Ignition	Pts	Qts
Ohlsson #1, #3	.75	1.40
Power Mist #6	.65	—
Reg. Pink	—	1.25
For Glo		
Ohlsson #2, #4	.75	1.40
Ohlsson AA	.75	—
Ohlsson #2 or #4 Econ.	.55	—
Powermist Glo	.85	—
Powermist Spitfire	.80	—
Ranger Glo	.80	—
Red Devil	.60	1.10
Testors 33	.75	—
Dynaglo	.75	—
Ranger AA	.80	—
Spitfire AA	.80	—
Blue Blazer #1	.60	—
Blue Blazer #2	.70	—
OK Cub	.75	—
For Diesel		
Drone	—	1.00
Ranger (Fixed Head)	1.00	—
Ranger (variable head)	.85	—

Pouring Spout For pint cans... .10
Hot Fuel Proofer ..... .25, .35 & .45

PROPELLERS

Rite Pitch Stunt 8, 9, 10, 11, 12, 13, 14 in., 8 and 8 pitch..... .35
Rite Pitch 8, 9, 10, 11, 12, 13, 14 in., 6, 8, 10 or 12 pitch ..... .35
Scamper Plastic 5½": Sp. 25: 9" 60: 45: 10": 10s, 11" 8p .85
Super Spl. 8", 9", 10", 11"in 6 & 8" p. ..... .25
Veco 6" Sp. 4p, 7" 4p, 5p, 8" 5p, 6p, 9" 6p, 7p ..... .25
Also Ohlsson, Flo-Torque, Gardsy

RUNNING & TEST BLOCKS

E-Z Running Stand 1.25
Universal Running Blocks 1.50

METAL GAS TANKS

Dale Stunt Tanks—All Sizes ..... .65

SPARK & GLO PLUGS

Arden Glo (V2 or V3) ....65 & .85
Arden AA ..... .49
Champion Glo V, V2, V3 ..... .75
Champion V, V2, V3, VR1, VR2 .80
Infant Glo-plug ....(spl)... .45
McCoy Hot Point ..... .49
Ohlsson Glo (V, V2 or AA) ..... .65
Ohlsson Economy V3 or AA ..... .50
O.K. Glo-plug (V2 or V3) ..... .49
Plug washers ..... .05

IGNITION ACCESSORIES

6 ft. Hook-up wire ..... .35
Alligator clips ..... .10
Arden Booster Jack ..... .35
Austin Booster Plug-it ..... .30
Midget Switch: slide—.25 Turn .50
Ohlsson Snap-Pack ..... .35
Arden Battery Cord Kit ..... .35

PROP SPINNERS

Adapter Nuts (state eng.) ..... .20
¼"—20's; 11/32"... .45
1½"-.85s; 1¼"-.90s; 1⅝"-.80; 2¼"-1.00
3" Needle Nose 1¾" dia. 1.15
2" 1.20
Plastic 1½" ..... .50
Scamper Plastic 1½", 1¾", 2", 2½" ..... .45

WHEELS

Semi Pneumatic (pr) 2" ... .85
2½" — 1.00. 3" ... 1.50
Sparky Tail Wheel Assembly .25
Sponge Rubber, Dural hub (pr) ½"—.20's; 1.1¼"-.25s; 1¼"-.30
1½"—.45s; 2"s ..... .60
Sponge Rubber, Wood Hub (pr) ½"—.40's; 2½"—.60s; 3½" ... .80
Tail Wheels ½"—.10's; 1¼" ... .15
Trexler Pneu. (pr) 1½" or 1¾" ... .40
1¾", 2"—.50's; 2¼", 2½" 60c; 2¾' 1.00
3"—1.25; 3½"—1.50; 4½"... 1.75

FLIGHT TIMERS

Austin metal 1.50
D-E Shut Off Valve 1.00
Elmic (Ign. or glo) 1.85
Hillcrest plastic 1.25
Stotler-off Valve ..... .75

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E-Z Minimount ..... .35
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.005 x 3—.50
Spinners (state engine) ..... .60
Presto Starter (state engine) ... .25
Prope (state engine) ..... .50
Rotary (state engine) ..50, .60, .75
Neoprene (ft) ..... .15
Fuel Meter ..... .60

MISCELLANEOUS

Batt. Box Pen. and Medium ... .40
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Copper Tubing ⅛" OD, per ft. .20
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Metal Pump Can .....75's & 1.50
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Neoprene Tubing per foot ..... .30
Transparent (reg. or AA) ft. ... .15
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heavy 24x36" (white) .10
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Flexible ..... .75
Vibratac 2.00

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Adjustable Push Rod set	.25
Aristrol Plastic Handle	.75
Bellcrank 2"or 3"—10c, 4"	.15
BERKELEY control lines .009, .010, .012: 2-55	.50
.008, 7.010, .012, .014 2-70	.65
.016: 2-150	1.00
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Berkeley Metal Handle	1.00
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Elevator hinges 4 for	.10
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.010, .012, .014, .016, .018, .020 dia. 2-70' lines	.85
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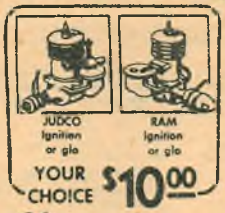

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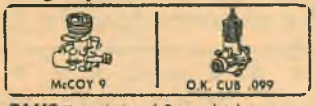

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Grum. Ager TBF-1 ..... .50
Corsair F 4U-1 ..... .50
Vultee Ven. A-35 ..... .50
Piper Cub ..... .50
Ercoupe ..... .50
Dipper ..... .50
Skyrocket ..... .50
Stratus ..... .50
Sparky ..... .50
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Doug. A-26 30" 1.00
Thunderbolt 24" 1.00

Hellcat F6F 24" 1.00
Lightning P-38 34" 1.00
Clipper, Jr. 36" 1.00
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Taylorcraft 54" 1.00
Aeronca 54" 1.00
Piper Cub 40" 1.00
Gull 42" 1.00

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Jasco Special $1.50
Jasco, R.O.G. ..... .35
Jasco Kid ..... .50
Jasco Jr. ..... .85
Jasco Sr. 1.25

MONOGRAM — Piper Cub, Aeronca, Monocoupe, Ercoupe, Boeing Kaydet, Midget Mustang, Prowler 28", Pirate 31" — SPEEDY BUILT 75c

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Pirate 31" 1.25

SCIENTIFIC — Atlantic Ace, Skipper, Yellowbird — 27" 50c

Scient. R.O.G. ..... $ .95
30" Brewster Buffalo ..... .50
30" Bullet 1.00
30" Circle King ..... .50
30" Clarion 1.00
30" Mustang P-51 ..... 1.00
42" Olympic 1.00
42" Spartan 1.00
30" Thunderbolt P-47 ..... 1.00
30" Whippet ..... .50
42" Zephyr 1.00
All America 42" 1.00
Flea 36" 1.95
Firefly 36" 1.95

Hornet, Royal, Major, Miss America 36", Miss Worlds Fair 50" — Windsor, Bantam, Ranger — 25" 35c

Miss America 36" 1.95
Miss Worlds Fair 50" 1.50

GLIDERS

Sindbad Jr. 30" ..... $ .50
Sindbad 40" ..... .75
Sindbad Sailor 50" 1.50
Super Sindbad 2.50
Imperial 72" 1.00
Zenith 33" ..... .50
Condor 60" 1.00
Baby Condor 36" ..... .50
Thermic C ..... .80
Thermic 70 ..... 3.50
Thermic 50 ..... 1.00
Thermic Trio ..... .35
Thermic 72 ..... 3.50
Thermic 60X 1.00
Thermic 30 ..... .50
Trooper ..... .65
Floater 2.50
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1903 Rambler $2.50
1911 Maxwell 2.50
1904 Olds 1.95
1903 A Ford 2.50
1909 Stanley 2.95
1910 T Ford 2.50
1909 T Ford 2.95
1900 Packard 2.50

MOD-AC

Brougham $1.95
Victoria 2.35
Surrey 1.75
Horseless Carriage 1.50

DYNA-MODEL

F6F, P51, F8F, F4U, P40, F.W. $2.75
P38 ..... 3.50
P47 ..... 2.95

HAWK

F84, Constellation, S6B $1.00
GeeBee, Curtis, Ike, Laird ..... .50

FADOR

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1908 EMF 2.95
1908 Hup 2.50
1903 Cadillac 1.95

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The Readers Write

(Continued from page 4)

Air Show Risks . . . The enclosed photograph was taken at the 1949 Oakland Air Show by Oakland Tribune photographer Bill Crouch. This picture was captioned "a five-foot near-miss," and was published in papers all over the country, won a Pulitzer prize, and because of its caption, caused much unfavorable publicity for air shows.

It is true that depth perception is not easily discernible in a photograph, however, had these planes been anywhere near each other, the size of the Stearman would have been approximately the same as the distance between the two engines on one wing of the B-29. In reality (and I was present at the Oakland Air Show along with many hundreds who could substantiate this) these planes passed each other with at least a 500 foot clearance, which, according to C.A.A. regulations, is a legal passing distance.

The flight of Army B-29's was scheduled to fly over and Chet Derby, the pilot of the Stearman, was advised of this fact before taking off. The B-29's were in constant radio contact with the Oakland control tower and were informed of the stunt plane passing below them. Therefore, although this is an outstanding picture, properly captioned it would have been of no value from a news standpoint.

As a result of this picture a good many editorials and letters to the editor published in various aviation magazines have referred to air shows as being haphazard exhibitions of daredevil tricks which result in causing a great deal of risk both to the spectators as well as the participants in the show and in addition, are a detriment to commercial flying.

In analyzing these statements, first consider the reference that such shows are haphazard and a risk to everyone involved. Air shows are operated under a waiver granted by the C.A.A. Application for such a waiver is made at least two weeks prior to the show and is approved only after officials of this office have studied the schedule of [illegible] and participants and concluded that the show will be safe for both the spectators and participants. During the show, a C.A.A. representative is on hand to see that their regulations and safety measures are strictly observed.

All shows in which I have participated have been insured by Lloyds of London, a firm dealing strictly with facts. If they anticipated any danger of loss whatsoever, or if from their statistics air shows had proven to have a poor record of risk, an application for insurance would never be considered.

As for being detrimental to commercial flying, air shows have no connection with commercial flying. To make such a comparison is as logical as comparing everyday automobile driving with the Indianapolis

"A five-foot near-miss"

Speedway Race or a swimming and diving meet with ordinary swimming. A spectator does not leave the Speedway determined never to drive an automobile again because of the dangers he has witnessed, or return from a swimming meet afraid to go swimming because he has witnessed some hair-raising stunts off the diving board. The public has common sense enough to realize that there is no comparison between these exhibitions and the phase applicable to their everyday routine. So it is with air shows—the participants are men who have spent many hours of practice to perfect their particular acts. There should be no confusion in anyone's mind as to the difference between this kind of flying and commercial aviation.

In the past most of these letters and complaints against air shows have been written by people who are commonly referred to by the general public as "cranks." The picture which they have painted of air shows is as distorted and erroneous as the caption "a five-foot near-miss" on the picture of Chet Derby's stunt plane passing under the B-29. I believe that it is time the true facts surrounding air shows and their operation be brought before the public in order to correct a popular misapprehension.

V. J. D'erker, Alameda, Calif.

Clark Monoplane . . . Whatever happened to the Clark F-46-A, a single-engine, low-wing monoplane built around 1939? Especially unique was its stressed plywood and molded Bakelite fuselage and wingtip slots. It was powered by a 420 hp 12-cylinder inverted V Ranger engine which gave it a top speed of 235 mph. Provision was made for four passengers and a pilot. It was built by the Fairchild plant at Hagerstown, Md.

Wayne Christison, Emmett, Idaho.

• The Clark F-46 was an experimental plane to test the practicability of the Duramold process, which consisted of molding plywood to the required shape of fuselage, wing or tail surfaces. It was never intended to go into production as far as we know.

Those $$ for Defense . . . In my September issue just received you have an editorial called "Dollars for Defense . . .?" where you talk about how much money was being spent for other government stuff and how little for planes needed by Army & Navy.

You guys asleep? Haven't you heard about Korea and the billions of bucks for more warplanes?

Jerry Marone, Jersey City, N. J.

• We're not even dozing. The September issue went to press exactly one week before the North Koreans launched their war. The sudden expansion of our warplane program followed.

Showcase

Contact your hobby shop for items shown here. Both the price and the specifications are subject to change.

A streamliner in its day, the 1909 EMF "30" racer is the newest addition to the Fador Mfg. Co.'s line (501 E. Clinton St., Elmira, N. Y.) This forerunner to the Studebaker has a wheelbase of 6¼ in., retails for $2.50 in kit form. Features single bucket seat, double gas tanks. Concern has created the Smallster Auto Club which purchasers of Fador auto kits are invited to join. Members receive data on the historic autos they build. . . . De Bolt Model Engineering Co. (Williamsville, N. Y.) has released the Speedwagon "50" control line speed kit which qualified for the A.M.A. national Class D speed record. The speed model takes McCoy 49 or 60 engine and sells for $5.95. Design is a refinement of Harold deBolt's winning ships. Features include "circle flight" with "weather vane" stability; an anti-spin guide; a pressure cowl and a pressure fuel system. Balsa parts are shaped. Full-length steel-reinforced maple crutches support powerplant. . . . Newcomer to the prop field is the Pam plastic blade model propeller which the P.A.M. Propeller Co. (Box 1268, Dallas, Texas) folks say was five years in the development stage. Diameter is 11 inches, pitch is adjustable. Hub is chrome-moly steel. Blades are matched for size and weight. All props are guaranteed against defects. Sells for $1.00. . . . Duro-Matic Products Co. (Hollywood, Calif.) has introduced its 1950 "Hot-Point" glow plug which has a special Iridium Platinum element. D-M says it will improve the starting and power output of any model engine. Designed for high rpm, long life and easy starting, this lightweight plug stands pressure up to 1,800 psi, several times the pressure developed by the average model engine. Special patented material which stands high pressures and extreme heat is used for the gasket seal. Individually packaged, Hot-Point glow plug is priced at 49c. . . . In the event that you missed them the past couple of months, we want to call the attention of all gasoleers to the plug connectors that are on the market. Illustrated here is the K&B Slip-On connector. Takes all engines up to .074 and some of the .09's. At your dealer's, 19c. Ohlsson and Rice have an O&R Instant Clip which fits all O&R plugs,


Fador's EMF


Dimeco's "50"


Pam Prop

Showcase

Try your favorite hobby shop for items presented here. Write the manufacturer if you can't find it.

plus many others. By itself it sells for 15c; with double lead and battery terminals, 35c. Big deal about any such connector is that you no longer have to worry about shorting out your battery by inadvertently crossing lead ends in your anxiety to get a motor airborne. . . . Staring at you below: Development Engineering Co.'s (Box 691, Hagerstown, Md.) team racing pilot which is in the exact 1/10 actual scale required by the A.M.A. team racing rules. For those of us who can't carve, Dan Deco is just the fellow we want in our team racer. . . .

Comet Model Hobbycraft (129 W. 29th St., Chicago) advises of a new line of 10c Struct-O-Speed prefabs, the "C" series which is made up of Piper Cub, Taylorcraft, Aeronca, Stinson Voyager, Cessna and Fokker D-8. "M" series of S-O-S prefabs sells for $1 and includes plastic molded parts. They take motors up to .045 cu. in. "M's" are Taylorcraft, Piper Cub and Aeronca. Comet also announces a new Piper Cub Trainer, $1.95. This control-line training kit model will take engines up to .074 cu. in. Concern says it's excellent for beginners. . . . One of the most comprehensive catalogs of books on leisure-time activities is Polk's Model Library for Hobbyists available from Polk's Model Craft Hobbies (314 Fifth Ave., N.Y.C.) for 10c in coin or stamps. It lists 66 models and full-scale aviation books, plus many books on associated hobbies. . . . A biplane model with a completely carved fuselage retailing at $1.50 is Scientific's (113 Monroe St., Newark, N. J.) Little Bipe. For engines from .02 to .09, this U-control kit makes up into a model with span of 16 inches, length of 11½ inches and weight of 4.5 oz. All parts are cut and shaped. Features Walker's U-control system. . . . Latest entrant in the .045 engine field is Mel Anderson Mfg. Co. (1819 Third Ave., Los Angeles) with "Spitzy." Engine comes in a combination package at $3.95 featuring engine and tank, glow plug, combination clip, prop, prop wrench and mount bolts. . . . . Latest addition to Jasco's (Junior Aeronautical Supply Co., 203 E. 15th St., New York 3, N. Y.) famous Phoenix series is the IMP, a high-performance contest A/2 free flight. Designed by Frank Ehling, the Imp has a span of 29 inches, area of 120 square inches, and uses any A/2 engine from .020 to .049 cubic inch displacement. Ribs are die-cut; price $1.45.

Showcase

Contact your hobby shop for items shown here. Both the price and the specifications are subject to change.

A new name in the model field is Airlane Model Co. (318 W. 29th St., Chicago). Outfit starts out with a series of 25c prefabbed scale models, rubber powered. These are the 13-inch-span Beechcraft Bonanza, and the Stinson Voyager, Taylorcraft, Piper Cub, Aeronca and Cessna 170, all 15 inch span. Kits have plastic prop, bent landing gear, hardwood wheels, thrust button, rubber motor and prop shaft. . . . The "Sioux" is a free flight model kit by Henry Engineering Co. (Box 229, Burbank, Calif.) and was designed for engines from .035 to .074 cu. in. displacement. Wingspan is 36 inches, wing area 180 sq. in. Priced at $2.25. . . . Sterling Models (406 Vine St., Philadelphia) is out with Sterl-X, a clear hot fuel-proof fuel line tubing in two sizes, 3/32 inch inside diameter by 3/16 inch outside diameter and 1/16 inch inside diameter by 1/8 inch outside diameter. Latter is for infant-size engines, other for 'most all others. Sterl-X lasts four to five months under contest use, holds up under temperature ranges from -16 degrees F. to 175 degrees. Large size is 15c per foot; small size, 12c per foot. . . . Acme Model Engineering Co. (8120 7th Ave., Brooklyn, N. Y.) offers its new Type D tank as either a 1½ or 2 inch long job with a front bracket that mounts right on the back of an O&R 19, 23, 29 & 33, or a K&B 24, 29, 32. With other engines it can be mounted flush against the firewall. Long, rectangular tank retails for 79c. . . . A recent Comet ad (see item on preceding page) brings back a famous name—the Dipper, a 50c kit. Many an old-timer built the Dipper and Dart models of early Comet concern. Both were small rubber-powered free flighters.

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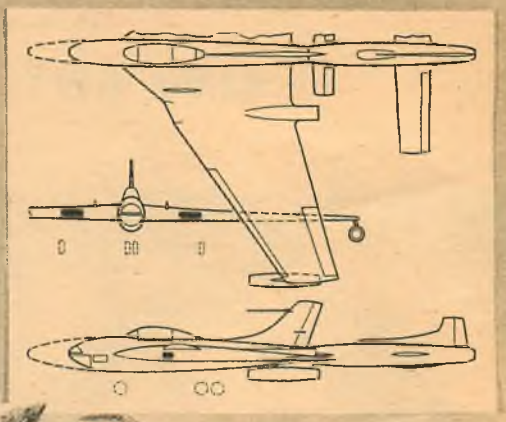
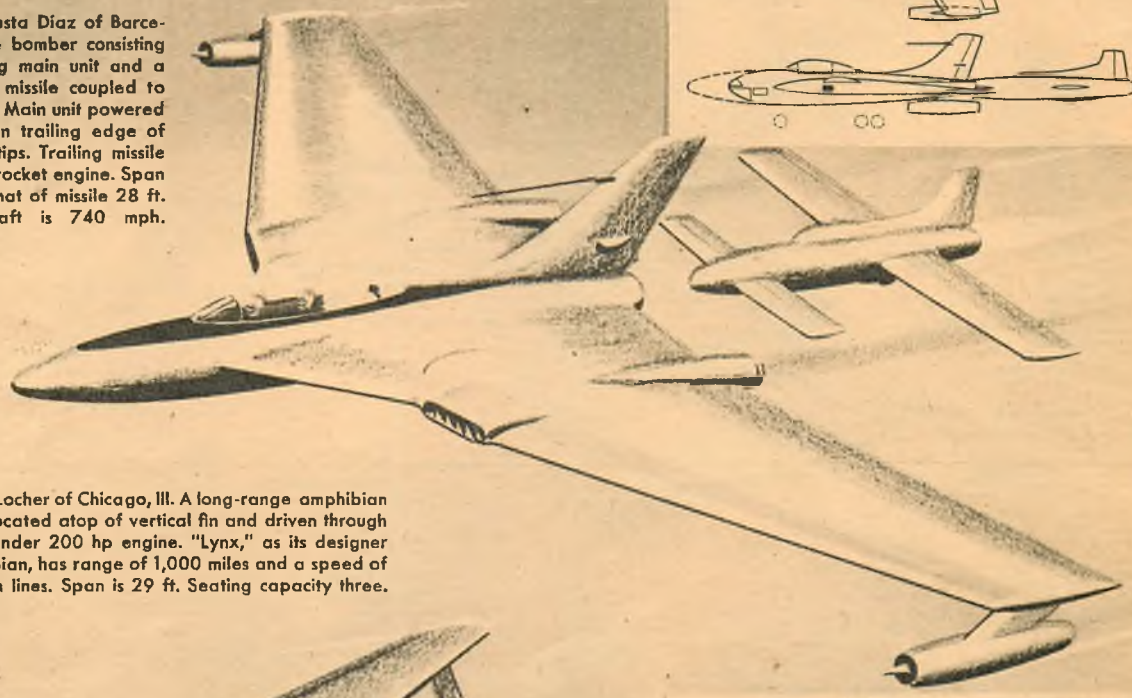
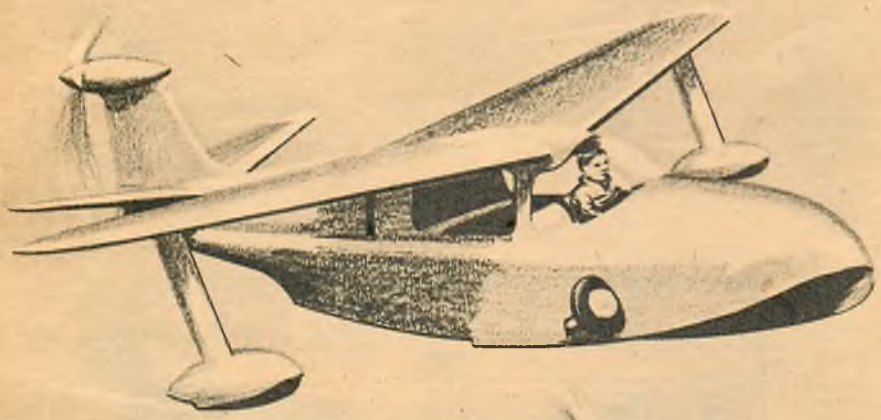
DESIGN COMPETITION

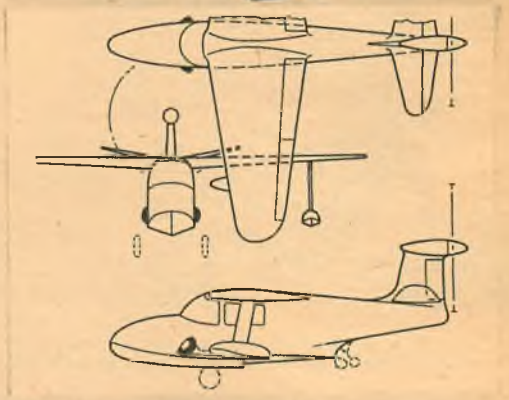


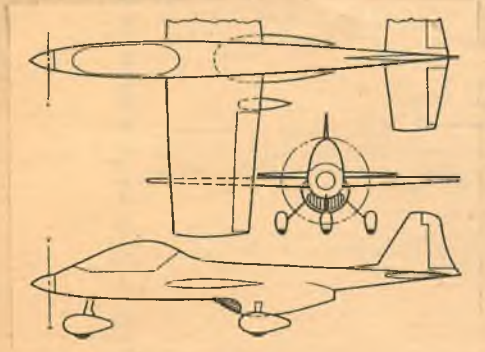
First prize: by Pablo Ayesta Diaz of Barcelona, Spain. A composite bomber consisting of a manned flying wing main unit and a canard radio-controlled missile coupled to rear of the mother-plane. Main unit powered by 2 turbo-jet engines in trailing edge of wing and 2 ram-jets at tips. Trailing missile derives its power from a rocket engine. Span of flying wing is 85 ft., that of missile 28 ft. Top speed of this craft is 740 mph.

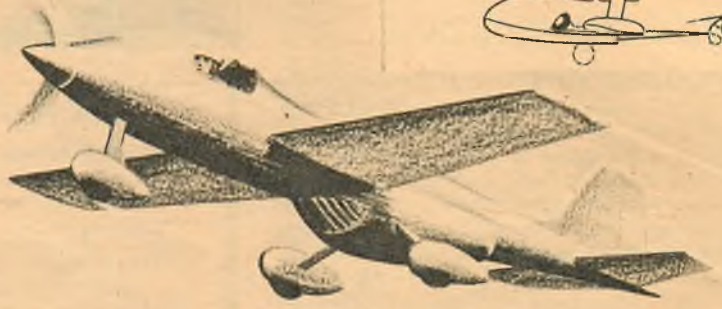


Second prize: by Richard Locher of Chicago, Ill. A long-range amphibian with a pusher propeller located atop of vertical fin and driven through geared shaft by a 6-cylinder 200 hp engine. "Lynx," as its designer calls the all-metal amphibian, has range of 1,000 miles and a speed of 170 mph, thanks to clean lines. Span is 29 ft. Seating capacity three.









Third prize: a single-place racing plane of the 190 cu. in. midget formula by Ernest Barter, Oakland, Calif. Novel design features mid-fuselage location of engine which drives propeller through shaft and chains running in oil bath. In this case the ailerons act also as flaps. The plane has speed of 180 mph.

Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½ x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of $25. Payments of $5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, Box 489, Elizabeth, N. J. The editors regret that because of large number of entries they cannot enter into correspondence on Airmen of Vision.

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*Robert B. "I wanted to let you know how much I appreciate your help in securing this position. I work in the Missile Flight Test and Analysis Department and am very satisfied with the type of work. Mr. (another Northrop graduate) is also employed in the same department, and Mr. (still another Northrop graduate) of my own class is here but in another department. We're looking forward to seeing future Northrop graduates down here."

*Roy B. "I have been working for (name of aviation firm) and have been putting in some terrific overtime. We manage all the way up to 70 hrs. a week and it doesn't make anyone angry either, with time-and-a-half and double time."

*These are actual quotes from only a few of the letters on file in the N. A. I. Graduate Placement Department. Names are abbreviated out of respect for personal privacy.

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air notes | AVIATION TODAY AND TOMORROW

New Liaison Plane: The first large order since World War II for lightplanes for the Army Ground Forces has been placed with Cessna Aircraft Company following evaluation tests of a number of observation-reconnaissance prototypes. The winning Cessna Model 305, which in military terms will be the L-19A, is a single-engine, high-wing, tandem-seating, two-place liaison plane. Four hundred of these ships will be procured, with deliveries due to begin in December, 1950.

The L-19A is of all-metal construction, with a steel spring landing gear that combats ground-loop tendencies and makes rough field operation possible. The plane is powered by a Continental Model E-190 engine, which can provide 213 horsepower for short take-offs under adverse ground conditions.

Army aircraft of this type are part of the normal combat equipment for infantry, combat engineer, and armored cavalry regiments; certain Signal Corps units, Army Headquarters, and training schools. They are used for reconnaissance to locate targets, adjust artillery and mortar fire, obtain information on enemy defense forces, perform limited front-line aerial photography; they serve in emergency wire-laying, aerial resupply, and evacuation of wounded, as well as in staff transport, courier service, and training.

Engine Testing: An accelerated engine testing program believed to be the first of its kind attempted with jets, is being carried on by the General Electric Company with an Air Force B-45 bomber. The purpose of the program is to pile up hundreds of flight hours on the plane's J-47 engines in the shortest time possible under known service conditions. Data on service life of the engines, overhaul intervals, and modifications necessary will be made available weeks, and sometimes even months, before it could be compiled as the result of normal practice missions.

Cross-Country Tracker: "Navigation made easy" is the promise of a new flight instrument developed by a manufacturing company in Ohio. The instrument, called the Grimes Navigator, is a device which automatically converts time to distance after the pilot sets his estimated ground speed and starts the built-in timer. At any point en route, the pilot may read from the instrument face the number of ground miles he is from point of departure. By referring to his chart and to the instrument's transparent navigation tape marking his course, he can see his exact position at a glance.

Flaps from a Kit: Something new in private planes is the wing-flap kit now being built by the Luscombe Company. The new kit, say Luscombe's engineers, radically improves short-field performance, permitting take-off over a 50-foot obstacle in 600 feet or less, and landing in 450 feet or less. The flap kit sells for $300 and can be installed in any metal-wing Silvaire.

New Sonic Tests: After an intensive 18-month testing program by company crews, Northrop has delivered to the Air Force its two X-4 research planes. USAF will flight-test the tiny swept-wing craft. The X-4's, latest in the famous "X" series of experimental planes, are designed to explore the high-velocity band just under the speed of sound. They are powered by two turbo-jet engines which will make possible flights of comparatively long duration at high subsonic velocity.

ANG Pilot Training: Air National Guard enlisted men who want to become pilots will get a break under a new program announced by the Air Force for providing NG pilot replacements. Eligible enlisted men of the ANG may now be trained as pilots by the Air Force for service as pilot-officers with Air Guard units. Air units may enlist men specifically for the pilot training. Requirements: age 20 to 26½, with two years of college. Three years' service as Air Guard pilots is required following the flying course.

Omni in Plastic: The new look in omniranges is a circular plastic dome to shelter antennae from the weather. CAA has ordered the plastic domes to replace the square antenna houses now in use on some 400 omnirange towers. Advantages of the new domes are the plastic's uniformity of thickness, low moisture absorption, and minimum interference with transmitted signals.

Pack Plane Premiere: The Fairchild XC-120 Pack Plane, which has a detachable cargo pod that may revolutionize future military logistics, has been rolled out of its production hangar ready for Air Force testing. Its first flight, tentatively scheduled for mid-summer, probably is history by now. The Pack Plane is similar in appearance to the C-119 Packet and will have basically the same operating characteristics, plus many new potentialities due to its detachable cargo compartment.

A transport plane of this type should be able to eliminate the long, expensive periods on the ground while cargo is being loaded or unloaded, as is necessary with present planes. A loaded fuselage on the Pack Plane could be detached for later unloading and reloading and the plane sped on in a matter of minutes with a new preloaded cargo pod attached. There are also interesting possibilities in the development of special types of pack sections, such as hospitals, communications centers, or repair shops, which could be flown in ready for operation wherever needed.

To speed up attaching and detaching time, the XC-120 has a unique quadricycle gear that will permit rolling away of the cargo section from either end of the plane. The plane rolls on four dual-wheeled main gears, two on either side. In addition, the fuselage has four smaller dual-wheeled gears which permit it to be towed about on the ground.

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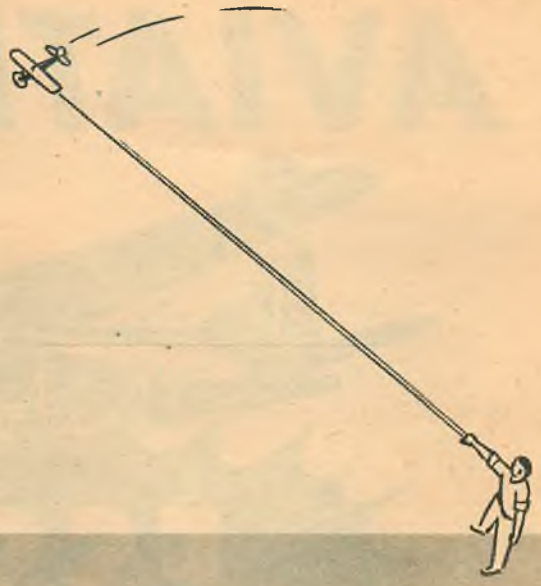

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TRAIN IN MIAMI -- AIR CAPITAL OF THE WORLD

AIR TRAILS
OCT., 1950

Commies in Profile

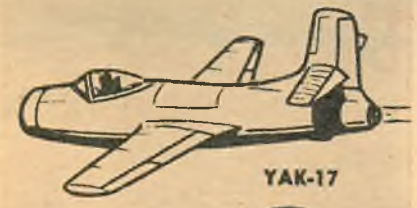
Some months back Air Trails presented evidence that the Reds weren't stallin' when it came to aeronautical advancements. Here's an up-dated report on the latest Russian warplanes that comes from behind the Communist curtain. It proves that the Reds will be hard to beat in the air.

COMMIES IN PROFILE

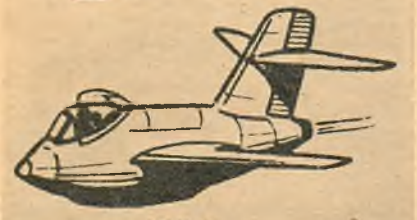
FIGHTERS

YAK-9

YAK-15



YAK-17



YAK-21

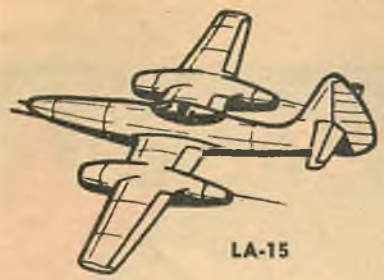
MIG

MIG-9

LA-9

LA Fighter

LA Research



LA-15

HELICOPTERS

VERTOLYOT

OMEGA

OMEGA II

■ To underestimate the strength, brains and ability of a potential enemy is one of the most serious mistakes a nation can make. Although a country may seem backward to us by our own standards of everyday living, it does not follow that its military might and know-how are on the same, less favorable level. The most striking example of this paradox today is Communist Russia, and perhaps the most arresting phase of that example is its air force.

Always having produced good firearms, artillery and tanks, the USSR is turning out a first-class air arm which in quality approaches ours and in quantity probably far exceeds it. Shrewd and unhampered by economic aspects of government purchases, Russia solved its engineering and technical handicaps by acquiring some of the best scientific brains of Germany; moved a number of German plants into its interior, and has in its possession many of the latest Nazi research and experimental aircraft, jet engines and guided missiles. Add to all this the fact that Soviet industry has remained on a war footing, and it is not hard to conclude that the Communists would make a formidable adversary in the air.

The Soviet planes shown on these pages confirm the strength of the Russian Air Force. That the information on them is available also points to the likelihood the Commies have bigger and better aircraft up their commodious red sleeve.

It might be pointed out that Russian airplanes are designated by the first two letters of their designers' names and not by type as in the United States. Thus the prefix YAK means the craft was designed by Alexander Yakovlev; LA, by Semyon Lavochkin. If more than one person was responsible for the design, the designation combines the initials of all, as in the case of the MIG, the designers of which were Mikhoyan and Gurevitch.

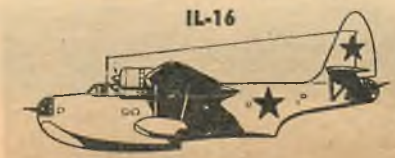
Engine designers are also honored by having their names affixed to the name plates of engines, except that the initials of the first name are added to those of the given name. Thus, the ASH radial air-cooled engines are named after A. Shvetsov; the 12-cylinder V-type liquid-cooled powerplants AM and VK after A. Mikulin and V. Klimov. However, the Russians in some cases stick to the all-over designation of "M," (for motor) as exemplified by the engine designation of the small MIG Utka liaison plane and the large four-engined transport TU-70.

BOMBERS

TU-70B

YER-2

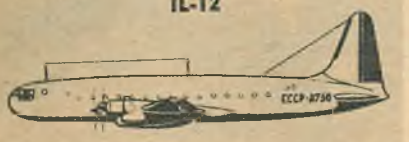
IL-16



MTB-2

TRANSPORTS

IL-12



IL-18

SCE-2

KC-20

SPECIAL ATTACK CRAFT

IL-10

PE-3

Fighters

YAK-9. This is a World War II single-place fighter of which there are three variants, 9D, 9U and 9T. The D is a conventional high-altitude aircraft while the T and U were modified to act as tank destroyers and low-altitude strafers. The D was armed with a 20-mm cannon firing through the propeller hub and two synchronized 50-cal. machine guns in the engine cowl. In the other two models the 20-mm cannon was replaced by a 37-mm. The structure of the three models is the same, consisting of a steel tube fuselage covered by plywood shell. The wing has an extruded aluminum spar, wooden ribs and plywood skin. Control surfaces are fabric covered. The YAK-9 is also used by the Polish and North Korean air forces.

Wingspan 32 ft. 10 in. Length 27 ft. 10 in. Gross wt. 7,100 lbs. Powered by a V-12 liquid-cooled engine rated at 1,260 hp. Maximum speed 370 mph. Range 900 miles.

YAK-15. The first Russian service jet fighter, this is now relegated to secondary duty of training jet pilots. Early news reports had this airplane appearing on the Korean front. In any case, it is likely the Russians do not find its performance adequate for their own service squadrons. It is claimed that the YAK-15 made its debut in small numbers when the Soviet Forces entered Berlin in 1945. Contrary to general practice, YAK-15 has two-wheel landing gear.

Wingspan 32 ft. 10 in. Engine Junkers Jumo type developing close to 4,000 lbs. of thrust. Maximum speed, approximately 500 mph.

YAK-17. A new fighter, information on which is not available. Generally resembles our Republic F-84. Tail-surface shape departs from usual Soviet practice, especially as to the rudder, which in most cases has a well-rounded trailing edge.

YAK-21. To call this airplane YAK is a typical Russian stunt, for it is nothing more than a redesigned Messerschmitt 163 or its later version known as Junkers 248, the famous German rocket fighter. The designer Yakovlev did add a horizontal tail to the original version. The YAK 21's are known to be in mass production and fitted with adequate artillery to take care of any high-flying enemy bombers which may invade Soviet territory. Duration 15 minutes.

