

# AIR TRAILS

FEBRUARY 1949

35 CENTS

*Pictorial*



**THE REDS  
AREN'T  
STALLIN'**

FRANK THORNTON

# AIR TRAILS

*Pictorial*

FEBRUARY, 1949

VOL. XXXI, NO. 5



What progress has Russian aviation made since the end of war? How far advanced are they in jet design and bombers? Have they attained supersonic speed? How about the atom bomb? In "The Reds Aren't Stallin'," author James L. H. Peck analyzes these questions and comes up with some significant answers.

## THE READERS WRITE:

### More About U-Control

Sirs:

In my recent article, "You, Too, Can Fly U-Control" (Jan., 1948), one or two points might well stand elaboration. I stated that all connections or loops in control-line ends should be soldered. I might better have said that if the modeler is incapable of making a strong double-wrap without soldering (to my mind the best type of safe connection possible when made properly), *then* he should solder.

In the light of recent design trends an error in the "Control Line Design Factors" table which appears on page 108 should be rectified. Wing loading suggestions for sport and stunt models should be transposed: for sport models, loading should be between 12 and 20 oz. per 100 sq. in.; for stunt models, loading should be between 8 and 12 oz.

New stunt models are now carrying symmetrical airfoils of between 15 and 18% thickness, instead of the 12 to 15% listed.

S. CALHOUN SMITH

Deal, N. J.

### The Dope on the X-1

Sirs:

I would like to say a few words about an interesting lecture delivered recently at the New York chapter of the Institute of the Aeronautical Sciences. It dealt with a subject so popular these days—supersonic speed—and the two speakers were men probably better versed in its problems than anybody in the country, Stanley W. Smith, Project Engineer of Bell Aircraft Corp., designers and builders of the rocket propelled XS-1, and Captain Charles E. Yeager, who reached transonic speed in the ship.

Security regulations forbade both Smith and Yeager to disclose flight and control characteristics of the plane, physical and psychological effects on the pilot at speeds higher than Mach 0.87 (87% of speed of sound). Nevertheless, the two speakers gave an interesting and enlightening account, the highlights of which we would like to share with you.

The XS-1, or X-1 as it has been recently redesignated, is the heaviest aircraft of its class. Under full gross weight conditions, it tops 13,000 lbs. and has a wing (*Turn to page 9*)

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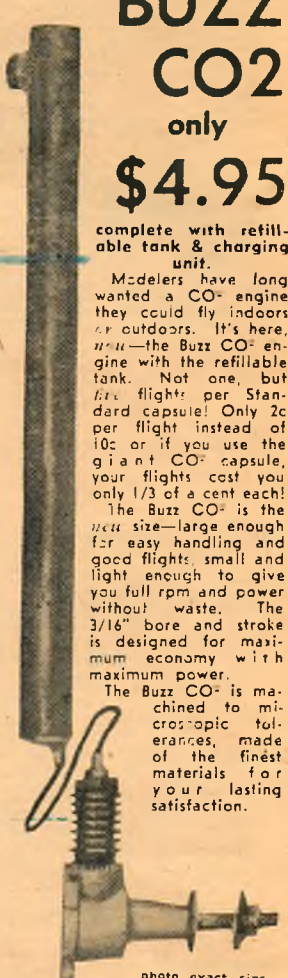


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## THE READERS WRITE

(Continued from page 4)

loading of nearly 100 lbs. per sq. ft. Most of its weight of 8,000 lbs. is in the fuel, liquid oxygen and alcohol. Once the fuel is expended, the plane weighs only 5,000 lbs. and has a wing loading of around 40 lbs. per sq. ft. The extremely high wing loading was one of the reasons why the X-1 was launched from the air instead of taking off from the ground. The other factor was that it takes only 2½ minutes to burn up the 8,000 lbs. of fuel. Launched from the ground it would use up more than half of the propellant to reach its operational altitude of 25,000 ft. The 6,000 lbs. thrust, quadruple rocket gives the X-1 a rate of climb of better than 20,000 ft. per min. from sea level to 35,000 ft. at a climbing speed of 500 mph. At higher altitude the potential climbing speed of the plane is 120,000 ft. per min. flying at approximately 1,400 mph.

Under full load conditions, the X-1 stalls at 240 mph, and on landing, it touches down at 148 mph. All landings are made with fuel tanks empty. If not used up in flight, fuel is jettisoned.

Why the straight wing on the X-1 instead of the much ballyhooed sweptback? Because the project called for an aircraft of conventional configuration in order to test very-high-speed capacities of such a plane and besides, at the time the project was started, little was known about the characteristics of a swept planform wing. The wing of the X-1 is very thin, 8% thickness, and that achieves everything offered by the sweptback shape which fools the air by making it believe that it is thinner than it actually is. Don't forget that thickness is calculated in percentage relative to chord. Same is true with the horizontal tail of the X-1 which has a 6 percent thickness ratio. Despite its thin wing and tail the X-1 is a sturdy craft capable of withstanding loads as high as 18 G's, or 50 percent more than a conventional fighter.

All supersonic flights were made by Yeager at very high altitude in slightly climbing attitude in order that the ship could be slowed down instantly in the event something went wrong, such as extreme buffeting due to compressibility. Yeager insinuated that nothing radical was felt by him while flying through the transonic range, neither did he experience any harmful physical or psychological effect. He completely discredited the general belief that deceleration from supersonic to subsonic speed is so violent that bone crushing strain is imposed on the pilot. (In the November 1948 *Air Trails*, David Anderton in his article "Beyond the Barrier" states that deceleration under these conditions will rarely exceed 3 G's). Though not quoting exact

figures Yeager said that on a number of occasions he has exceeded 60,000 ft. of altitude.

Flight characteristics of the X-1 are excellent. It is very light on controls, responding to the lightest touch and has best coordinating qualities of any plane flown by Yeager. When he first saw the X-1 Yeager was ready to take the next plane back to Wright Field, where he was attached to Fighter Test Flight Branch flying F-80's and F-84's. "I just got used to flying airplanes without propellers," he said, "and now they give me one with hardly any wing on it." But he soon got used to it, and ended up by being its staunch admirer. He nevertheless draws a line to his fast flying activities. "Someday soon," he says, "they will launch a rocket to the moon—and hit it, too—but boy, you won't find me in it!"

"OBSERVER"

New York, N. Y.

● *Air Trails* thanks "Observer" for his interesting comments on the X-1. All letters bearing a nom-de-plume must be accompanied by full name and address of the writer.

### Booster for Oldies

Sirs:

I have been reading your magazine for about a year. I only buy two magazines each month, and of those two I think yours is much the better.

In my opinion there is only one thing that would make your magazine better. That is: plans for some planes like the Wright brothers', old Curtiss jobs and the like, in rubber model form.

How about some solid model plans for 'copters?

HARRY CALKINS

San Mateo, Calif.

### The Readers Turn

Sirs:

First I want to pat you on the back (to find the best place to stick the knife).

Your magazine is in my opinion the best, in articles, plans, and everything except arrangement. I haven't missed an issue in over 3 years and they are still in the same shape now as when I received them. In fact, I intend some of these days to bind them.