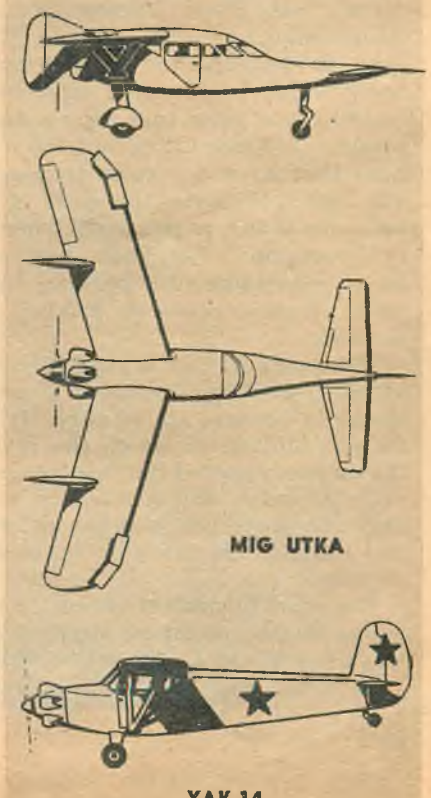
MIG—. This is a design by the combined forces of Mikhoyan and Gurevitch who produced a number of successful fighters during the war. This particular model is based on one of their latest efforts in piston-engined single-seaters to which has been added a liquid-propellant rocket located in the rear section of the fuselage. Whether this design was an experimental one to test rocket propulsion or whether it is a standard service aircraft equipped with rocket boost for extra thrust is a matter of speculation. By all outward appearance the plane is similar to the MIG-5. The piston engine is a 14-cylinder, air-cooled radial ASH-82 rated at 1675 hp.

MIG-9. This is a twin-jet heavy fighter with both engines located on the underside of the fuselage, which has a single divided air intake in the nose. The two powerplants are variously reported to be either the German BMW 03 of 3,300 lbs. thrust each, or the Russian Chelomeyov, a modified version of the BMW design, but of greater (*Continued on page* 73)

TRAINERS

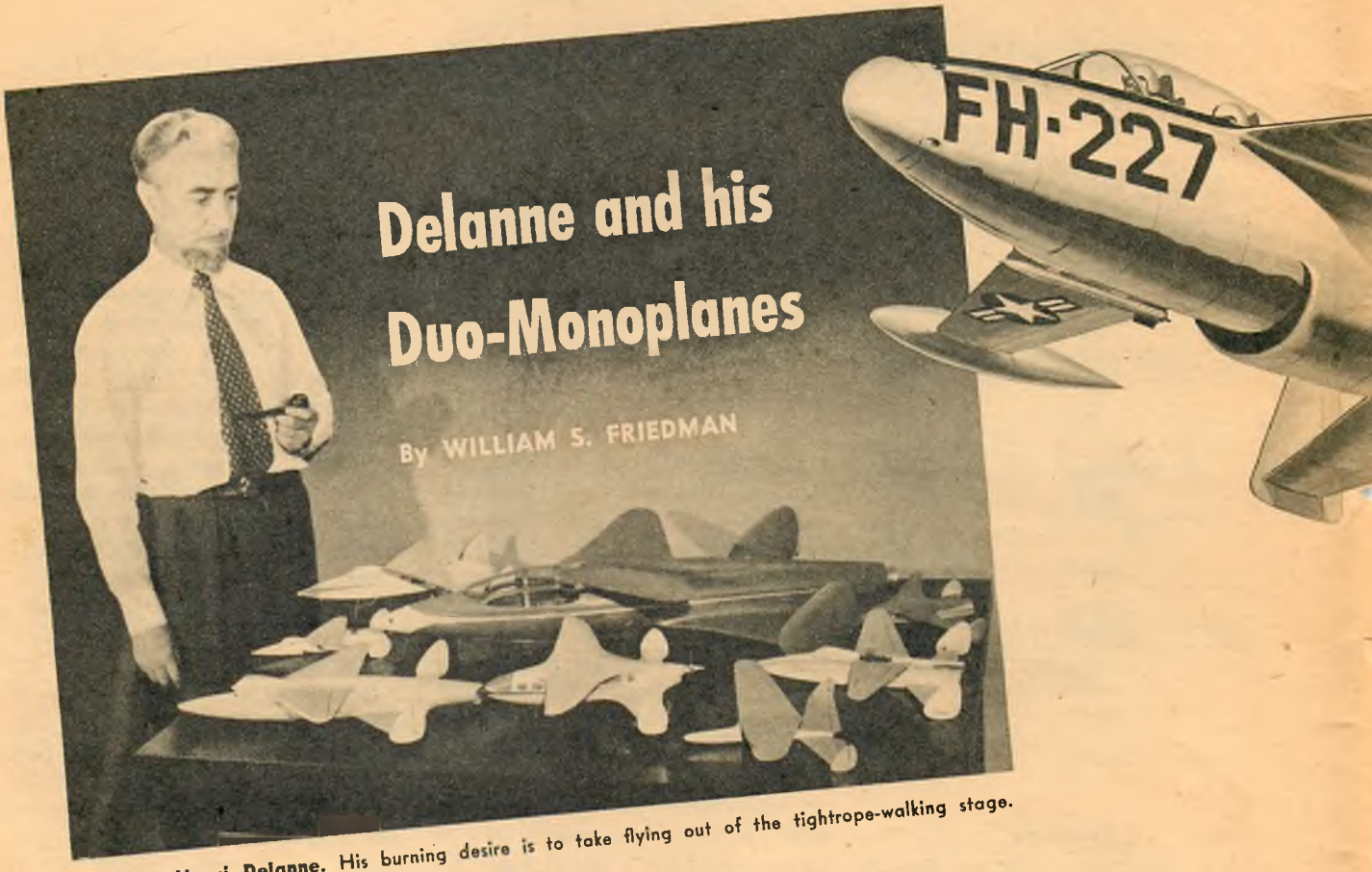
YAK-20

LIAISON



MIG UTKA

YAK-14



Delanne and his Duo-Monoplanes

By WILLIAM S. FRIEDMAN

Maurice Henri Delanne. His burning desire is to take flying out of the tightrope-walking stage.

How a brilliant French designer kept from the Nazis the secret of his sensational plane that may solve one of our most critical air problems today

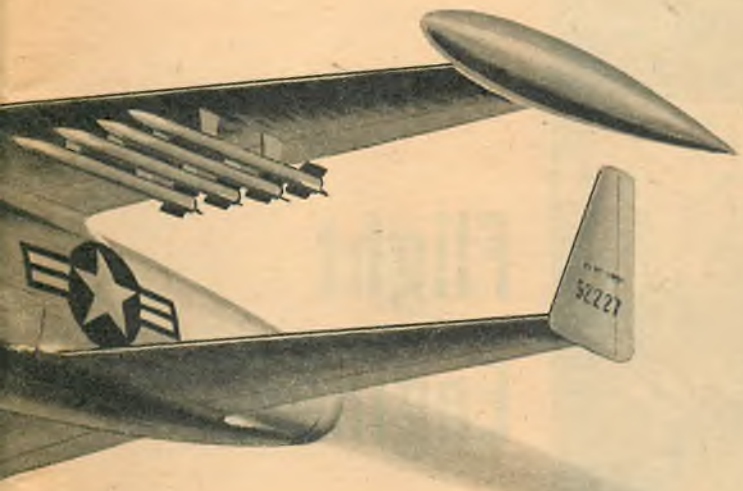
■ In a quiet, cell-like room, below the level of New York's busy Park Avenue sits a studious engineer named Maurice Henri Delanne. His hair streaks from grey to dead white—characteristic irregularity for those whose hair turned color in a hurry. His neat beard is iron grey, and from a distance, he looks like a venerable savant, except for a pair of lively blue eyes that have a certain teen-age sparkle to them. His face still carries the scars of great suffering, but his voice is gay, particularly when he talks about "my configuration." For these two words represent his prize possession—the possible solution to aviation's most pressing problem: landing speed and take-off distance.

The configuration is currently being merchandised as the Duo-Mono type. It is somewhat unconventional in general appearance. It resembles a highly stagger biplane in which the rear airfoil, located at the extreme rear of the fuselage, is somewhat smaller than its mate, and mounts on its trailing edge not only elevators but ailerons as well. End-plate fins and rudders are mounted on either side of the rear member.

The exact formula covering the relation between the wings in size, distance, angle of attack and the like was the prize in a neat yet terrible battle of wits and patience between Maurice Delanne and the agents of the Luftwaffe. Had the Nazis won, they might have had in their possession a system for giving their bombers and fighters faster take-off, greater range and cruising speed as well as better payloads and maneuverability. The end effect cannot be calculated at this point. However, the mathematical proof of the efficiency of this formula is so fantastic that it has taken since 1946 to convince some of our leading manufacturers that it was even possible.

Now, through a slow and scientific presentation of the facts, a number of leading plane builders are re-examining the Duo-Mono system. This time, they must. With the demand for higher cruising speeds for fighters and bombers, landing speeds and take-off distances are becoming impossible. The high-lift devices currently known are definitely limited, and jet-assisted take-off is not only expensive but has strict limitations for formation and rapid-sequence take-off. Something new has to be added. Delanne's Duo-Mono configuration may very well be it.

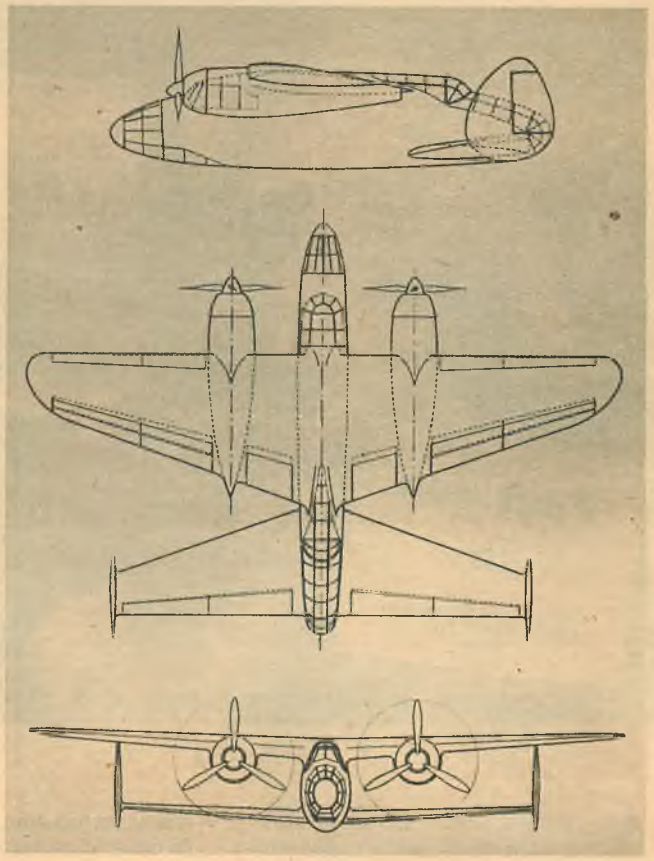
Those men who have had the opportunity to examine the Duo-Mono type's performance have great faith in its possibilities; but success or failure, it is the center of one of the most dramatic stories of our times, the story of a stubborn and courageous man



Delanne jet fighter as visualized by our artist. Top speed should be 700 mph.

who knew that he had something to offer mankind, and was bent on seeing it used for good purposes only.

Maurice Henri Delanne was born in the town of Diors in France early in 1901. He grew up in the golden age of French aviation, the age of Farman and Bleriot; of Fonck, Guynemer and Nunguesser. He received his degree at the famed Superior School of Aeronautical Engineering in Paris, in 1924. Having some funds of his own, he founded his own company, the "Société Anonyme de Recherches Aeronautique." In this era the biplane was still supreme. Surplus equipment from World War I was still available, so Delanne decided that what (*Continued on page* 60)



Twin-engine bomber was in the design study stage as a special project for the French Air Force when the Nazis struck.

Model 20T-02. First Delanne Duo-Monoplane to fly. Had remarkable performance considering that it was powered by only 180 hp. Rate of descent in stall comparable to that of a parachute. Rudders, in this instance, act as tip plates, increasing efficiency.

Flight Engineer

"The Third Man" is the theme of this career report; the flight engineer is a specialist whose field is growing every day

■ Jack Allen turns his head slowly, staring at a multitude of gimmicks. He's sitting at the flight engineer's station in the crew compartment of a Constellation mockup.

Left to right, Jack fingers master propeller control throttles, supercharger controls, mixture-tank valves, carburetor air, cowl flaps, feathering, fuel boost, oil cooler flap. Altogether, Jack flips 25 engine and 14 propeller controls, 25 fuel valves, 22 oil switches and valve controls, and 10 heating switches.

Within easy reach he sees exactly 295 gadgets, all able to do something to tell him what's going on inside the many mechanical assemblies that fly the aircraft and keep the passengers comfortable.

Jack is an embryo flight engineer. Those scores of dials and gauges and knobs seem appalling for the moment. During the next 12 weeks he will study and handle them every working day. He will bone up on his mathematics—algebra, plus a smattering of trigonometry. Later 50 hours of transitional air training will knock off the rough edges.

Soon Jack will be flying on regular schedule with one of the air lines. His acceptance means he now is a specialist. Not a mechanic, not a pilot, he's the third man of a smoothly operating team. Actually, he becomes the mechanical side of the pilot. There are several thousand like him in the business today, if you include the armed services. His job is expanding, and will continue to do so as aircraft grow larger and more complex.

Sitting at the gauge-dotted console, only a few feet aft of the pilots, Jack will handle engine power, cabin pressurization, air-conditioning, and the electrical and hydraulic systems. It is he who will control fuel mixture, feather the props, dump fuel in an emergency, depressurize the cabin if required.

Jack might be considered a preventive maintenance man. Lots of thought has been given to prevention in recent years, ever since the Air Force set out to learn what was downing B-29s in the Pacific during the war. He will learn to interpret, through manifold gauges and indicators, what the engines try to tell him. Like a doctor listening through a stethoscope, he will learn when the beating hearts are about to fail.

More broadly, Jack and his kind are safety addictives. The CAA agrees that most accidents occur only after the pilot has reached the point, through fatigue and time, where he cannot use his head to think out a plan of action because he is using his hands in too many directions.

Jack wasn't aboard when a northbound Connie put down three times in zero-zero night landings not long ago. An older and more experienced flight engineer sat at his station that night. Rain was falling from 8,000 feet as the plane roared into the traffic pattern at Washington, D.C. To the crew, dove-tailing their duties with symphonic precision, it was only another let-down. The captain, sitting at ease, handled the radio. At intervals he called out instructions. His copilot flew the plane according to the captain's orders. For his part, the flight engineer juggled power settings, dropped the flaps, made other fine adjustments, finally cut the power. They were down on the first approach. Twice again that night those three people landed the plane zero-zero, at LaGuardia and Boston, with first-time approaches.

The captain had confidence in his first officer, and both trusted the flight engineer to do his job efficiently and safely!

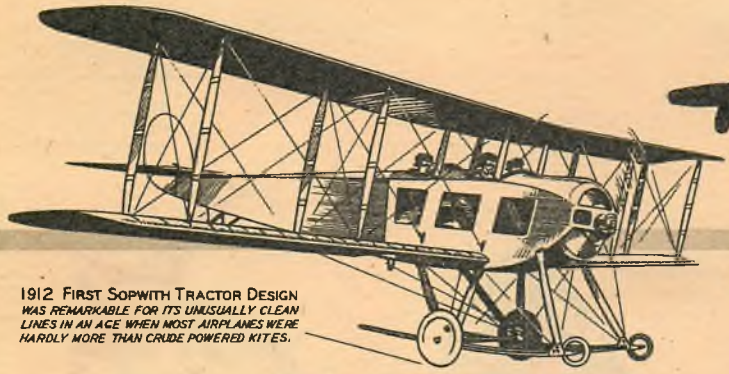
Jack knows he will stick to reciprocating engine aircraft for several years, at least on commercial runs. From his transition flights, he has learned that modern planes have become flying power stations—their generators turning out enough juice to light a small town. His biggest worry is whether he will do his job well and offload worry from the captain.

"Pilots," he confides, "have become so confused, handling scores of knobs and watching hundreds of dials, they (*Continued on page* 80)

Hawker Super-Fury

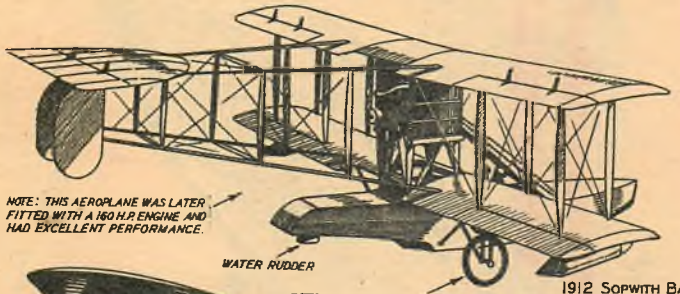
AIR-BORN IN 1933, THIS RAF FIGHTER WAS FASTEST PLANE OF TIME. TOP SPEED, 252 MPH

Air Progress



1912 First Sopwith Tractor Design
Was remarkable for its unusually clean lines in an age when most airplanes were hardly more than crude powered kites.

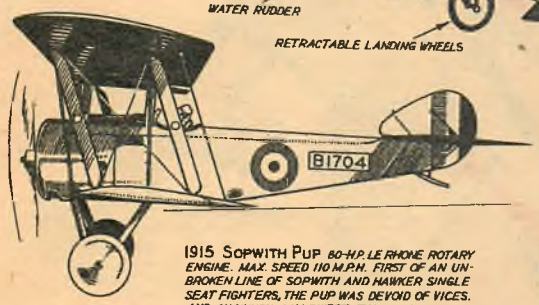
1913 Sopwith Tabloid
80-H.P. Gnome rotary engine. Max. speed 92 M.P.H. The Tabloid revolutionized all previous concepts of airplane performance and is the ancestor of all present-day single-seat piston-engined fighters.



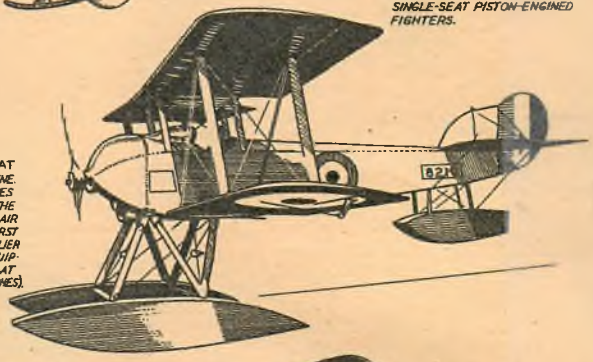
Note: This aeroplane was later fitted with a 160 H.P. engine and had excellent performance.

Water rudder

Retractable landing wheels

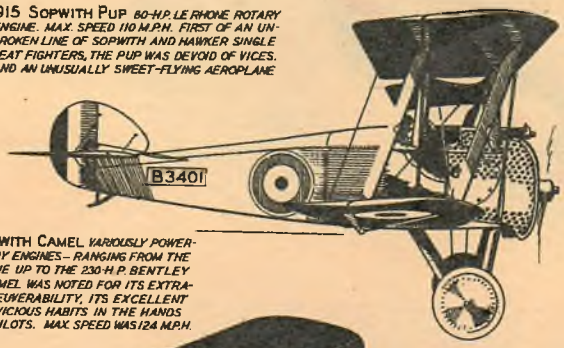


1912 Sopwith Bat Boat
80-H.P. Austro-Daimler engine. One of the few pusher types produced by this company, the Bat-Boat takes its place in air progress as the world's first genuine amphibian (the earlier Fabre "amphibian" was not equipped with wheels—made float landings on open sandy beaches).

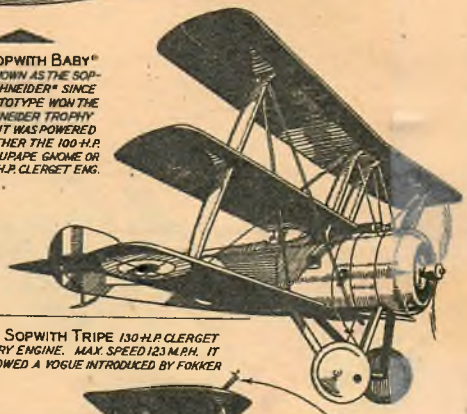


1915 Sopwith Pup *80-H.P. Le Rhone rotary engine. Max. speed 110 M.P.H. First of an unbroken line of Sopwith and Hawker single seat fighters, the Pup was devoid of vices, and an unusually sweet-flying aeroplane*

Douglas Rolfe

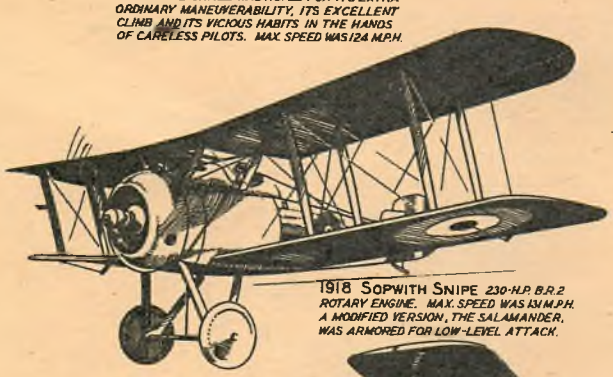


1914 Sopwith Baby*
**Also known as the Sopwith "Schneider" since the prototype won the 1914 Schneider Trophy races. It was powered with either the 100-H.P. Monosoupape Gnome or the 110-H.P. Clerget eng.*

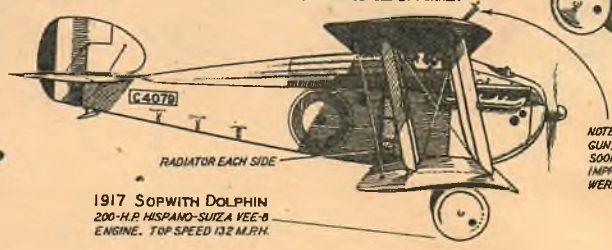


1916-18 Sopwith Camel *Variously powered with rotary engines—ranging from the 110-H.P. Le Rhone up to the 230-H.P. Bentley B.R.2—the Camel was noted for its extraordinary maneuverability, its excellent climb and its vicious habits in the hands of careless pilots. Max. speed was 124 M.P.H.*

1916 Sopwith Tripe *130-H.P. Clerget rotary engine. Max. speed 123 M.P.H. It followed a vogue introduced by Fokker*



1918 Sopwith Snipe *230-H.P. B.R.2 rotary engine. Max. speed was 131 M.P.H. A modified version, the Salamander, was armored for low-level attack.*

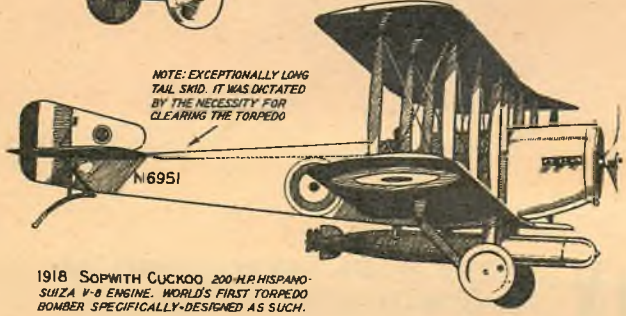


Radiator each side

Note: The flexibly gun, or guns, were soon found to be impractical and were eliminated

1917 Sopwith Dolphin
200-H.P. Hispano-Suiza Vee-8 engine. Top speed 132 M.P.H.

Note: Exceptionally long tail skid. It was dictated by the necessity for clearing the torpedo



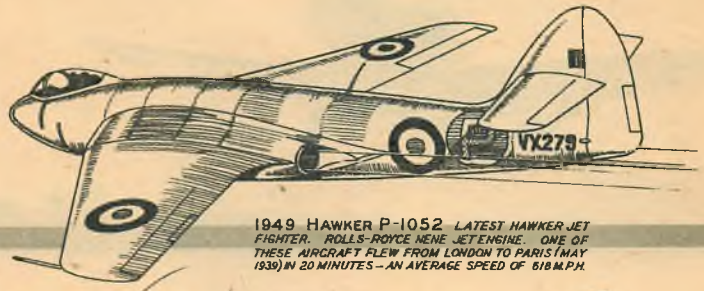
1918 Sopwith Cuckoo *200-H.P. Hispano-Suiza V-8 engine. World's first torpedo bomber specifically designed as such.*

The Hawker name immediately suggests fighter planes in aviation circles. During World War I this British company produced more than 12,000 first class single-seat fighters, and managed to come up with at least two of the very best fighters in World War II. Founded in 1912 by T. O. M. Sopwith, a wealthy sportsman pilot, it was originally named the Sopwith Aviation Company. Associated with Sopwith were Fred Sigrist, designer, and Harry Hawker, test pilot. The latter, of course, is responsible for the name of the present firm.

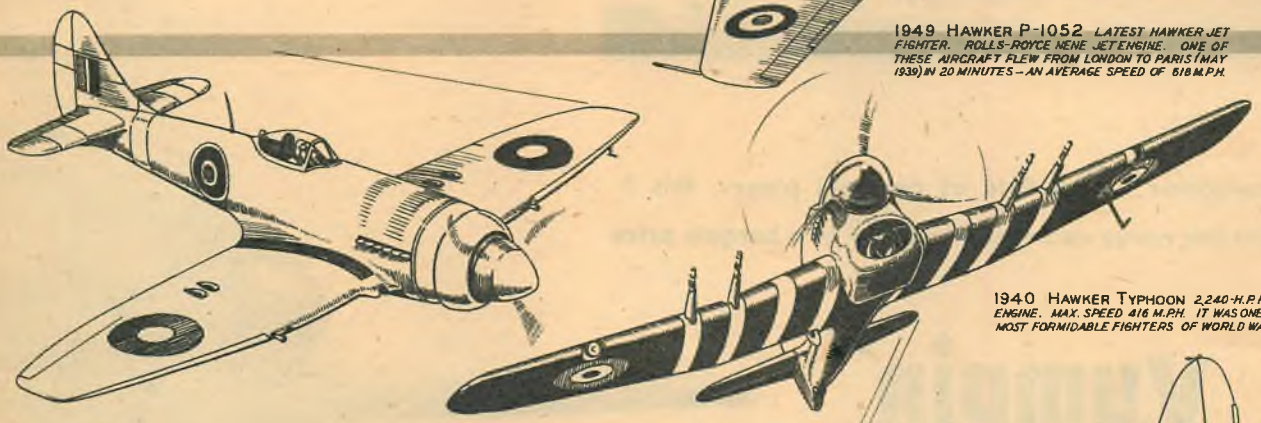
From the very start the Sigrist-Sopwith-Hawker planes were notably superior to most contemporary design. The revolutionary Tabloid, an exceptionally clean single-bay strutted biplane may

The HAWKER Story

By DOUGLAS ROLFE

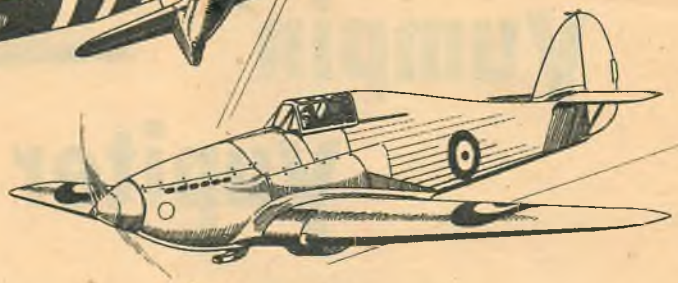


1949 HAWKER P-1052 *LATEST HAWKER JET FIGHTER. ROLLS-ROYCE NENE JET ENGINE. ONE OF THESE AIRCRAFT FLEW FROM LONDON TO PARIS (MAY 1939) IN 20 MINUTES — AN AVERAGE SPEED OF 618 M.P.H.*

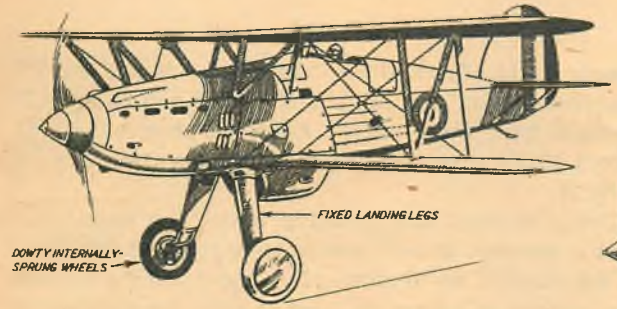


1940 HAWKER TYPHOON *2,240-H.P. NAPIER ENGINE. MAX. SPEED 416 M.P.H. IT WAS ONE OF THE MOST FORMIDABLE FIGHTERS OF WORLD WAR NO. 2*

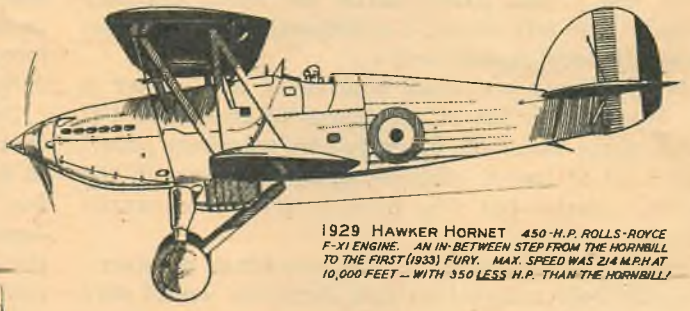
1947 HAWKER TEMPEST *2,240 H.P. LIQUID-COOLED 24-CYLINDER H-TYPE NAPIER SABRE ENGINE. LAST AND FASTEST OF THE PISTON-ENGINE HAWKER FIGHTERS. MAX. SPEED 392 M.P.H. AT SEA LEVEL — 435 M.P.H. AT 17,500 FEET. AN EARLIER VERSION OF THE TEMPEST WAS USED WITH CONSIDERABLE SUCCESS DURING THE LATTER PART OF WORLD WAR 2 TO COMBAT THE V-1 BUZZ-BOMBS.*



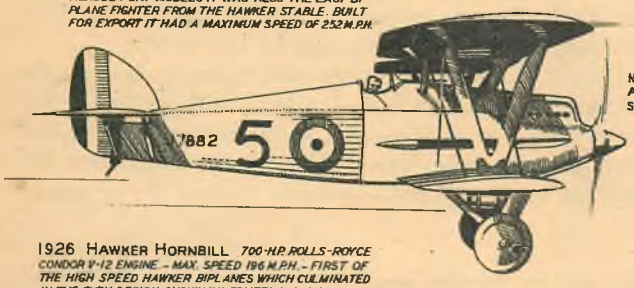
1935 HAWKER F-36 34 (PROTOTYPE HURRICANE). *1025-H.P. ROLLS-ROYCE MERLIN ENGINE. MAX. SPEED 325 M.P.H. THE HURRICANE MADE HISTORY DURING THE BATTLE OF BRITAIN*



1936 HAWKER FURY *745-H.P. ROLLS-ROYCE KESTREL ENGINE. LAST AND FASTEST OF THE NUMEROUS FURY MODELS IT WAS ALSO THE LAST BI-PLANE FIGHTER FROM THE HAWKER STABLE. BUILT FOR EXPORT IT HAD A MAXIMUM SPEED OF 252 M.P.H.*



1929 HAWKER HORNET *450-H.P. ROLLS-ROYCE F-XI ENGINE. AN IN-BETWEEN STEP FROM THE HORNBILL TO THE FIRST (1933) FURY. MAX. SPEED WAS 214 M.P.H. AT 10,000 FEET — WITH 350 LESS H.P. THAN THE HORNBILL!*



1926 HAWKER HORNBILL *700-H.P. ROLLS-ROYCE CONDOR V-12 ENGINE — MAX. SPEED 196 M.P.H. — FIRST OF THE HIGH SPEED HAWKER BIPLANES WHICH CULMINATED IN THE FURY DESIGN SHOWN IMMEDIATELY ABOVE THIS SHIP*

NOTE: ALL AIR SPEEDS QUOTED ARE AS AT SEA LEVEL UNLESS SPECIFICALLY NOTED OTHERWISE

1925 HAWKER CYGNET *32-H.P. BRISTOL CHERUB ENGINE. THIS TWO-PLACE ULTRA-LIGHT LIGHTPLANE, LIKE MOST HAWKER DESIGNS, WAS A THOROUGHLY GOOD AIRPLANE*

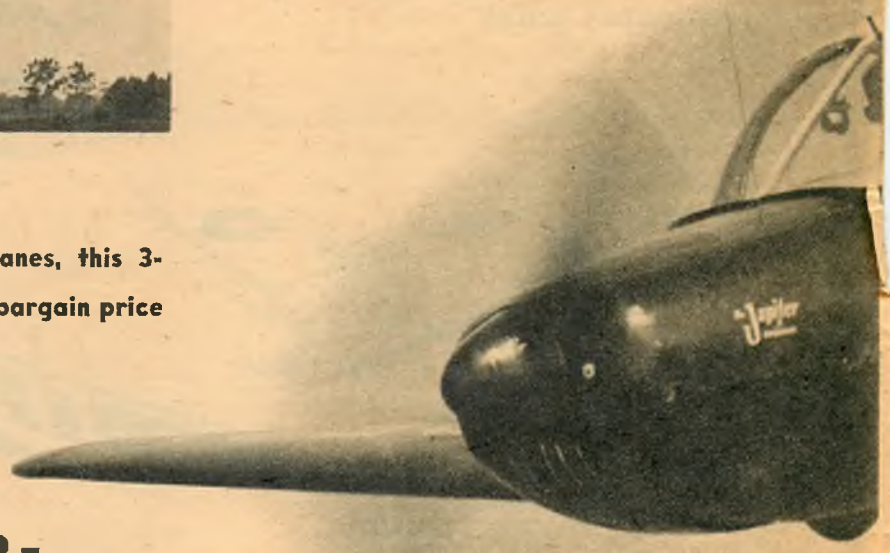
1923 HAWKER DUIKER *400-H.P. BRISTOL JUPITER ENGINE. THIS 2-SEAT ARMY LIASON PLANE WAS ONE OF THE FIRST DESIGNS PRODUCED UNDER THE NOW WORLD-FAMOUS HAWKER LABEL*

be truly regarded as the direct ancestor of all single-seat fighters up to the advent of the jet fighter. Some readers may recall the fabulous Camel, which with all its faults was probably the most maneuverable fighter produced during World War I. Most are apt to forget or not even know about the other successful Sopwith designs employed during this period. A few types are shown on these pages. Last design by the original Sopwith company was a special biplane in which Harry Hawker almost made the first nonstop trans-atlantic flight. He failed due to engine trouble, was rescued. The more important types developed under the now familiar Hawker label are displayed here on the right-hand page.

With flaps in maximum lift position, Jupiter hops off at 45 mph after not more than 300-ft. run. As soon as gear is tucked in place she accelerates fast.

A newcomer in the field of personal planes, this 3-placer has range and speed to spare at a bargain price

Yumpin' Yupiter



By ED FRANCIS

■ If Yamieson's Yumpin' Yupiter never does anything else it has surely given the flying citizenry something to talk about. Loquaciously and with gestures. Nobody seems neutral.

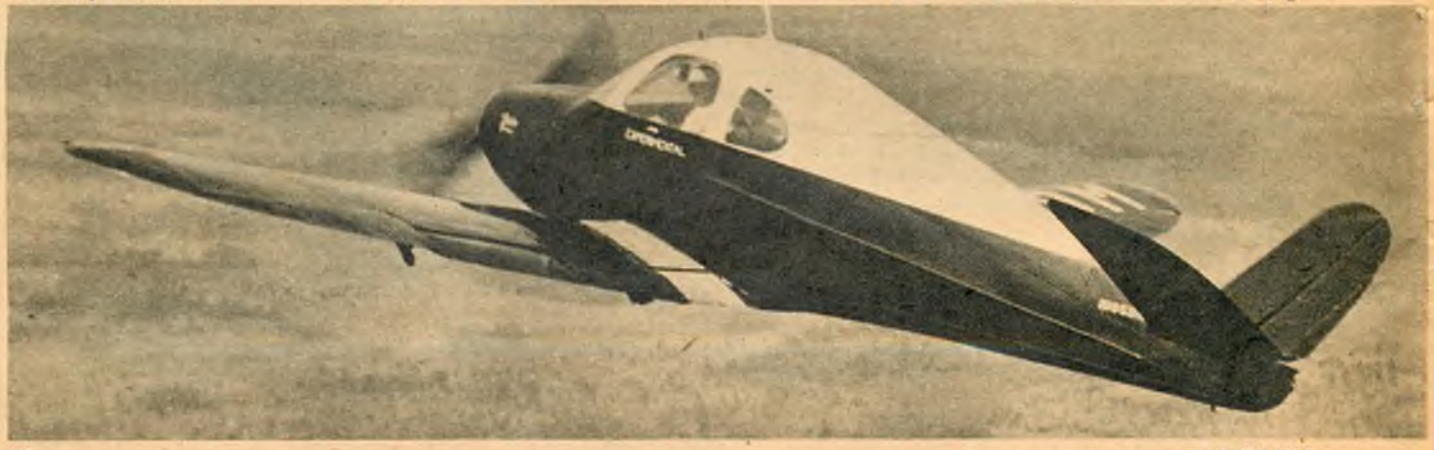
On one hand are those who think the Jupiter is the answer to a lot of the gripes of frustrated but still hopeful would-be plane owners who were promised a lot of cheap, efficient, flying machines in the postwar marts—but who have sampled those available and declined.