The one thing that really gripes me to the core is your extreme use of: (*Turn to page* —). You start as many as three articles on one page and continue all of them some place else. I can't see why this type of magazine with the type of advertising you run can't print an article straight through. In a recent issue you started an article on Page 34 with forty words, then that ever-present (*Turn to page* —). Why not ask your other readers what they think?

ED STIGMILLER

Toledo, O.

● We know just how you feel. Unfortunately various editorial and production problems make it impossible to print articles straight through.

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# Showcase

## Some Baby →

Infant Torpedo is new eye-opener from K&B Mfg Co. (6901 Eastern Ave., Bell Gardens, Calif.). It's .020 cu. in. disp. glow plug job, no higher than kitchen match. Bore is .281"; stroke, .331"; weight, 1 oz. Comes with stamped aluminum prop for \$7.95. The Infant is said to be world's smallest production-made glow plug ignition engine. Motor adaptable to many rubber and CO<sub>2</sub> kits now on market.



## ← Plymouth Champ

Paul K. Guillow (Wakefield, Mass.) announces new Trixter Invert Jr. which was used by Lou Andrews to cop the '48 International Plymouth meet stunt championship at Detroit. Junior model powered by Ohlsson 23 did the job; span, 40". Trixter Invert Sr. has 47" span, took New England championship stunt title. Firm also puts out Trixter Trainer as 25" ship for A-B; 34" job for Class C.



## We Saw It →

Here's something you never saw before: a coping saw with a spiral safety blade. It's by X-acto Crescent Products Co. (440 4th Ave., New York 16, N. Y.) and sells for 90¢ with 3 blades. Exclusive Tyler snap-on frame makes blade changing easy. With continuous spiral tooth on blade you don't need to shift work or the saw, or readjust the blade. Extra blades, 3 for 25¢. Similar blades for hacksaws available.



## ← Yates' Latest

Designed by J. C. "Madman" Yates, Jr., and made by Burbank Mfg Co. (120 E. Santa Anita, Burbank, Calif.) the new Madman Junior stunt model may be had as a standard kit for \$4.95 or as a deluxe kit for \$6.95. Similar to Madman Senior with added feature to prevent tip stall: root rib is NACA .0015 which tapers out to NACA .0018. Tips have slightly more lift. For engine from .19 to .49.



## Stunt Prop →

Something new in big U-control stunt props is the 12" diameter, 7" pitch job made by Y & O Propellers (1523 W. 70th St., Los Angeles 44, Calif.). Y & O stand for J. C. "Madman" Yates, Jr., and Henry Orwick, both well known in the competition field. The pair state that two year's research went into this prop's size and shape. For engines of .60 cu. in. displacement or larger. A big job for big motors.



# Showcase Shopping

For items presented here try your nearest hobby or photo shop. Write to the maker for address of a retailer handling the product if you can't locate it. Prices and specifications are subject to change.

## Flying Wings →

Brown Mfg. Co. (2818 E. 79th, Chicago 49, Ill.) comes up with this eye-opener: a flying wing kit that retails for \$1.98. You get two fully built and glued wing sections, motor mount-fuselage finished, all parts ready for assembly. Span is 30"; symmetrical wing section is 5 1/4"; takes motors from .19 to .30 cu. in. displacement. Plans show step-by-step assembly. Brown says it does all stunts—plus.



## ← Folder

Acme Model Engineering Co. (8120 7th Ave., Brooklyn 9, N.Y.) makes this prop folder for various size blades. For a diameter range between 6" and 10". Said to work equally well on free-flight and control-line models. Folder comes complete with screws, wood center bushing and instructions for 35¢ at your dealers (40¢ by mail). Prop folder fits well in spinners, and can be used for gas or CO<sub>2</sub> motors.



## Comet Kid's Latest →

Another in new series of Comet craft is the Stratus for powering either by rubber or carbon dioxide engine. Kit is L-11 and sells for 50¢. Wing span is 32". Manufacturer is Comet Model Hobbycraft Inc. (129 W. 29th St., Chicago 16, Ill.). This model and its stablemate, Skyrocket, continue Comet's interest in the low-price field. Oldtimers will recall Comet's famous series of Dipper and Dart models.



## ← New Cement

One of the newer adhesives offered to modelers is the Meteor cement, a product of William Bishop Co. (3223 Burton Ave., Burbank, Calif.). You can buy it in 10¢ tubes and it is described as transparent, fast hardening, waterproof, tough and flexible. Mr. Bishop has been associated with model kit and cement business for past 19 years, is now heading his own company. Meteor cement is first product.

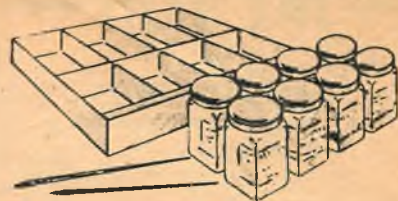


## Box in Name Only →

F & B Model Aircraft (1832 Broadway, Boulder, Colo.) has as its latest kit the Super Sky Box for Class C and D engines. Model is 47" in wing span, has 8" chord. Kit contains ready-built fuselage, all parts cut to shape, formed landing gear, hardware, shaped and notched trailing edge, grooved leading edge. Has won in stunt events at Tall Corn and Cheyenne meets, and others. Costs \$4.95.



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1 4	50c	1x4	12c 24c 36c 48c 72c
3 8	60c	1x6	15c 30c 45c 60c 90c
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		2x6	30c 60c 90c 1.20 1.80
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# Showcase

## Hot Dog →

Hot Dog is a fast Class A or B speed control model put out by Master Modelcraft Supply Co. (1074 Franklin Ave., New York 56, N. Y.) that comes prefabricated in kit form and sells for \$2.00. Assembly time is said to be short. Prefabbed parts include airfoiled wing, shaped tail, carved fuselage, hardware and bellcrank. Hot Dog is a companion ship to concern's streamlined silhouette Leapin' Lena.



## ← Two Control

You can count on John Young of Development Engineering Co. (Box 691, Hagerstown, Md.) to come up with something different in control-line handles! This is a two-speed handle with self-contained batteries. A 3-volt remote control device, two standard flashlight cells are carried in the handle and actuate 2-speed relay in plane through control wires. Button controls the current. Sells for \$2.50.



## Correct Pitch →

Something new in the stunt picture is Rite-Pitch (Bob Roberts, 110 West 7th Ave., Gary, Ind.) Super Stunt props. These feature square tips and wide blades good for stunt events. Sizes available are: 8" diameter with 8" pitch; 9" diameter with 8" pitch; 10" diameter with 8" pitch and 11" diameter with 8" pitch—all selling for 50¢ each. Another size, the 12" diameter with 8" pitch retails for 60¢.



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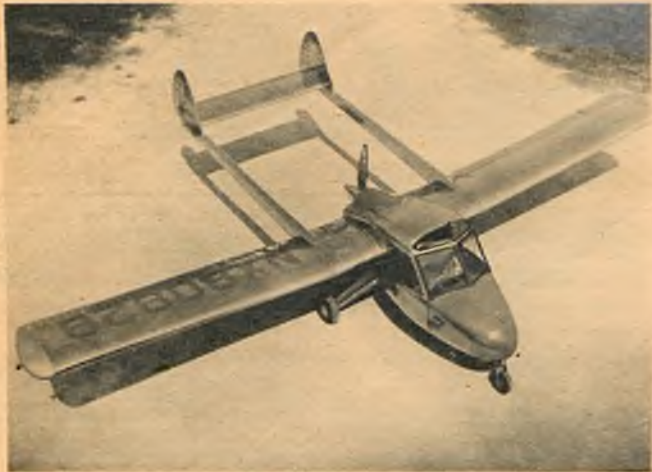
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● Mock-up of latest entrant in the field of sonic speed, the Northrop X-4, now undergoing tests at Muroc Air Base. Features low-drag flying wing principle. Powered by 2 Westinghouse J-34 jets, 3,000 lbs. thrust each. Span 25'.