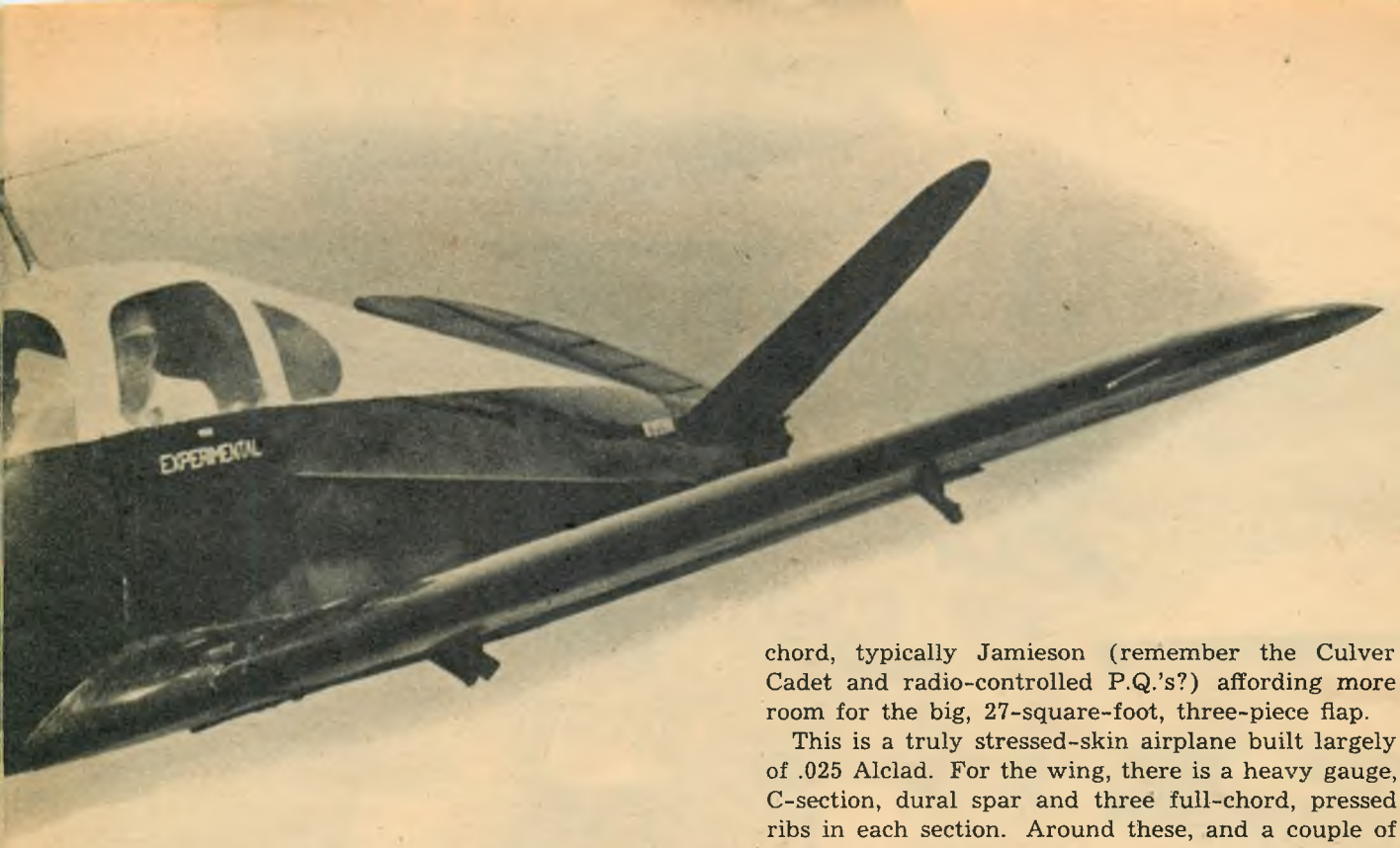
These are countered by the mouthings of others, ranging from indignation that Jamieson would dare profane their ears with such claims as he has made for the Jupiter, to a seemingly fair discussion of the claims, a wistful comment or two on how nice if it could be so, followed by discussions of other foolish dreamers who have tried to build functional airplanes people could afford to buy. Invariable is the shrewd conclusion that if a high performing airplane could be built with the Jupiter's horsepower and the projected $2,500 price tag, the big companies would have done it.

Being curious and laboring under the impression that a reporter should spend some time on the scene of the conflict, so to speak, I've spent during the last five months an aggregate total of forty days at Charlie Jamieson's factory in DeLand, Florida. I also have the distinction of being the first person, other than company pilots, to check out in the Jupiter.

I think Jamieson hurt his own cause by being a bit premature with the first Jupiter publicity releases—more than a year ago—and being over-optimistic regarding production dates. When these dates were not met, set back, and not met some more, a lot of people

Visibility is excellent, even rearward, due to curved and contoured side windows. Cruising speed is 150 mph. Climb, 1,000 ft./min.





who had greeted the original Jupiter announcement with enthusiasm began to think they had been had.

But this same optimism, plus eighteen-hour days at the factory, and adamant refusals to stay whipped for long on the part of Charlie Jamieson and his associates, have carried them through the three and one-half year development, the struggles of getting into production with an airplane, and should add up to Jupiters actually being delivered by the time this is in print.

The first impression, walking toward the Jupiter from the nose, was that it's a bigger airplane than expected. The single-piece engine cowl is neat, and for any servicing other than checking or adding oil, lifts clear of the airplane. The engine room is spacious, with plenty of room around and behind the engine. From the back of the Lycoming's mags, it's a full ten inches to the firewall.

The wing is slim and graceful with an aspect ratio of about seven. The leading edge is straight and tapers while the trailing edge sweeps around in a beautiful elliptical curve. The ailerons are short span, deep chord, typically Jamieson (remember the Culver Cadet and radio-controlled P.Q.'s?) affording more room for the big, 27-square-foot, three-piece flap.

This is a truly stressed-skin airplane built largely of .025 Alclad. For the wing, there is a heavy gauge, C-section, dural spar and three full-chord, pressed ribs in each section. Around these, and a couple of nose ribs, the nose skin is wrapped and riveted. Back top and back bottom skins about complete the deal. Light and easily built, it's tough, too, with its machined, tapered, dural spar reinforcements to carry concentrated loads at the roots.

The fuselage, likewise, is simple. Back of the cabin, for example, there are three skins. The seams, riveted on the inside, form longitudinal stiffeners which are aided by five lengthwise beads. A full bulkhead at the baggage compartment and two triangular trusses and half bulkheads further back take crushing loads and dampen vibration and carry the control-rod guides. All controls, except trim tabs, are actuated by push-pull rods.

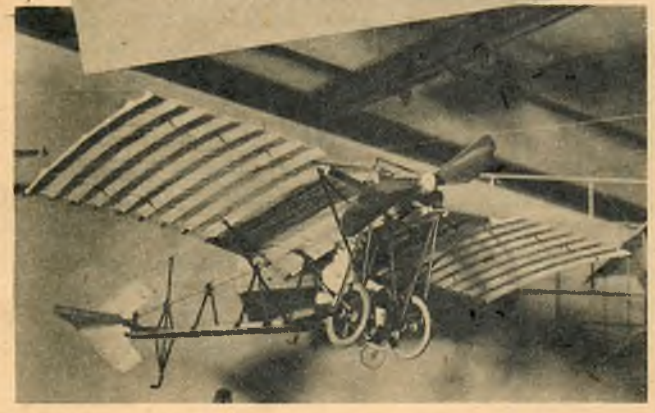
Although the bare airframe weighs only about 257 pounds, this ship is rugged and tough. From a production standpoint the structure is composed of quickly and easily formed components which should fabricate with a minimum of man hours. There are no lefts nor rights on the main landing gear, for example. They are interchangeable. It's a production design. Sequence assembly (*Continued on page* 70)

Wingspan is 29 ft., length 20 ft., 10 in. Engine, 108 hp Lycoming.

Structure consists of only 200 parts not counting bolts, rivets.

Development Highlights

Navy P2V-4 Neptune, latest model of Lockheed patrol bomber, is powered by two 3,200 hp Wright Turbo-Cyclones, which have three small exhaust gas turbines geared to the prop drive shaft.

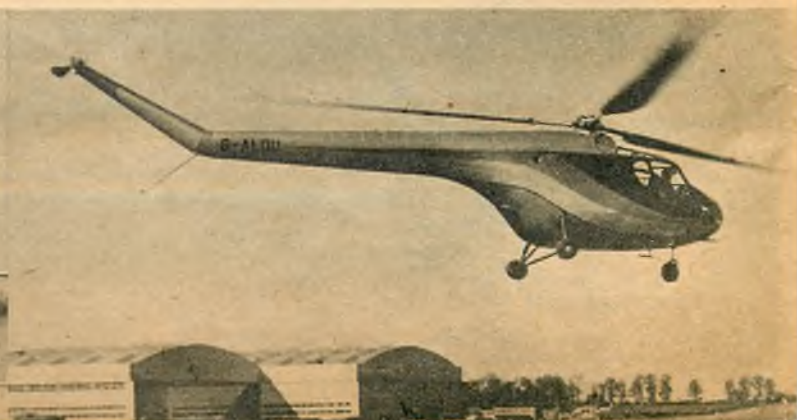


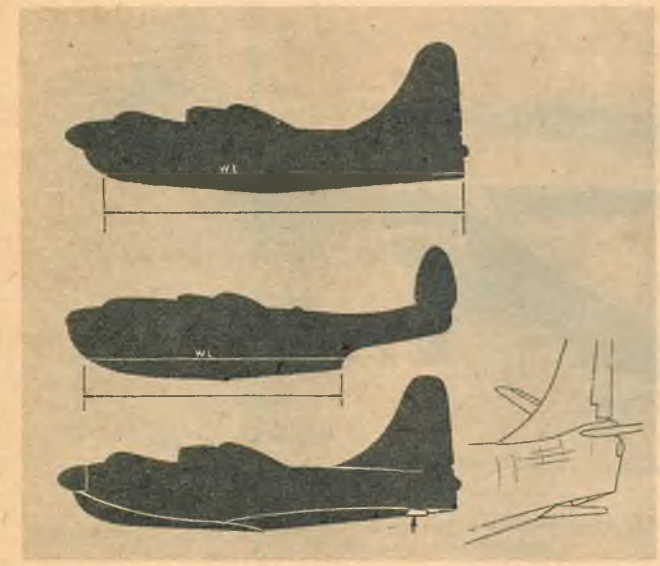
Britain's first military plane displayed in a London museum. Built in '07 by S. F. Cody of U. S. Engine 50 hp Antoinette.

Percival P.56, British side-by-side trainer. 420 hp Armstrong Siddeley Cheetah; fixed l.g. Semi-skilled personnel can service.

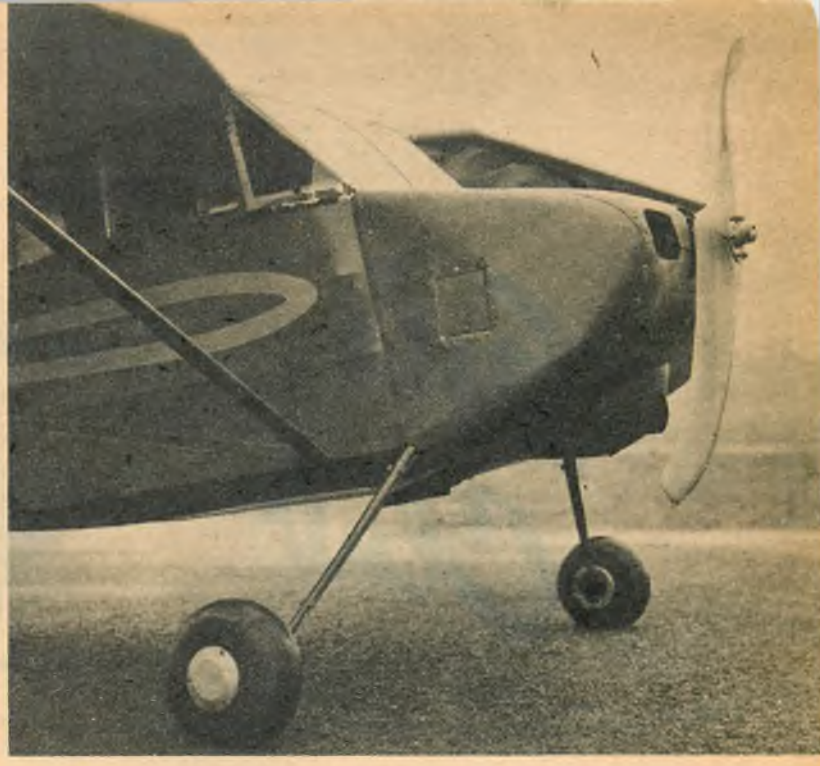
Revolutionary new transport for military services, Fairchild XC-120 Pack Plane. Lower fuselage detachable. Plane itself can fly minus pod. Engines 3,250 hp each. Wt. 6,400 lbs.

Bristol 171, first British-designed helicopter to go into production, even though it is an experimental model for the twin-rotor model 173 which is slated for active service in British European Airways.





Three silhouettes show difference in hull length between Martin PBM and new PBM-1 (second figure). Hull flap shown in bottom corner greatly increases plane's taxiing maneuverability.



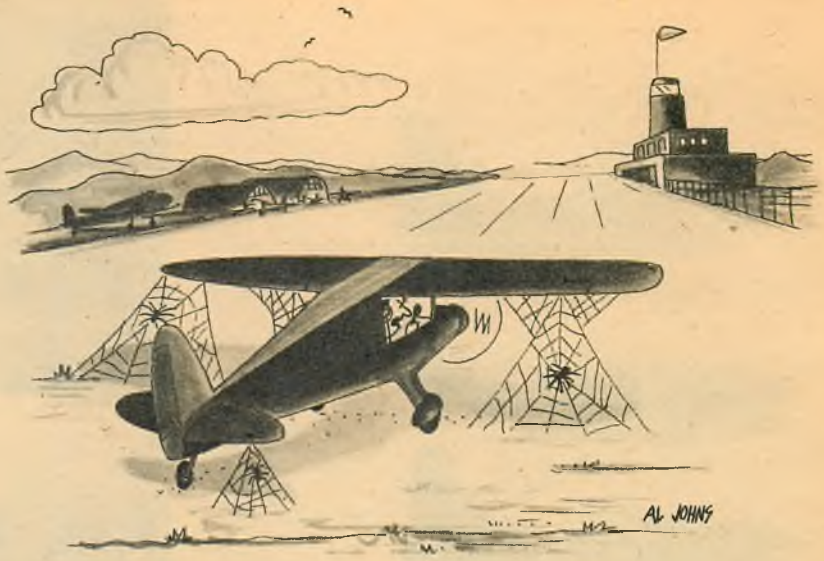
Steve Wittman, famous racing pilot, designed this lightplane, the "Buttercup." Top speed 130 mph. It lands at 30 mph. Gear flexes fore and aft. Even the prop was designed—and built—by Steve!

Cessna L-19A, latest liaison plane for Army field forces and National Guard. Powered by a Continental O-470-11 of 190 hp. Can cruise on only 29% of power, so has fuel economy of a plane with 100 hp. Cruising speed 114 mph; climb over 1,000 ft./min.

Luscombe Observer, all-metal liaison plane design, has more than 500 parts interchangeable with the civilian Silvaire model. Engine 90 hp Continental with injector. Stalling speed is 35 mph.

"Hush-hush" fighter, recently unveiled, British Hawker P.1801. It is powered by the Rolls-Royce Nene turbo-jet whose air intakes are in leading edge of the wing roots. The span is 31 ft.

Solo Club



"I hate to keep bothering you guys, but I'm waiting for permission to take off."

■ Do you enjoy cross country? Or, maybe, in view of the last Solo Club survey, the question should be: "Do you fly cross country at all?"

The big wheels of private flying have been telling pilots that most of us are far too weak in cross country experience. But, while the wheels have only the notion, your Headquarters can tell you with considerable accuracy that the log book of the average Solo Clubber shows only 10-15% of its total hours as cross country time. Thousands of our members have less.

Everyone attending this meeting knows the story. Each of us is secretly embarrassed and almost openly annoyed at the difficulty of piling up X-country time. The problem before the club, therefore, is not to buzz those members whose time with the chart is less than their time in the dentist's chair, but to learn what helpful thoughts our more footloose members have to help the rest of us see even little pieces of America from the air.

So your old-timer will kick in with a couple of ideas just to set the ball rolling. This isn't news to anyone, but X-country costs money. Money is what most of us Solo Clubbers don't have much of. But if you can afford to fly you probably can go cross country. Or at least practice. Haul out your local sectional chart and we'll show you.

Many of us may live too far from the waterhole for this to apply, but at least as many more, especially big city members, will find the scheme practical. How much flying do you do? Of any variety? An hour a week? Allowing a few minutes for warm-up, taxiing, and so on, make a circle on your chart, with the home-port for a center, and a half hour's flying time for a radius. (This ignores wind but you can allow for that.) Do you see any other fields inside the circle? If you do, you can set up a little practice X-C hop. Suppose familiar airport symbols, excepting your port's, are missing from your circle. What happens if you double your time by flying every other week-end?

Increase the radius to one hour. See any other ports within the circle? City dwellers, even most suburbanites, certainly should. You get the idea. Pilots with more total time may be able to concentrate time in a once-a-month flight. The lay-over will not affect their technique. No requirement can be put on how much total time you must have in relation to how long you can go without flying before your technique suffers, but every member knows his own ability

The one sure way to tell is whether or not you have any doubts. If (*Continued on page* 82)

HOW TO BECOME A SOLO CLUB MEMBER

This club is open only to those who have actually soloed a heavier-than-air craft, either powered or motorless. It does not matter where or when the flight was made. Applicants must furnish the membership committee with a satisfactory proof of their qualification for acceptance. There are no dues. Once a member, always a member.

To obtain sterling silver Solo Club wings and life membership card, send coupon, with 75c, to Solo Club Membership Committee, Air Trails, 122 East 42nd St., New York 17, N. Y.

Proof of qualifications as a Solo Club Member:

1. CAA Airman Certificate, number and rating .....
2. F.A.I. license and number .....
3. Evidence of: Service in Army, Navy air forces, either as a rated pilot or having received flight training including solo time (attach).

Applicant ..... Age .....

Street ..... City or Town ..... State .....

Civil Air Patrol Newsletter

The Civil Air Patrol is the civilian auxiliary of the United States Air Force. It deserves the support of every citizen. Membership is open to any American boy or girl 15 years of age or older of good moral character. Those under 18 are classed as CAP Cadets, those over 18 are Senior Members. If you would like to join the CAP write a letter to Air Trails (122 E. 42nd St., New York, N. Y.) indicating your interest, and your communication will be forwarded to your state's Patrol Wing Headquarters. Wing HQ then transmits it to the Group, Squadron or Flight nearest your home. For latest news of the CAP read this monthly Newsletter which is prepared in Washington, D. C., and New York City.

On the Beam: The Patrol is logging a record of public service unique in the history of the United States as every Wing chalks up thousands of hours of service flights, all without cost except those for the Air Rescue Service, and then the outlay is only for gasoline and oil.

Searches for lost or overdue fishing parties, lost or crashed aircraft, delivery of blood plasma, emergency air ambulance service, even a search mission for Eskimos lost on an ice floe off Alaska, are a few of the services rendered the Air Rescue Service, the Coast Guard, the Red Cross, cities, state governments, forestry service, and individuals.

Unfortunately, many searches are called on false alarms, largely due to the fact that civilian pilots forget to file flight plans or fail to close their flight plans when originally filed at the departing airport. Thus searching parties are handicapped in their mercy mission.

In five months of 1950 more than 60 search and rescue missions were performed by CAP. Arizona Wing flew nearly 2,000 hours, California Wing about 1,200 hours, other Wings hundreds of hours, searching for lost children, reporting forest fires, even hunting an escaped leopard from a zoo.

Two recent examples are typical. The California Wing was alerted to search for a downed Navy F-80 in Monterey Bay. The CAP search mission soon located the oil slick and the Coast Guard located the plane in 30 feet of water. But while searching for the F-80, the mission also located the wreckage of a Luscombe in the hills near San Jose. Chester B. Hector of the San Jose AA Flight spotted the downed pilot even before the crash had been reported. The pilot was rescued promptly.

In the Idaho Wing, a mercy mission saved hours. A serious apartment house fire in Pocatello brought an urgent request for a Red Cross worker. CAP flew the worker from Boise to Pocatello in a few hours.

Reserve Reverse: National Headquarters has announced that in view of the current annual assessment program there is no longer a need for a CAP Reserve as originally proposed.

Primary purpose for the original activation of the Reserve was for active Senior members to retain their rank and remain in a semi-active status for a period of five years. Concurrent with the annual assessment program all personnel in CAP Reserve automatically lost their rank. Since the CAPR is expected to be abolished, all personnel will have to renew their membership annually.

As National Headquarters explains, paid-up members are now carried annually. It therefore appears that as long as dues are paid members are active, otherwise they are inactive but carry no reserve status.

Automatic PFC: Cadets who possess certificates of proficiency and have completed their Cadet training courses are now eligible for ratings of PFC upon initial enlistment in the Air Force Reserve or Air National Guard.

Roundup: At last count CAP had a total of 7,100 rated pilots, 250 Senior pilots and 227 Command Pilots. In addition, records showed 727 observers, 112 senior observers and 6 glider pilots.

Maine's Portland Squadron has an expert on flying saucers, Cadet Pvt. Joseph Jutras who claims they "do exist, they are ours, and they come from here in the U. S." Writing in the Maine CAP's monthly "Wing Over," Cadet Jutras, who has been studying this phenomenon of mystery for nearly three years, states:

"Incredible as these objects may seem, they are real. There are several types varying in size and shape. Some are small white discs, 20 inches in diameter and 6 inches thick (such as were found in Galveston Bay, Texas); others found were 250 feet in diameter. Most flying saucers are round. They may be or may not be guided. They have no stream of light or smoke, no propeller mechanism, and give no sound. They can be momentarily stationary in the air, or dash off to the left or right, wobbling and picking up speed until they move like lightning, but they are as yet harmless.

"The true flying saucers," concludes Cadet Jutras, after naming dates and places where they have been seen and found, "are only a part of a big and still expanding experimental project which has been progressing in the U. S. since June 25, 1947."

Arkansas is taking aviation education to the place where it counts most—present teachers in that state's schools, and to potential teachers among the undergraduates and graduates of the University of Arkansas. With the help of both Federal and Municipal agencies, the Arkansas Wing has conducted several "Aviation Education Flight Days" at different cities in the state, designed to provide teachers and administrators a day of first-hand aviation experiences.

Talks by both educators and those with operating aviation experience, film strips, flight demonstrations to show the utilization of aircraft in such occupations as dusting and spraying, and actual plane rides for the teachers, demonstrate to the school officials the value of aviation in present day life.

At the (*Continued on page* 77)

YOUNG MAN FROM MISSOURI

Cadet M/Sgt. D. E. Chaney

An unassuming young Cadet from Missouri, Cadet Master Sgt. Donald Eugene Chaney, literally stole the show at the CAP Congressional Dinner.

Chosen last year to go to England in the Cadet Exchange Program, Cadet Chaney was put on the Congressional Dinner program to speak briefly on his experiences and impressions of that trip.

As Cadet Chaney described those impressions in simple but dramatic fashion, the banquet room of 800 Senators, Representatives, Generals, Admirals, Wing (*Continued on page* 84)

Author-designer-flyer Smith

we model the Duo-Mono

By S. CALHOUN SMITH

Is it a tailless bipe or a mono with a misplaced empennage? The Delanne builds easy, performs like a dream

■ Experiments in various wing arrangements with full-scale aircraft have resulted in some pretty strange shapes through the years of aviation development. Successful results have been frequent; yet fallen along the wayside we find combinations such as the canard, tandem wing and circular wings. Today designers have pretty well settled for the conventional wing stabilizer or all wing set-up.

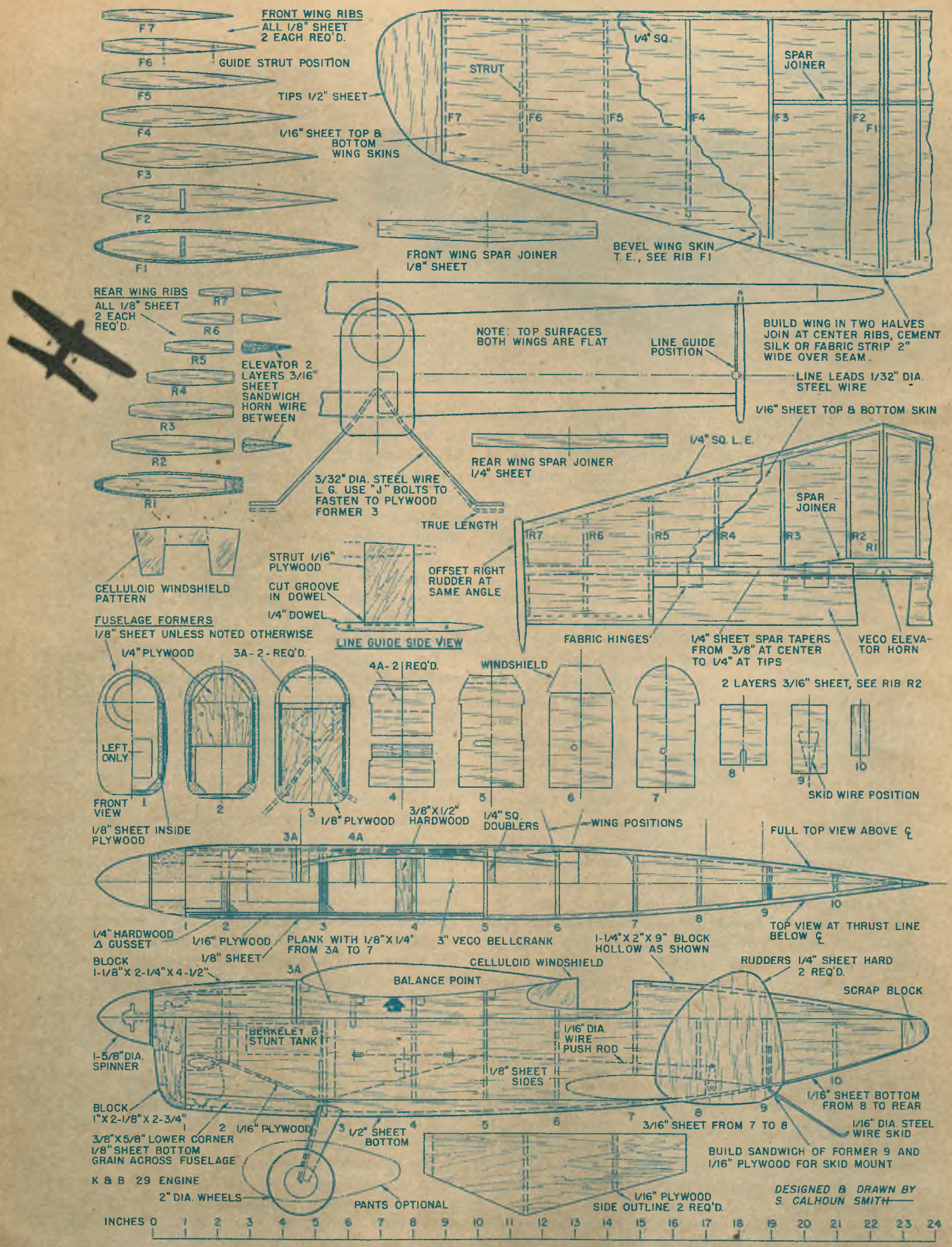
The original versions of Maurice Delanne's double-monoplane were singularly successful. They possessed a high degree of maneuverability, a high top speed, together with a very low landing speed. Air Trails has been fortunate in securing from Mr. Delanne drawings of his Sport Model 20 which was built and flown in France during 1938-1939.

The design lends itself admirably to sport control line flying, and although not a strictly scale version of the large Delanne 20, we hope the design liberties taken will not offend.

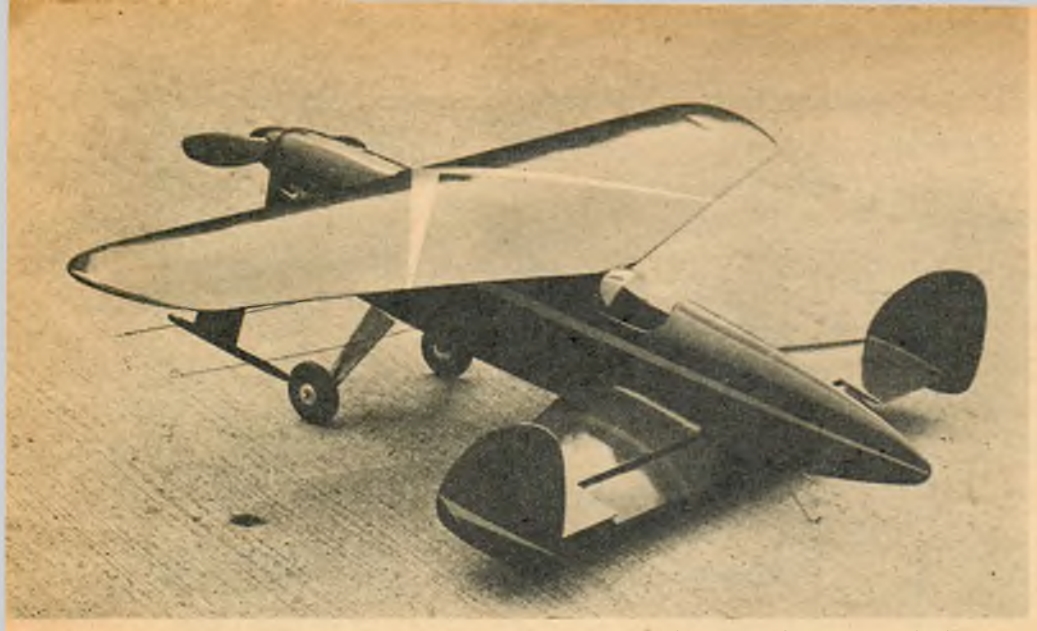
The 31-in. span model weighs in at 24 ounces. Considering both wings as effective area (according to Mr. Delanne) gives a total of 280 sq. in. wing area. Wing loading is 8.5 oz. per 100 sq. in. If only the front wing is considered effective area (184 sq. in.), wing loading comes to 13 oz. per 100 sq. in. The model has good stability in flight, but we would rather assume the loading to be higher than the 8.5 oz. figure. If you split the difference, loading is probably closer to 10-11 oz. per 100; at least that's the way the model feels out on the end of the wires. So don't attempt the full stunt pattern with this ship although you can have plenty of fun with big loops, horizontal eights and inverted flight. The K&B "29" in the nose furnishes plenty of power—speed is a little above 70 mph.

Construction follows standard practices and a strong light structure has been achieved without excess weight.

The fuselage can be built first. Cut out the two ⅛" sheet sides. These should be of medium hard or hard stock.



In-flight photo of semi-scale Delanne Duo-Mono model forms background for these two pages. Ship is remarkably fast for power & weight, helping prove Delanne theory.



Pert beauty is the Duo-Mono. Power can be anything around .30 cu. in. displacement.

Next cut out the two 1/16" plywood sides from the pattern shown on the plans. The plywood and the balsa sides should be glued together with hard glue such as Weldwood or Casamite. Clamp uniformly and set aside to dry thoroughly.

Cut out the fuselage formers from the stock indicated. Be careful that the formers are of equal width for the forward section so that the fuselage sides come out parallel.

When assembling the fuselage sides and formers, the top rounded portion of the formers can be cut off level with the top of the sides so that the sides can be placed upside down directly over the top view for building. Let the nose hang over the edge of the workboard so the firewall, former 2, can be located easily. Glue the firewall 2, plywood 3 and hardwood bellcrank mount with Weldwood. Small brads nailed through the sides into these pieces will insure a good joint. Add formers 4, 5, 6, 7, 8, 9 and 10 in that order. Check sides with triangle or square for squareness.

When this basic fuselage structure has dried thoroughly it can be taken up from the workboard. Further work can be done "in the hand." Add the top of the formers and the block balsa turtle deck. The section between former 3A and 7 is planked with 1/8" x 1/4" strips. This planking can be left rough on top until the front wing is fitted and joined.

Bend the landing gear from 3/32" dia. steel wire and attach to plywood former 3 with "eye" or "J" bolts. Next the 1/16" plywood floor can be added between plywood formers 2 and 3. This should be glued with Weldwood. Face the inside of the plywood sides ahead of the floor and firewall with 1/8" sheet balsa. This serves as a stiffener and additional surface for the nose block when the sides are shaped and rounded off. Add the 3/8" x 5/8" strips along the bottom of the lower cowling. Next add the 1/8" sheet bottom over this section with the grain running across the fuselage.

The engine should be fitted in place temporarily now so that proper clearance of the sides and bottom can be checked. The upper and front cowling can be carved from solid blocks and checked for fit around the engine. The cowling can be assembled in one piece and held with suitable bracket and screw through the top and guide pins or dowels from the front portion into the front face of the fuselage sides. A simple angle bracket can be attached to the firewall with the top engine mounting bolt. This bracket should have a nut soldered to its underside. A bolt is then passed through the top cowling to serve as a hold-down.

Got everything so far? O. K., take a short blow.

A couple degrees of right thrust should be used on the engine. This can be built into the firewall when joining to the sides or added later with washers under one side of the engine mount bolts. Make allowances for the offset position of the thrust washer and shaft when carving the nose block. Mount the spinner and carve the block accordingly.

The fuel tank can be installed now and filler lines and fuel line positioned to complete the power plant section. Remove the engine and give the inside of the entire nose section and cowling a coat of thinned Weldwood to fuel proof.

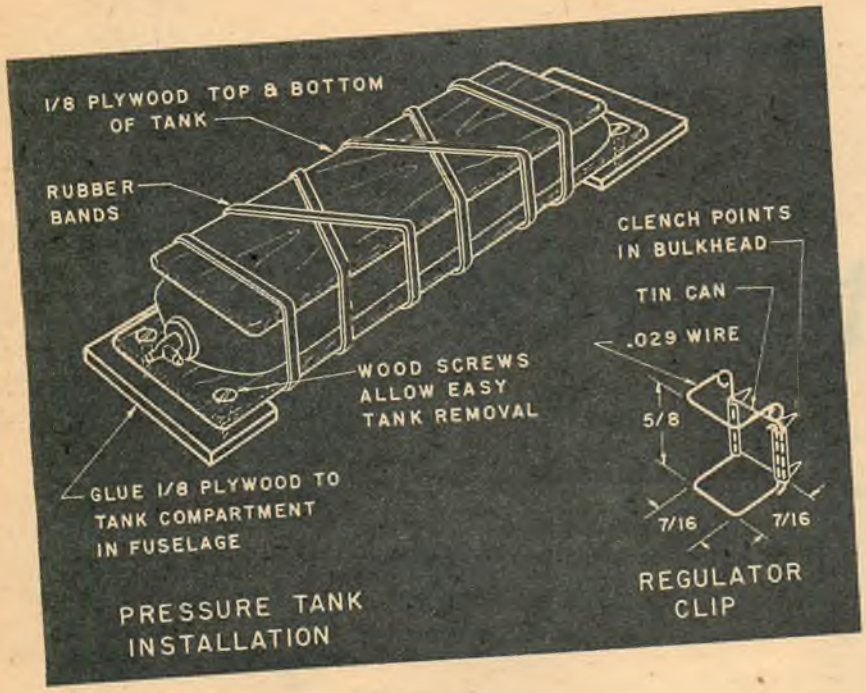
The fuselage bottom should not be added until the rear wing is built and installed. This is a simple job; 1/2" sheet is cemented to the bottom and carved to fair into the fuselage sides.

The rest of the fuselage can be sanded smooth and given a coat of filler or dope. Later when wings are assembled to the fuselage, final filling and doping can be completed.

The rear wing is next on the list. Cut out all ribs, leading edges and spars. Assemble the frame and ribs over the plan. Block the leading edge and spar up 1/16" off the bench at the tip. At the center rib block up the leading edge 1/4" and the spar 3/16". (Now go back and read the last two sentences again so you won't forget.) Bevel the leading edge so that the wing sheet will curve easily off the rib onto it. Plank one half of the wing with 1/16" sheet 6" wide. If this is unobtainable, join two 3" wide sheets. Cover other half in similar manner. This must be done by halves because of the slight break in taper angle at the center.

When dry, remove from the workboard and cover the other side with 1/16" sheet. Check wing against any twist by sighting spanwise while you are cementing top sheet down.

The elevators can be made at this point. If a Veco horn is used make a sandwich of two layers of 3/16" sheet. Groove out inside of the sheets for the horn wire, then cement the clamp until dry. Carve elevators to proper cross section and assemble to wing with fabric hinges or your (*Continued on page 79*)



Pressure regulator valve tested with siphon tube for correct opening-closing pressure.

By WALT HUGHES

Squeeze Play

An old fuel falls into the company of Jim Walker and gets tanked

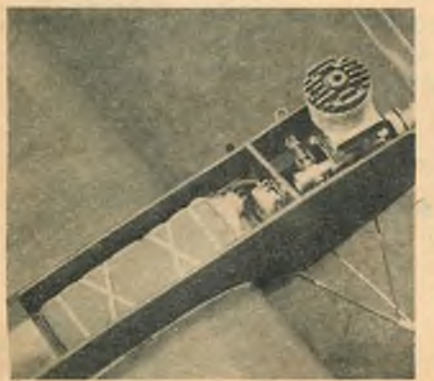
■ Improvements in model airplanes and engines continue to place more severe requirements on the fuel system. Balloon tanks created a lot of interest in stunt flying last year, and the speed boys solved some of their problems with pressure tanks. Now, Jim Walker has taken the best features of each and combined them in his new pressure tank and regulator system. We have put them in four different airplanes and found advantages for you to consider.

The first trial was a stunt ship whose engine refused to run steady. It had a metal fuel tank fitted with a swivel suction line and baffles to eliminate dead spots. Maneuvers were so tight that changes in fuel pressure caused the engine to slow down or stop at the time when full power was necessary. Tank adjustments that worked last year wouldn't help this up-to-date "hot job," so we tried a long shot and put in a "Walker" system.

Considerable improvement was noticed immediately and after some adjustments the engine ran steady. The most outstanding feature is constant engine performance from beginning to end of flight. Most tanks require a rich needle valve setting for take-off and the engine "comes in" during the middle of the flight and then runs too lean toward the end. A Walker tank will keep the engine at full power till the last two or three laps.

Best results are obtained with a lean needle valve setting, and this produces a considerable saving in fuel. When designing a new ship the following pressure tank features should be considered: constant power from engine; light weight—6/10 oz. for tank and regulators; no exposed vents required—cleaner beauty and scale designs; tank location not critical, may be above or below needle valve.

With all these advantages there are a few bugs. Dirt in fuel causes clogging or leakage and certain fuels cannot be used because they swell parts in the regulator. However, Jim Walker points out that glow plug fuels containing nitrobenzene or nitro-propane are not so numerous (*Continued on page 71*)



Single tank installation on rear disk valve engine. Regulator lined up with needle valve.

Top plywood pressure plate is lifted up when tank is filled; don't stretch tank with fuel.

Double pressure tank installation for 8 min. stunt flight with large displacement engine.