## DEVELOPMENT HIGHLIGHTS



● Artist's conception of Navy's Convair XP5Y-1 patrol plane with performance comparable to land-based bombers. Two of the craft are on order. Powered by four Allison Turboprop engines. Span is 146', length 130', top speed 375 mph.

● Britain's jet-powered transport, the Avro Tudor VII, powered by four Rolls Royce Nene turbojets, two to each nacelle. Not intended for airline operation, craft is used as flying research lab to determine practicality of jet airliners.



● This small single-place jet plane with wing span of only 20' 10" was designed by students of Cal-Aero Tech., Glendale, Calif. Engine is of their own design, built around type "B" supercharger. May be used as pilotless target drone.



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### Jet Tests

How close can you get to a jet plane without being sucked into the intake? A Navy medical lieutenant, held by heavy safety lines, found out with a North American FJ-1 Fury as the plane's jet engine ran at full power. At two feet the suction was equivalent to more than 40 mph. Twin-jet craft with smaller intakes would present even greater danger at two feet distance.

### Record Procedure

An Air Force major whose hobby is building model airplanes, Dick Johnson, broke the world's speed record with an average speed of 670.981 mph in a jet F-86 last September. As the military unveils the shroud of secrecy and since you'll be hearing more and more about new world speed records, it's interesting to know just how official speeds are timed.

To qualify officially for a world's speed record recognized by FAI (Federation Aeronautique Internationale) a plane must make four passes over a 3-kilometer (1.863 miles) course, two in each direction, not higher than 1,640 ft. or less than 328 ft. so as to nullify the effect of wind and prevent acceleration through diving. Official speed is the average of the four runs.

All four runs are photographed and timed by special cameras mounted on concrete stands at both ends of the course. The cameras take 600 frames (pictures) a second and each frame records the time in split seconds.

Officials take the time on the frame showing the ship's nose nearest a vertical crosswire at the entry post, and also on the crosswire at the exit post. The four passes are averaged. Planes seeking records can make more than four runs, but the four accepted passes must be taken in pairs and the entire test completed within 30 minutes.

### Flying Businessmen

American business is going for planes in a big way, especially multi-engine aircraft. A recent survey shows that more than 1,000 such planes are now being used by about 800 private business corporations in the U.S. Predictions are being made that within the next five years more than 3,000 will be using about 5,000 multi-engine planes.

### Reserve Force

"Biggest stick" in the world today is air power, and the United States is on the way to making its big stick a massive club.

Few realize to what extent air power has grown, outside of building and flying planes. A significant part of air power today and in the 'morrrows to come lies in the reserve it can count upon in any emergency. Here are a few that while not as flashy as news of new jets are of extreme importance:

*Air Reserves:* supplies emergency units effectively organized and trained for rapid mobilization.

*Air National Guard:* today has nearly 400 units with a personnel strength of almost 23,000 and plans to convert all its fighter squadrons to high-speed jets in the next few years.

*Air ROTC:* a Reserve Officers Training Program which produces college-trained officers for the regular Air Force, the Air Reserve and the Air National Guard.

*Civil Air Patrol:* an auxiliary of the Air Force with more than 160,000 Seniors and Cadets possessing an effective national communication system, several hundred planes, a sound aviation education program which produces and maintains a reservoir of men and women all contributing to air power.

### Policing Picture

The trend toward more state policing of air safety continues to grow, and unless additional employees are soon added to the CAB safety staff the states will be forced into policing air safety. Accident investigations are already handled in 24 states by special state agents.

At present CAB safety staff has more than a year's backlog of safety cases pending. The backlog is increasing rather than diminishing.

While apparently no one in the industry wants state policing the increase in air traffic and in all aviation for that matter will force a showdown soon. Pilot certificates have jumped from about 23,000 in 1938 to nearly a half million at present. Certificated planes have increased from about 11,000 to nearly 100,000 in the same period.

The brightest spot in the picture, however, is the fact that the majority of states are progressing toward uniformity in their aviation laws.

### D.C. Dope

Washington corridors whisper that USAF is quietly warning aircraft manufacturers to step up production . . . that the RB-49, an 8-jet 500-mph flying wing bomber will be especially equipped with elaborate photo equipment for long range mapping missions . . . that the smaller airports will possibly lose out in the CAA program in '49 and '50 due to funds being allocated to fields which can use the navigation aids desired by the military . . . that Convair is making important changes on the B-36C including a new Pratt & Whitney engine to give the bomber a 12,000-13,500 mile range . . . that CAA is planning refresher exams for applicants who pass written exams and then allow too much time to elapse before taking flight tests . . . that the National Flying Farmers Association plans a comprehensive research program to develop better techniques for aviation spraying and dusting of farmlands . . . that Piasecki is secretly developing a huge long-range 'copter for AF as big as the C-54.

### Glider Recognition

Growth of gliding and soaring may bring more safety regulations. CAB is asking comment on revised regulations, such as issuing glider flight instructor ratings to those capable of meeting the necessary requirements, allowing 10 short-patterned released glider flights to be counted the equivalent of one hour of flight time in credit toward a powered-plane rating, and requiring glider pilot applicants to perform at least 10 flights under supervision of a rated flight instructor.

### AF Cutting Down

Air Force's miniaturization program should add distance and increased load to its transports, and ultimately be reflected in civil aviation. Under the program the size and weight of aircraft electrical equipment are being drastically reduced by the Materiel Command.

For example, one large bomber now has nearly two tons of electrical equipment. Any reduction in size and weight will increase useful load or greater distance—perhaps both. Other benefits will be more easily manufactured units using less strategic materials, occupying less storage space and easier to transport.