Strato-Flash

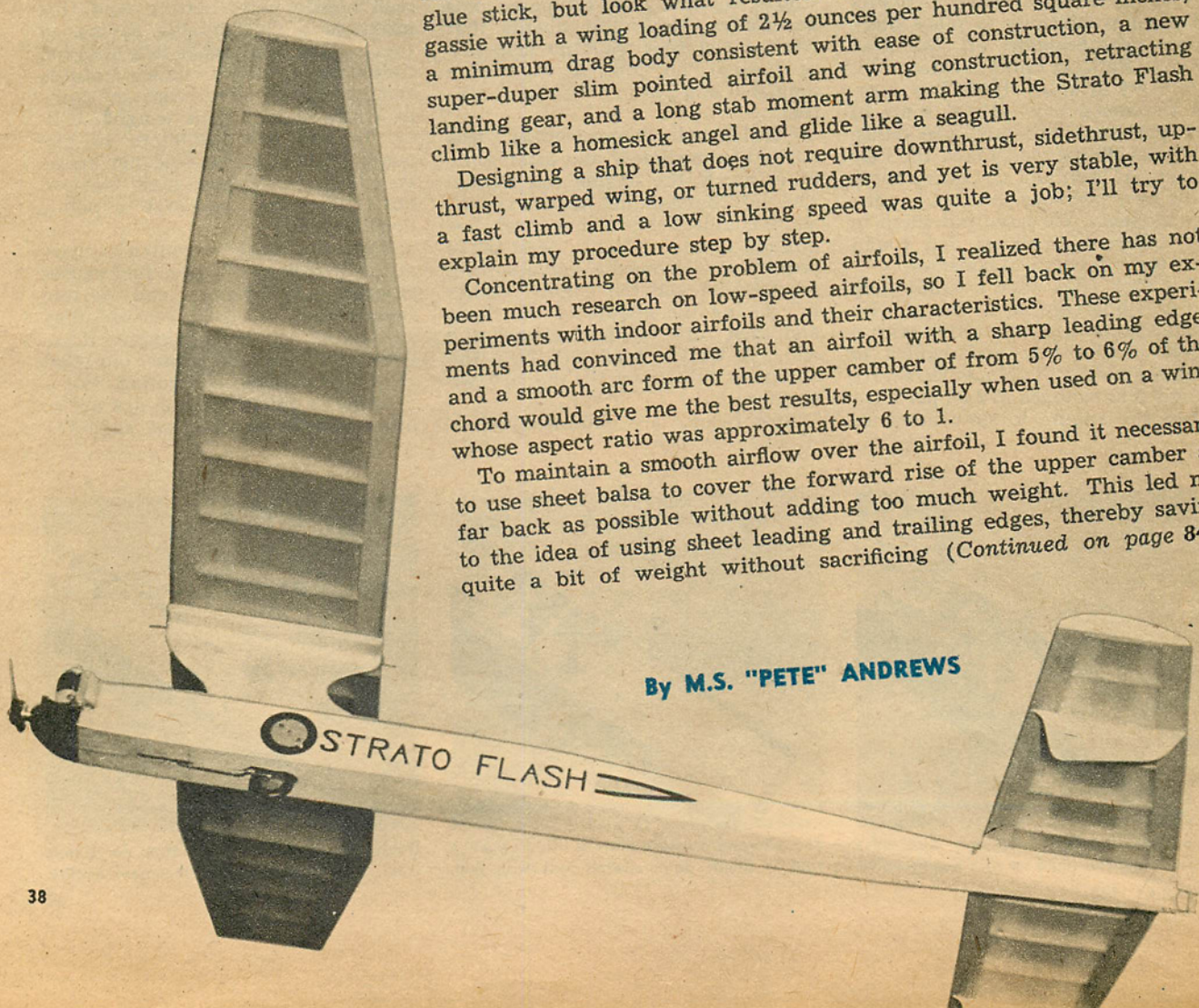
Holder of world's record for indoor microfilm models shifts to Cl. AA; results: spectacular!

■ They laughed when I, the indoor addict, sat down to build a gassie, for they thought I didn't know which end of the broom to use as a glue stick, but look what resulted: a high-performance Class AA gassie with a wing loading of 2½ ounces per hundred square inches, a minimum drag body consistent with ease of construction, a new super-duper slim pointed airfoil and wing construction, retracting landing gear, and a long stab moment arm making the Strato Flash climb like a homesick angel and glide like a seagull.

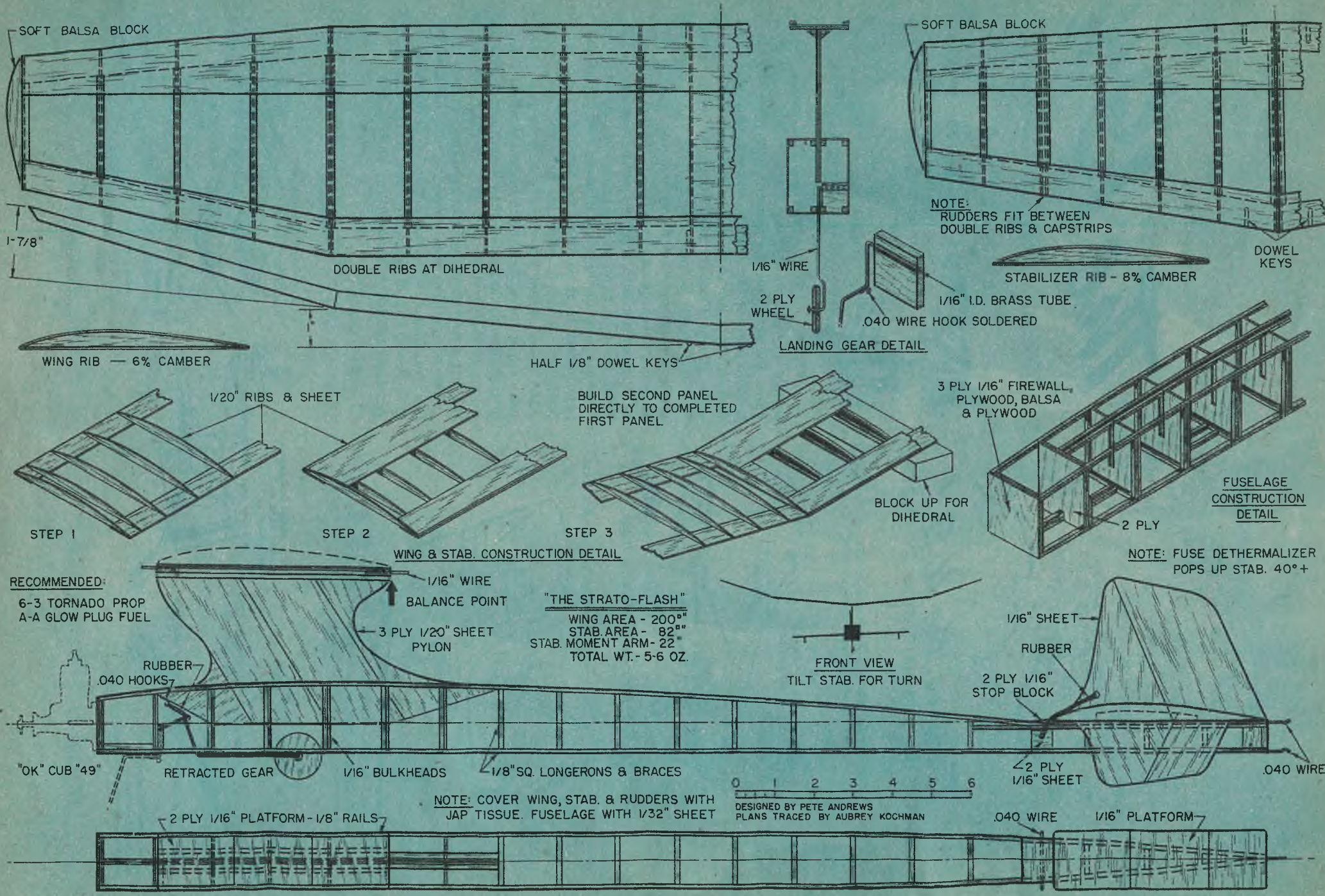
Designing a ship that does not require downthrust, sidethrust, upthrust, warped wing, or turned rudders, and yet is very stable, with a fast climb and a low sinking speed was quite a job; I'll try to explain my procedure step by step.

Concentrating on the problem of airfoils, I realized there has not been much research on low-speed airfoils, so I fell back on my experiments with indoor airfoils and their characteristics. These experiments had convinced me that an airfoil with a sharp leading edge, and a smooth arc form of the upper camber of from 5% to 6% of the chord would give me the best results, especially when used on a wing whose aspect ratio was approximately 6 to 1.

To maintain a smooth airflow over the airfoil, I found it necessary to use sheet balsa to cover the forward rise of the upper camber as far back as possible without adding too much weight. This led me to the idea of using sheet leading and trailing edges, thereby saving quite a bit of weight without sacrificing (*Continued on page* 84)



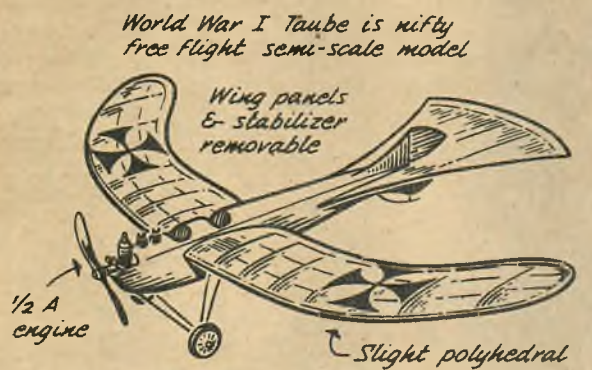
By M.S. "PETE" ANDREWS

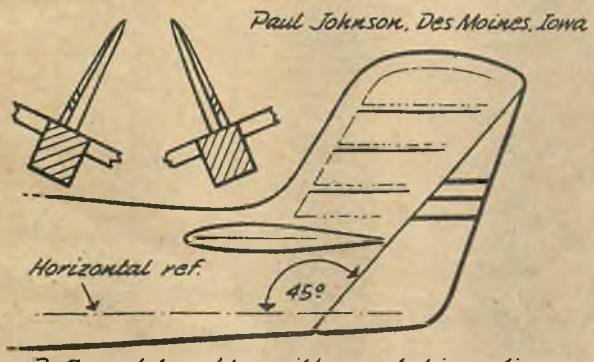

SOFT BALSA BLOCK
1-7/8"
DOUBLE RIBS AT DIHEDRAL
WING RIB — 6% CAMBER
HALF 1/8" DOWEL KEYS
1/16" WIRE
2 PLY WHEEL
LANDING GEAR DETAIL
1/16" I.D. BRASS TUBE
.040 WIRE HOOK SOLDERED
SOFT BALSA BLOCK
NOTE: RUDDERS FIT BETWEEN DOUBLE RIBS & CAPSTRIPS
DOWEL KEYS
STABILIZER RIB - 8% CAMBER
1/20" RIBS & SHEET
STEP 1
STEP 2
BUILD SECOND PANEL DIRECTLY TO COMPLETED FIRST PANEL
STEP 3
BLOCK UP FOR DIHEDRAL
3 PLY 1/16" FIREWALL, PLYWOOD, BALSA & PLYWOOD
2 PLY
FUSELAGE CONSTRUCTION DETAIL
WING & STAB. CONSTRUCTION DETAIL
NOTE: FUSE DETHERMALIZER POPS UP STAB. 40°+
RECOMMENDED:
6-3 TORNADO PROP
A-A GLOW PLUG FUEL
1/16" WIRE
BALANCE POINT
3 PLY 1/20" SHEET PYLON
"THE STRATO-FLASH"
WING AREA - 200"
STAB. AREA - 82"
STAB. MOMENT ARM - 22"
TOTAL WT. - 5-6 OZ.
FRONT VIEW
TILT STAB. FOR TURN
1/16" SHEET
RUBBER
2 PLY 1/16" STOP BLOCK
RUBBER .040 HOOKS
"OK" CUB "49"
RETRACTED GEAR
1/16" BULKHEADS
1/8" SQ. LONGERONS & BRACES
2 PLY 1/16" SHEET
.040 WIRE
0 1 2 3 4 5 6
NOTE: COVER WING, STAB. & RUDDERS WITH JAP TISSUE. FUSELAGE WITH 1/32" SHEET
DESIGNED BY PETE ANDREWS
PLANS TRACED BY AUBREY KOCHMAN
2 PLY 1/16" PLATFORM - 1/8" RAILS
.040 WIRE
1/16" PLATFORM

The 19th

Texas vs. the U. S.!

FIRST DAY'S REGISTRATION BY STATES

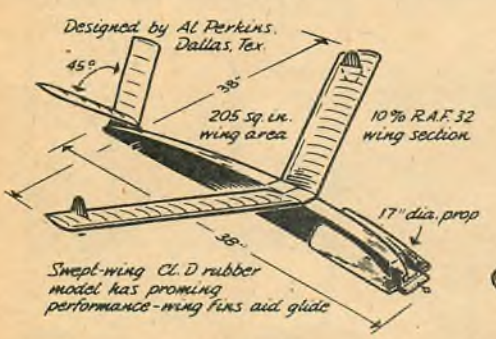


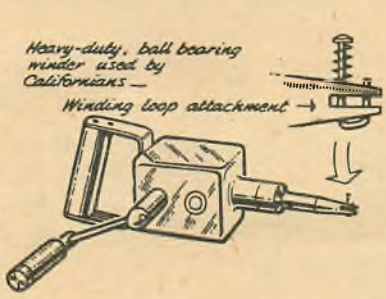


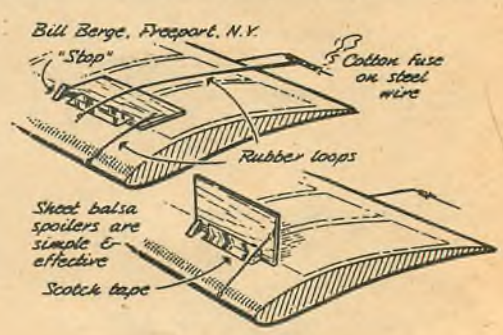
■ The 19th Annual National Championship Model Airplane Contest held at Hensley Field Air Station, Dallas, Texas, took place amid a grim air of military preparedness as Marine air combat teams and Navy air squadrons were activated for the Korean conflict, but true to its reputation for being ready to handle any emergency, the Navy airfield's personnel under the direction of Capt. Hugh R. Nieman proved it could prepare for warfare and still play host to the first National model meet in the Southwest.

As Marine Corsairs and Navy jets went through final test flights before winging off to join unnamed carriers, more than 500 eager contestants, early birds all, were knocking on the gates of Hensley Field a full day before the 19th Nats got under way on July 26. From the first glimpse it was obvious that modelers from all parts of the U. S., Canada and Mexico were determined to make this the most exciting of all Nationals. Many flyers in the Senior (Class 1 under AMA rules) event between 18 and 21 years of age were expecting to hear from hometown draft boards, or had already indicated their intention of enlisting in one of the services, and were trying their best to make this contest an occasion to be remembered by all.

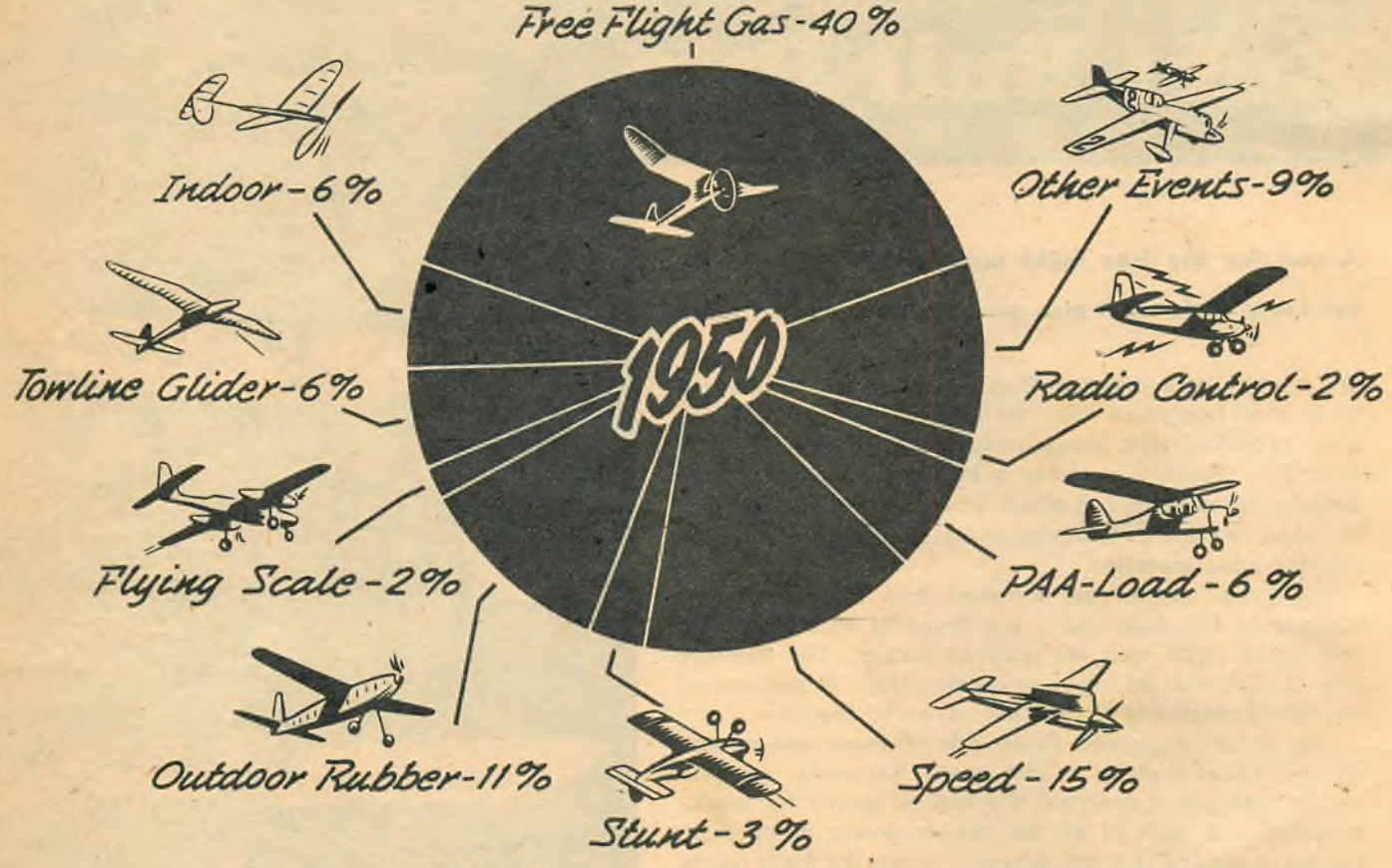
The competition was sponsored by the Exchange Club of Dallas with the active cooperation of the U.S. Navy, and directed by John E. Clemens of the Academy of Model Aeronautics, sanctioners.





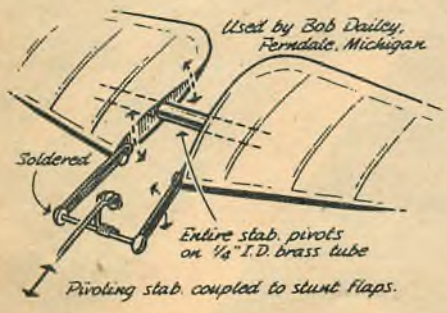


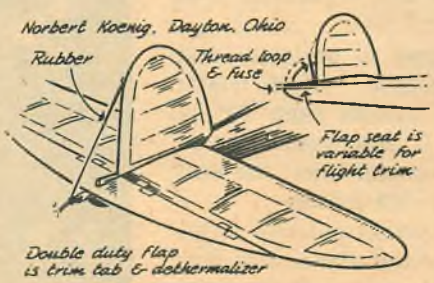
Model Nationals

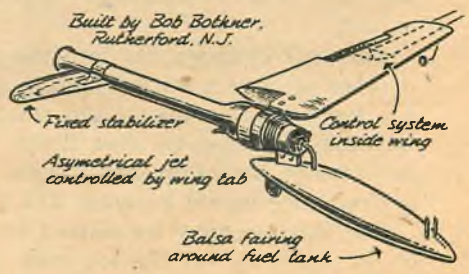


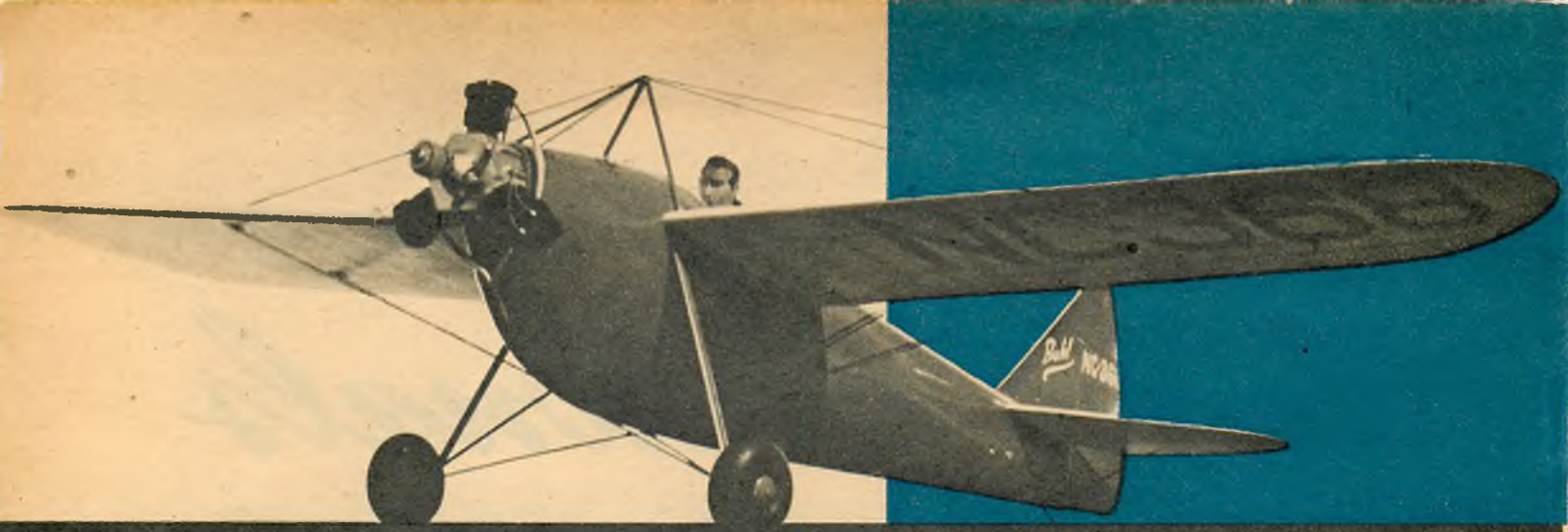
Free Flight was Most Popular

PARTICIPATION BY EVENTS BASED ON EARLY REGISTRATION









Buhl Bull Pup

By CHARLES HOLLINGER

A gem for the free flight scale enthusiast—and we see those scale stunt men grabbing this one but quick

■ Twenty years ago the Buhl Aircraft Co. announced their new lightplane the "Bull Pup." Several versions were produced with wingspreads ranging from 27 to 36 feet. This resulted in either a high top speed plus high landing speed with the small wing, or a slight sacrifice in speed for slower landings and higher ceiling with the 36-foot wing installed.

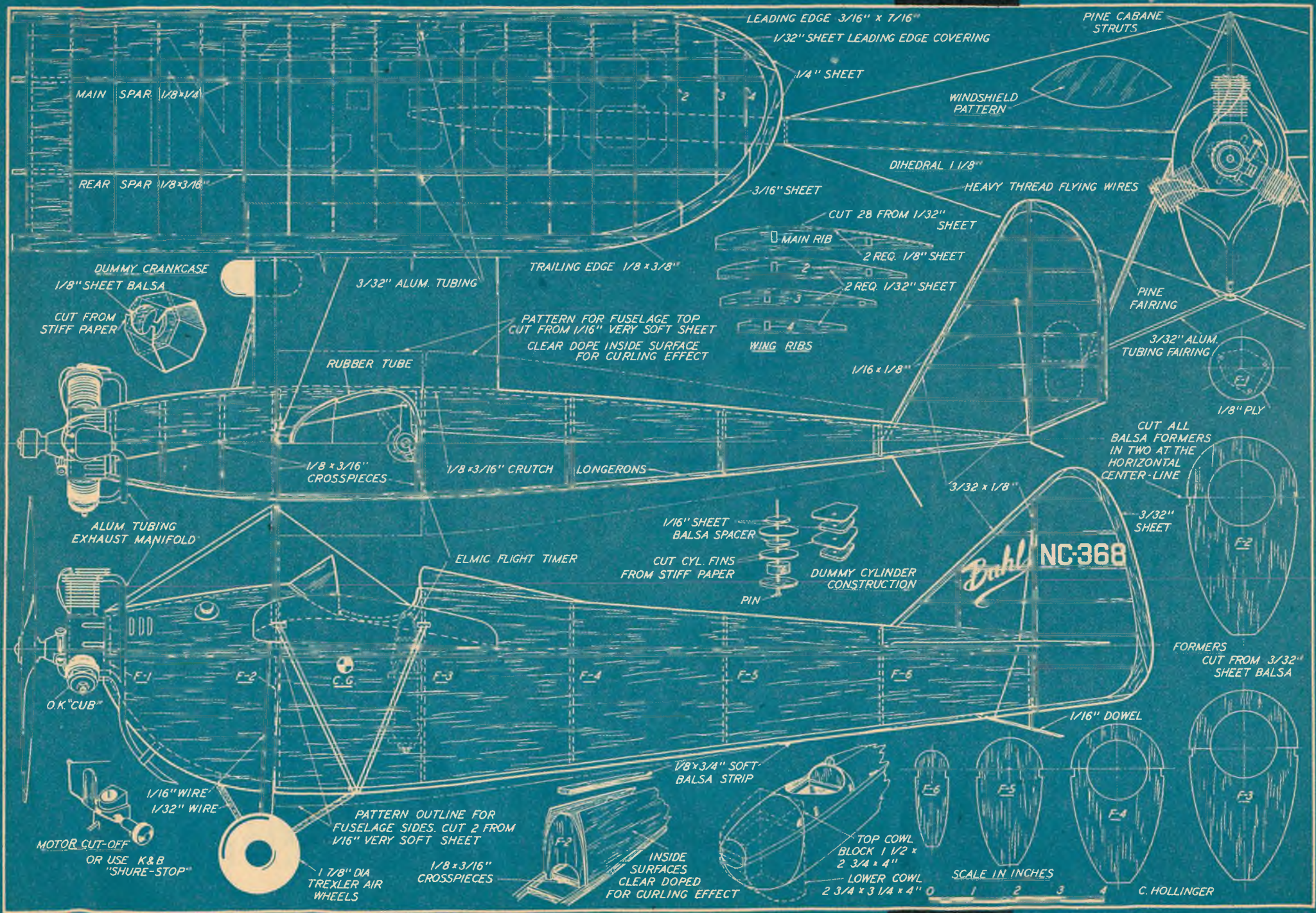
The "Pup" seated one occupant, had a three-cylinder Szekely in the nose and a top speed of 90 mph, which was doing right well for only 45 horses. The fuselage was of all-metal monocoque construction. It was one of the first lightplanes to use this advanced feature.

Our model happened to be one of those last-minute affairs built for entry in last year's Nationals. In spite of the rush job it received the highest points for workmanship and scale of all the rubber-power flying scale entries, dropping to third, however, when the flight points were added. This was with two official flights since the rubber motor broke on the third wind-up, necessitating repairs to the fuselage.

AT's editors saw the Pup at the Nats and thought it would make a good Half-A flying scale. The changeover from rubber to gas power was very simple and has resulted in not only an attractive display scale model but one that is an exceptionally stable and a realistic flyer as well.

The real cylinder fits into the nose so perfectly that it takes at least a second look to discover "which triplet has the piston." Any of the small motors from .035 to .049 may be used for free flight. If you would like to convert the Bull Pup into a scale control liner, the best performance would be with .074 to .099 motors.

The fuselage may be started by laying out two strips of ⅛" x 3/16" over the top view of the plans. Use pins to hold them in place along the (*Continued on page* 78)


LEADING EDGE 3/16" x 7/16"
1/32" SHEET LEADING EDGE COVERING
1/4" SHEET
MAIN SPAR 1/8 x 1/4
REAR SPAR 1/8 x 3/16"
3/16" SHEET
TRAILING EDGE 1/8 x 3/8"
PINE CABANE STRUTS
WINDSHIELD PATTERN
DIHEDRAL 1 1/8"
HEAVY THREAD FLYING WINDS
CUT 28 FROM 1/32" SHEET
MAIN RIB
2 REQ. 1/8" SHEET
2 REQ. 1/32" SHEET
WING RIBS
PINE FAIRING
3/32" ALUM. TUBING FAIRING
1/8" PLY
DUMMY CRANKCASE
1/8" SHEET BALSA
CUT FROM STIFF PAPER
3/32" ALUM. TUBING
PATTERN FOR FUSELAGE TOP CUT FROM 1/16" VERY SOFT SHEET
CLEAR DOPE INSIDE SURFACE FOR CURLING EFFECT
RUBBER TUBE
1/16 x 1/8"
CUT ALL BALSA FORMERS IN TWO AT THE HORIZONTAL CENTER-LINE
1/8 x 3/16" CROSSPIECES
1/8 x 3/16" CRUTCH
LONGERONS
3/32 x 1/8"
3/32" SHEET
ALUM. TUBING EXHAUST MANIFOLD
1/16" SHEET BALSA SPACER
CUT CYL. FINS FROM STIFF PAPER
PIN
DUMMY CYLINDER CONSTRUCTION
ELMIC FLIGHT TIMER
Buhl NC-368
F-1
F-2
C.G.
F-3
F-4
F-5
F-6
FORMERS CUT FROM 3/32" SHEET BALSA
O.K. "CUB"
1/16" DOWEL
1/16" WIRE
1/32" WIRE
1/8 x 3/4" SOFT BALSA STRIP
PATTERN OUTLINE FOR FUSELAGE SIDES. CUT 2 FROM 1/16" VERY SOFT SHEET
MOTOR CUT-OFF
OR USE K&B "SHURE-STOP"
1 7/8" DIA TREXLER AIR WHEELS
1/8 x 3/16" CROSSPIECES
INSIDE SURFACES CLEAR DOPED FOR CURLING EFFECT
TOP COWL BLOCK 1 1/2 x 2 3/4 x 4"
LOWER COWL 2 3/4 x 3 1/4 x 4"
SCALE IN INCHES
0 1 2 3 4
C. HOLLINGER

All the scoop from the leading model designers on what airfoils are most widely used in meets

Leading Lifters

Compiled by Frank Zaic

■ If you were to ask a model builder what he would like most, he would answer, "Fast climb and slow glide." No mention of a million dollars. Anyway, the majority of the builders who cooperated with Air Trails in the making of a survey of the most significant model airfoils now in practical use mentioned "fast climb and slow glide" as their main objective in the search for the "ideal" airfoil. Seems like this end, according to the answers, can be achieved with airfoils having flat bottom or undercamber.

On radio control models, NACA 6412 seems to be the main choice. Both Walter A. Good and R.F. (Radio Frequency?) Gelvin like it for its high lift at low speed as well as its gentle stalling characteristics. Gelvin talks about 5 lbs. on 6 sq. ft. and 35-40 mph flying speed. He also uses Clark Y. Both men agree on 37% C.G. and 2 deg. angular difference between wing and symmetrical stab. Walter is tempted to try a flat bottom next time because of simpler covering. Capt. H. M. Bourgeois, U.S.M.C., used NACA 4612 on eight R/C models and is pleased with its weight lifting and low stalling speed.

Response from the control line boys was surprisingly good. Walton Hughes and Harold Reinhardt favor NACA 0012 and 0015 for stunt ships. Claim tighter maneuvers and smoother level flights, and small Center of Lift shift. Hughes places C.G. at 5% to 10% and Reinhardt at 20%. Capt. Bourgeois is trying his own which looks like laminar flow. High point at 50% with C.G. at 15% to 25%. Supposed to give high speed with little power, good maneuverability, low stalling speed and good gliding ratio. He plans gradually to move the high point back to 70% and C.G. to 20-30% to obtain semi-scale stunt models that would perform with pure stunt models. Idea being to get more lift and lower G-stall ratio with narrower wing.

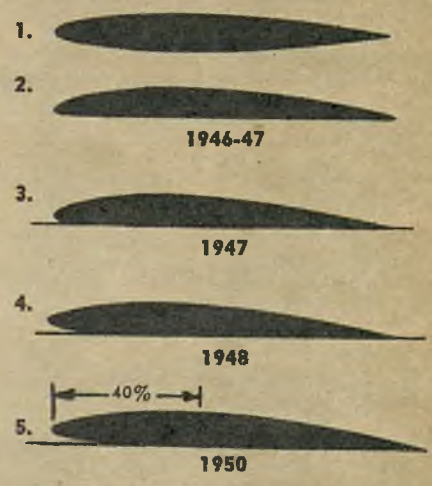
While still in experimental stage, the section developed by Jim Saftig showed promise by performing very tight and violent stunt maneuvers while capable of large smooth patterns and stability. It is of deep symmetrical type with high point at 25%. He also notes that actual performance depends a great deal on overall design of the model.

H. A. Thomas sent a very good report on the development of the Little Rock high-speed airfoil. It goes from 1946 streamline to 1950 streamline in front of 40% and Clark-Y-ish towards T.E. He mentioned that streamlined or similar sections tended to do a "high speed mush" at times—while present section indicated sharp improvement in lift, lower drag and stability at high speed. He also believes that it makes trimming easier and provides good lift at landing speed. Used in combination with streamlined stabilizer with 1½ deg. difference, and rectangular planform.

Most unusual speed and jet section was developed by William D. Viets. Nearest relative would be the M-6. He divides the thickness so that it is two-thirds above center line and one-third below; while high point on top is at 33% and bottom at 50%. He claims more speed, less drag and better handling at top speed. At or near top speed it flies light but steady, while at low speeds flies evenly without abrupt stall so that it flies right to touchdown. Did 154 mph. We've heard of all types of curves but this is the first time that a catenary curve was used for lower portion.

Free flight boys returned the largest percentage of the questionnaires. The surprising fact was the popularity of the NACA 6409 in almost all divisions. The new "light wing loading" rules for gas models did bring about a "new" airfoil which can be best described as a "thinned" Clark Y.

Carl Goldberg is still using his proven section with slight modification (G-610B) to allow L.E. and T.E. to lie flat on working surface. He believes that its lines are more nearly correct for airflow at model speeds. As some of you may recall, Carl made a series of tests to determine best airfoil for models, with his design as the result. His normal setting between wing and flat bottom stab is 1¼ deg. with C.G. at (*Continued on page 68*)



Little Rock Speed Sections

NACA 6412

NACA 4612

NACA 4409

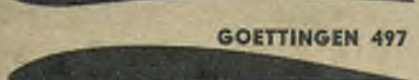
NACA 6409

DAVIS #5

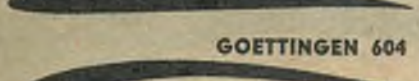
RAF 32

EIFFEL 400

GOETTINGEN 497



GOETTINGEN 604



S-2

B-7

CLARK Y

9% CLARK Y

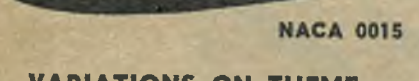
NACA 0009

NACA 0012

NACA 0015

VARIATIONS ON THEME

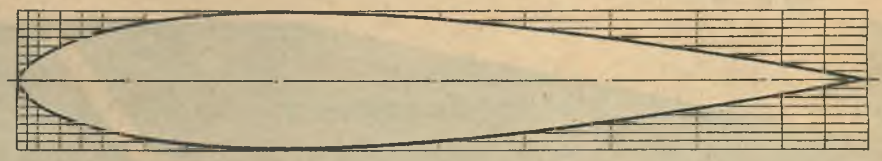
JUSTICE



HESS

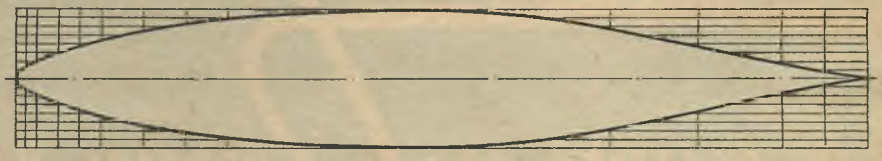
TAIBI

LIDGARD



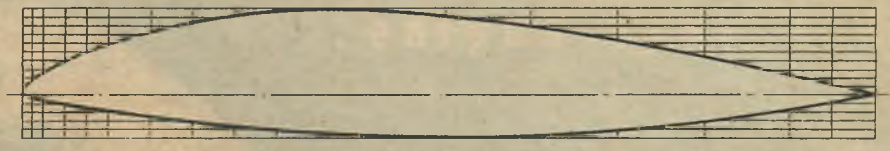
SAFTIG

Chord %	0	1¼	2½	5	7½	10	15	20	25	30	40	50	60	70	80	90	95	100
Upper	0	1.9	2.8	4.1	5.0	5.7	6.7	7.4	7.7	8.0	7.7	7.0	6.0	4.6	3.3	1.7	.8	.1
Lower	0	1.9	2.8	4.1	5.0	5.7	6.7	7.4	7.7	8.0	7.7	7.0	6.0	4.6	3.3	1.7	.8	.1



BOURGEOIS

Chord %	0	1¼	2½	5	7½	10	15	20	25	30	40	50	60	70	80	90	95	100
Upper	0	1.2	2.0	3.0	3.7	4.4	5.5	6.2	6.9	7.4	7.8	8.0	7.3	5.9	3.9	1.7	.7	00
Lower	0	1.2	2.0	3.0	3.7	4.4	5.5	6.2	6.9	7.4	7.8	8.0	7.3	5.9	3.9	1.7	.7	00

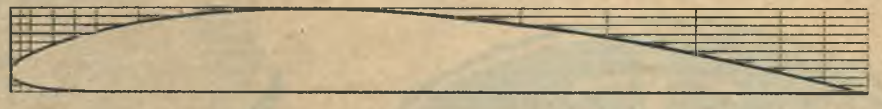


VIETS-S-4

Chord %	0	1¼	2½	5	7½	10	15	20	25	30	40	50	60	70	80	90	95	100
Upper	.5	1.8	2.6	4.0	4.9	5.9	7.3	8.4	9.3	9.7	9.8	9.2	7.7	6.2	4.2	2.1	1.0	0
Lower	.5	-.4	-.6	-1.1	-1.5	-1.9	-2.5	-3.2	-3.7	-4.2	-4.8	-.5	-4.8	-4.2	-3.2	-1.9	-1.0	0

GOLDBERG G-610-B

Chord %	0	1¼	2½	5	7½	10	15	20	25	30	40	50	60	70	80	90	95	100
Upper	1.	2.7	3.7	4.0	6.0	6.7	8.0	9.0	9.5	9.8	9.8	9.1	7.7	6.3	4.3	2.3	1.2	
Lower	1	0	0	.1	.3	.7	1.1	1.5	1.7	1.9	2.0	1.9	1.6	1.2	.7	.1	00	00



A-A 1950 (HATSCHEK)

Chord %	0	1¼	2½	5	7½	10	15	20	25	30	40	50	60	70	80	90	95	100
Upper	2.4	4.0	4.8	6.0	6.7	7.3	8.3	9.0	9.5	9.8	10.0	9.5	8.3	6.7	4.8	2.6	1.3	0
Lower	2.4	1.1	0.7	0.3	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0

WE COINED A NEW WORD...

"POWERformance"

...to describe the greater POWER, improved PERFORMANCE that this outstanding fuel gives your engine...

You'll find Testor's "39" unequalled for easy starting, maximum power output, dependable all-weather performance, exactly-right quality and quantity of lubrication, extended engine life, non-gumming characteristics under any condition! It was to tell this story clearly and simply — to sum up all these features in one easy-to-remember expression — that we coined the descriptive word: *"power*formance". You will see what we mean the first time you use this outstanding aviation fuel. Try it now... for stunt, contest, or just-for-fun flying with either glo or ignition type engines!

TESTORS

Half-Pint 39c
★
Pint 75c
★
Quart $1.40

TESTOR CHEMICAL COMPAN

NO OTHER HOT FUEL PROOF FINISH GIVES YOU SO MUCH...

STA

...now in new 15c size bottle and with a range of 15 colors plus STA Sealer and STA Thinner

Testor's STA is the *only* hot fuel proof finish on the market which is not in the least affected by any known hot fuel . . . including those containing high concentrations of such ingredients as nitro-methane, nitro-propane, castor oil, methanol, etc. It is fast-drying . . . covers well (actually better than dope) . . . can be applied over previous coats without dragging or lumping . . . has excellent luster . . . lends itself well to hand-rubbing despite the fact that the film is extremely tough.

Now — for your convenience — STA comes in a handy new 15c size bottle; is also available in a complete range of 15 colors.

You'll find this superior hot fuel proof finish in stock at dealers everywhere . . .

TESTORS

Your Choice of All These Colors

- ★ Medium Red
- ★ Dark Red
- ★ Maroon
- ★ Cream
- ★ Light Blue
- ★ Medium Blue
- ★ Dark Blue
- ★ Light Yellow
- ★ Medium Yellow
- ★ Orange
- ★ Medium Green
- ★ Light Gray
- ★ Black
- ★ White
- ★ Clear

Y • ROCKFORD, ILLINOIS

Handsome launch by Charles Stump, Los Angeles. Plane is Atom-powered. Photo by newspaper photog Dick Turner, 1/600 sec. at f/8.

Model Matters

News, Views, Comments and Photos from Model Clubs and Enthusiasts in America and Overseas

Swedish jet held by P. Lekares; Comet jet has 1 lb. thrust. Span 48", wt. 32 oz.

DOPE CAN

BY "DOPESTER"

■ Reaction to the Air Trails proposal to keep records for the greatest number of outside loops, inside loops, and straight duration by control line models has been excellent and immediate. It will require several months to accumulate the first data, but by the next issue we hope to have the first records for you.

If you want to try your hand at this type of record flying, drop us a note here at Air Trails and we'll send you an official form to be filled out upon completion of your flight. We'll set up separate records for both men and women as well as efforts by teams.

The tremendous hold that U-control flying has on modeldom in every land is illustrated by photos and stories in overseas publications that find their way to this country. The English, who first pooh-poohed control line flying, are head over heels in the activity as are most of the Continental nations, South Africa, Australia, and New Zealand. But we cannot blame other countries if they're slow to take up this type of aeromodeling since our own record in the United States indicates that Jim Walker had a tough time "selling" U. S. model leaders on two-wire flying.

It's only human to resist change. But an appalling lack of interest met Jim during 1940-1941 when he toured cross-country in an effort to acquaint hobby dealers and clubs with this revolutionary phase of modeling. Old-timers at free flighting scoffed at the idea. A few were induced by Walker to try out his original Fireballs. They complained of dizziness after a short flight, claimed the American enthusiast would never go for any such contraption. It's a mighty good thing for modeling that Professor Walker doesn't give up easily and is hard to discourage even when a lot of prominent flyers turn thumbs down on something new and startling.

These overseas publications we mentioned filled today with pictures of control line models are a tribute to Jim Walker, the gent who really changed the world-wide complexion of air-modeling.

If you were active in modeling before the war you will probably remember early efforts at U-controlling in your own neighborhood. Everywhere the picture was pretty much the same. Flyers who had been accustomed to short engine runs in free flight for years found difficulty in keeping their powerplants going for several minutes. The fuel system problem had to be re-examined. Tanks changed radically. Landing gears had to be redesigned to "take it."

Remember those early attempts at stunting? Then a wing-over was a big deal. And the fellow who flew inverted was the envy of the entire club. First stunt rules were met with raised eyebrows, until word leaked out what the West Coasters were doing. "If they can do it, we can do it," said (*Continued on page* 86)

● Payment of $3 to $5 is made for glossy photos (at least 4 x 5 in.) sent exclusively to AT and used. Don't send negatives.

Getting off to a Good Start...

In model aviation, as in any other hobby or sport, starting right is half the battle. With a majority of aeromodeling interest centered in control line flying, most of the new recruits now start off in that phase of flying. It's fortunate, then, that the American manufacturers have emphasized training-type sport models to the point where the novice has a wide and appealing selection from which to choose.

On the next two pages Air Trails presents a representative group of 17 control-line kit models which qualify as trainer-sport craft, and in some instances are capable of moderate or advanced maneuvers. For the overseas readers who may not have the benefit of our kit models, and for that relatively small band of enthusiasts who build only from plans, we offer the Peppy Trainer which embodies many of the features of the average primary trainer. It might well be described as the "All-American PT" Model.

About the best word of advice that could be given to a newcomer is that he link forces with an experienced flyer. Most modelers, when approached, are more than willing to pass on their suggestions, and it's a wise recruit who has an experienced man check over his control mechanism and the force and balance set-up of his ship before that glistening new plane takes to the air. A good policy, too, is for the novice to run his engine before the critical eye and ear of an expert.

Another good assurance of getting off to a good start is to seek out your nearest model club. Get acquainted with all the modelers in your neighborhood. If you can't locate a club, ask your dealer. And lastly, read with care all directions furnished—then heed them.

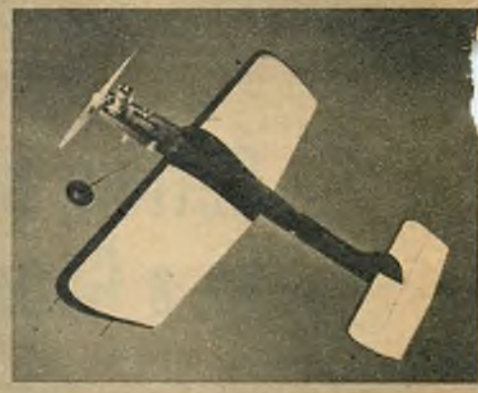
Master Modelcraft's Primer

Testor's Freshman

Enterprise's New Era

Top-Flite's Lil' Rascal

The Peppy Trainer



This job's built to take it; limited maneuverability makes it ideal for club instruction; all wood sizes are standard at 'most any hobby shop

■ If the Peppy Trainer looks like a lot of other U-control models but isn't, blame the dozen distinguished kibitzers who had a hand in its design. The development of a trainer for magazine presentation proved to have many odd ramifications. Talks with editors, expert flyer-designers, hobby shop dealers and modelers brought out many requirements that ordinarily wouldn't meet the eye.

In consideration of the people who would build the model and therefore have to buy materials out of dealers' stocks, standard size sheets and strips had to be used and these in a minimum number of sizes. Cost must be held down. It all added up to a healthy respect for the kit manufacturers who bring you so much for so little.

For instance, it was found that one leading edge size, usually considered easily available, would have cost 75c at the average hobby shop, for you'd have to cut it out of a small plank. Random specification of sizes frequently doubled, even tripled the cost, as compared with similar size kits. There was the interesting additional factor that kit design could not be followed, inasmuch as builders of magazine projects do not have prefabricating machinery worth (*Continued on page* 75)

Dmeco's New Bipe

Henry Brave

F-B's P-T Trainer

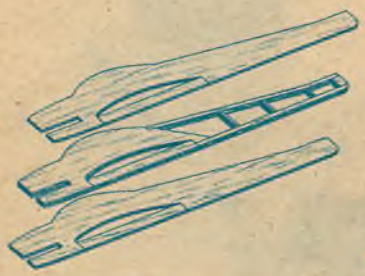
Monarch's Wee Willie

Midwest's
Biffer

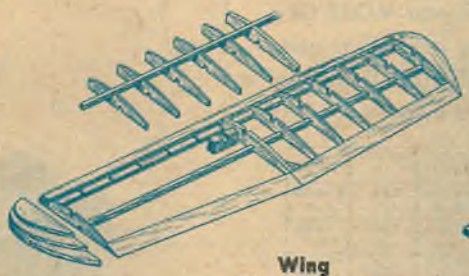
Stanzel's
Tiffy

Berkeley's
Senor Puddle-Jumper

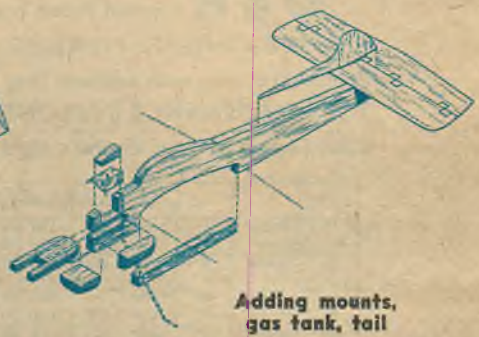
Scientific's
Kingpin



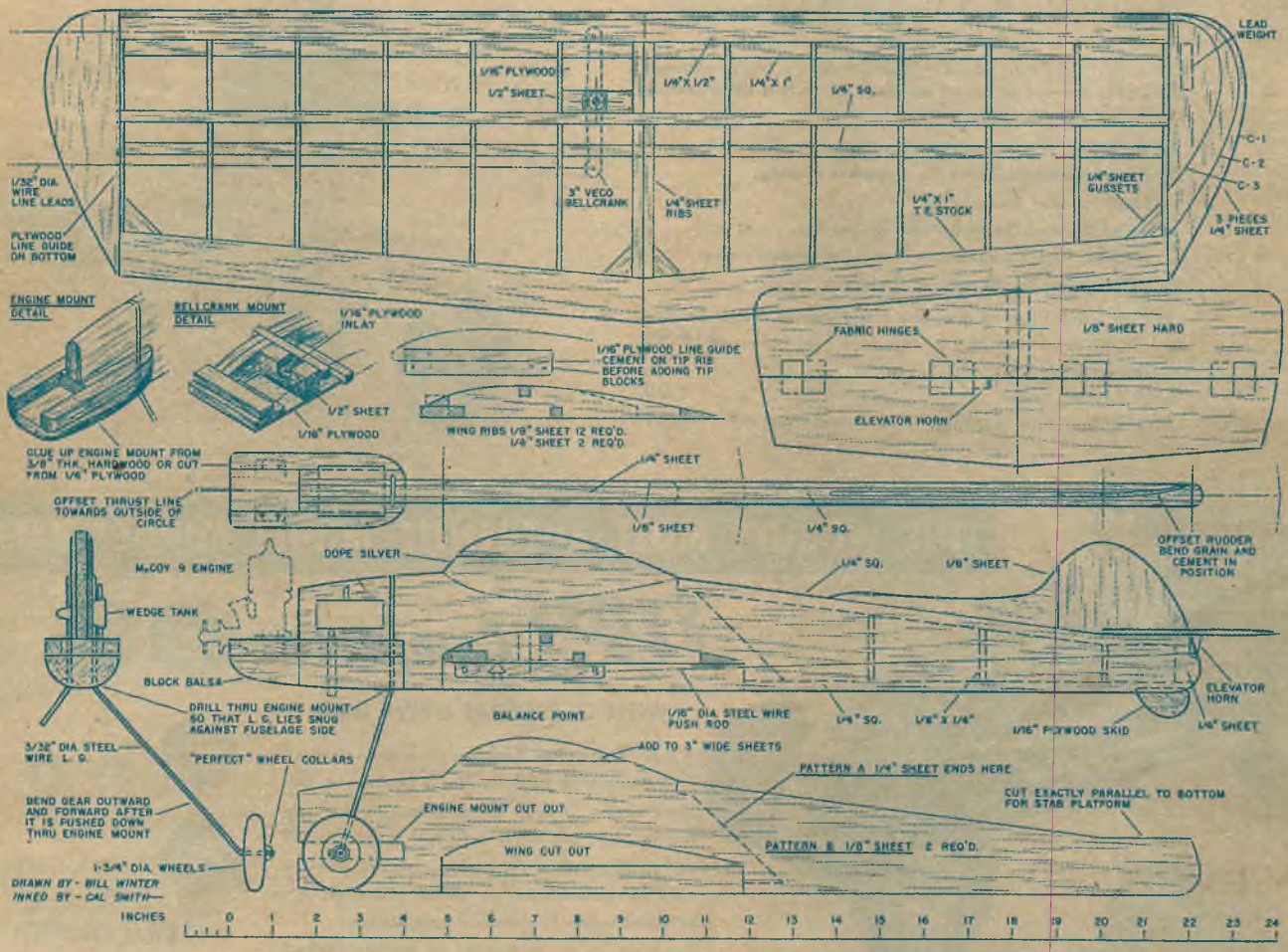
Fuselage
Sandwich



Wing
Construction



Adding mounts,
gas tank, tail



A-J Aircraft's
Fireball

Sterling's
Mavervick

Comet's
Piper Cub Trainer

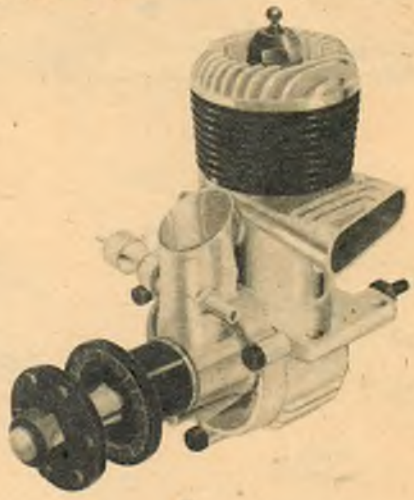
Joy Products'
Pee Wee

Guillow's
Trixter Profile

NEW! 1951 O&R ..

O&R Lapped Piston Engines are EASIER STARTING, HIGHER POWERED and MORE DEPENDABLE than ever before. They are built to give TOP PERFORMANCE and LONG LIFE. Get your O&R Engine at your dealer's right away.

MODEL	TYPE	CLASS	DISP.	BORE	STROKE	STATIC THRUST	WEIGHT OZS.	PRICE
19	GLOW	"A"	.1962	.684	.534	40 ozs.	4.75	$10.95
19	Ignition	"A"	.1962	.684	.534	40 ozs.	4.75	11.95
23	GLOW	"B"	.2299	.684	.625	50 ozs.	5.00	10.95
23	Ignition	"B"	.2299	.684	.625	50 ozs.	5.00	11.95
29	GLOW	"B"	.2999	.759	.663	64 ozs.	5.25	12.95
29	Ignition	"B"	.2999	.759	.663	64 ozs.	5.25	13.95
33	GLOW	"C"	.3299	.759	.729	68 ozs.	5.37	12.95
33	Ignition	"C"	.3299	.759	.729	68 ozs.	5.37	13.95
60	GLOW	"C"	.6000	.937	.875	90 ozs.	10.00	13.95
60	Ignition	"C"	.6000	.937	.875	90 ozs.	10.00	14.95



The NEW O&R FRONT END FLYWHEEL Marine Engine changes the whole concept of model boating. It's truly a REAL Marine Engine from stem to stern.

- ✓ **Front End Flywheel permits lower placement in hull.**
- ✓ **Dual Counter-weighted for smoother running.**
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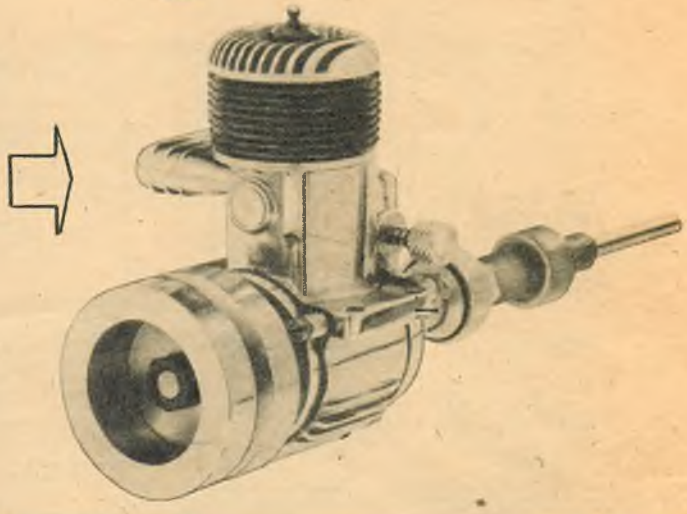
- ✓ **Roller Bearing Crankshaft for longer life.**
- ✓ **All New High Compression Piston for greater power.**
- ✓ **Ball Bearing Thrust reduces friction.**



O&R .29 Marine Engine complete with Flywheel, Thrust Bearing and Universal Coupling **$14.95**
Marine Flywheel **1.50**
Thrust Bearing only **1.00**
Universal Coupling (available in 15 thread sizes) only **1.49**

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$19.95 Complete

WITH O&R SPORT DRIVE UNIT

A true 12 to 1 scale model of the famous "Offie" that consistently held the No. 1 position at Gilmore Racing Oval in Los Angeles. It's not only fun to race, but is an accurate, fully detailed reproduction of a real midget racer. Can be used for either tether or power operation. It's safe and simple to operate in small areas.
Available in an assortment of brilliant baked enamel colors.

Model Racer only	$ 5.95
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Model Racer Complete with Sport Drive Unit	19.95
Authentic Driver illustrated, extra . .	1.50
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Designed for competition racing. Four semi-pneumatic tires and hubs. The O&R Competition Unit is available for installation in standard O&R Model Racers.

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½ Pt. 40c Pt. 75c
Qt. $1.40
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½ Pt. 40c Pt. 75c
O&R "30 PLUS"
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Most popular and largest selling model engine fuels in the world.

INSTANT CLIP

Designed for greater efficiency. Gives positive double connection and much easier starting.
INSTANT CLIP ONLY **15c**

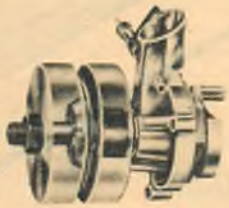
GLOW PLUGS

STOCK NO.	TYPE	THREAD	HEX	THREAD LENGTH	WEIGHT OZS.	WEIGHT GRAMS	PRICE
5-7	Standard	¼" x 32	⅜	3/16	.135	3.82	45c
5-8	Standard	¼ x 24	⅜	13/64"	.240	7.08	45c
3-8	Racing	¼" x 32	5/16	7/32	.07	1.98	45c
5-8	Racing	¼ x 24	7/16	7/32	.16	4.53	45c
AA	Baby	¼" x 32	5/16	5/32	.10	2.83	45c
Miniat		None	None	None	.08	2.8	35c

NEW! HI-GLOW PLUGS

STOCK NO.	TYPE	THREAD	HEX	THREAD LENGTH	WEIGHT OZS.	WEIGHT GRAMS	PRICE
Spitfire OK Cub	Hi-Glow	¼" x 32	5/16	5/32	.10	2.83	65c
Atwood	Hi-Glow	¼" x 32	5/16	5/32	.05	1.42	65c
S-8R	Hi-Glow Racing	¼" x 32	5/16	7/32	.07	1.98	65c

FLYWHEEL



Exclusive Trueing Washer insures "wobble-free" running.
19, 23, 29, 33 FLYWHEEL . **$1.25**
60 FLYWHEEL **1.50**

UNIVERSAL COUPLING

MARINE FLYWHEEL

THRUST BEARING

The only complete line of improved universal couplings. Available in the thread sizes shown.
UNIVERSAL COUPLING . . . **$1.49**
Wrench **25c**
BALL THRUST BEARING, COMPLETE **$1.00**
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COUPLING THREAD SIZES			COUPLING THREAD SIZES		
# 5–40	TO	# 5–40	# 6–32	TO	¼–24
# 5–40	TO	# 6–32	# 10–32	TO	# 10–32
# 5–40	TO	# 10–32	# 10–32	TO	¼–28
# 5–40	TO	¼–28	# 10–32	TO	⅜–24
# 5–40	TO	⅜–24	¼–28	TO	¼–28
# 6–32	TO	# 6–32	¼–28	TO	⅜–24
# 6–32	TO	# 10–32	⅜–24	TO	⅜–24
# 6–32	TO	¼–28			

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. . . that will give you many new and useful ideas for your model building. Fill in the coupon below and mail together with 15c in stamps or coins to cover mailing and handling costs. SEND FOR YOUR COPY NOW!

O&R .23 again wins the 1950 Nationals. Joseph W. Foster, the winner in Class B.

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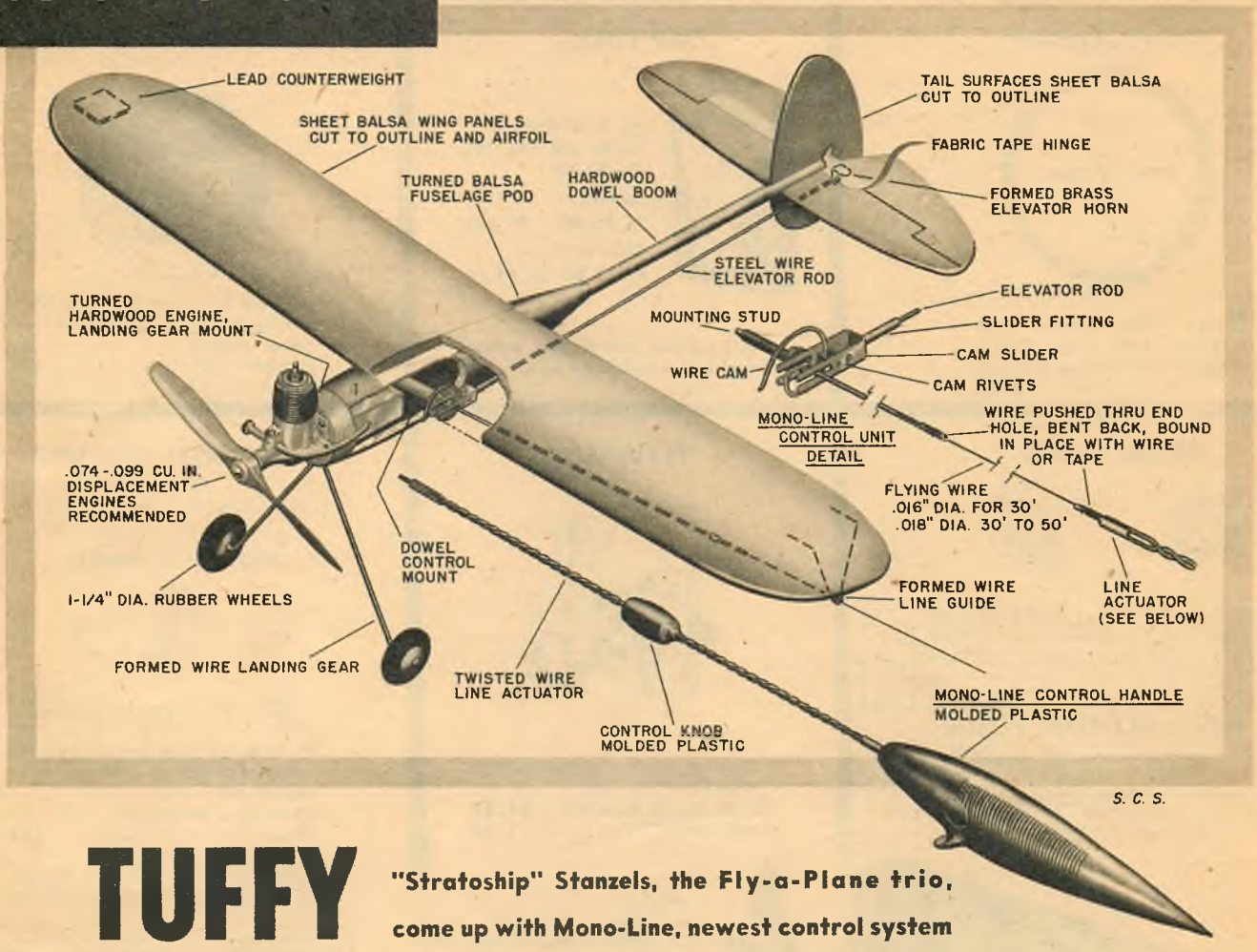
Model of the Month



TUFFY

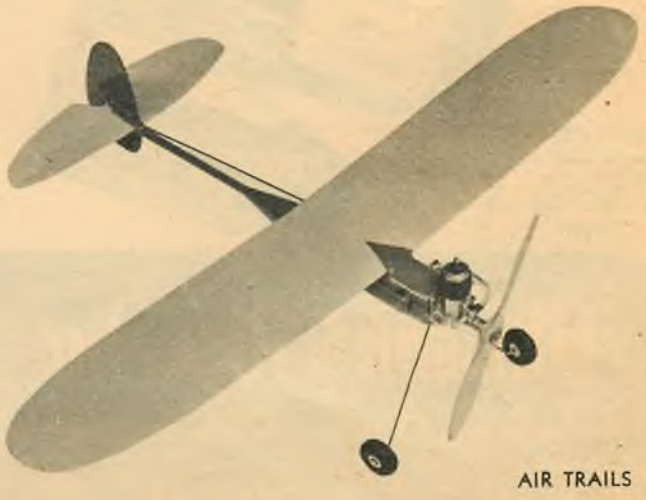
"Stratoship" Stanzels, the Fly-a-Plane trio, come up with Mono-Line, newest control system

■ Tuffy, the $1.98 prefabricated, single-line elevator control model by Victor Stanzel and Co., Schulenburg, Texas, is one of the more unique jobs described in this series. Which puts it mildly. But, perhaps, this story best tells itself.

While the Tuffy kit is a first-rate manufacturing effort, it is the control system and its unusual possibilities that merit most attention. The Mono-Line system involves an elevator control unit (98c) and a control handle ($1.50) which, of course, can be used on other models. As the illustration shows, the control handle consists of a plastic grip, provided with a twisted wire actuator and a sliding knob for working the controls. The principle is not unlike that used in the familiar toy helicopter wheel which is made to fly by sliding a knob upward abruptly to send the wheel spinning into the air. A single line connects the twisted wire actuator to the control unit on the airplane. When the sliding knob is moved along the twisted wire it causes that wire to revolve, and it is this torsional action which is transmitted, rather converted, into a fore and aft movement of the pushrod, by the elevator control unit.

The most startling thing to the conventional control line pilot is Tuffy's ability to fly on slack lines. The torsional action of the control remains whether the lines are taut or hanging outrageously. This permits a design with sufficient inherent stability to take off and fly on its own, thus relieving the beginner of having to provide complete control from take-off or of avoiding over-control; whenever the torsional line is free, the elevators automatically seek neutral. Because the Mono-Line job will maintain complete control with slack lines, it will perform in unusually windy conditions (when properly counterbalanced, of course).

By the same token, semi-free flight models may be flown on lines of from 100 to 200 feet in length. With long lines, wire diameter (*Continued on page* 62)



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MONOGRAM'S Three Sensational NEW SPEEDEE-BILT models

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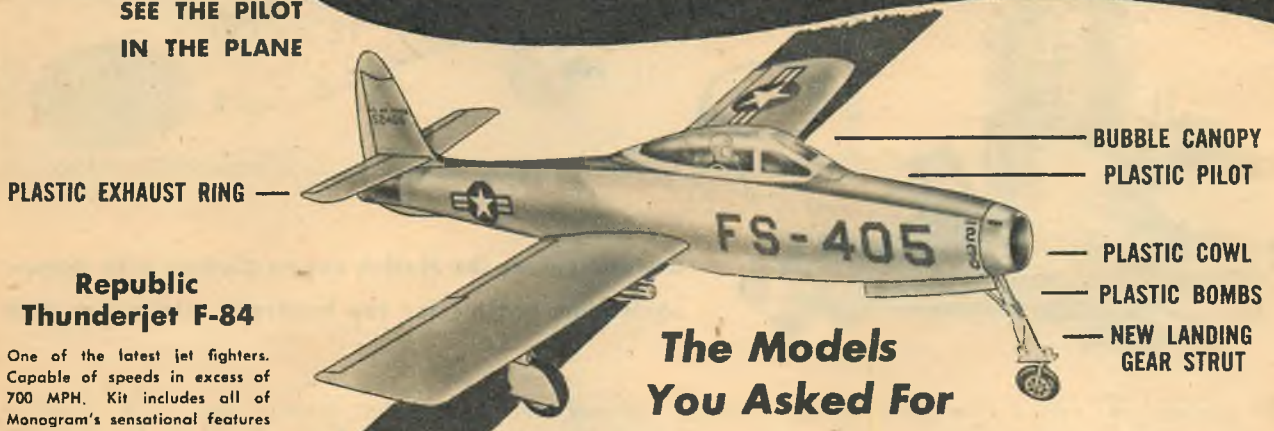
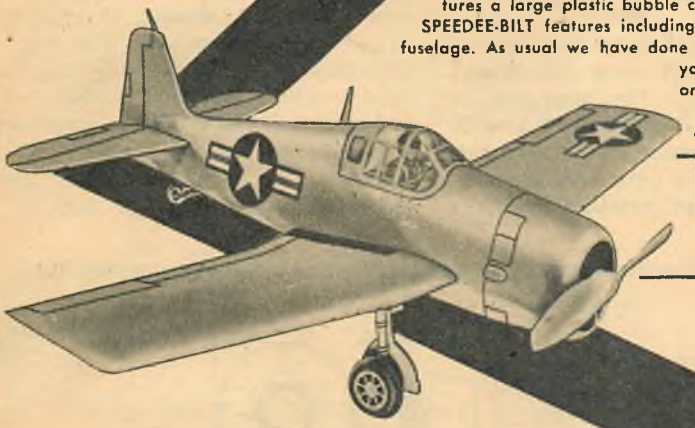


Republic Thunderjet F-84

One of the latest jet fighters. Capable of speeds in excess of 700 MPH. Kit includes all of Monogram's sensational features including formed wire parts and three-color decals. Can be powered with Jetex 50 engine. Only 75 cents.

The Models You Asked For

We just can't say enough about our three new SPEEDEE-BILT models. We know you will enthuse over them too because they are the models you wanted—the planes you asked us to bring out—and they are the most thrilling numbers in the entire SPEEDEE-BILT series. Just think of it, each of the new models has a plastic pilot to give you that extra scale realism. Each kit features a large plastic bubble canopy and other new plastic parts plus all of the regular and exclusive SPEEDEE-BILT features including speed construction with the patented Monofoil wing and precision-cut fuselage. As usual we have done all of the hard, time-consuming work ourselves but left all the fun for you. You'll enjoy building these new SPEEDEE-BILT models. You can finish one in an evening.



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The popular carrier-based fighter that gave such terrific performances in the Pacific. The most notable naval fighter of World War II. This SPEEDEE-BILT model with all of its exclusive features captures the true realism of this remarkable airplane. Only 75c.

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The newest 1950 version of this popular four-place airplane seen at most airports. Note the attractive and huge bubble canopy on our model. See how realistic is the pilot. You'll want to build and fly this new model right away. Only 75c.

Only 75 Cents Each

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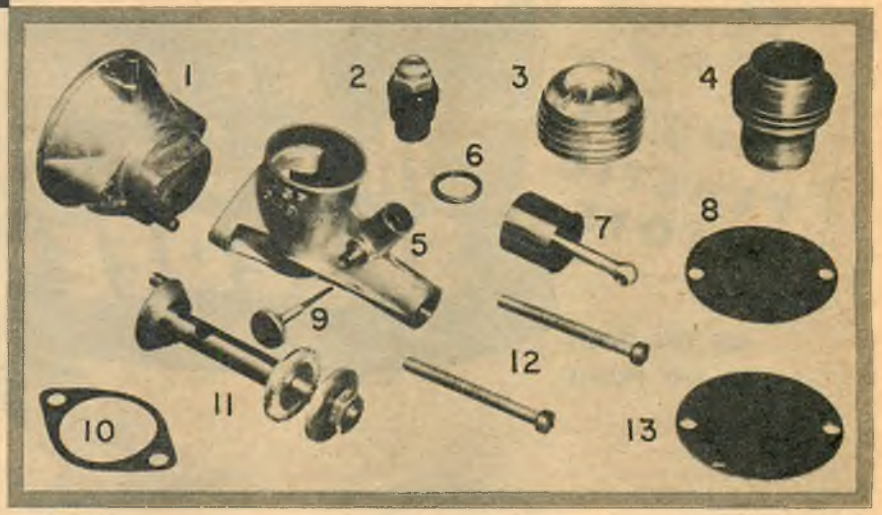
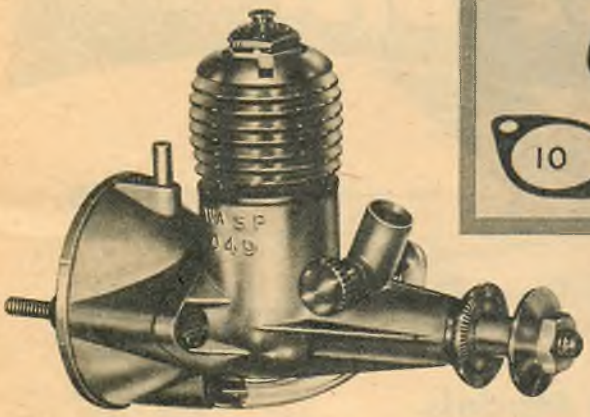
MONOGRAM MODELS, INC. 225 N. RACINE AVE. CHICAGO, 7

Motor of the Month

Wasp .049





Atwood enters the Half-A engine picture with snappy contender; battles for top honors in mini-motor field

■ A number of radical features have been incorporated in the design of the new Class AA (or "Half-A") Atwood Wasp .049, resulting in good appearance and outstanding performance. Some improvements such as short stroke, long crankshaft, and cap type cylinder head carrying most of the cooling fins bear a close resemblance to modern European diesel engines.

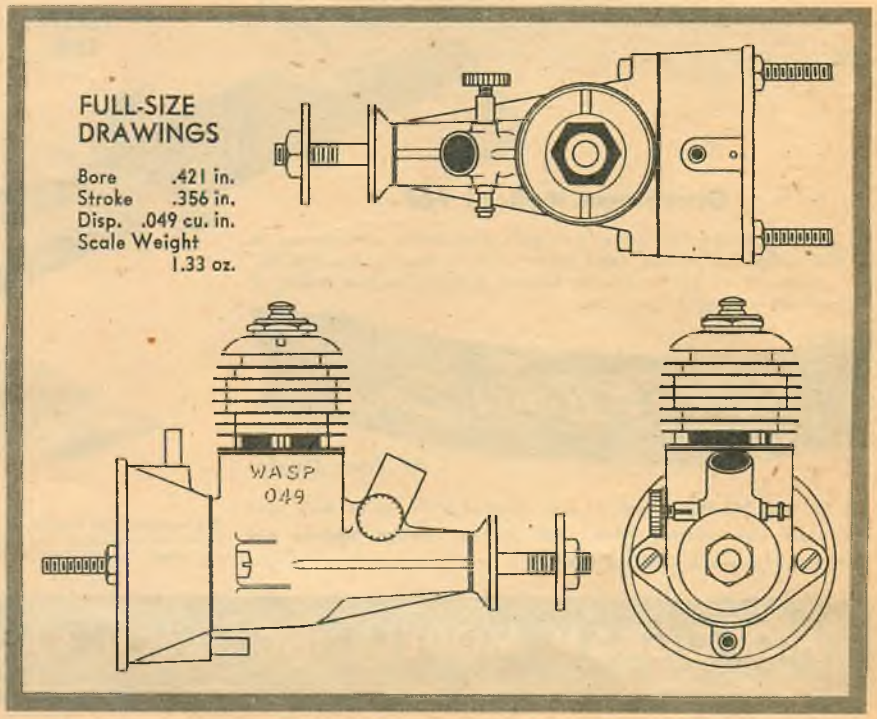
Engine "whittlers" from the speed circle set will take great delight in sawing off the gas tank and filing away excess glow plug metal to produce the shortest and smallest frontal area currently possible in the mini-motor field. Crankcase diameter and engine height have been reduced by using a short stroke and short connecting rod. High rpm is achieved with a low stroke bore ratio and new 360° intake and exhaust porting. A circular recess bored in the cylinder acts as an intake port.

Fuel flows from the base through two bypass ducts to an intake distribution manifold. Three large mill-cuts connect this manifold with the intake recess. The cylinder with its many ports, passages, threads and only two cooling fins looks like the firing chamber from a Buck Rogers ray gun. Speed flyers will also like high speed wear resistance added by the steel crankshaft bushing.

Half-A stunt got a small start last year and should soon come to the front when the Wasp gets into capable hands. Here is a new high in steady running. The fuel level test of seven and one-half inches is more than double that of former designs. Atwood undoubtedly will regain its stunt fame set with the old model JH.

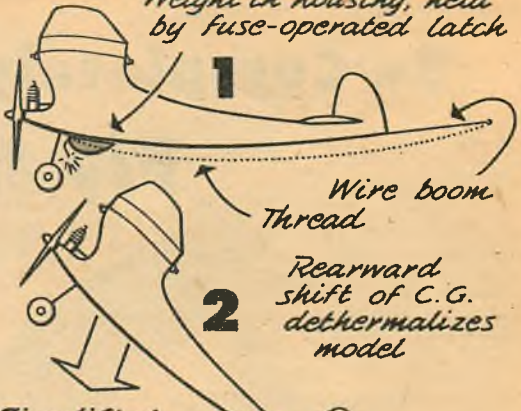
Free flight and sport fans should be well satisfied with the Wasp's pulling power. The performance chart shows 11,600 rpm on a wide blade 6/3 propeller. A built-in fuel tank provides a very simple radial type powerplant installation. Use a solid firewall for even pressure against the back of the tank to avoid leaks. A thin aluminum plate closes the back of the tank and is sealed with a gasket. Engine run was timed at 1 minute, 50 seconds (11,600 rpm; 6/3 prop). The Wasp has good strength considering its light weight. Inverted landings on the cylinder head should be avoided.

Five minutes of running was sufficient to limber up the test engine. At (*Continued on page 60*)



sketchbook

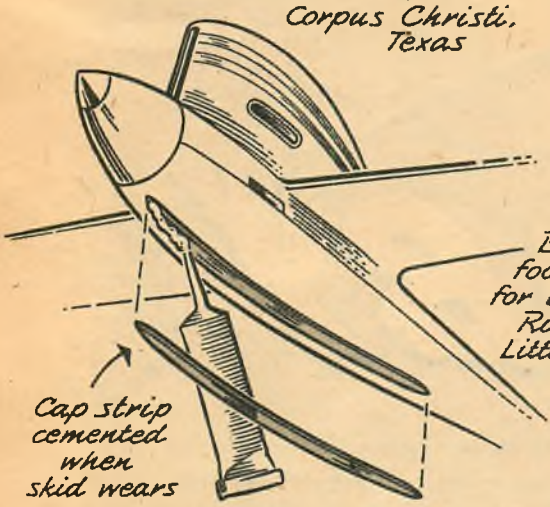
HAVE YOU DEVELOPED SOMETHING NEW IN CONSTRUCTION, CONTROL, OR FLYING THAT MIGHT INTEREST OTHER MODELERS? SEND A ROUGH SKETCH—WE'LL REDRAW IT AND PAY $2 FOR EACH ONE ACCEPTED

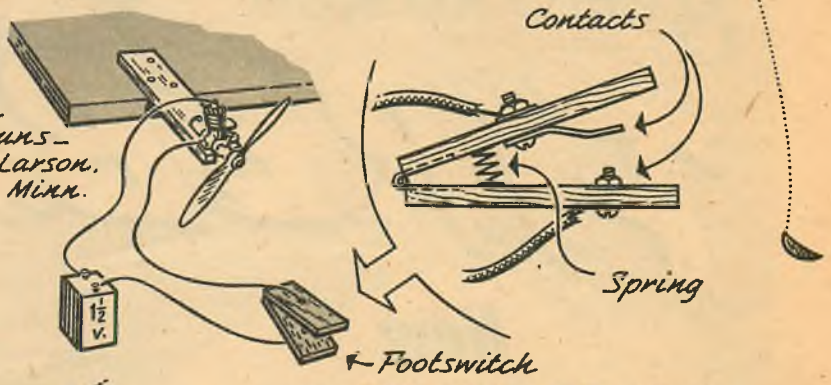


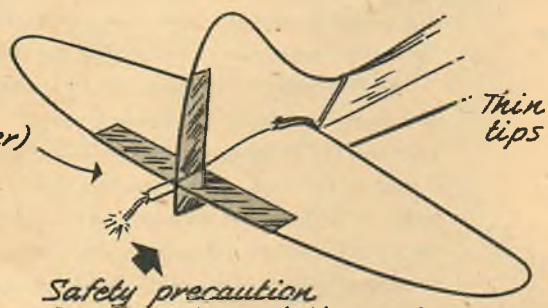
Simplified dethermalizer by Charles Francis, Hamburg, N.Y.