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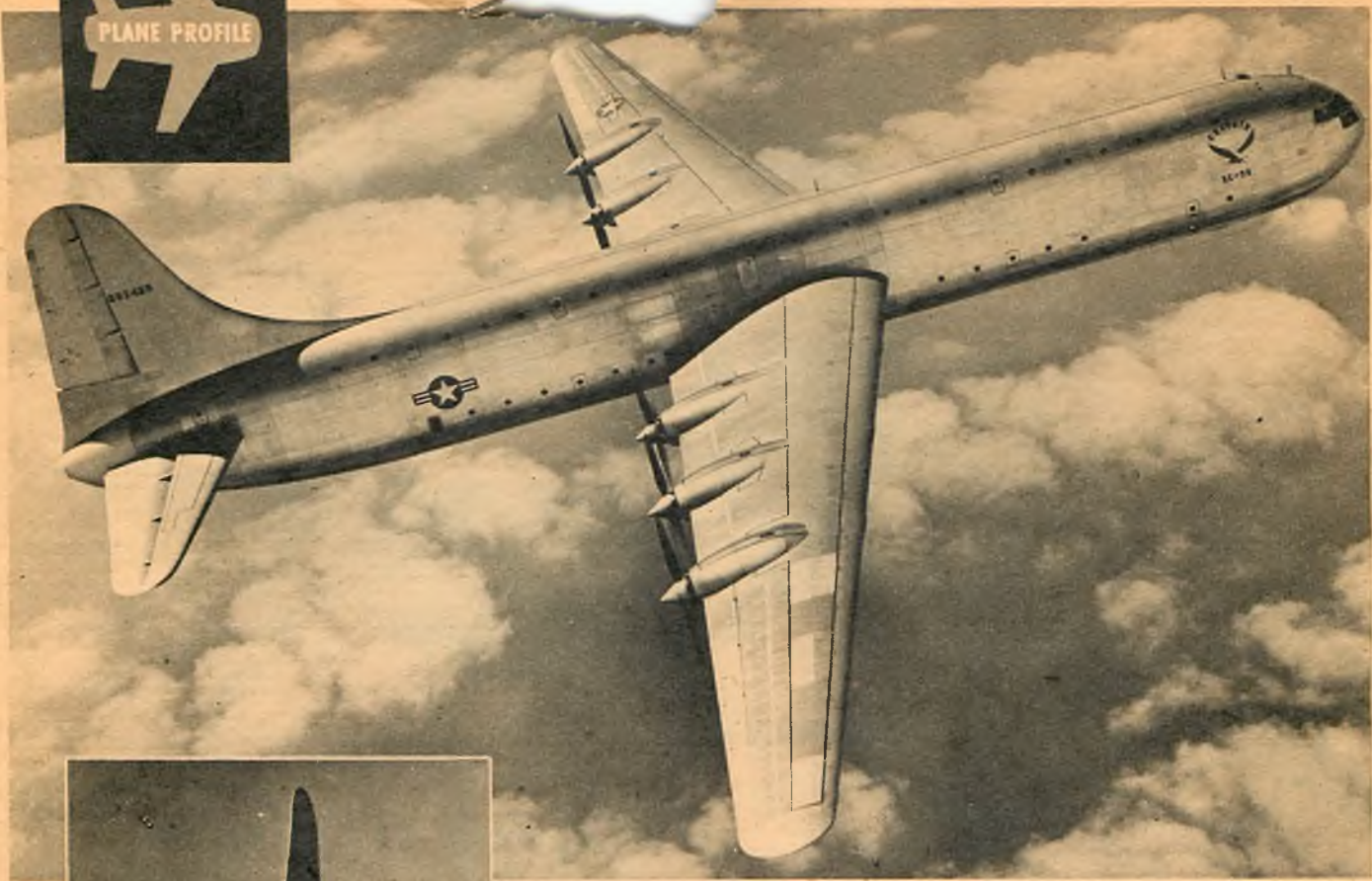
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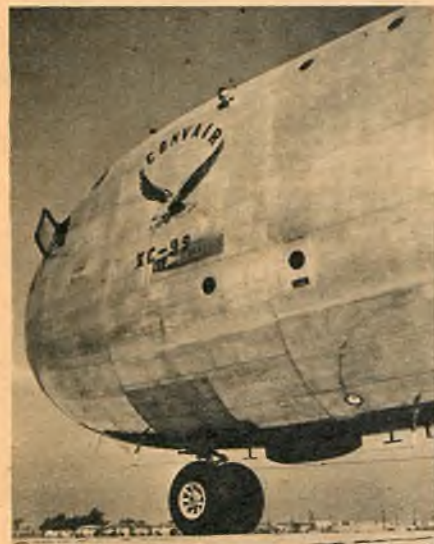
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● Rear view of huge vertical fin of XC-99 soaring 57 ft. into the air.



● Note how small man looks peering out of porthole. Fuselage 189 ft. long.



● Convair L-13 liaison plane is small enough to land on the 230-ft. wing.



● 6 pusher engines power the craft. P & W Wasp Majors, 3,000 hp each.

## Consolidated XC-99

**T**HE largest craft in the world at the present time, with the exception of the Hughes flying boat, the Consolidated-Vultee XC-99 is an experimental troop, cargo, and hospital transport. Its load capacity of 400 fully-equipped troops, or 100,000 lbs. of cargo, or 300 litter patients, dwarfs all transports of World War II.

The XC-99 is proof of the expanded use to which global air transport is to be put in the near future. Its six pusher engines have power equivalent to five locomotives, and the fuel supply, 21,166 gallons, would run an automobile around the world sixteen times.

At the present time the airplane is undergoing intensive test-flying by Convair personnel, upon successful completion of which it will be turned over to the Air Force. The XC-99 has a maximum range of 8,100 miles with reduced loads and a service ceiling of 30,000 feet. The maximum speed is better than 300 mph. The wings and power plants are the same as those of the B-36.

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**TRAIN IN MIAMI -- AIR CAPITAL OF THE WORLD**

# The Reds Aren't Stalling!

RUSSIA IS MOVING AHEAD FAST IN THE DEVELOPMENT OF AN ATOMIC AGE

AIR FORCE. HERE ARE THE LATEST SOVIET FIGHTERS AND BOMBING PLANES

BY JAMES L. H. PECK

THE American people were told by their leaders nearly a year ago that the Soviets were out-building us twelve-to-one in military aircraft. Outside the military and the aviation industry—both of which have been accused of wanting to start another war—the significance of the warning did not register the way it was expected to, if at all.

Now the disparity is put at fifteen-to-one. To this sobering news—coming at a time when our new USAF and Navy air forces are just beginning to take shape on the production lines—is added the completely reliable information that out of the busy Russian plants are flowing jet fighters comparable to the best of ours. Jet bombers and piston-engined, long-range bombing planes are in operational service.

Moreover, it is now conceded in military quarters that the Red scientists have held atomic tests and should require only a little time to get into production a compact A-bomb.

But this bad news, coupled with Russian behavior in Berlin and the Paris UN sessions, is an ill wind that blows at least some good in our direction. We won't make the same disastrous mistake of underestimating a potential enemy that we did once before.

Enough intelligence has been gleaned in bits and pieces through cracks in the Iron Curtain to show clearly that if the efforts of statesmen fail, here is what the U. S. and the nations of Western Union would be up against tomorrow:

A Red Air Force of about 15,000 first-line aircraft, including some 2,400 jet planes, which at this writing are in operational service. The jets include a long-range "frontier" fighter; four interceptor models, two of which boast a generous range; a "storm" plane for tactical operations; and a four-jet bomber. As the accompanying illustrations reveal, these airplanes are of a thoroughly modern design that indicates research activity of the highest order.

This is indicated, also, in the now-admitted fact that the Soviets penetrated the sonic barrier at least three months before our X-1 did the trick in October, 1947.

Turbojet development of equally high caliber is evidenced in the big power plants now in production for these aircraft and others. Among those known to exist are the widely-used 4,000-pound-thrust Chelomey engine, a 6,000-pound version of the same make, and a copied British Rolls Royce Nene rated at 5,000 pounds thrust. Moreover, they have made successful tests with a more powerful turbojet that features the new annular burner and is reported to develop between 7,500-8,000 pounds of thrust. This effort parallels advanced American and British jet research.

The always-excellent Russian ordnance is in evidence in the armament of the new craft, and there are reliable reports to the effect that along with the power plants and airframes of our B-29, the Soviets also successfully pirated our RCT fire-control system.

"Absolute weapon" activity is known to be widespread, with extensive research in guided missiles and a few of the more weird projects Nazi scientists didn't have time to finish before V-E Day.

This state of the Soviet Union is not quite so surprising to U. S. intelligence agencies—nor so recently come by—as the lay public might understandably believe at first hearing. Russian interest in jets, for

## RUSSIAN CAST OF CHARACTERS

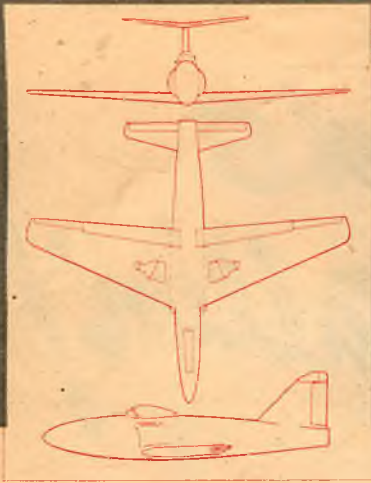
*Chief, Red Air Force:* Deputy Minister of Armed Forces, Konstantin Vershinin

*Leading atomic scientist:* Dr. Peter Kapitza

*Leading aircraft designers:* Tupolev, Yakolev, Ilyushin, Mikoyan, Gurevich, Lavochkin, Sukhoi

*Promising new aero designers:* Bratokin, Scherbakov

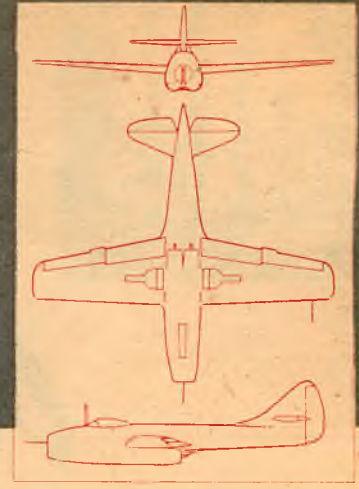
*Leading designers who are deceased, but whose works may still influence current design:* Petlyakov, Polikarpov



● High-speed research jet plane.



● Single-jet fighter by Mikoyan.



● MIG 7, interceptor with twin jets.

example, dates along with American efforts, and appears to have been equally independent of German influence in the earlier days.

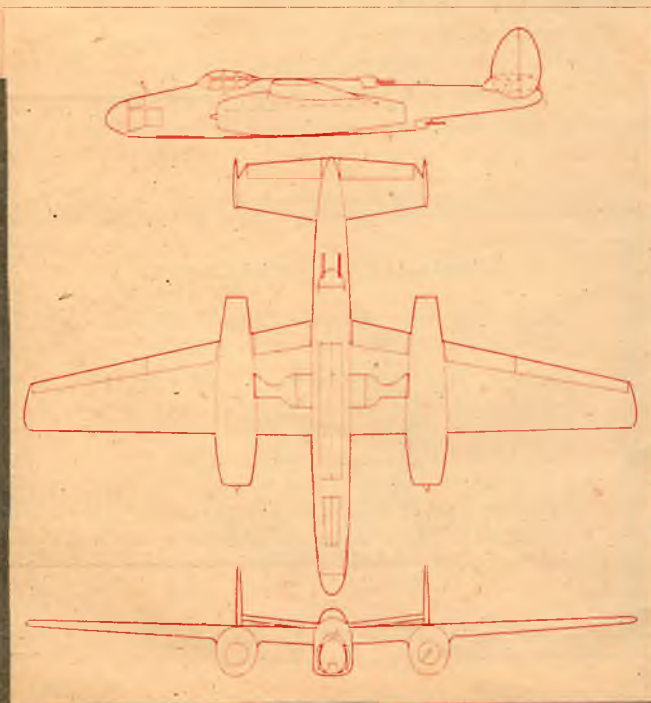
To understand better how this state of aerial eminence came about, we look back to 1942 when the Soviets began the development of what they called a "reaction engine." The then leading jet expert, Andrei Kostikoff, was given carte blanche the following year by the Scientific Motor Institute (ZAIM), at Stalin's intercession. By 1944, a hand-built YAK prototype was flying as far afield as Germany. This jet fighter performed well enough to survive several combats with Luftwaffe jets over the Berlin area.

As the Red Army rolled forward towards the German capital in 1945, its mop-up squads were followed closely by secret police (MVD) units with a very special mission. This involved the recruiting of ex-scientists, technicians, and skilled workers—aeronautical and otherwise. Willing Germans were offered good homes, liberal wages, and extra rations: as an added inducement, they might even bring along their families.

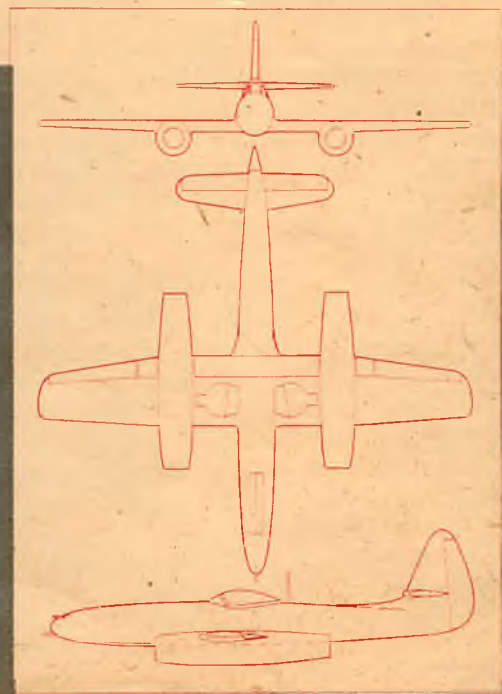
American Military Government officials have since estimated that at least 50 percent of the skilled workers in the Russian zone accepted; more than a few were persuaded to quit the U.S. and British and French zones before we started our own campaign to recruit German scientists. The plans, tools, and facilities that the Reds shipped home along with these erstwhile enemies constituted the richest prize the Russian government could have captured.

This involves the story, now well-circulated in intelligence circles, of the famous "two trains from Peenemuende." It seems that the Germans did not move as much equipment from this scientific center as we believed, following the destructive bombing raids of August, 1944. (They did move the great V-2 plant to an underground site near Nordhausen, but U.S. authorities later turned this over to the Russians anyway.) Valuable rocket test equipment and other gadgets, plans, and workers were loaded onto two trains for transfer to the USSR. They never got there, say folks with connections in the Polish underground.

● Tupolev jet bomber, with two German Jumo engines.

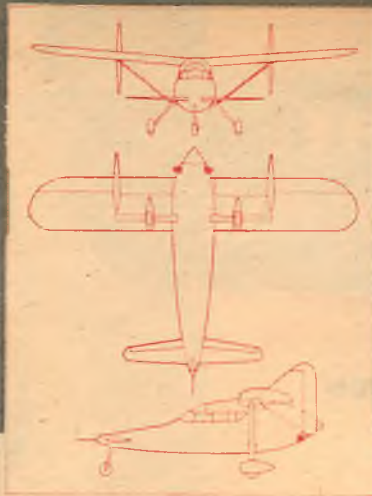


● La 8 fighter. Span 48' 4", speed 610 mph.