Fumes from thinner in tall bottle keeps brush soft & ready for use... Idea of Ray Biernacki, Webster, Mass.

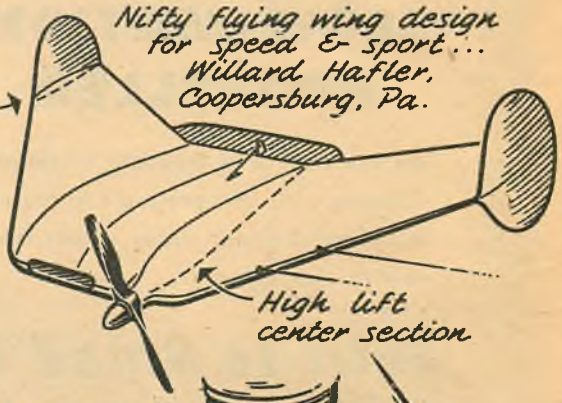
Plexiglas is best skid material for speed jobs claims H. G. Oliver, Corpus Christi, Texas



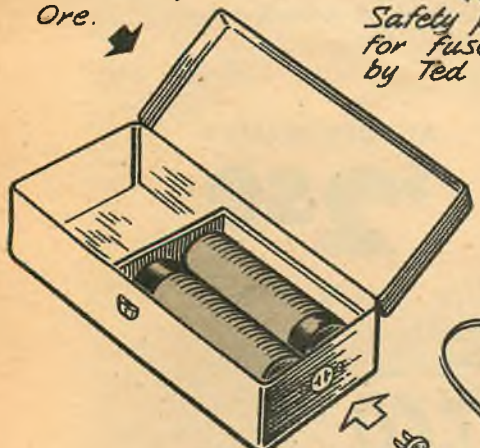




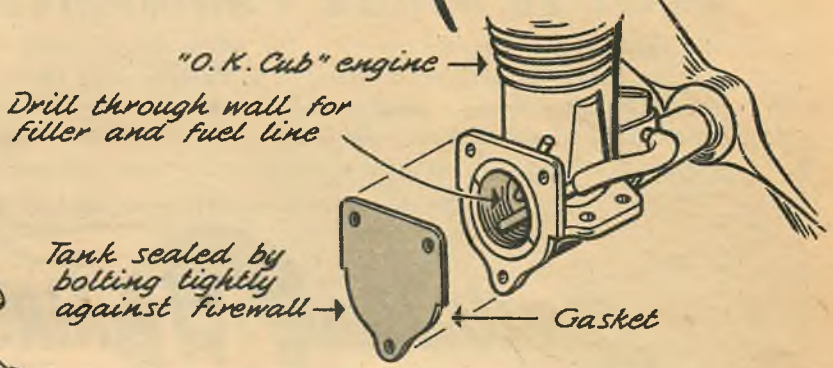
Safety precaution for fuse-type dethermalizers by Ted Jones, Oxford, Pa.



Don Nelson, Portland, Ore.



Booster battery cells wired from tool kit with receptacle and appliance cord & plug.



Recessed back of crankcase serves as tank for 10-20 sec. runs... Submitted by Leon Shulman, Newark, N.J.

HERE AGAIN!

NOW YOU CAN BUILD THESE BIG 30" WARTIME $1 FIGHTERS AGAIN

Just take a look at these grand 30" span flying model kits of the Curtiss P-40 "Warhawk" and Bell P-39 "Airacobra" kits at your favorite hobby shop, and we're sure you'll want to build them for free flight with your new half-A motor, or use rubber power. They use the familiar type construction of light weight and simplicity. Control line fans will want to beef them up and send them through their paces with A or B motors. They are complete kits except for liquids and motive power.

The "Airacobra" and "Warhawk" have been called back into our line through popular demand. Mounting enthusiasm for the glamour-covered warplanes of 1941-'45 has centered on these two outstanding designs — you'll be seeing these models everywhere soon—build and fly your own! Why not start them now, and get in on that good flying weather just before Fall! Or, if you build for display only, you too will want both these sleek aircraft—the P-40 (star of the "Flying Tiger" legend) and the P-39 (the famous "cannon plane").

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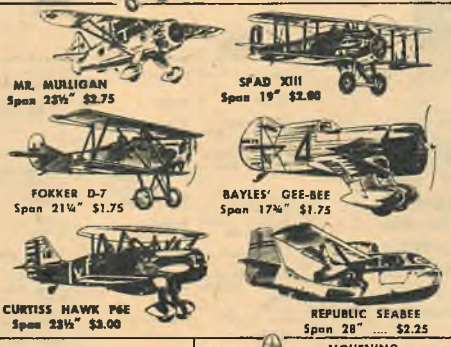

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War-famed, twin motored, accurate scale beauties for rubber, CO2 or ½A free flight, and also for ⅛A or A control line flying.

50c "E-Z"s ARE DIE-CUT, LIGHT, & TAKE MANY MOTORS

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CLEVELAND MODEL & SUPPLY CO., 4516K2 Lorain Ave., Cleveland 2, Ohio . WORLD'S FINEST MODELS — SINCE 1919

Wasp .049

(*Continued from page 56*)

the end of two hours there was no change, so the performance tests were made. Most Half-A engines run with a sputtering noise but the Wasp had a steady clear explosion at all operating speeds. At 15,000 rpm running was very consistent and the engine was not sensitive to fuel adjustment.

Improved scavenging due to the 360° intake port probably accounts for the steady running. Engine output increased 1,000 rpm when miniature fuel blends were used rather than standard varieties. Starting was best with a small prime in the exhaust and little or no prime in intake. Choking flooded the engine and usually caused hard starting. Needle valve should be opened approximately one turn so fuel will pick up after a burst.

Engine Data

PERFORMANCE. Bare Weight, with tank: 1.33 oz. Propeller—8/3 wide blade wood 11600 rpm; 5½/3 wood 12900 rpm; 5½/3 plastic 14000 rpm; 5/3 wood 15000 rpm; 5/6 wood 11600 rpm. Fuel: more speed from miniature blends. Fuel level test: 7½" at 14000 rpm.

DESIGN DATA. Displacement: .049 cu. in. Class: Half-A (A/2) free flight; A for control line. Stroke: .356 in. Bore: .421 in. Stroke-bore ratio: .846. Compression ratio head: 6.4. Compression ratio base: 1.66. Port area intake: .0123 sq. in.; bypass: .0126 sq. in.; exhaust: .0453 sq. in. Ignition: short glow plug.

CONSTRUCTION Features, Bearings: crankshaft, steel bushing; crankpin, aluminum connecting rod ball, aluminum and brass. Inlet and exhaust ports, 360°. Head covers most of cylinder.

A rounded crankcase adds a streamlined appearance to the Wasp. This is accomplished by using a cone-shaped crank disk. Base compression and weight are also improved by this feature.

The only criticism after careful testing concerns the short needle valve control knob. Exhaust gas shoots out in all directions and is very uncomfortable on the fingers. Adjustments can be made by holding a propeller blade against the cylinder to deflect heat away from the fingers. A needle valve extension would be helpful for cowled-in ships and is recommended for general use.

Wasp .049 Parts Illustrated

	Part	Material	Size (in.)	Wt. (oz.)
1.	Gas tank & back plate	Die-cast alum.		.21
2.	Glow plug	Steel	¼-32 short.	.11
3.	Cylinder head	Aluminum	.722 dia. x .408 long	.10
4.	Cylinder	Steel	.421 bore x .746 long	.18
5.	Crankcase	Die-cast alum.		.30
	Needle valve body	Brass		
6.	Plug washer	Copper		.01
7.	Piston Rod	Steel hardened & lapped aluminum	.421 dia. x .361 long	.10
8.	Gas tank gasket	Vellumoid	1/64	
9.	Needle valve	Brass	1-72	.02
10.	Crankcase gasket	Vellumoid	1/64	
11.	Crankshaft	Steel hardened & ground	.1865 dia.	.17
	Drive washer	Aluminum	½ dia.	.02
	Front washer	Aluminum	.490 dia.	.01
	Nut	Steel	5-40	.02
12.	Bolts	Steel	3.48	.05
13.	Gas tank cover	Aluminum	1.0 dia.	.03
			Scale weight	1.33
			Less tank	1.17

Delanne

(*Continued from page 23*)

was needed was a high-performance, low-powered personal aircraft. He realized that most of the planes available at the time were overweight for their function; as a result, they had to use huge engines with proportionately large fuel appetites.

Delanne's first design was a three-place low-wing monoplane powered by a 75 hp Anzani engine. This plane was the first semi-monocoque structure ever built in France. Its performance, at the time, was regarded as phenomenal. Even by today's standards, it would have been acceptable; a top speed in excess of 105 mph. The structural patents were considered so important that they were eventually acquired by the French Air Ministry.

During this period, Maurice Delanne learned to fly. By his own admission, he

(*Continued on page 63*)

Is She Right?

Dear Girls:

Do you treasure your youth, health, good looks, freedom, financial security—yes, even your sanity? Then, think carefully, and don't take that fatal plunge—DON'T marry a modeler!

No, I'm not an anarchist, or a social reformer. It's just that I hate to see so many of you poor, unsuspecting, sweet young things turn into disillusioned, ill-tempered shrews!

Of course the horrible thought has assailed me that this advice may come too late, for it's not likely that very many of you would be reading this modelers' "bible" unless you'd been snared already! But in the fond hope that perhaps this may catch the eye of some trusting maiden contemplating matrimony to one of these miniature bright-blue-yonder boys, I'll give you a rough sketch of "Life among the Props and Pylons" as experienced by many of the wives.

For instance, let's take a typical meet day—that is, ANY Saturday, Sunday or holiday! Time was when I, fool that I was, blissfully packed enough food for an army and went off expecting to have a jolly time at a sort of glorified picnic. Hah!

At 6:30 a.m. the Little Woman is up packing a lunch basket to provide two full meals and between-meal snacks for the family. At 7 a.m. she routs a sleepy youngster out of the sack and tears around, assisting and belaboring him until he's squared away. Between the two of them, they load the car with lunch basket, car robe, toys, books, etcetera, while Big Chief Super Sonic slumbers on!

At 7:30 she gives out with the first call for breakfast. At 7:45 the Chief jumps out of the sack, bolts down fruit juice, cereal, eggs, toast, coffee (prepared by you-know-who) and disappears down the cellar stairs. Breakfast over, the Squaw clears the table, washes the dishes, makes the beds, and dashes in to dress just as the car horn begins to blow. She dresses to the accompaniment of "C'mon, c'mon, we haven't got all day, what the heck have you been doing all morning anyhow?"

The Chief, his planes and equipment are ready to leave—five minutes ago!

Finally, Squaw (YOU, if you heed not these words) staggers out to the car and collapses into the seat, usually managing to smear her lipstick on and comb her limp locks as the caravan gets under way. If you're a philosopher, at this point you try to enjoy the scenery. You haven't the strength to do anything else, after having run a relentless race against time since arising.

At last you reach the hallowed spot where the meet is to be held. Daddy disappears in the direction of the registrant's desk and, if you're in luck, you *may* possibly see him again before dusk. But if, during the day, you should notice him heading in your direction, don't be flattered, girls. It isn't you he seeks. It's a sandwich.

Many hours later, just as the family is about to expire of sunstroke or ennui, Big Chief Super Sonic declares it's time to commence the trek back to the car. Squaw and Papoose gather up aforementioned necessities while Chief S.S. bears the remains of those beautiful ships with which you left home long eons ago.

On the other hand, if it's been a highly successful day, he will be carrying only slightly battered planes (a touch of Ambroid is all that's needed) and a couple of objects *he* calls "trophies"—but don't be taken in by the name—"dust collectors" is so much more apt!

Tired but happy, now that the prospect of home nears, you and the young 'un climb into the car and wait expectantly to leave. But don't think you're going to be let off that easily. Next comes the rehashing of the day's events with the rest of The Boys.

After an hour, more or less, of this, perhaps one of the other long-suffering wives comes over to drag her man homeward. Even though the men have never bothered to introduce their mere womenfolk, it would be pretty rude not to speak.

So just as you summon up your little remaining strength to smile and exchange a pleasantry with the other weary wench, our hero roars, "C'mon, quit the gabbing and let's get going! All you women do is talk, talk, talk." This, mind you, after you've listened to the boys beating their gums all day.

So think carefully, girls—are you sure you want to latch on to such a character? You'd do better to remain a Free Flight model than let him put you on a matrimonial U-Reeley!

—Norma R. Viets

Wow! 25c NEVER BOUGHT YOU SO MUCH FLYING FUN BEFORE!

REVOLUTIONARY NEW **Airlane** PRE-FABRICATED MODELS ARE *On the Beam . . .*

THRILLING TO FLY! A CINCH TO ASSEMBLE IN A HURRY! A JOY TO OWN — ADVANCED DESIGNS ARE KNOCKOUTS!

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wing span 13 in.

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Q6. AERONCA
wing span 15 in.

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Q2. STINSON VOYAGER
wing span 15 in.

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Q1. CESSNA 170
wing span 15 in.

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Tuffy

(*Continued from page 54*)

must be increased. The degree of controlling action transmitted by the handle is directly proportional to the length of the line, as well as its diameter and the number of revolutions applied by the sliding knob. Control handles giving more revolutions in both directions are necessary for such extraordinarily long lines.

We turned a Tuffy kit over to an inexperienced junior, this being an ideal way to highlight any possible difficulties. Bring it back in a week, he was told. Three hours later (!) it was ready to fly with one of the new K & B .049's on front. The chap who flew it had not been checked out on U-control, yet he soloed the Tuffy with no difficulty but with every bystander wincing as he permitted the line to sag on the upward side of the circle. This particular ship could have stood more weight on the nose for it tended to climb, yet the beginner pilot encountered only the slightest over-controlling in recovery descents. The Tuffy test model indicated its suitability for the totally inexperienced pilot.

The kit itself is most complete and thoroughly prefabricated as our tests proved. Despite its prefabricated contents, the kit includes a complete full-scale plan, with all three-views, and lengthy directions. The plan is better than average and the directions show a modeler's appreciation of the kind of info other modelers will require in building and flying.

The assembly breaks down into three groups: the landing gear and nose-block motor mount; the wing, fuselage, elevator control unit group; and the tail and tail boom group. The sketch shows how these parts fit together. Attention is directed to the attachment of the landing gear wire to the nose block and how that block fits snugly into the open, circular end of the fuselage pod. The pod itself is of circular cross section, hollow, and the tail boom, a hardwood dowel, fits tightly into a hole provided in the rear of the pod.

The wing is in two panels, requiring only the sanding of the tips down to the proper edge; these panels are joined à la hand-launched glider technique, the butt ends being cemented prior to actual joining, then recemented for joining. A cement skin is rubbed on over the dihedral joint. Tail surfaces cement to the boom. An unusual touch is the paper covering of the all-wood wing which goes a long way toward preventing breaking up of the wing through repeated rough usage. The tail-boom proved adequately strong.

Stanzel & Co. has been doing business quietly for a long time, and over the years since 1927 has been responsible for more than its share of worthwhile developments. "And Company" includes brothers Joe and R. Stanzel, a silent partner. Models and products are designed by Victor, experimental and development work carried out by both Victor and Joe. Joe is a true expert tool and die maker whose skill enables him to build necessary plastic injection molds, metal stamping and forming dies, as well as balsa cutting and forming tools. Stanzel's plant certainly is one of the few that turns out all its own parts, whether they be metal, plastic, or wood.

Victor Stanzel's first personal model was a Spirit of St. Louis. Hobby swiftly became business when young Victor found that nicely finished scale models of old-time army planes, like the P-6E, Falcon, P-12, could be sold to military personnel at various flying fields around San Antonio. In 1932 Stanzel decided to make these same ships available in kit form. Joe joined forces in 1934 and as the business took root, R. Stanzel came into the picture.

The Stanzels really went to town with their yen to make larger models. Typical were airplane ride devices they developed for amusement parks which include the Fly-A-Plane, a two passenger cabin plane mounted on a steel revolving boom with a ten-horse electric motor and prop for power. This Stanzel device could take off under its own power and the happy passengers could make it climb and dive as it circled the pylon. Still another of Stanzel's aerial rides was the "Stratoship," a rocket type ride device carrying six passengers through a hair-raising, twirling, diving, zooming flight through space. This proved so popular at the World's Fair that it was installed afterwards at many amusement parks both in this country and in England.

With the advent of the small gasoline model engine, Stanzel thought of control-line flying and, after much experimental work, came up with the Tiger Shark, so named because it flew on fish line. Other Sharks, to the confusion of the local telegraph office, followed. At least once the operator was startled, deep in the heart of Texas, to decipher an order for a "Gross of Baby Sharks. Please Rush." Among two-

line systems then developed by the resourceful Victor were Roller Control, the Direction Control Stick, the Thum-It and Control-It units.

Always interested in one-line elevator control, Stanzel experimented for six years before placing Mono-Line on the market. At least two good systems proved out earlier but the manufacturer felt the mechanisms could be further simplified. The most difficult obstacle was the effect of friction, due to line tension, on the control device on the model. Because small line diameters and long wire lengths greatly limit the torsional force that can be transmitted, the unit on the ship must be very sensitive and free from friction. This is made possible by means of the torsional anchor line within the tubular shaft which takes up all the tension and relieves the rotary cam of end thrust and consequent friction.

"Mono-Line is new and, like any other new product, we realize that there is a big educational job to be done in order to make it familiar to modelers," Stanzel told us. Speaking of Tuffy, the circulars state that it is Easy to Buy, Easy to Build, and Easy to Fly. And that's the truth.

Delanne

(*Continued from page 60*)

was not a very apt pupil. What disturbed him was the length of time it took to acquire the knack of flying well. It required at least two years for a man to become proficient in the full sense of the word, and a fairly constant degree of practice to "keep sharp." This was satisfactory for a professional pilot, but the number of serious amateurs who could devote that degree of time and effort to the art was, in Delanne's opinion, seriously limited.

It was the plane designer, Delanne decided, not the pilot, who must close the gap between the contemporary airplane and safe flying conditions. Conventional aircraft, it seemed, required too much skill of the pilot, a condition which would limit personal aviation to the very few who could afford the time to fly constantly. This would make aviation a very limited industry. Motor cars, Delanne observed, did not become common until their operation was simplified and professional chauffeurs were not needed.

In the late Twenties Maurice Delanne decided to alter the classic approach to designing airplanes: that of starting with the aerodynamics and powerplants, and hoping that the skill of the pilots would make up the difference. He began with the limited capabilities of the average man, and decided to tailor the aerodynamics to fit not the highly skilled pilot, but the Sunday-driving, somewhat inept average world citizen.

After considerable study of the subject, Delanne outlined certain basic requirements for his future design. He wanted a stable airplane; one that would take off rapidly, climb out of short fields well, land short and have no true stall; only a gradual reduction of lift. With power off and in landing position, the design would permit the plane to be "landed" if necessary, a hundred feet in the air, and then "mush" into the ground in perfect safety. These characteristics were to be accomplished without any complex and expensive high-lift devices, and with a cruising speed required to make it a practical air vehicle.

A tall order. In the early Thirties, the single-engined low-wing monoplane that Delanne had helped pioneer was achieving supremacy. He knew its shortcomings. The so-called tandem monoplane, the system of one wing ahead of the other showed great possibilities, despite the performance loss entailed by the interference between the two airfoils. Maurice Delanne sensed that there must be some ideal relationship between the wings in a tandem arrangement where the stability and stall resistance could be retained without sacrificing cruising speed.

In 1932, he initiated a test program to discover this ideal relationship. It was

a long, slow process, involving over sixty sets of wind tunnel models, their tests and accompanying calculations. Out of this test series came a simple formula for the relation between two airfoils in space and position which resulted in certain marked advantages over the existing systems. In the final arrangement, the wings were so arranged that at high angles of attack, the downwash effect from the front wing "fed into" the airflow of the rear airfoil.

This slot-like interaction compressed the air flowing over the rear so that, even at high angles of attack, and at slow speeds a normal volume of airflow was directed over the rear airfoil. Since this surface contained both ailerons and elevators, it retained not only lift but control sensitivity as well. The "end-plate" effect of the twin rudders at the tips of the rear airfoil further contained the airflow, boxing in the tip losses, and retaining control sensitivity at very slow speeds.

The tests, certified by the French Air Ministry, showed that the Delanne configuration had a ratio between landing and top speed of better than 7:1. (3:1 is average, 4:1 is considered very good.) It also certified that at normal cruising levels, the fuselage drag appeared to vanish. (Thus far there is no complete explanation for this phenomenon. It stems either from some positive pressure, descending from the wing, impinging on the fuselage, or from some defect in the classic Prandl formula for calculating drag.)

The F.A.M. report also indicated that the slot-like action, as previously stated, made the ship stallproof. Two other outstanding features had shown up in the tests; the design indicated that it could maintain longitudinal stability characteristics up to a center of gravity location of 67 percent of the mean aerodynamic chord. In practical terms, that meant that *all* of the fuselage was available for useful work, and that virtual coincidence of the center of weight and center of gravity was no longer necessary. To top it off, the configuration showed 35 percent more lift than a typical rectangular conventional wing of the same area and curve.

This was late 1936. The Air Ministry proceeded to give Delanne development contracts to build prototypes of his configuration. The first contract was for a two-place command fighter, a rather odd machine whose military purpose stemmed from a combat theory long since abandoned by air tacticians. Contemporary French tactical experts believed that the commander of a fighter squadron should fly a "winged command post" above his formation of fighters, and direct their actions by radio. To achieve this, a special two-place machine was designed in which the pilot-commander was freed from the task of defending his rearward arc by strong defensive armament. This called for a machine of varied characteristics.

Delanne's two-place command fighter was the only design submitted that satisfied the stringent requirements. The machine, known as the Type 10 C2 was a braced high-wing monoplane, powered by an 860 hp Hispano engine. The use of the braced-gull wing was characteristic of French military demands at the time. Delanne wanted a straight cantilever structure, but the Air Ministry was adamant on the subject.

The ship carried two men, command pilot and gunner. It was armed with a 20-mm cannon, firing through the hub, two 12.7-mm machine guns in the wing, just free of the propeller arc, and an electric turret in the tail, carrying four rifle-caliber guns. Despite the load, the ship achieved a top speed of 360 mph, climbed at 40 feet per second, had a 17.6 feet per second rate of descent and landed at a bit under 50 mph. Like most of the French fighters of its time, its range was about 1,000 miles.

During this period of development, Delanne built some conventional ships

in his plant in order to meet operational expenses. One was the Model 60-E-1, a single-place aerobatic training glider. Nessler, the noted French glider pilot, kept one of these machines aloft for 28 hours. Two hundred of them were ordered by the French government in 1938. Three-quarters of the lot were delivered before the invasion of France. On the basis of the single-seater's success, a two-place machine was ordered. The prototype was test flown, but the invasion cut short its production.

Even though the conventional gliders were his bread-and-butter contracts, Maurice Delanne's heart was in the Duo-Monoplane. When the fighter contract was launched, a requirement for an aerobatic trainer was posted by the French Air Ministry. This, too, was a job in which a Duo-Mono design could have performed well. The Air Ministry awarded Delanne a study contract, but Delanne, impatient of delay and confident of an ultimate contract, proceeded to build the trainer as a four-fifth scale model of the fighter. The little ship, the 20T-02, was finished before the fighter, in March of 1938. The delay in the fighter stemmed from certain confusions in French prewar industry that delayed parts for prototype aircraft.

The little trainer was given a two-month workout in the full-scale wind-tunnel at Chailais-Meudon, and was delivered to the Air Ministry late in the spring of 1939. The trainer was powered by a 180 hp Regnier engine. It spanned 25.8 feet, weighed 2145 lbs., and had a top speed of 195 mph. The machine climbed at 1740 feet per minute, descended at 17.6 feet per second and landed at 37.5 mph.

The official reports on the trainer make very good reading. For example, one of the tests required the plane to clear a 65-foot hurdle from a dead start, 1,970 feet away. Classical type 1939 airplanes just about cleared it. The Delanne trainer cleared it with *108 feet to spare*. M. Lane, Delanne's test pilot, popped the eyes of the observing F.A.F. officers when he cut the throttle over the hurdle and with his prop idling, flaps retracted and still all the way back, landed the plane from an altitude of over 170 feet. At 56 mph airspeed, he contacted the ground at only 17.23 feet per second. On the second try around, Lane tried it with full flaps, and the contact speed, at 37.3 mph indicated air speed was only 17.7 feet per second. The average man sitting down on a chair makes contact at just about that velocity.

Despite the pressure of other established manufacturers, the French Air Ministry showed definite signs of interest in the Delanne plane. He was given contracts to do design studies on a bomber and on a glide bomb, as well as to design and prepare to build a giant troop glider.

In the meantime, he was in the process of perfecting the prototype fighter and trainer, preparatory to production, when France fell.

The offices of Delanne's company were in Paris. The prototypes were at the Villacoublay airport on the outskirts. When the capitulation occurred, collaborationists were in command of the airport, and they sealed it off from anyone they thought could not be trusted.

Maurice Delanne joined the father of the French Resistance units, *Mouvement Vengeance*, and became not only an operative but a recruiting contact. In the meantime, the Resistance movements developed central command, and instructions came down the line for Delanne to start working from inside the enemy camp. He was to pretend to collaborate, and to use his position to gather information about the action of the enemy.

The Germans were in need of a ground-attack design for use on the Russian front. The Delanne fighter, with its heavy rearward turret, looked as if it had possibilities. The Vichy government ordered Delanne to complete his test program, and to turn the prototypes and data over to the Ger-

mans. Delanne sought instructions from the Resistance headquarters. Their answer was, "Stall as long as you can!"

Delanne and his crew were a valuable asset. In addition to the inside dope they were able to gather on German technical progress, they were able to hide a couple of small cameras in the aircraft, and the pictures they took of factories and airfields in the Paris area were priceless to the Allies.

Finally, the Germans indicated that they were not waiting for Delanne any longer. They were moving in. Delanne had, in the meantime, "corrected" his technical data so that it was worthless. The two prototypes however, could have formed the basis for the rediscovery of the subtle Delanne formula, so they had to be destroyed. The Vichy guards had been instructed to keep the French pilots away from the machines, but Delanne was permitted to work on them. Maurice chose a daylight raid on the airport as the time to act. Feigning great worry and confusion, he hopped into the trainer on the pretense of taxiing it to safety, and being an "excitable individual and a poor pilot," he managed to ram the fighter, destroying it. As a matter of fact, he hit it so badly that the two wrecks started burning, and the designer barely escaped with his skin.

The Germans accepted his explanation with very poor grace. They sentenced Delanne to five years in the fortress of Siegburg, near Bonn. For the time being, they had solved their contour fighter problem with the conversion of the Seibel trainer, so the temperamental designer who flew so badly, went off to prison.

Delanne's adventures in Siegburg would make a novel in themselves. He was placed in solitary confinement for his noncooperation. After a while, he was let out for interrogation and for labor, but was made to spend all off-duty hours alone in his cell. Over a period of time, he was able to accumulate enough scraps and pieces to allow him to build a simple radio receiver, which he hid in an abandoned chimney in his cell. Thus he was able to receive the BBC broadcasts. The contents of these were circulated among the other inmates of the fortress by means of a little handwritten newspaper, *Le Petit Menteur*, or the Little Liar.

One of the things that kept many a patriotic Frenchman in forced labor of the Nazis was the fact that, with some ingenuity, he could always find some way to sabotage the Nazi war effort. One of Delanne's first jobs was that of knitting wool socks. They used hand-operated knitting machines. After due study, Maurice "redesigned" the system of tying of the yarn at the toes so that, after a little use, they would come apart at the heel and toe.

Later, he was assigned to a group making hand grenades. He managed to rerig the system so that the greater part of that unit's output would either fail to detonate or would fire prematurely, in the German soldier's hand.

Another job was that of overhauling German automotive equipment. Delanne discovered ways of hiding emery powder, salvaged from around the fixed grinding wheels in the shop, in those places in the engines where it would come loose after several hundred miles of running. This usually brought the breakdown somewhere in the fighting zone, where it would do the greatest harm.

Late in 1944 the Germans again looked up Maurice Delanne. They had a problem with their interceptor fighters. While the Me 262 jet fighter was adequate for most purposes, it needed two engines. Furthermore, it was a big airplane, tough to produce. The Germans were seeking an easy-to-fly single-jet design with take-off characteristics good enough to get it off of short fields. Someone remembered a design that had once been termed by a Nazi researcher as the most valuable thing the Reich got from France.

They located Delanne at Siegburg. They offered him his freedom, a plant to work in and "the good life," if he would cooperate. They underestimated the mild-mannered Delanne. The "convincing" process wasn't pretty. It reduced Maurice Delanne to a taut-skinned skeleton weighing barely 80 pounds. He had to be carried out of Siegburg when the fortress was finally delivered by troops from the 15th Army under Major Donald S. Scarborough of Coxackie, New York.

One has to examine the situation in Germany, late in the war, to discover the real effect of Delanne's heroism on the final stages. Had the Germans been able to get an easy-to-fly jet fighter in time, they might have turned their air war into a stalemate. The time they wasted "convincing" Delanne can be subtracted from the so-called Volksjaeger program. In desperation, the Luftwaffe ordered large numbers of the Heinkel 162-A fighters, the little single-jet mass-production job. Luckily for the Allies, it proved a tough and unstable plane to fly, and vital weeks were wasted improving it.

Had Delanne given up his formula easily, the Luftwaffe might have had an easy-to-fly single-engined jet in time for a last-stage fight for their inner citadel. While it might not have changed the ultimate result of battle, it might have dragged the conclusion out by many months.

It took Maurice Delanne over a year to regain the salvageable part of his health. His plant was gone, his resources were scattered. France, trying to reconstruct her economy, had to rebuild her major airplane plants first, so there was no room for the heroic, quiet man. On the invitation of one of our major airplane builders, Maurice Delanne came to the U. S. His arrival here was ill-timed, for the nation, confident in her victory, was cutting back on defense appropriations. Here too, the major problem was keeping the heart of the industry alive, and newcomers with new ideas had a difficult time.

Selling airplane companies on a new configuration, no matter how promising, is a difficult problem. Even primary explorations are expensive. Certain government agencies had shown and demonstrated some interest in the system, but their work cannot be discussed in print.

There are definite signs of interest on the part of two or three of the nation's leading companies. The demand for a workable military liaison plane that can perform the wide range of jobs that are being piled on the "jeeps of the sky" point to an immediate task for the Delanne Duo-Mono. The needs of certain personal and agricultural types are similar, and plane builders, seeking better designs for the flying farmer's vehicle, are examining the design with a much more sympathetic eye than four years ago. There are also a number of military uses possible and being explored that were not even considered a few months ago.

In the meantime, Maurice Delanne sits over his drawing board with his dreams and a formula that reads like magic. He has ideas about a fighter that can outrun sound and land just a little faster than a trainer; a heavy bomber that can take off and land from the length of a fighter strip. But best of all, he has in mind a sweetheart of a four-place job that the tyro pilot can fly safely, and as Maurice Delanne puts it: "A sheep I can fly even wan I am ze great grandfatheire. . . .!"

PHOTO CREDIT LIST

Page 4—Courtesy Cessna Aircraft.
Page 9—Wide World.
Page 12—Warren Watson.
Page 22—William Friedman.
Pages 28-29—Delmar Pendley.
Page 30—Cody's plane: Keystone.
Page 31—Buttercup: H. Levy; Hawker P.1801: Keystone.
Pages 34-35-36—Smith-Coda.

Lifters

(*Continued from page 44*)

57% when using 29% wing area stab.

Another user of Carl's G-610 is Claude McCullough, who likes the glide and the unusual good climb it gives. He also uses it on rubber and tow-line gliders. Believes performance equal to if not better than 6409, without the construction difficulties due to thinness. Everything considered, he prefers deep airfoils in contrast to thin sections now currently popular. Claims thin section can't get high enough to justify glide loss, except on small sizes. It has been his observation that as the size of the model increases, the greater is the necessity for a deep, high-lift section. On the other hand, he has a suspicion that on AA anything with a bend will do the job.

William H. Parmeter varies his choice. Thin G-610 good for windy weather, he states, and especially for large C's. For calm weather and high climb he prefers flat bottom type. Believes undercamber easier to adjust, while flat is ticklish and sensitive under high power. And Ocie Randall found Gibson-Goldberg "Arrow" airfoil the best all-around and uses it for all models.

NACA 6409 has a good following. C.O. Wright's report just about summarizes the opinions expressed. He uses it for all free flight models, from AA to C. Tried many, including thin Clark Y and some of his own, and finds 6409 good. Climb is good although not as fast as thin Clark Y, but the glide is much better. He likes thin sections and 6409 is about as thin as can be had and still allow space for spars. It is used in combination with thin 40% Clark Y stab set on long moment arm. This sets C. G. at about 60%. He finds 3 deg. angular setting a good compromise. Although glide may be improved with two surfaces closer to similar angles, the chances of ship not pulling out of a dip are not worth taking.

Wright ends by saying that in truth he believes the airfoil section is not as important as some may think; it is the overall efficiency of the model that counts. Clayton Newlin, David H. Hunt and C.P. Tiers agree practically 100% with Mr. Wright. Charles Folk also uses 6409 but close coupled to obtain tight turning ship.

Sal Taibi does a lot of flying over weekends and after 6 p.m., and here is what he says about his modified 6409 (likes sharpened leading edge): "Use it on A, B, C, and D Pacer type. Power characteristics are excellent, cuts down zooming tendencies, does not stall out easily and is much faster on power. First tried on A size and found that it glided smoother, flatter and better in respect to flight time. Angular difference between 1 deg. and 3 deg. Very slight lifting stab with C.G. between 50% and 70%."

Benton Cleveland uses 6409 straight in combination with 9% Clark Y and 45-50% stab. Finds this set-up allows him to balance at T.E. and set stab until a slight mush develops. Then by tilting stab the desired glide, circle is obtained, while rudder is used for determining power turn.

Still in the NACA camp but on the thicker side we have Parnell Schoenky who uses 6412 for rubber and gliders, and 6411 for gas. Reason being that he uses high aspect ratios of 10 to 13:1 and heavy fast ships to obtain good glide characteristics. He should know, as he started with Eiffel 400, Goettingen 497 and RAF 32 in 1938-39. Made three originals in 1940-42 period. Since 1946, he's been using 6412 in combination with Clark Y stab with about 4 deg. difference and 2-3 deg. downthrust. Harold Stofer ranges from 6409, 6412 and 6512 for gas and 6712 for rubber. Believes that "6" camber factor best for all around gliding qualities.

Delving into the "original" field we find Paul Del Gatto going strong for Davis type. Claims that it has higher L/D ratio than majority of airfoils used and backs it up with tests. Henry Cole, who uses Davis #5 (A.T. May 1942) on Wakefield and gas, states that Davis airfoils are noted for their anti-stall characteristics and low drag at high lift coefficients, also their excellent recovery from stalls and exceptional pull-outs on gas models. No. 5 gives 1.3 lift coefficient in glide.

"Dutch" Hess lets the record speak for his airfoil, sixteen places between 1st and 3rd during 1948-49. It's 12% thick with Clark Y top and Grant bottom, set at 5 deg. Developed through experiments. Edward J. Lidgard spent 20 years in cut-and-try to develop his favorite Wakefield section. Made test in an armory and found that it has 1.7 ft./sec. sinking speed and 11:1 glide angle and 17 mph. It's thin section with high point at 25%.

Remember the "Ritz" wing? Curtis D. Janke still uses single surface type on rubber designs. It is his opinion that drag depends as much on thickness between upper and lower camber as it does on camber depth. He notices a definite lower sinking speed.

Dick Everett finally settled on Marquardt

S-2 for rubber, McBride B-7 with flat bottom and slightly rounded L.E. for Half-A's and A's, and Goettingen 602 for B's and C's. According to his report, B-7 climbs with the best and is still up when others are down. 602 and S-2 compared on a Wakefield. S-2 climbed better than Goettingen 602 but glide not as good, and S-2 also touchy due to C.P. movement. On gas models, 602 glide makes people stare, reports Dick. On all ships, except Wakefield, stab area 60% with C.G. at 75% to 125% of chord behind L. E.

James Noonan also uses B-7, though for indoor. His outdoor favorite is Eiffel 400. Chester D. Lanzo has not changed his winning Eiffel 400 on 300 sq. in. rubber models.

Vernon W. Oldershaw ("Slim Jim" and "Glory Bee") is now working with NACA 4612 as a change from his thick original sections developed from Davis formula. His originals were regular weight lifters, 14 oz. per sq. ft. According to Vernon, 50% change in C.G. made no difference. Talking about 4612, Hal Roth said that after careful check-up it proved no better than Clark Y. Hal uses RAF 32 and Clark Y on Wakefield and 6409 on gas. He believes in flight and glide by wing loading and incidence set-up rather than by airfoil. With a warp-free surface at correct incidence and wing loading, 'most any airfoil provides good results, hence the use of Clark Y.

Frank Parmeter also likes thick sections with lot of undercamber. He uses it in combination with thin 50% stab on short moment arm with success. By using high-lift wing a large stab can be employed to carry part of the load without being critical under power. His C.G. around 90-100% point.

By chance Earl L. Cayton, W. Harold Bunting and Don Justice worked out almost similar airfoils. The surprising part is that Cayton used "intuition" while Justice used NACA reports. The basic pattern is an arc median line with about 10% thick streamline plotted around it. The result is similar to 6409 but with camber's high point further back. Justice said that T.R. 460 mentioned that highest $C_{l\ max}$ is achieved by having maximum camber at 60-70% from L.E. Such sections, however, had higher minimum drag coefficient than normal type. Justice also tried a birdlike section with upturned T.E. and reports terrible stall characteristics. On outdoor H.L. gliders, Cayton uses thin Clark Y, and thin undercamber for indoor type.