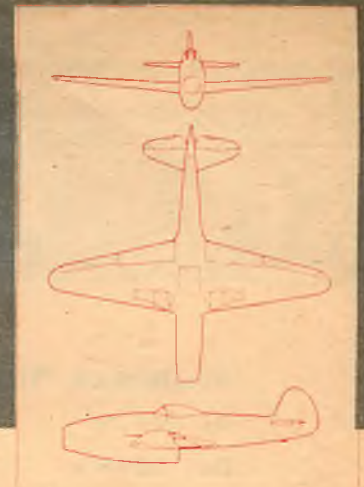




● Interceptor, designation unknown.



● The Utk utility plane, 145 hp.



● Single-jet Yak 15, interceptor.

Less doubtful is the fact that a lot of wind tunnels and valuable apparatus did reach Russia; the Reds were able to get to many of the best spots before ALSOS representatives and other U.S. technical intelligence teams arrived.

For the most part, these transplanted scientists were settled in a new center 24 miles from Moscow, under the watchful eye of Marshal Lavrenti Berea, MVD chief. The site was placed under the over-all jurisdiction of the Commissariat of Defense. A nearby air-drome at Ramenskoye was greatly enlarged and beautifully equipped as a flight test center, after the fashion of our Muroc base, under the direction of the very highly regarded Central Institute of Aero Hydrodynamics (VAIM).

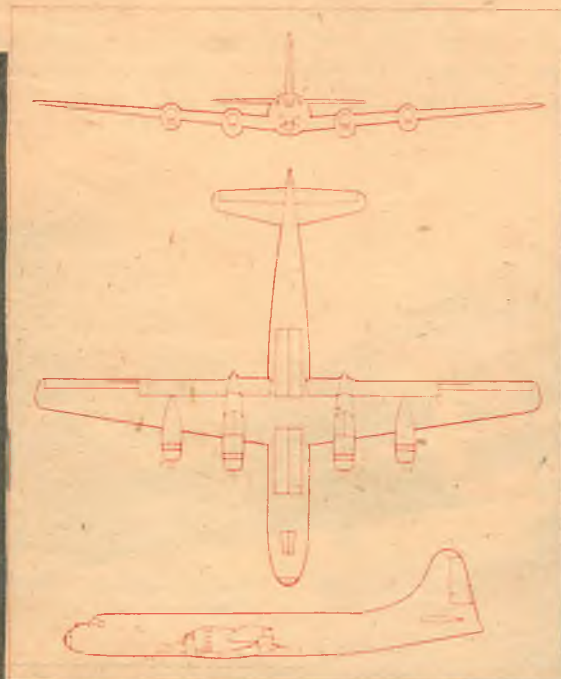
The Russians took possession of the German DFS-346 supersonic research plane together with technical staff responsible for its construction. At the time they took it the DFS-346 was almost completed and ready to fly. The ship had three sets of wings built for it, one set straight, one with 20° sweepback and one with

45° sweepback. It had the most elaborate telemetering equipment ever installed in a research plane which left the pilot only with the task of flying. He did not even have to take down notes on a knee pad or remember any particular instance of flight, for the Askania telemetering device took it all down and relayed it to ground observers as well as photographed an elaborate instrument panel.

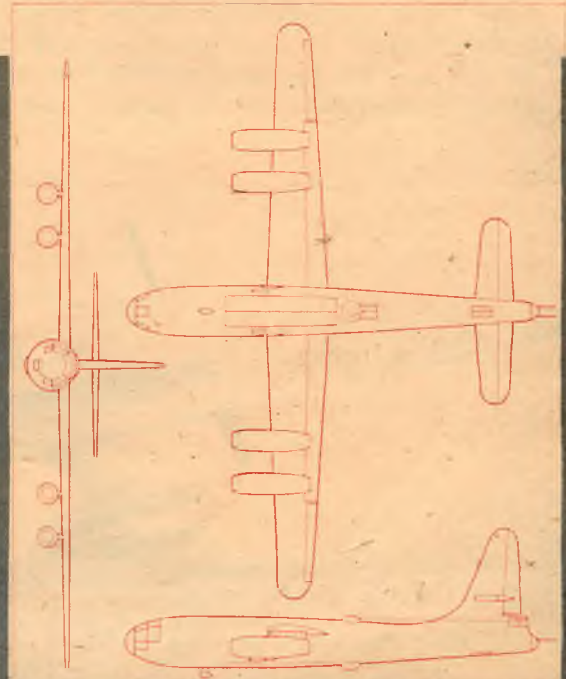
In view of the fact that the Russians had the 346 long before our XS-1 was completed, it is very possible that this was the ship they flew at supersonic speeds before us. The Germans believed that the 346 could reach the speed of Mach 2.5 at altitudes in the region of 75,000 feet.

The real significance of all this is not so much the fact that Red research is a good five years ahead of schedule because of the contributions of German brains and equipment; but that such marked progress has been made because they *were far enough advanced on their own to take immediate advantage of the most advanced German ideas.* The Soviets were *(Turn to page 93)*

● Bomber version of Tu 170. Existence not certain.



● Ilyushin four-jet bomber (remote-control turrets?)



We  
Fly

## THE MINNOW

BY HERMAN "FISH" SALMON

As Told To  
Don Downie

THIS MONTH WE DIGRESS FROM OUR COVERAGE OF  
PERSONAL PLANES AS HERMAN "FISH" SALMON  
TELLS US ABOUT FLYING THE GOODYEAR WINNER



ONLY two and a quarter seconds . . . That's all the lead my "Minnow" had over Steve Whitman's midget at the end of the Goodyear race this year. Art Chester, the young-old man of this race game was just another two seconds behind Whitman. The finish of the Goodyear was just that close—and the fans loved it.

Into that scant margin of victory went the part-time labor of 30 men for nearly two years, plus \$45,000 of our own money. Funds to build the three identical Cosmic Wind racers, "Little Tony," "Ballerina," and my "Minnow," came from Tony LeVier, Glenn Fulkerson and myself. LeVier is Chief Engineering Test Pilot for Lockheed. I'm his assistant, and Fulkerson is one of our leading flight test engineers.

The engineering and mechanical know-how for the Cosmic Winds came from the best brains that Lockheed employed. The company approved the project, but these three little racers were strictly our own doing. All the designing was done after working hours and the actual construction took place in garages, back yards

and cramped home workshops. LeVier hasn't been able to get his car into his garage since we started the project in January, 1947.

Actually, we started out to build a fleet of five identical midget racers, but two of the pilot-owners backed out at the last minute because their wives didn't approve of the investment. We set up a regular midget production line with complete wing and fuselage jigs and masonite dies for all the fittings. We had a pint-sized production job and, believe me, it took a whale of a lot of work. We still have the parts for two more planes that could be purchased at a below-cost figure.

Our design work must have been sound since these three ships finished first, fifth and seventh in the Goodyear this year against some mighty fast little airplanes.

Winning a closely contested race like this goes all the way back to the original designers, those scholarly gents with the slide rules that figure the general layout of the airplane. In charge of design for the Cosmic Winds was Irven Culver who did much of the original



layout work on the P-80. Back in 1936 he was instrumental in designing the sailplane "Screamin' Weiner" that has finished in the money in the last two National Soaring Contests.

Over 1,000 hours was spent on the original design of the Cosmic Wind. An additional 500 hours of drafting went into the development of the design. The toughest problem, according to "Irv" Culver, was designing a cowling that would give sufficient cooling without undue drag. Wing fillets were a second big headache.

The Cosmic Winds were tailor-made for the two-mile Goodyear course with their wing aspect ratio and rate-of-roll specifically designed around the requirements of this vest-pocket race track. Actually, the control touch on my "Minnow" is very much like the P-80, and the smooth booster control on the 185,000-pound Lockheed Constitution is in the same class. One afternoon I climbed out of the Constitution and test-hopped Fulker-son's 565-pound midget right after work. After all, they're both airplanes and fly more or less the same way.

Specialists designed each phase of these midgets. H. R. Bojens engineered the cowling, wheel pants and power plant installation. P. W. McLane concentrated on the control system. J. A. Yager dreamed-up the 19-foot wings and Dave Hill produced the landing gear and brakes.

Wayne McNemee took care of our biggest construction headaches. He's a wizard with "double-formed" parts and can bend duraluminum skin into almost any shape with exasperating ease.

George Yates did our welding in Maynard Gilford's shop; the same garage where the late Floyd Roberts built his Indianapolis race cars in Van Nuys. When we were having trouble with tail skids wearing on surfaced runways, Yates unearthed a super-hard metal from the Stoodly Corporation that did the job. Now he's working for them, but the remainder of our group is still with Lockheed.

H. R. Bojen's wheel pants, incidentally, were the final factor in my winning the Goodyear. We were so rushed with work at Lockheed that we built only one set of pants before the Nationals this year. Since the "Minnow" was actually one mile-an-hour faster than the other two ships—we've never (Turn to page 89)



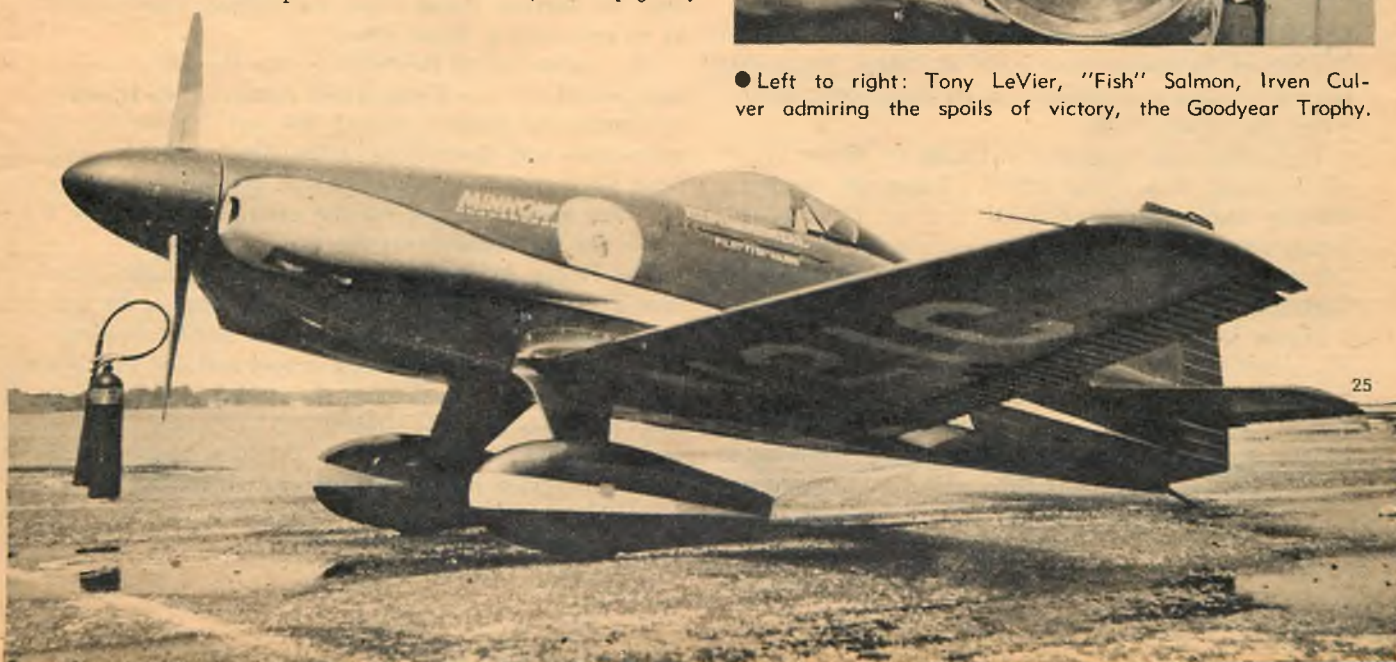
● The happy family greets Salmon after winning Goodyear Trophy race. Young "Scooter" Salmon is a rabid modeler.



● Minnow rounds the home pylon. Fast rate of roll, quick take-off characteristics and speed are hallmarks of winner.



● Left to right: Tony LeVier, "Fish" Salmon, Irven Culver admiring the spoils of victory, the Goodyear Trophy.







● Modernistic administration building of Dallas Aviation School at Love Field. Airport was an ATC base during war.



**A LONE STAR STATE SCHOOL IS THIS MONTH'S SUBJECT IN OUR AERONAUTICAL EDUCATION SERIES**

**S**INCE its beginning in 1926, the Dallas Aviation School, located at Love Field in Dallas, Texas, has trained thousands of students in its classrooms, laboratories, and flying fields.

The school was organized in Dallas by Major W. F. (Bill) Long as a flying school. Later on, mechanic training and other specialized courses were added. Texas was a natural for aviation even in the early days, and as the industry continued to grow, the demand for Dallas students grew, too.

Major Long's successful operation of a commercial school came to the attention of the Government in 1939, when the Army's plan for training 12,000 pilots a year was conceived. He was one of nine operators in the country awarded a contract to give primary training to U. S. Air Corps flying cadets. As this program ex-

panded, Long established an army training school at Brady, Texas—the Brady Aviation School. Another flight contract resulted in the Texas Aviation School, established on the site of old Hicks Field, Fort Worth, Texas. As the national emergency became greater, an Army Mechanics' School was inaugurated at Love Field for the purpose of training Air Corps maintenance personnel.

It seemed that all available facilities were busily engaged in the war effort. However, in 1941 the British Government awarded Major Long a contract to train military pilots for the Royal Air Force. A new school, called Terrill Aviation School, was located at Terrill, Texas, and before the war was over, this school had won the highest praise from the British Government as an outstanding flight school.

The nucleus of all this activity was the Dallas Aviation School at Love Field, which continued its training of commercial students during the war. Most of the instructors and supervisors of the Army Schools came from the commercial school, which served as a feeder for these operations and for the aviation industry as a whole for the duration of the war.