So far we have mentioned Clark Y in combination with others. This does not mean that it is not being used much. Just think of all the kits. Actually, since the advent of light wing loading rules, Clark Y is making a serious comeback in the thinned version. Theoretically speaking, it is no longer Clark Y, but you get the idea. Clark Y with occasional modification on lower camber to slow down the glide is being used by C. L. Bristol, Rogers L. Barton and Albert Casano because of ease in construction and excellent power on and off stability.

In the thinned-out class we have Carl Hermes, Robert Hatschek, Leon Shulman, Malcolm Smith and Frank Ehling. Thickness varies from 9% to 10% with high point at 30%-40%. This type is definitely intended for fast climb where thermals are strong. The boys do not brag about the glide but mention it as being fair and good enough. Type has good stalling personality, and is for current light wing loading and fast simple construction. As a group the boys use angular difference ranging from 3 deg. to 3 deg. in combo with 5 deg. to 7 deg. thin stab. Hatschek section seems to average those submitted, and since he supplied ordinates we might as well present it as a standard for this particular group. We are calling it AA-1950. (All American-1950).

This completes the actual tabulation of the survey, but some of the boys had comments that seem worthwhile to pass on.

William L. Effinger, Jr., advises not to bother using ordinates anymore. Old fashioned. Just bend a good symmetrical section around the desired median. Generally use "64" series median and streamline it with laminar flow, or the regular NACA symmetrical section, depending on structure and aerodynamical requirements. Recommends that one should quote Millikan (from "Aerodynamics") on airfoils. It is all so simple.

Bill Winter does not hold high opinion of the present crop of thin sections. Believes they have poor recovery after stall, are difficult to adjust, and that only light wing loading saves them. Likes Eiffel 400 for rubber; tried Midwest kit wing of this section on Half-A and what a glide! At least equal to Eiffel 400 and possibly better due to extreme difficulty in stalling is NACA 4612. It gives more lift than 6409 at small increase of drag.

De La Mater said that median line ordinates of 400 and 4612 are almost identical, which may explain their similarity. He uses thick section stabs on pylons, thin lift on moderate high wing and symmetrical on cabin. On difference between wing and thrust line he begs to differ with theory. Adding incidence is not automatic down-

thrust, as he has repeatedly noted. Stab angle must also be increased. And he had lots more to say which will eventually show up in his writings.

C. C. Johnson recalled an incident which occurred in 1938. It seems that Eastman N. Jacobs, then of the NACA staff at Langley Field, offered to demonstrate flow patterns about airfoils for members of a local club. He asked all members to bring any section of airfoils that interested them for demonstration.

The tests were conducted in a small two-dimensional "smoke" tunnel and were not set up to indicate the performance of airfoils except as could be visually determined by observing the pattern of flow through a glass window. About the only significant characteristic that could be determined was the angle of attack at stall. Nothing unusual occurred with the exception that one test specimen stalled at an angle of attack several degrees higher than the rest.

This particular panel was taken from an old model and was poorly constructed. Several spars on the upper surface were projecting above the fair surface about 1/16 inch. Mr. Jacobs demonstrated that a piece of string or wire located on the other airfoils in a similar position would increase their stall angle to equal that section. He also stressed that a high stall angle was not necessarily important to model planes and that such devices would be expected to reduce the performance at more reasonable angles of attack.

In spite of Mr. Jacobs' warning many of the fellows rushed madly off to cement balsa strips all over their model wings!

On his returned questionnaire Mr. Johnson stated that he used medium camber airfoils on all types of models. Nothing in particular led him to develop this section, which has flight and glide characteristics the same as all the rest. He mentions that he uses stabilizer which has flat lower surface for ease of construction but keeps quiet about angular difference. Very uncertain about C.G. position but says it varies.

However, he's definite about construction; lots of spars and all on top surface only. Very frank about the advantages of his airfoil over others by saying it has none. Also sees no future for it. We can only say: Mr. Johnson, you speak like a man who is hiding something very special until the next big meet!

And so the summary of the survey is finished. It may have different meaning and value to different people. No attempt has been made to distort the issue, and original wording was used whenever possible. We close by quoting Mr. Bristol who mentioned that the Clark Y "served me well. I am now too old and fat to chase free flight."

Jupiter

(*Continued from page* 29)

is followed, which eliminates blind rivets and speeds assembly.

The cabin is big and roomy, and when you sit down and lean back it's on thick foam-rubber upholstering. With just two aboard there is room to expand all over the place, and with three in it's no more crowded than the average two place side-by-sider with two in. Seat size and distance from the floor are the same as in a 1941 Dodge coupe. There is a carpet on the floor. Plenty plush for a $2,500 dollar airplane.

The seat backs fold forward to afford access to the 120-pound baggage compartment. When used for luggage the two jump seats (for kids or one rather cramped adult) ingeniously fold up to make a cover for the compartment, forming a large flat map-throw and catch-all.

The instrument panel is straight up and down and strictly functional. The left third is devoted to the dials and gadgets pilots like to fool with, the center for any radio equipment desired, and the right side contains an ash tray and a truly large glove compartment, 9" x 19" x 19".

Ross Holdeman, vice president and sales manager, who together with Earl Ortman, the noted racing pilot, has done the testing on these ships flew with me. The morning was bright, surface temperature in the high seventies, and surface wind west about 10 mph. The air was stable with haze in the lower levels and a few thin stratus type clouds aloft. The sun hadn't had time to trigger-off any convection as yet.

Getting off on the first hop we used about 300 feet of runway. The airspeed needle hovered around the 45 mph mark when Ross popped the ship off with the wheel. The nose rocked up, we flew about 15 feet into the air and I thought: "That did it;" and waited cynically for the string to break and drop us through the runway. It didn't, though. The Jup grabbed air and climbed right on up and out, accelerating rapidly to 90 mph as the gear whined up.

As soon as we jumped off I started the stop watch. "Take her right on up to 4,000

feet," I told Ross. I wanted to check the rate of climb and, frankly, on this test it was poor. Five and a half minutes to 4,000 feet for a RC of about 730 feet per minute. It wasn't all the ship, however. Just a bad morning for climbing. Large scale subsidence, or "falling air mass" was under way. I'd suspected this at the time and confirmed it with Weather at Daytona Beach and the pilots of several other planes flying at the time. A Cessna 170 pilot said he'd been flying nose high all the way from Jacksonville and "couldn't get altitude worth a darn."

Later in the day when we were flying circuits around the field I timed it at 30 seconds from the time the throttle was opened to 500 feet. This would work out in line with company claims for 1,050 feet per minute RC, but of all the performance claims I consider this one the most marginal.

Daytona Beach airport was clearly visible from 4,000 feet, directly over DeLand Airport. "Take her straight to Daytona Airport, hold your 4,000 foot altitude, and make it indicate 140 mph all the way," I instructed Ross, clicking the stop watch.

Over Daytona I stopped the watch, we called the tower and started down. It's while in traffic around a big field that you really appreciate the truly magnificent visibility of the Jupiter. No neck straining nor head ducking is necessary. The side windows curve in at the top, completely eliminating that feeling present in so many airplanes of peeping out from under a culvert when the wing on your side is down.

Back at DeLand, following another 4,000 foot altitude bee-line at 140 indicated, stop watch timed, I vectored the flights over and back, using the 280° 18-knot wind that Weather had given me for the 4,000-foot level. The 140 indicated airspeed corrected to 143 true. (Outside temperature at 4,000 feet was 65° F.) The vectored ground speeds checked with the timed speeds within 1 mph. 162 mph over, 122 mph back. This was all by way of assuring myself that the airspeed indicator was correct in the cruising range, anyway.

Later, I put the ship through its paces myself. Taxiing back in after one of the most enjoyable experiences in all the flying I've done, I reflected on what a superb cross country airplane this Jupiter will be. With 700 miles of range on its 30-gallon gas capacity and a 150 mph cruise, you really make little miles out of big ones.

If the Jupiter gets into continued production it will be the biggest shot in the arm private flying has received since C. G. Taylor built the first E-2 Cub. This is the cross country age and cross country performance is what the Jupiter has plenty of.

JAMIESON JUPITER DATA

Wingspan	29 ft.
Length	20 ft., 10 in.
Height	6 ft. 9 in.
Wheel tread	6 ft., 2½ in.
Wing area	132.20 sq. ft.
Aileron area	7.69 sq. ft.
Flap area	27.00 sq. ft.
Movable tail surface	8.99 sq. ft.
Fixed tail area	13.86 sq. ft.

	Regular Normal Category	Non Stall, Non Spin Normal Category	
Gross weight	1600	1737	lbs.
Empty weight	800	800	lbs.
Useful load	800	937	lbs.
Payload	690	827	lbs.
Wing loading	12.98	14.10	lbs./sq. ft.
Power loading	13.91	15.10	lbs./hp.
Cruising Speed	over 150 mph.		
Landing Speed	under 40 mph.		
Rate of Climb	1050 feet/min.		

Engine: Lycoming O-235-C1 108 max. sustained hp.
Propeller: Fixed pitch, wood.*
*Aeromatic or other props at extra cost.
Performance figures based on gross weight at sea level.

Squeeze Play

(*Continued from page 37*)

Most new fuels are okay, with the exception of O&R #1, which is taboo in the instructions. Locate the regulator close to the needle valve either ahead or to the rear. The center of the regulator must be lined up with the needle valve within 1/16". Little harm is done by placing the regulator up to 4" to the rear of the valve, but a closer location is desirable.

Note in the photograph that the regulators are placed crosswise in the ship. If they are placed flat or sidewise centrifugal force will act on the pressure plate and cause variations in fuel flow. Location of the small vent hole is also very critical. Air must enter the vent to act on the diaphragm for correct operation so the diaphragm must be exposed to the air, but it must not receive a direct blast. Any variation in pressure at the vent will cause a change in fuel pressure.

Although in several installations we encountered poor results with a regulator placed ahead of the needle valve on a shaft rotary valve engine, Jim writes that

"best results are obtained with the regulator ahead of front rotary engines, since the longitudinal distance from the main body of the regulator and needle valve is cut down to less than ½ inch."

This follows his instructions, of course. We figured that on the installations that gave trouble eddy currents and prop wash from the propeller hub caused pressure changes during maneuvers. No cure was found till the regulator was moved back into the fuel compartment. Regardless of placement—and you might like to experiment in that respect—do not place the vent against a bulkhead or other flat surface because oil will collect and cause a pressure trap.

A convenient tank installation is shown. Note that the lower plywood pressure plate is held down with wood screws so the rubber tank will not chafe against the fuselage sides due to engine vibration. The tank or rubber bands can be changed at a flying field by removing the wood screws. A single tank will give 8 to 10 minutes on a .29 engine but is not large enough for .49 to .60 engines. Two tanks can be coupled with a "T" fitting (see photo) for 8-minute flights on a large engine.

Says Jim, "Two tanks can also be coupled together by holding check valve open with a piece of small wire on one of the tanks, and putting it in series with the other tank. Also, we can supply tanks without check valves."

Engine operation is very simple with a Walker System. Fill the tank with a conventional fuel pump and disconnect filler tube. A small check valve holds pressure in the tank so fuel can't escape. Start engine in usual manner with needle valve rich, but don't choke very much because fuel flows into carburetor very fast. When engine starts, point nose of ship upward to run out air bubble in tank. Adjust engine very lean before take-off because it becomes slightly richer rather than the usual leaning out.

At an early meet several model fans saw our pressure tank stunt ship and asked how it worked. Resulting chinfest indicated that many failures came from not following instructions. Two seemingly unimportant details are a "must" to keep the regulator operating: Filter all fuel and use only approved fuels.

Dirty fuel will give a few good flights and then the engine begins slowing down and seems to turn lean. Opening the needle valve will keep the engine running but the adjustment is not consistent. So much trouble develops that the tank and regulator seem worthless. The dirt can be removed by pumping fuel through the regulator backward, but dirt in the tank clogs the system again very quickly.

We've had no dirt trouble at all since filtering fuel through four thicknesses of silk. Cotton may leave small pieces of lint or fiber that clog the filter or stick in the valve. Always rinse the can with clean fuel, dump it out and refilter; or use the same clean can over and over again. Remove dirt from fuel pump before placing in fuel. No matter where dirt comes from it all clogs the regulator. Wrong fuels cause as much trouble as dirt.

A list of approved fuels is supplied with each tank and regulator. We've used Power Mist High Thrust because it is popular in our neighborhood and is on the approved list. Home-made fuel containing castor oil, methanol and nitro-methane is also satisfactory but not as powerful. Fuels containing nitro-benzene cause the regulator diaphragm to swell and press against the valve in a few minutes. Nitro-propane has a slower action and may take several days to cause trouble when present in small amounts. A swollen diaphragm will cause trouble very similar to dirty fuel and is confusing to detect. Stick to approved fuels at least for a week of operation and watch carefully for trouble when trying some brand not on Walker's list.

For your first pressure tank ship use an engine that is well broken in. Stunt flyers often blame their fuel tank for trouble caused by the engine. Try your engine on a test block with any plain metal tank. Get it started and lean out the needle valve to attain peak speed. Now turn the valve down till the engine slows down slightly from being too lean. If broken in properly the engine will continue to run lean and will pick up speed again when the needle valve is opened a minute later. Tight engines will often continue to run on a rich setting, but overheat when lean and finally stop. Don't blame this on the fuel tank.

When trouble develops on a new gadget it is very baffling to locate. Here are some ailments with symptoms and cures.

1. *Insufficient pressure from rubber bands.* Six small rubber bands are supplied with each tank. We have found that they are often too small to give constant fuel supply in the air. Consistent results are obtained with two 1/16" x ⅛" x 3" bands, or three may be necessary on a double tank system. Low pressure will cause the engine to run lean and may be detected

by squeezing the tank by hand to see if constant rpm is restored.

2. *Dirt in fuel*—clogs filter or sticks in valve. Engine runs well for a short time and then turns lean. Opening valve restores speed for a while but mixture soon changes again. Squeezing tank will make engine pick up by forcing more fuel through clogged filter. Symptoms similar to lack of pressure or wrong fuel, but trouble may be detected by pumping fuel through regulator backwards. Engine will run well for a short time before dirt clogs regulator again.

3. *Wrong fuel*—swells regular diaphragm causing pressure against valve. Engine dies out in similar manner as with dirty fuel or low tank pressure. Pumping dirt out of regulator has no effect. Squeezing tank will make engine rich but not run constant as in the case of insufficient tank pressure. Pump alcohol or approved fuel through regulator to remove swelling.

4. *Leaky regulator*—causes fuel to flow through regulator and flood engine. May be dirt in valve that can be forced out by pumping fuel through regulator backwards. New regulators sometimes leak due to diaphragm being dry. As soon as fuel has been run through it a few times, it usually will stop leaking.

5. *Punctured diaphragm.* In this case, fuel flows out through regulator vent. Cover plate may be loose. Leak often caused by poking pin or sharp instrument through vent to push against pressure plate in order to open valve. A better scheme is to blow in the vent.

6. *Pressure variation in air vent:* eddy currents act against vent and change fuel flow during stunt maneuvers. Happens most frequently when regulator is mounted in front of engine. Engine will run consistently on ground till tank is empty, but is unsteady during flight in certain positions. Trouble cannot be detected on the ground. Try placing regulator in tank compartment.

7. *Tank too full.* Do not fill the tank to the point where the rubber is stretched. The pressure developed by stretching the rubber envelope is far too great and should be avoided. Otherwise erratic operation will result.

If any questions should arise concerning the regulator, a simple test will tell if it is functioning properly. Connect a 10" piece of Neoprene to the engine side of the regulator and connect the tank in its usual position. Blow into the regulator air vent to start fuel flowing and then the Neoprene tube will act as a siphon causing a suction on the valve in the same manner as the engine.

Now lift the end of the tube up even with the valve and it should shut off. A correctly functioning regulator should start to open with the tube two to three inches below the regulator and be full open from five to seven inches below. High tank pressure will increase these figures. A regulator that fails to operate correctly may be swelled with bad fuel or have dirt in it. Before shipping back to the manufacturer, clean with an approved fuel and test again.

Commies

(*Continued from page 21*)

thrust. Wingspan 40 ft. 6 in. Maximum speed approximately 600 mph.

LA-9. Single-place fighter, also a World War II plane, designed by Semyon Lavochkin. The LA series of fighters were especially designed to combat such German fighters as the FW-190, and were very fast and maneuverable. This model and the improved LA-11 are still in active service with the Soviet fighter forces. Probably the difference between the LA-9 and the LA-11 is in the "horses." The LA-9 is powered by an ASH-82 radial 14-cylinder engine of 1850 hp, while the LA-11 is equipped with an ASH-90, a copy of our Wright 18-cylinder & Wright Duplex-Cyclone rated at better than 2,000 hp. Armament consists of two 20-mm. cannon in the wing and two 50-cal. synchronized machine guns. Wingspan is 34 ft. 10 in. Maximum speed 400 mph or better.

LA— Communist sources claim this to be the latest Russian fighter, replacing the YAK-15. Has a sharply swept-back wing and T type tail surfaces. Slim fuselage suggests use of axial flow jet engine with air intake in the fuselage nose. Reported maximum speed over 650 mph.

LA— Research plane, similar to the LA above, is not identified, though may also have come from the drawing board of Semyon Lavochkin. Has side air intakes, swept-back wing and horizontal tail. There are rumors it is a supersonic research monoplane.

LA-15. Single-place twin-jet fighter designed by Semyon Lavochkin and undoubtedly influenced by the British Gloster Meteor.

Bombers

TU-70B. Whether this is the true designa-

tion of this heavy four-engined bomber is not known. Here the prefix TU means that the aircraft was designed by Andrei Tupolev. Actually the bomber is a dead ringer for our B-29, several of which made forced landings in Soviet territory after raids on Tokyo and have never been returned to us. It is said that two were used for structural study and one for test flying, after which the Russians turned out a large four-engined transport, the TU-70, the outward appearance of which was very similar to the B-29.

On various occasions the TU-70B has been designated as the PE-8 by the press; however, that would mean that its designer was Petlyakov and not Tupolev. The original PE-8 was also a heavy bomber but powered by V-12 engines. and was built back in 1943. It made its appearance in Washington, during the war, having flown Molotov over from Europe. In size and dimensions the TU-70B is identical with the B-29 and is powered by four M-90 engines, copies of our Wright R-3,350, rated at 2,500 hp.

YER-2. Twin-engined medium bomber designed by Yermolayev. This type first saw action during the Russo-Finish war. The craft is of all-metal construction and has an inverted-gull wing in order to increase bomb bay space. Pilot's cockpit is asymmetrically located on the left side of fuselage to permit better access to the glassed-in bombardier compartment.

Wingspan 67 ft. 6 in. Engine 12-cyl. VK-103 rated at 1050 hp. Top speed 265 mph. A later model, YER-4 has the cockpit located centrally, is armed with .50-cal. guns instead of .30 and has slightly more powerful engines, VK-105's of 1,100 hp. Maximum speed is 280 mph.

IL-16. A four-jet bomber designed by Serge Ilyushin. Judging from picture the only armament carried is twin machine guns in tail. Astrodome atop fuselage suggests that this is a long-range aircraft.

MTB-2. The designation points to the fact that this flying-boat patrol bomber is of World War II vintage as the letters are not initials of the designer but are type designation. In this instance they mean "Navy Heavy Bomber." Nevertheless, it is a fairly modern flying boat design, powered by four M-87 engines of 1,100 hp each as well as a 1,200 hp V-12 powerplant in the fuselage driving a large supercharger which supplies air boost to the four engines. The airplane was used for anti-submarine patrol during the war and was later modified as a cargo transport. Wingspan 121 ft.

Helicopters

VERTOLYOT, K-17. A small helicopter designed by N. I. Kamov. (The name Vertolyot means vertical flight.) This particular craft is an experimental prototype. The production article will have a regular streamlined fuselage and pilot enclosure. Its application will be courier flights in and out of inaccessible areas. Powered by a 17 hp modified Aubier-Dunne engine, similar to the one used in the early Mignet Flying Flea plane.

OMEGA. First observed on the 1946 Air Force Day, the OMEGA helicopter is not unlike our twin-rotor McDonnell XHJD-1. Engines are nine-cylinder radials of unknown type. The designer of the aircraft is I. P. Bratuchin.

OMEGA II. Latest and streamlined version of Bratuchin's helicopter.

Transports

IL-12. A medium transport extensively used on the Russian main airline Aeroflot as well as by some satellite countries. Carries 32 passengers as a short-range airliner; for longer range the seating capacity is 27. Tricycle landing gear. Wingspan 104 ft. Engines two ASH-82's of 1,700 hp each. Maximum speed 250 mph at 8,000 ft.

IL-18. Large four-engined transport almost the size of our Stratocruiser. Carrying capacity 66 passengers and a crew of five. Wingspan 131 ft. Engines four ASH 88-112's rated at 1,700 hp. Maximum speed 300 mph. Range 1,850 miles.

SCE-2. A light transport which during the war was used as a troop carrier and cargo craft for supplying Russian guerrillas behind the Nazi lines. Designed by Alexei Scherbakov, a well-known glider designer. At present the SCE-2 serves as an inter-city cargo transport with Aeroflot. Span 72 ft. Engines two AM-11D rated at 145 hp each.

KC-20. A large cargo and troop transport glider very similar to our Waco CG-13. Designed by Kolesnikov and Cybin. These gliders are now used for cargo carrying on regular airline routes. During last year's Air Force Day celebration. twelve air trains each consisting of an IL-12 tow plane and two gliders were flown over Moscow.

Trainers

YAK-20. An all-metal military trainer, just recently placed in production. No information as to dimensions, powerplant or performance available. Probably on a par with our T-6.

Special Attack Craft

IL-10. An improved version of the famous Soviet anti-tank attack plane IL-3 Stormovik. The Russians are firm believers in heavily armed and armored low-level attack planes, and the Ilyushin machine is an excellent example of it. The Stormoviks were the first planes to be armed with rockets. First models, the IL-2's, were single seaters, but later version, the IL-3, had a rear gunner as protection from attack. The IL-10 has been considerably streamlined with flush landing-gear retraction, the wings are more tapered and the vertical surfaces increased in area.

Span is 48 ft. Engine VK-107 rated at 1,800 hp. Maximum speed 280 mph. Armament consists of two 32-mm tank cannon and two .30-cal. machine guns in the wing. Rear turret carries either one 20-mm cannon or .50-cal. machine gun. In addition there are rocket launches underneath the wing.

PE-3. Multi-purpose medium bomber designed by Petlyakov. Saw service during the latter part of the war as reconnaissance craft, dive bomber, level bomber and fighter. Vane atop rear gun turret is supposed to correct for windage. Span 56 ft. Engines two VK-105R's of 1,100 hp each. Maximum speed 266 mph.

Liaison

MIG "Utka." (Duck). A versatile and interesting canard design, for liaison, light cargo and instruction work. Can be transformed into a snow-sled by installing skis and removing wings. Plane was designed by Mikhoyan and Gurevitch.

Wingspan 32 ft. 8 in. Engine 110 hp M-11. Maximum speed 120 mph. Accommodations, pilot and two pasengers.

YAK-14. Liaison and sport plane by Yakovlev, not unlike our lightplanes. Seats three or four. Span 39 ft. 10 in. Engine 145 hp M-11FM. Maximum speed 142 mph.

Peppy

(*Continued from page* 50)

thousands of dollars at their disposal.

As to the design itself, it was felt that standard performance could result from the use of standard engines for the particular airplane, specifically an .09. The airplane is shown with the McCoy, but may be flown with a Cub .09 or the small Arden.

Since "timbers" could not be used for the triple reasons of cost, shaping difficulties, and weight, it was decided to use a sandwich construction of sheet balsa in the fuselage, and a built-up wing. You'll find the directions interesting, therefore, even if you don't build the airplane.

The fuselage consists of three plies of sheet, a ¼" center ply and the two outer plies of ⅛" sheet. The thick center ply is not full length and is cut to outline (full size on the plans which may be obtained from the plan service). Two strips of ¼" square run along the top and bottom edges of the fuselage toward the rear and a few cross-pieces complete the structure, with the outside plies being cemented in place. The top of the canopy will have to be butt-jointed as the depth at this point exceeds three-inch stock.

The edges may be rounded off with the exception of the front edge behind the engine, the wing cut-out edge where the wing will rest later, and the small portion that supports the stabilizer. The result is a fairly light semi-profile body that is not shaped from an expensive piece of wood.

The motor mount has been fabricated from pieces of standard ⅜" square hardwood. This stock is cut into four pieces which are then cemented side by side for the necessary U-shape and width. The finished mount slides into the special slot at the front of the fuselage. The landing gear is bent from 3/32" wire and slides down over the fuselage and through the holes drilled in the mount. The gear goes through the mount before the ends are splayed outward for the wheels. Two bottom blocks further lock the mount in position and give support beneath the engine. The McCoy crankcase requires very little cut-out.

The engine is mounted with four 2-56 machine screw "bolts" from your dealer or hardware store. Note that the holes are drilled in such manner that offset thrust results, pulling toward the outside of the circle. Soldering the nuts to a piece of tin or brass which then glues beneath the mounts is desirable but is a fairly difficult operation. The nuts may be locked in place with cement by mounting the engine and tightening the "bolts." Locate the bolts before shaping the bottom blocks or cementing them in place.

The tail surfaces are cut to shape from ⅛" thick sheet balsa; the leading edge of

the stabilizer is rounded, as is the front edge of the elevator. The trailing edge may be shaped to a slight point. Pinking tape hinges were used on the original but small hinges may be bought. A manufactured control horn is recommended. Note that the rudder portion of the vertical tail is cocked toward the outside of the circle. The stabilizer is mounted to the fuselage, then the vertical tail cements to the top of the stab.

The wing is unique in that the one-inch square leading edge that would be required ordinarily for the rib contour has been avoided by the simple process of cementing a piece of ¼" x ½" to a ¼" x 1", as shown. The latter piece can be cut from a piece of ¼" sheet balsa. So can the trailing edge, unless you prefer to buy a finished one-inch-wide trailing edge piece. The tips are built up of three laminations of soft ¼" sheet.

The wing is built flat on the bench. First glue up the leading edge; noting that, when it has dried, notches are cut into the ¼" x 1", that portion of it which projects behind the full depth of the laminated portion. Pin down the leading and trailing edges, cementing the butt joint of the trailing edge at the same time, and the bottom spar of ¼" square. Ribs are cut from fairly soft ⅛" sheet. Cement the ribs in place, add the unfinished laminated tips, then the top spar of ¼" square.

The finished wing is removed from the bench, and the edges and tips are shaped as required with razor and sandpaper. Note that the center rib really consists of two ¼" thick ribs, cemented side by side. This provides firm mounting to the fuselage. Put in the bellcrank mounting block as per the detail.

The wing should be covered with bamboo paper, Silkspan or Sky Sail. First dope the entire wing frame—the surfaces that will contact the paper—and allow to dry. The neatest form covering is wet covering, if you use Silkspan or Sky Sail. Simply wet the paper under the faucet, sop up excess moisture between the folds of a towel, then lay the wet paper over the frame, carefully pulling out wrinkles. Then brush the dope over the paper *only where it contacts the two edges, the center rib, and the tip.*

To avoid wrinkles at the tip, try small pieces of paper from the outermost rib to the tip. When the wet tissue has dried and pulled taut, brush on several coats of dope and finish to suit. The original had Testor's Sta (maroon and white color scheme). Colored Sta is fuel proof, eliminating separate dopes and fuel proofers.

Be sure to use colored Sta only in combination with other Sta items, such as clear Sta, Sta sanding sealer, and so on. Indiscriminate mixtures with regular dopes, sealers, and the like may murder the finish. Use masking tape or Scotch Tape to obtain sharp edges in the color scheme.

Before attaching the wing, install the tank. A profile tank that fits against the side of the fuselage is the neatest to mount on a profile job, but a standard wedge tank that may be had at any dealer's is shown on the plans. It is necessary to cut into the fuselage to locate the tank. Be sure to keep the feed in line with the intake on the side view and minimize the length of the feed line, but avoid very sharp bends that produce kinks and fuel starvation.

Slide the wing into its cut-out, cement, and allow to dry thoroughly. Check the alignment with a triangle or any object that will show a right angle. It is suggested that the fuselage be painted before final assembly. The wing-fuselage joint may be touched up later.

The outer wing tip should be weighted down with a piece of lead or by nails inserted into the tip. Enough weight should be used to tip the model outward when supported at the nose and tail on its center line. First tip the ship with its inner wing slanted about 45 degrees toward the ground; the weighted tip should be just capable of righting and tipping the plane in the opposite direction.

The three-inch Veco bellcrank is mounted on the lead-out side of the wing with the portion taking the pushrod pointing toward the fuselage. The rod, 1/16" wire, runs along the side of the fuselage, about a quarter-inch out from the wood, and is braced midway with a wire staple to prevent buckling of the rod. Attach the lead-outs, then bolt or screw the crank into position.

The ship was turned over unflown to Don Grout, a dealer who, in turn, farmed it out to one of the local stunt boys. If the Peppy Trainer was to be billed as a trainer with added flight possibilities, it was felt it should be subjected to tests by U-C experts with wide experience, including beginner work. Both these men stated that the Peppy Trainer did all that it was supposed to do. Adjusted for adequate control movement it can perform some stunts—it has a flat bottomed wing and therefore is limited. It flies nicely and, if fitted with a symmetrical wing, would make a good sport stunter.

Bill of Materials—Peppy Trainer

(Note: With the exception of the motor mount, this ship can be built entirely from ¼" and ⅛" sheet balsa, if you are willing to slice wood to save money.)

3 pcs ⅛" x 3" x 36" medium-hard sheet balsa. 1 pc. standard ¼" x 1" x 36" hard, trailing edge stock. 1 pc. ¼" x 1" x 36" medium. 1 pc. ¼" x ½" x 36" medium. 2 pcs ¼" square x 36" medium. 1 pc ¼" x 3" x 36" medium sheet. 16" of ⅜" square hardwood, motor mount stock.

1 1½" minimum wedge tank. 1 3" Veco bellcrank. 1 control horn. 16" of 1/16" music wire for pushrod. 20" of 3/32" wire, landing gear. 1 pair 1½" or 1¾" wheels (watch the hole size!). 1 pc of 1/16" ply for line guide. 2 grommets for guide (extremely loose fit on leads).

1 sheet Silkspan or Sky Sail paper; cement and dope as required; soft scrap blocks of balsa for nose under motor bearers (or build up with leftovers from your ¼" sheet). 42-56 or 4-40 machine screws for mounting engine. 1 propeller: McCoy 9 or 8/6 Power Prop or Top-Flite for .099 engines.

C. A. P.

(Continued from page 33)

University of Arkansas the Wing helps in a six-weeks' course by furnishing the CAP's aviation study manual which is one of the required texts for the course in acquainting the students with the necessity for air age education.

North Dakota rang up another CAP first when it became the first Wing to have an exchange of Cadets from another country. The Wing staff and Fargo Squadrons were hosts to 25 Cadets of the Air Cadet League of Canada. Last year 20 CAP Cadets from Fargo and Grand Forks flew to Winnipeg, to take part in that city's 75th anniversary.

Because the Wing has a Communications Officer, Dep. Wing CO Lt. Col. Julius Hetland, who really knows his stuff, an AF B-25 with its entire radio system out of order which made an emergency landing at Fargo on a holiday weekend, was enabled to proceed quickly on its way to Boston. Commented Lt. Col. G. B. Price, in command of the B-25, "It was the best service I have received at any field I've ever been on."

Col. Hetland answered the emergency call by coming out to the airport on a Sunday, stripped the plane of its radios, took them to the CAP office, repaired them in an hour and reinstalled them in the bomber.

Washington has designed a new sleeve patch. In the center the emblem is that of CAP, and flanking it are two large green fir trees, significant of Washington's chief product, lumber. In the background, covered with snow, is Mt. Rainier. The entire scene is floating on clouds and across the top of the patch is "Washington."

Nevada: The Reno Squadron performed one of the CAP's outstanding mercy missions when a railroad agent at Gerlach reported a plane crash with three dead and one critically injured. Dr. Emanuel Berger, Squadron Medical Officer, Maj. Theodore Morrill, Squadron Pilot and his ambulance plane, and F/O Marionne Merhar acting as Registered Nurse took off within minutes after notification.

Arrived at the scene, they found the pilot and two passengers dead, and an 18-year-old girl critically injured. Blood transfusions were administered at once. It required two hours' medical work before the girl could be placed in the plane. During the flight to the hospital Dr. Berger had to administer more blood transfusions. A waiting ambulance rushed the girl to the hospital from the airport. Maj. Les Connolley, Squadron CO put it tersely, "Mission complete success. All personnel deserve commendation."

Nebraska's Hastings Squadron isn't losing any time getting its own building. Applying to the City Council, it not only obtained permission to erect a building on the municipal airport, but will be charged no fee for rental of the ground.

C. A. P. NEWS c/o Air Trails
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I'm interested in more information on the CAP and would like to hear from my nearest unit.

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Buhl Pup

(Continued from page 42)

fuselage outline. This will furnish the crutch onto which the fuselage formers will be attached. Cut the crosspieces of the same stock and cement to the longerons. Formers 2, 3, 4, 5 and 6 are now cut out of soft 3/32" sheet and then cut horizontally at the centerline as the bottom of the fuselage is assembled and sheeted while the crutch is still pinned to the plan.

With the lower sections of the formers cemented in place you are now ready to sheet the bottom section. Be sure to get the very softest 1/16" sheet you can find, for it will curl more easily. Cut these sheets to the pattern shown along the lower edge of the side view and brush on three coats of clear dope extended to about the position of former 5 on the inner sides only.

As the dope dries it will begin curling the sides, so now is the time to cement them to the fuselage crutch and to former 6. When this is dry cement the sheets in contact with formers 3, 4 and 5, using plenty of pins to help hold them to the formers. If the sides aren't curling enough, dampen a rag and rub over the areas where more curve is desired. Before cementing the front edge down to former 2, force it down by hand, and if it tends to buckle slightly cut a slit 1/16" wide at the front tapering to nothing at former 3, then cement to former 2. Take a scrap piece of ⅛" x ¾" sheet and lay along the bottom. Lift this completed structure off the plan and glue the top formers in place.

The top of the fuselage from former 3 back to 6 is covered in one piece. Dope the inside as you did on the bottom but apply several extra coats toward the tail as it will have to curl more sharply. The covering from former 2 to 3 is one piece, but don't cut out for the cockpit until the fuselage is ready for covering. A small block is used to fill in the section on top from former 6 to the end.

Cut the two soft balsa cowl blocks to approximate shape, then lightly cement onto the nose. Carve and sand to conform to the fuselage, then cut loose and hollow, recementing solidly to the fuselage. Two sections cut from ¼" hard balsa ½" long are cemented onto the front of former 2 for the upper part of the main landing gear wire to enter. Former 1 may be cut out now, but do not cement it to the fuselage yet. Carve the headrest and cement to fuse. The finish of the fuselage is greatly improved and is much stronger if you cover it with tissue.

The tail surfaces are of the usual construction and are covered with light tissue, not Silkspan. Spray lightly with water to tighten.

For the wing, cut out the ribs from 1/32" sheet, or if you're allergic to cutting out so many ribs the number may be reduced to one-half, but in this case use 1/16" sheet instead. Two of the ribs next to the fuselage are cut from ⅛" sheet, following the dotted line on top of the rib for the outline in place of the solid line. The two ribs next to these are also trimmed along the top.

For assembly, slip the ribs over the spars to their approximate spacing, then lay on the wing plan and pin the spars in alignment with the drawings. Now true up all the ribs and cement to the spars. The trailing and leading edges may now be cemented to the ribs. Cut the wing tips from the required thicknesses of scrap balsa. The 1/32" sheet leading edge covering is cut to the required width, then cemented along the leading edge.

When this is dry, cement the rear edge of the sheet down to the ribs, using pins to hold in place. Don't forget the 1/32" sheet covering over the first two ribs at the wing root. Now the two short lengths of 3/32" aluminum tubing may be cemented alongside the rib as shown on the plan. This will give the right wing panel. However, it will be necessary to turn the plan over in order to get the left panel. A small amount of oil or Vaseline applied to the wing plan will make the paper translucent. Repeat construction. After carefully sanding the two panels, cover with tissue and spray with water.

Now we finish the fuselage, tail surfaces and wing panels. Brush two coats of a mixture composed of equal parts of clear dope and clear lacquer over the fuselage and wing, but only one coat on the tail surfaces. If at all possible spray the remaining finishes. Now apply two coats of wood filler or automotive primer to the fuselage, sanding between each coat. Spray three coats of red to the fuselage and rudder. The wing and tail will require three coats of cream.

The main landing gear strut is formed from 1/16" dia. wire, using the front view on the plan for the exact shape. Run the wire one-half inch into the fuselage. The supporting struts are bent from 1/32" dia.

wire with sections of slightly flattened 3/32" dia. aluminum tubing slipped over.

Before mounting the wing panels it will be necessary to cut slots in the fuselage for insertion of the wing spars and leading and trailing edges. Slip the panels in place and raise each tip to its required dihedral. The flying wires are composed of heavy thread and are threaded through the aluminum tubing inserts in the wing and through a hole at the top of the cabane struts. Pull all wires tight and cement not only the thread, but also the leading and trailing edges to the fuselage.

Mount the gas tank inside the nose as far forward as possible. Bolt the motor to former 1 and securely cement onto the nose. The dummy crankcase and dummy cylinders will greatly increase the appearance of your model while requiring only a slight amount of extra work. The exhaust manifold is probably the most difficult part of the model. One of the best ways to make a sharp bend with aluminum tubing is first to fill the inside with solder, bend to the desired arc, and then melt the solder out. Be sure to get the softest grade of aluminum tubing for this.

If you will be flying your model within small areas it would be well worth putting in a Maeco flight timer as it weighs practically nothing and gives you complete control of the ship's flying radius.

Before going out for the first flights check your model for its balance point and compare with the c.g. location as shown on the plans. If it is close you are ready for your trial flights; if not, it will be necessary to add a slight amount of weight to either the nose or the tail until it balances correctly.

As with all free-flight models it is best to hand-glide the model, adjusting for a straightaway or large circle without any signs of a stall. The model is now ready for its power flights, and you will find it to be an exceptionally easy ship to adjust and one that can take more than its share of the usual knocks.

Duo-Mono Model

(*Continued from page 36*)

favorite type system which works out well.

Assemble the rear wing to the fuselage, installing the pushrod and bellcrank therein. Add the line leads and you are ready to button up the bottom of the fuselage. Check control system for complete ease of movement. No binding or stiffness should be evident.

The twin rudders can be carved from hard ¼" sheet and cemented to the tip face of the rear wing. Note offset angle to the right shown on the plans; both rudders should be the same.

Construction of the front wing follows the pattern of the old favorite Fireball. Make top and bottom wing half sheets to width needed, out of 1/16" sheet. Cement ribs in place on right sheet half. Omit rib F1 until later. Bevel the ¼ in. sq. leading edge and cement in place along the sheet and ribs. Now assemble the left sheet, ribs and leading edge. Join these two assemblies with the ⅛" sheet spar joiner and two F1 ribs at center seam. This forms the bottom wing surface. Bevel the leading edge strips and trailing edges of the sheet on this lower surface and on the top surface sheets.

The plywood line guide strut can be cemented in place against the side of rib F6 on the left side before the top sheet is put down. Cut a slot in the skin beside the rib to allow plywood to pass through.

Add the top wing sheets on first one wing half, then the other. Check constantly by sighting spanwise to prevent any twist. The wing should not have any warps in either panel. Cover the center seam with a 2" wide strip of silk or aircraft fabric to further strengthen it. Now add the ½" sheet tip blocks and the ¼" dowel line guide to the strut to complete the wing construction.

Join the front wing to the fuselage now. Cut the top planking to form a tight-fitting saddle. Check for parallel relation with the rear wing, viewing model from nose and tail. When everything is snug and aligned, cement wing down and use plenty of goo at all points of contact with the fuselage structure. A shallow plastic wood or balsa fillet can be added to both front and rear wings to further strengthen and clean up the wing-fuselage junction.

If a good finish is desired, the entire model should be sanded and filled, then covered with lightweight tissue for a good undersurface. Then put on several coats of filler or primer and as many coats of dope as desired.

The original model was finished with a minimum of dope in order to hold the weight down. Two coats of talc-dope filler and two coats of dope were used. Fuel proofer was added over this.

It is recommended that a fuel-proof finish be applied from the wood outward, using Sta or Aero-Gloss for the entire job.

Check balance as indicated on the plan side view before flying. The original model turned out a bit nose heavy, and although on first flights it went like a streak, up control was at a minimum. About one ounce of lead was added to the tail and immediately results were better. The landing gear was moved a little ahead to insure better ground running characteristics.

The Delanne wing arrangement allows for a more rearward C. G. location than is used on both full-scale and model aircraft. With C. G. and bellcrank as shown, performance is fine. Even better maneuverability would probably result if the C. G. and bellcrank were moved back another half inch.

If any modeler wishes either to enlarge or reduce the size of this ship for flying with other engines, it is important that the same relationship of wing stagger and gap be retained. This is the essence of the Delanne design upon which the excellent performance of this rather unconventional ship depends.

Bill of Materials—Duo-Mono

(Balsa unless otherwise specified)

3 pcs. ⅛" x 3" x 36" fuselage, formers and wing ribs. 5 pcs. 1/16" x 6" x 36" wing sheets. 2 pcs. ¼" x ¼" x 36" wing leading edges. 4 pcs. ⅛" x ¼" x 36" fuselage planking. 1 pc. 1⅛" x 2¼" x 12½ fuselage top blocks. 1 pc. ½" x 3" x 24" fuselage bottom, wing tips. 1 pc. ¼" x 3" x 12" rudders. 1 pc. 1" x 3" x 3" nose block. 1 pc. 3/16" x 3" x 12" elevators. 1 pc. ¼" x ⅜" x 24 rear wing spar.

¼" hardwood plywood 2" x 2½" firewall. ⅛" hardwood plywood 2½" x 3" former 3. 1/16" hardwood plywood 5" x 9" fuselage sides. ⅜" x ½" hardwood bellcrank mount. Scrap 1/16" sheet for bottom.

1 ft. .093" dia. steel wire, landing gear. 15 in. .062" dia. steel wire, pushrod and tail skid. 30 in. .031" dia. steel wire, line leads. Veco 3" bellcrank. Veco elevator horn. 2" dia. wheels. 1⅝" dia. Scamper Plastic Spinner. Berkeley "B" stunt tank. "Eye" or "J" bolts for landing gear. Cement, Weldwood, dope, tissue, Trim-Film as required.

Flight Eng'r.

(Continued from page 24)

literally couldn't make a decision. I don't want to be flying when my captain makes a serious mistake because I've got a job with a future and I want to be around when the future arrives."

Jack isn't worried too much about the advent of jet transports. He knows the CAB requires flight engineers on all planes grossing 80,000 pounds or more. It isn't likely the passenger-carrying jets will weigh less. Should they become lighter, the rules may change in his favor.

True, the experts differ on the question, will the jets need flight engineers? Some argue that, with increasing speeds, the coming planes will go from here to there before engineering services aloft will be required.

"But," says Joe Towle, Lockheed's chief pilot, "look at it this way: The pilot doesn't care how the engines are operating, or how much power they're putting out. He's interested in the total results of whatever power he has—as the airspeed and rate of climb. His job is enormously simplified when he can disassociate himself from details of operation."

Jack may get the nod one day, and find himself tending the controls and myriad instruments on a transatlantic jetliner. He'll make the crossing much faster than do the Connies and DC-Sixes. John Cunningham, DeHavilland's chief test pilot on the Comet, knows how much faster these planes fly than current airline models. He carries along a navigator on every distance flight, even though the margin of error through vagrant winds is less than with a slower plane.

"It's important to know exactly where we are at all times," testifies Cunningham. "There's no time to study charts. Decisions must be made in seconds, not minutes."

The same reasoning recently impelled Cunningham to remark that the jets will need flight engineers. On a slower plane Cunningham may need to know, at some stage of flight, how many

more minutes of fuel remain in the tanks, how many more minutes of flying time remain before touch-down. On the jets, he tells you, decisions must be made fast. Because human reactions have not kept pace with speed-up of machines, nothing less than training and experience will qualify Jack for that important job.

Civil Air Regulations, Part 35, point out specifically how Jack can prepare for his first post. He can take his choice among these routes:

Most highly approved, and recommended by operators, is a two-year course in specialized aeronautical training. One man who knows the requirements is Chuck Mercer, Lockheed's chief flight engineer. Mercer wants men who have enjoyed a good mechanical background, the type of training that produces an A and E license. Fact is, all operators of Constellations, without exception, require their flight engineers to have A and E licenses. Also, some training should be had in physics and engineering.

Other approaches include three years of diverse practical experience in the maintenance and repair of planes and engines, including one year on multi-engine ships of 800 horsepower per engine or more; 100 hours of flight experience in the duties of flight engineer, or 100 hours as pilot of four-engine aircraft.

Should Jack sign on with Pan-American, he would learn his is a respected and responsible job in a growing profession. His chief would hand him a small, printed brochure, from which he would learn that the purpose of the engineering officer position is to furnish the plane a crew member responsible for safe and efficient functioning of the plane and engines, that he would work under the chief flight engineer, that he would be responsible to the captain for the safe, conservative, and efficient execution of his duties.

But what are his duties and responsibilities?

Prior to departure, Jack would satisfy himself that the airplane is airworthy. He would measure the gas and oil, making certain the quantities meet requirements of that particular flight.

Once airborne, he becomes responsible for watching continuously and adjusting properly all the equipment under his care. He must keep complete engineering logs. If any malunctioning occurs, he notifies the captain, recommends a course of action, logs the incident.

After landing, he may assist the station mechanics in repairs—so long as he gets enough rest to continue his duties aloft efficiently.

Important, too, is the instruction he gives station mechanics in new mechanical developments, servicing procedures and maintenance problems of the planes operated by his company.

Jack may have been too young to remember a day when there was not even a copilot. He'd have to look back to the late Twenties for the beginning of his profession. Pan-Am took the initial step. The company was operating Sikorsky boats and Consolidated Commodores over water for long distances. Both the distances involved and a paucity of good facilities at overseas stations led to an inevitable conclusion. The planes must carry flying mechanics.

The difference between a flight mechanic and a flight engineer? Considerable. The mechanic usually goes along to be available for mechanical jobs on the ground. The flight engineer not only has a major share in operating the airplane during flight; he is interested in the overall results of efficient and safe flight as a result of his handling controls, fingering dials, turning valves, and perhaps making repairs in flight.

Pan-Am early learned that the mechanic was doing a good trouble-shooting job while in the air. He kept the engines ticking more smoothly. He helped conserve fuel. The pilot began to rely upon his advice when anything mechanical went wrong. Then changes

began to appear on the newer planes. Flaps, retracting gear, food warming equipment, multiple gas tanks. There developed a need for very close control of fuel, together with installation of carburetors which could vary the amount of fuel fed to the engines. Duties for the flight engineer began to multiply.

By 1934 the flight engineer attained new status. By that year the Martin China Clipper was hauling cargo and passengers. That plane had a flight range of 20 hours or better. The China Clipper really fathered the flight engineer. On more than one occasion, he repaired broken parts during flight. Experience then demonstrated that, given means to reach them, he could repair engines while airborne.

Next came the Boeing 314 triple-tail Clipper. By crawling out through the wing, he could reach all four power plants. Flight engineers wrought what were then considered minor miracles. By tying a splint made of pencils, one dexterous FE repaired a broken throttle shaft. Another replaced magnetos while the prop was feathered. From his station, a flight engineer actually took off and flew briefly one boat after broken catches dropped the seats away from the pilot and copilot. These unrelated incidents were not only demonstrating an unsuspected ability of the flight engineer to meet many demands, but also were developing a teamwork necessary to fly the big jobs neatly.

The team has now proved itself, and the third member—the flight engineer—has a place of growing responsibility.

Solo Club

(*Continued from page 32*)

you do, you should fly more often, which means that you are more limited (for the time being) as to how much time you can save up for a cross country by missing out on a few week ends in between.

Even if you can't go further than a neighboring airfield, that practice will serve you well on future, longer X-C's. Lay out your course just as if you were going 100 miles instead of five or ten. When you leave the pattern see how accurately you can put your nose on course and how close you come to the destination without getting off course. You'll have to look over that other field, let down, enter its pattern. Both going and coming you'll have a chance to attain, then maintain, the desired cruising altitude.

If there is a wind, it will reverse your drift on the return trip. Outside of checkpoints, you get the works. If there's a cluster of fields near your town, make a tour of them, just landing, then taxiing back and taking off immediately. Get together with another pilot to share the expense of slightly longer tours, taking turns getting into and leaving the various ports.

The less experienced pilot sometimes finds annoying the setting up of a course in the air. Lightplane pushers know how fast a 65-horse job will swing off course due to torque in the climb, and how hard it is to hold the nose where you want it. Working the map at this stage compounds trouble. So, without going anywhere, you can sharpen this part of your cross country. Lay out imaginary courses. A slew of them. Then take off, leave the pattern and establish course number one. Then quit, return, and land at your base. Make another hop establishing course two. Work out little tricks through this practice for quickly and accurately getting on the desired course.

For example, one of the runways may have the same heading. Gain altitude, then fly over the field, lining up with that runway. If a highway or railroad leaving town is on course or close to it, pick up enough altitude before starting out, then get lined up with road or tracks. This, by the way, is a good compass check. If the compass is off, line up with a known runway heading in the same general direction, and note your compass reading. Your Headquarters staff recently encountered a compass 40 degrees off by this method.

If possible, lay out your course the night before. The next morning, or before takeoff, you'll be getting weather and winds aloft. But, for now, pencil in the line from point of departure to destination. Study that course for a few minutes, noting significant check points along the way, as loops in a river, or singular rail lines, ridges, large cities. Fix in your mind this general im-

pression of the country ahead so that a missed check point, or a doubtful check point, won't set you to worrying.

Note where the destination port lies; on what side of the city. Don't fly to some place like Chicago, then wonder where to land! In busy areas, your head should not be buried in the map; your eyes should be alert to other aircraft. Note rivers, tracks, and so on beyond the destination in case you miss it! Note where other fields lie with respect to these landmarks. Spot various fields along your route so that, for example, by turning 90 degrees, where two converging railroads intersect your course, and flying between the two, an alternate field will be found where they finally cross, and where you can land safely if weather doesn't look good, or if daylight runs out faster than expected.

Mark those ten-mile points prominently on your course line. Put a bold arrow, a series of them if need be, alongside the course. If you pick up the map suddenly the arrows always orient the eyes. Also mark down the degrees—after allowing for wind, variation, deviation, preferably in bold colored letters. When you do take off have the map ready in a handy pocket, properly folded, then hold it with your destination away from you, so the course on the map coincides with the real course. Prepare the folds so that, when you fly over a crease, the map may be unfolded further without disturbing your cockpit procedure. Don't look like a man reading the comics; have the map neatly folded in your lap.

Though it may take longer, lay your course near hospitable terrain. No one can relax properly with 30 miles of mountains between him and the next clearing. Not in a puddle jumper. We aren't blasé pros! Knowing you can reach out to land—and fly high enough to do it—takes the edge off that subconscious tension. Don't crowd your gas. Figure on landing with gallons in the tank. One hundred fifty miles for a hop in a 250 mile-range ship is about the best you can reliably and practically count on. Shoot for nearer fields and always have one slightly further on in mind—just in case. The charts don't always keep up with the operator's misfortunes. Notices to airmen mean about as much to the week-end lightplaner as a state sign declaring that a highway is *legally* closed for repairs. Always have an alternate field in mind.

Another little thing that can cause tension of an unexpected variety, and is a result of the same hasty planning, is forgetting to note beforehand the altitude of your destination, then computing the difference between altitude at take-off and landing so you'll know where to fly to get into the strange pattern. Arriving at a field at 300 feet—if you see no aircraft in the air to indicate the pattern level—is not a healthy practice. All of us tend to do these things and, in fact, such practices are the result of insufficient flying.

Perhaps you have worked out little tricks, ideas of your own, to boost X-C time at the expense of idle, around-the-field milling. Maybe, in your regular flying practice you have found ways to smooth the technique for cross country. How have you made cross country enjoyable? How have you benefited and learned from beyond-the-field hops? We'd all be glad to hear.

Next Issue:
I Designed the Zeke
By Jiro Horikoshi

Man From Mo.

(Continued from page 33)

Commanders and others became completely silent.

". . . My main impression that I got of the English people was the fact that they were a number of individuals. For instance, there was Johnny Hall. John was an English Air Cadet who was coming to this country on the Exchange Program. One day he and I were walking down the street together in Uxbridge, England . . . Suddenly he said to me, 'Don, this is a great idea, that is, the Cadets of one country visiting another' . . . He said, 'Think how many wars could have been prevented if the people of the two warring nations had had a chance to come together and to know and to meet and to understand each other'. John was right. . . .

"My trip to Great Britain . . . was one of the greatest gifts of my life, not only because it gave me a broader education, but because it gave me a deeper understanding of the people of other nations and made me realize that they too were human beings just like myself, and therefore not perfect.

". . . When the RAF flew us over into Germany and we could look down and see their bombed-out cities, and their fields pitted with shell holes and burnt-out pillboxes, and could see with our own eyes the disaster that had been heaped upon that nation because they had been so foolish as to allow themselves to come under the rule of a dictatorship, I appreciated more than I had ever appreciated before in my life the United States of America."

The words rang with sincerity, with simplicity, and when they had been spoken more than 300, the Congressional group, as well as all others, jumped to their feet. The applause lasted almost as long as the brief talk.

Strato-Flash

(Continued from page 38)

strength. Due to the skin stress this construction properly made has less tendency to warp than the standard solid spar wing.

My next problem was to test the effects of varying camber sections in the stabilizer, and this led to rather pleasing results, for by varying the camber percentage in the stab I acquired control over the climb characteristics of the plane under power. This was another development of my indoor experiments, since they had shown that an 8% airfoil in the stab would furnish the best climb and the most stable flight pattern, while the 10% stab airfoil had too much lift effect during the climb, and the 6% airfoil in the stab resulted in an attitude of climb that could bring about a stall, and had an erratic flight pattern due to its unbalanced condition. I proved this point on my gassie for the 10% stab on the Strato-Flash made the plane fly level with the ground under full power, and the 8% stab airfoil as shown on the plans made the ship climb at an angle of approximately 50 degrees—which to my way of thinking results in the maximum altitude under full power.

The long stabilizer moment arm was necessary to insure stability under full power and to utilize the lift of the stabilizer. The pylon wing mount was used to reduce the angular difference between wing and stab and thus reduce profile drag, and to counteract the torque of the pro-

peller under power. This is very effective, for the Strato-Flash when adjusted to glide to the left or with torque, will circle to the right or against torque under power.

Construction of the plane is fairly easy if the proper procedure is followed. The first step is to select quarter-grained sheet stock for maximum strength, then cut out all parts before reaching for the glue.

The wing should be made one panel at a time, letting it dry on the board before propping one end up for the proper dihedral, and then building the next panel to it, making sure that the sheet edges are sanded to fit before gluing in place.

The stabilizer is made in the same manner, only cover the rudders and glue in place during the construction and not as an afterthought. The body is of conventional construction; add the retractable gear before covering with 1/32" sheet.

The profuse use of laminations is necessary for maximum strength, so do not change these parts. The wing, stab, and rudders are covered with Jap tissue, two coats of plasticized dope and one coat of fuel proofer. The body should be colored with an analine dye dissolved in alcohol, then add two coats of clear dope and one coat of fuel proofer.

One item not included in the plans is the gas tank, for we used an eye dropper vial marked off for various engine runs, and since this may not be 100% accurate, it is suggested you use your own favorite method. The stab should have thread glued to the trailing edges and to the bottom of the stab platform as an angle stop when the dethermalizer is in effect.

After the ship is complete with engine mounted it should balance at the trailing edge of the wing, and should have a straight glide, slightly stalled, without any turn adjustment. It should glide to the left when viewed from the rear; this is accomplished by putting thin strips of wood between the stab and the stab platform on the side toward which the plane should turn. The turn should be set for an approximate 50-foot circle, with the plane gliding smoothly without stalling or diving, before adjustment strips are glued to the stab platform.

The glide should be about 7:1, or when launched from a height of 4 feet it should land 28 or more feet away.

Before flying, be sure to check the ship for any possible misalignment, especially in the thrust line which should be neutral.

The plane under full power should make a wide sweeping turn to the right, or against torque, and then when the engine cuts it should make an S turn, and glide to the left without a stall or dip.

The best procedure is to test-glide your ship, start the engine, light the fuse, launch it into the wind at an angle of 30 degrees and start running.

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HENRY FORD II

Dope Can

(Continued from page 48)

Midwest and Eastern enthusiasts grimly. And finally everybody could. Today, so fast has control line flying progressed, general opinion seems to be that the AMA stunt rules are much too easy—too many entrants can do them to perfection, placing more of a load on the judges who must decide between near-perfect performances.

As a matter of fact, the current national stunt rules, it has been said, are more of a test of the judges than of the contestants. Those who have had an opportunity to participate in the Mirror Model Flying Fair meets say the more stringent regulations which govern the MMFF's stunt competition are in better keeping with the capabilities of the average contest goer. Certainly they deserve careful consideration by the AMA contest board.

Handicap system. Mention of the Mirror and its annual meet reminds us that we've had some requests for additional data on the handicap system under which those contests are conducted. It operates thusly: if a contestant has entered (or won prizes) in 5 to 9 major meets during the preceding year he loses 3 mph from his speed score and 20 points in stunt; participation in 10 to 14 major meets means a minus 6 mph and 40 stunt points; those who have flown in 15 or more meets lose 12 mph and 80 points in stunt. This year's meet saw surprisingly little griping about the system; apparently it answers the professionalism question very nicely, although it does require extra recording work.

Other contests could set up a similar system and elicit the necessary information from entrants by means of the meet application blank. Handicaps could be posted at the registration table the day of the meet so anyone who phonied up his report could be detected by other entrants. If a modeler failed to provide the necessary information, or it was known to be false, he would be given automatically the toughest handicap under which to fly.

More Walker Wisdom. Before we leave the subject of Gentleman Jim and his pace-setting planes we want to tell you about his latest two ideas. One is on slow-speed U-control flying and the other on free flight pre-determined flight-path contests. We'll call the latter "Pre-de" free flight until someone comes up with a better term.

Jim is very certain that the uncontrollable speed of glow plug engines has been responsible for a lot of disappointments for the beginner. He'll soon introduce his little Firebaby model with a speed retarder which will allow the novice to learn to fly in slow motion. The retarder is nothing more nor less than a metal prop, bent in the opposite pitch direction and fastened behind the regular propeller. Even using the retarder as a regular prop will work, except that it does not allow the nicety of adjustment obtained with the combination.

Walker feels that any antagonism towards the metal propeller in Half-A class is unjustified since its small size puts it completely out of the danger class. In fact, says he, tests have proven that the metal prop with rounded edges is safer than a wooden propeller with sharp ends. He does not think this holds true for metal props for Class A or larger size engine events.

The retarder can be bent for any adjustment and for any speed, so that the model's speed can be held down for first flights, then stepped up as the skill of the flyer increases.

The Pre-de free flight event operates with the contestant filing a flight plan with the judges before taking off that explains exactly what the flight will consist of. Points will be compiled according to how close he follows the flight plan. Three attempts will be given to make three official flights. Highest score in any one flight determines the winner. Scoring is as follows:

1. Take-off—10 points for every second model is on ground during take-off. Model may be hand launched, but receives no points under this section.

2. Circles—10 points for each complete circle. Any circles over or under the flight plan will be deducted at the rate of 5 points per circle from the score.

3. Flight—two points for every second in the air. One point will be deducted for every second over or under the f.p.'s stated time.

4. Landing—spot landing is worth 100 points. One point will be deducted for every five feet from the contestant's chosen spot. If model lands more than 500 feet from the spot all score is canceled for that flight, but it is recorded as an official attempt.

After drawing up these original rules, some refinements were found to be in order. Writes Walker, "As you probably know, we have held a number of these contests in

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both U-control and free flight. The former is fairly good, but the latter is really terrific. Although the set-up sounds complicated, it is really of the utmost simplicity since all the contestant has to do is fly his plane and then count the circles, time in the air, and stick a flag in the ground wherever it lands. He then runs back to the judges and files the exact flight plan that he just made and tries to duplicate it exactly. This is all there is to it and it really makes sense because it is exactly what anyone does when he takes off on a private flight.

"A new adjunct to the rules is a specification that the contestant making a flight has priority over any other entries, rather than stepping back into line. As you can visualize, the wind conditions might change so that he cannot even get close to his first flight, so we are going to specify that any contestant so wishing can make his three flights consecutively to take advantage of identical weather conditions.

"This contest works out particularly well with the small engines, because the model usually turns pretty sharp." For the time at least, Jim suggests that all circles be counted regardless of direction, with the number scored as stipulated in Rule 2.

AT Models In England. A. E. Bailey of Wheelock, Cheshire, sends along some interesting data on two ships now flying which were patterned after Air Trails plans. One is a free flight scaled down from Carl Wheeley's Senator by Arthur Stubbs for a Mills diesel engine. The plane has been a great success from the start and its only damage to date has been from trees and other obstacles. Entered in only one contest, the North-West England Halifax trophy competition at Chester, it placed fourth out of 200 entries. When the All-England results were tabulated for this event it was scored 11th out of 600. This despite the fact that on the first flight Arthur left the timer on the short run of only 8 seconds. The other two flights were opened up to the allowed 20 seconds; the first flight was only 1:30. At the scale he made it the job works out to about 45 inches span with a weight of 14 ounces.

Last winter while recovering from a football injury Mr. Bailey saw H. A. Thomas' Southerner and decided to build it as soon as he had the use of both arms. As time wore on he realized he had no equivalent engine to the Arden and that installing any other motor in the neat layout would amount to "butchery." So using the Southerner more or less as a guide he came up with a low-winger that appears to be a cross between a Navion and the Meyers lightplane. Spanning 52 inches and powered with a .17 cu. in. Allbon diesel, it weighs a rough 28 ounces.

Says AEB: "The weight is due to the very heavy sheeted construction which has proved necessary in some of the violent collisions that its fast glide has made a regular feature. Like all low wings it will turn only left under power, but is very controllable on the left turns. A shallow turn gives quite a good climb with a tight right glide whereas a tight left turn kills the climb and after several circuits it is still at low altitude flat-hatting the spectators."

Another Movie. Here's one for your club that the gals will appreciate, "High-Way to Hawaii," 16-mm sound and color motion picture by United Air Lines. Available free to clubs, churches, schools and other organizations through UAL's traffic offices. Wonderful evening's entertainment — has some excellent travel shots through the Islands.

As Maine Goes . . . The Maine Council of Model Aeronautics recently released its state record listing. Wonder how the records for your state stack up against them. What! You have no state governing body? *Tsk, tsk.* Well, here's the dope from one state that shows how it can be done. These are all control line marks (Maine is short on the wide open spaces for free flight work, you know).

Speed A—Cl. I, Howard Smith, Augusta Flying Maniacs, 102 mph; Cl. II, Matthias Marquardt, AFM, 103 mph; Cl. III, Arnold Fitton, Waterville Flying Aces, 59.2 mph.

Speed B—Cl. I, Howard Smith, 116.1 mph; Cl. II, Robert Morin, Lewiston Sky Devils, 102.5 mph; Cl. III, Arnold Fitton, 64.7 mph.

Speed C—Cl. I, Howard Smith, 112 mph; Cl. II, Matthias Marquardt, 109.5; Cl. III,

ADVERTISERS' INDEX

October, 1950

While every precaution is taken to insure accuracy, we cannot guarantee against the possibility of an occasional change or omission in the preparation of this October, 1950, index.

Raymond Welch, Bangor Hedgehoppers, 71.9 mph.

Speed D—Howard Smith, 128.5 mph; Cl. II, Matthias Marquardt, 110 mph; Cl. III, Raymond Welch, 62.3 mph.

Stunt—Cl. I, Bill Duggan, Bangor Hedgehoppers, 255 pts.; Cl. II, Richard Smith, Bangor Hedgehoppers, 398 pts; Cl. III, Raymond Welch, 272 pts.

Scale—Cl. I, Manning Hobbs, Bangor Hedgehoppers, 165 pts; Cl. II, Richard Smith, 177 pts; Cl. III, Richard Lahaye, Augusta Flying Maniacs, 148 pts.

Pen-Photo Pals. Brian Anthony Barnett is 16, interested in free flight and control line models, does a lot of cycling. Lives at 51 Aldhohm Crescent, Hawthorn, Wiltshire, England. Wants to contact American flyers. Robert Spicken, 2447 R. Bond, East St. Louis, Ill., looking for German correspondent. Omar C. Oudin, Box 87, Sylvan Beach, N. Y., is 15, seeks English model-minded pen pal. Queries Joseph J. Soukrada, 40 New St., East Islip, L. I., N. Y., "I would like to know if I could contact modelers or aviation enthusiasts interested in exchanging photographs of full-size military and commercial aircraft. I have quite a collection which I have taken during the past four years which I would like to trade. I would prefer a correspondent in the Cleveland area, Los Angeles area, one in England and one in Sweden if possible."

Flight Report. Bill Davis of Urbana, Ohio, built AT's All-American free flight and says it's been a terrific performer. From the first test glide it flew right off the board, so to speak. First real flight test was at a Ft. Wayne, Ind., meet where it flew for 4 minutes with practically no adjusting. Bill used an Arden .19 ball-bearing motor with a Spitfire timer valve. Ship has a pop-up tail with fuse dethermalizer.

Construction was changed slightly by use of 1/16 inch sheet on the fuselage covered with Silkspan, warp-resisting stabilizer (à la Andy Bauer of Urbana, we're informed), gussets on the wing and tail, and a removable $\frac{1}{8}$ inch aluminum firewall which is mounted on a $\frac{3}{8}$ inch plywood firewall by rubber bands around the engine bolts and wood screws in the plywood. Complete, BD's "AA" weighs 20 ounces. Sez he, "Don't blame me, it's my first free flight!"

RS vs. ECL. Ronald Schlosser of Irvington, Calif., read E. C. Linthicum's comments concerning control liners. Remember where Mr. L. brought up data to indicate you couldn't call a U-control job an airplane? Well, says Ron, that very issue had a photo of Ray Matthews' PAA-Load international free flight. He wants us to compare it with the swell Swee' Pea, the Jap-made B-36 and the Minnow (all control line ships) with Matthews' plane. Claims there's no comparison—all the votes would go to the circle ships since they definitely look like real airplanes (and why not, they're flying scale models) while the payload plane (Ron calls it a "thing") is a far cry from anything we'd recognize in the full-scale field. Could be he has a point there.

Club Activities vs. Contest Flying. It's long been a moot point among clubs as to how much emphasis should be placed on flying and how much on meetings. The Ft. Worth, Texas, Aero Modelers Association was bothered by this so decided to redesign its schedule. It works out to such a nice proportion between out-in-the-open stuff and indoor yak-yak time that you might like to check their arrangements.

There will be one meeting per month henceforth, decided the FWAMA'ers. This is held on the first Wednesday. In addition to this meeting, the 5-man advisory committee which makes primary club decisions and basic plans on all problems (later submitted to the membership for yeas and nays) meets on the third Wednesday. The committee plans the program for the next general session, edits the club's newsletter and schedules contests. Any member can attend the committee get-together if he or she desires.

There's a contest on the second Sunday of each month—rain or shine. Contest can be called off only by the refusal to fly by the contestants or by the advent of ice and sleet (what—in Texas?). Otherwise contest goes on. An entry fee of 50c is required of all non-club members flying and of FWAMA'ers not in good standing. All active members (that means, dues paid up) enter free. Club dues, incidentally, are 50c a month. Two events are held at the present at monthly meets: Half-A gas and Open (Rubber, CO_2 and A-B-C gas constitute the open event).

Winner of each of the two events is awarded a gift certificate donated by the local hobby shops. If either event winner is a club member in good standing he also receives $5 from the club—a total of ten skins, 5 in merchandise, 5 in cash.

Any club member who remains in good standing for 12 months will have his AMA license renewed or bought by the club. That means by paying out $6 a year for club membership a flyer is eligible for $120 in cash, $120 in merchandise, a free AMA membership and a year of fun and fellowship. It was decided that a member will not be allowed to pay up his dues on a contest Sunday, so if he misses a club meeting he mails his dues to the secretary or coughs up a not-in-good-standing entry fee of 50c.

No Keeping a Good Man Down. The clipping from the Phoenix, Ariz., paper read, "John Defty was a proud man yesterday. The arthritis-stricken youth entered his plane in the open free flight trials and watched as James Berry took over the flying of his plane and copped the victory for him by keeping the little speedster in the air 11 minutes, 43 seconds."

We checked with Gilbert B. Bogart, a friend of Mr. Defty's, and found that fine flight was in the Half-A category. John, now 21, has been crippled for the past 11 years and must get around on crutches, but that doesn't keep him from being a top-notch model maker. In this contest, which was the big state Plymouth qualification meet, he competed on even terms with the best in the state. Nice going, JD. And a nod to Jim, too.

In that same contest, James McElroy, also of Phoenix, was only 7 mph behind the national Class D open speed record. And the temperature when he flew? A mere 102 degrees!

New Type Team Race. From Australia come some little known facts of the Aussie Nats via Neil Tinker, 1 Hider St., Warrnambool, Victoria. He included some shots of his Vagabond which won the Precision Payload event. For that event (which got him a silver tea service) he passes on the rules: entries ROG, minimum motor run of 35 seconds, planes must weigh 12 oz. per cc. displacement, plus 2 oz./cc. weight which must be removable, planes must be scale or semi-scale types, having cabin or cockpit complete with scale pilot (no pylons permitted!). Maximum flight time is 3 minutes; 1 point deducted for each second either side of the limit. Points for take-off, power flight, glide, approach, landing; points deducted for damage on landing. Attitude during flight to resemble that of full-size ships. Points for appearance, finish, workmanship.

Whew!

As for that very special team race. Here's the eye-witness account by Mr. Tinker

"The last event of the Nats stole the show. It was a team race with a representative from each state (thus 3 entries only)—New South Wales, Victoria, South Australia. They all got away well. N.S.W. was first to prang (crash) so their second model was brought into action. Vic and South Aus. pranged soon after so second models were brought out by both. Victoria and South Aus. pranged their second (and last) models near the 100 lap in this 140 lap race of approximately 10 miles. New South Wales jogged on to win. At this point we of the Warrnambool MAC decided to leave and as we drove away we looked back at the arena and saw a most unusual sight! The pilots representing Victoria and South Aus. were holding the handle of their lines while on the other end were chaps holding the bits and pieces of their planes running like mad and changing runners at the pits every few laps."

We never did hear who came in second. Neil, incidentally, would like to have a pen-pal or two in the States.

New Contest. The Academy of Model Aeronautics has been around long enough for most modelers to know what the letters "AMA" stand for. But, by golly, we're continually amazed at how newspapers write the organization up in their stories. Of course, to the layman, AMA can stand for the American Medical Association or the American Management Association.

So, for absolutely no prizes at all, how about sending in any clippings you encounter where the Academy is mis-labeled? First one we'll mention to start the ball rolling is the "American Model Association" from the Fargo, N. D., "Forum." We're sure someone can better that!

Wakefield Report. Close to press time word came from the AMA that models from the six American team members were being shipped to Finland to be flown by proxy. Cost of air freight for each model was about $40. The American Embassy was to return the models (if not flown o.o.s.) by boat.

Summer Course in San Francisco. During the summer school vacation, the Junior Museum of the S. F. Recreation Dept. ran a training course in building and flying model aircraft. Directors were experienced model builders. Work benches and tools were provided the youngsters participating, as well as locker space for models until completed.

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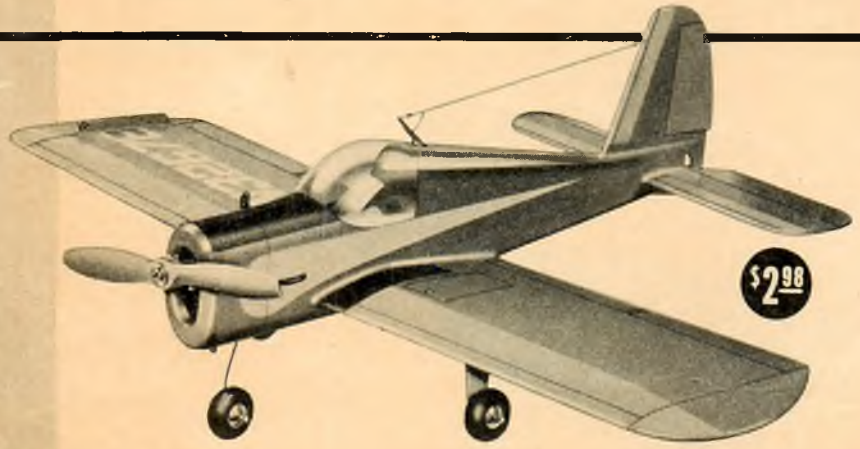

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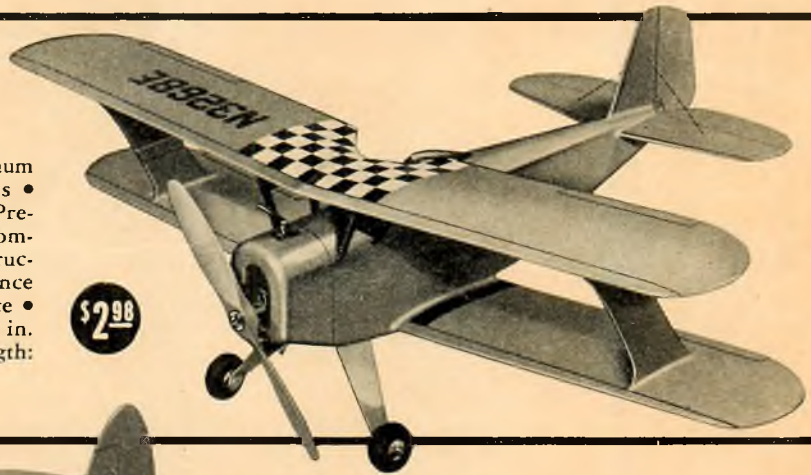

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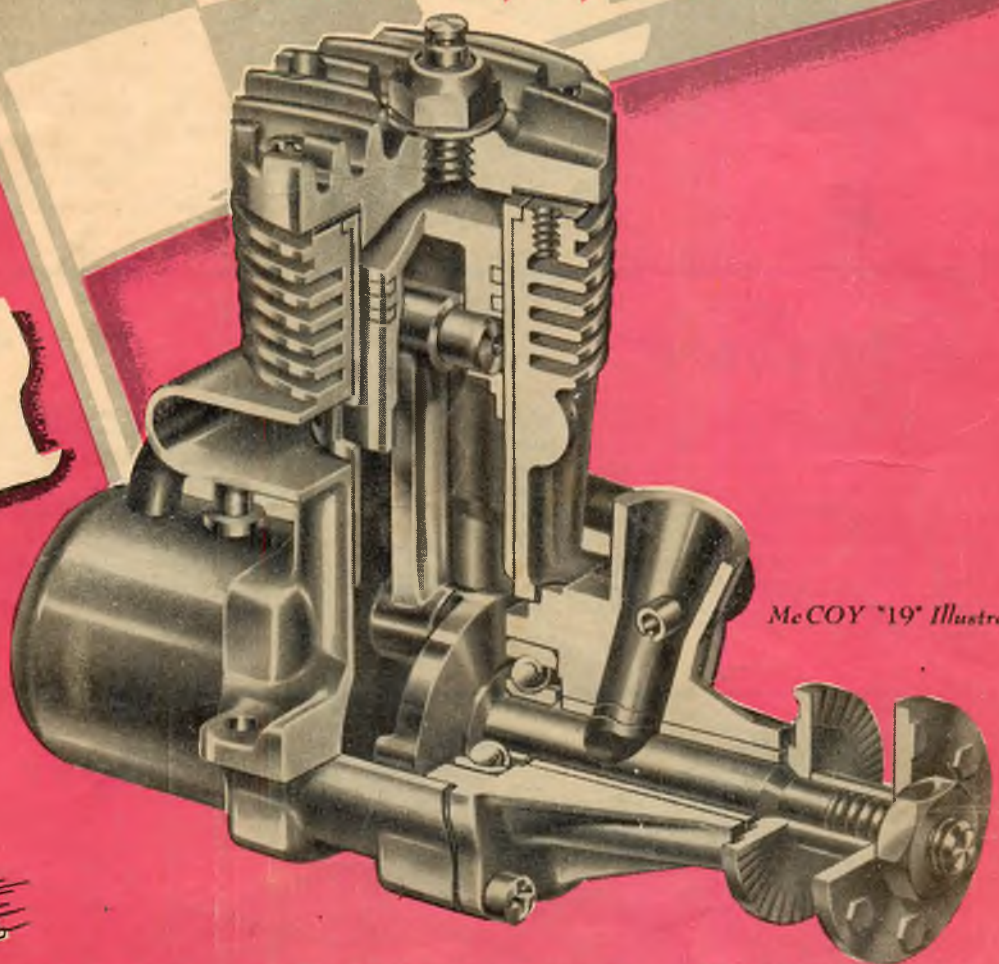

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