The Dallas Aviation School is not a vast school nor does it strive to be, except during such times as the war emergency when it was necessary to expand. Students have found it to be a thorough school and one that has made it a point to work with the student, emphasizing that close association of student and instructor is of the utmost importance. Officials of the school believe that if the instructor knows his student personally, knows

his problems, his good points and his weak ones, the student, as well as the school, will benefit from this association. If the student is in need of special tutoring, he gets it. If he is deficient in one of his basic subjects, he is given a refresher course in conjunction with his regular studies.

There is one prime requirement at Dallas. The student must indicate his willingness to make an effort or show initiative in his work. If he doesn't do that, he doesn't last. On the other hand, no matter how difficult a student may find the work, if he is doing his best, the faculty of the school will stand behind him with all the assistance available. There have been many students whose ability to complete training had been classified as doubtful, but who requested additional classes in order to make up their deficiencies and by doing so completed with good scholastic records.

The school requires an applicant to have a high school education or the equivalent. However, this is not always deemed an accurate gauge of knowledge or initiative. There have been times when the tables were turned and a youth with an educational handicap turned out to be the better student.

College engineering students have found this school well equipped to complete their courses in Mechanical and Aeronautical Engineering from the practical standpoint. These graduates are in demand by the aviation industry to fill top engineering and supervisory capacities.

Success at Dallas depends largely upon the individual—his school records and his willingness to accept the advice of his instructor. No matter whether the student is a college graduate, high school graduate, or possibly below high school level, personal contact with the instructor in the class and in the laboratory is still the difference between the successful and the unsuccessful student. The goal of each instructor is to enable a graduate to secure and hold a job, for this is the best advertisement that the school could possibly have.

The school employs a merit-rating system developed by the faculty which is designed to evaluate the student's work and form a permanent record of his progress. Instructors can immediately detect a weak spot in the student's program and make corrections in adequate time. In addition to the student's scholastic record, he is graded as follows on his merit rating:

*Motivation:* This represents the student's ambition, desire to make good and carry through. *Job Knowledge:* Ability to apply knowledge to practical use; skill,

"know-how." *Flexibility:* Ability to change thoughts and actions to meet the situation; adaptability. *Dependability:* Reliability in carrying out assignments correctly and promptly; stability. *Ability to Learn:* Ability to grasp and retain ideas; mental alertness. *Cooperativeness:* Willingness to help others; team work.

In each of these categories, the student is graded as Excellent, Above Average, Average, Poor, or Unsatisfactory. His class and laboratory grades will usually follow the same pattern as the merit-rating record above. Such records are invaluable to employers who are seeking qualified aviation personnel.

An illustration of the efficiency of the faculty and initiative on the part of the student can be seen in the recent case of one particular student who graduated with high honors. Ordinarily such an occurrence would cause little comment, but this was a test case. The student had been allowed to enroll in a Maintenance Engineering Course conducted at college level, with an extreme educational handicap. He had only one year of high school work to his credit. It wasn't easy but he accomplished this remarkable feat by attending night classes and special tutoring sessions in addition to his regular studies.

As in all other schools, Dallas Aviation has a large enrollment of veteran students. The Veterans Rehabilitation Program, since its inauguration, holds an important place in the school's training schedule. Students under this program are given special advice on their training and are screened very carefully in order to insure every graduate the best chances of employment. A large percentage of the disabled (Turn to page 109)



● Many of the school's students are ardent modelers, competing among themselves for design originality and speed records.

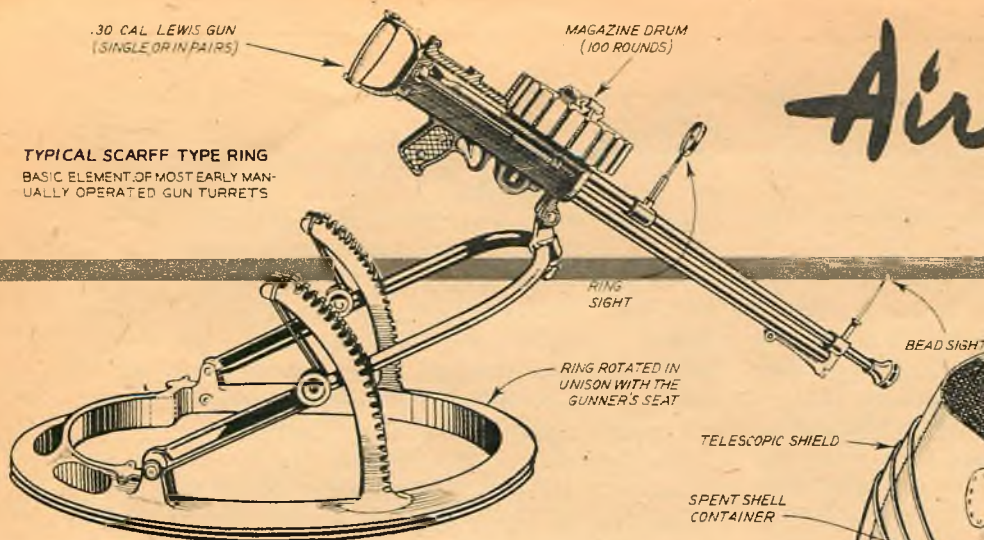
● Precision is the watch-word of engine mechanics. Dallas students are taught its importance in engine overhaul class.



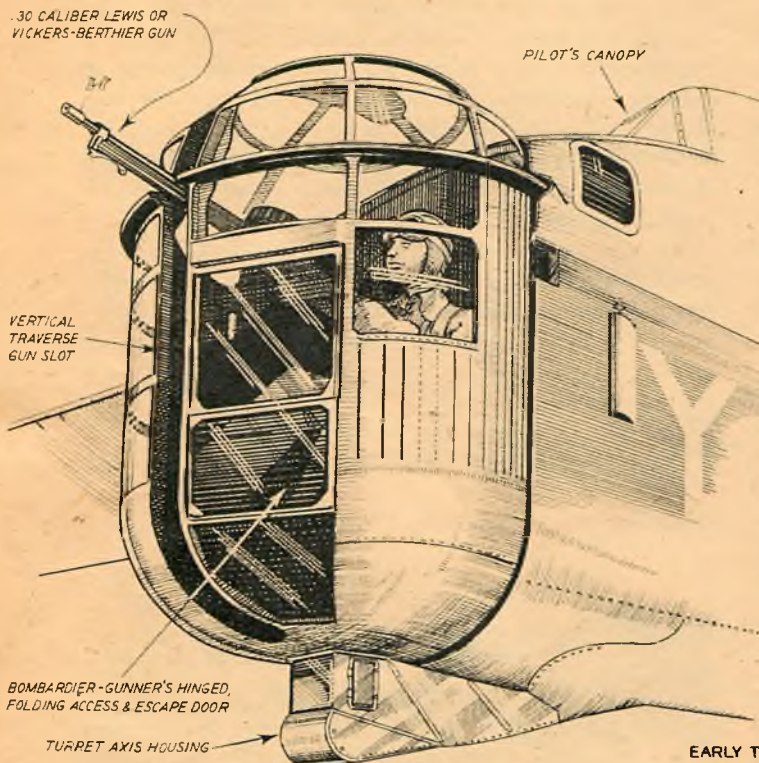
● Practical work on aircraft structures is in curriculum. Wing being sprayed under strict temperature and humidity control.



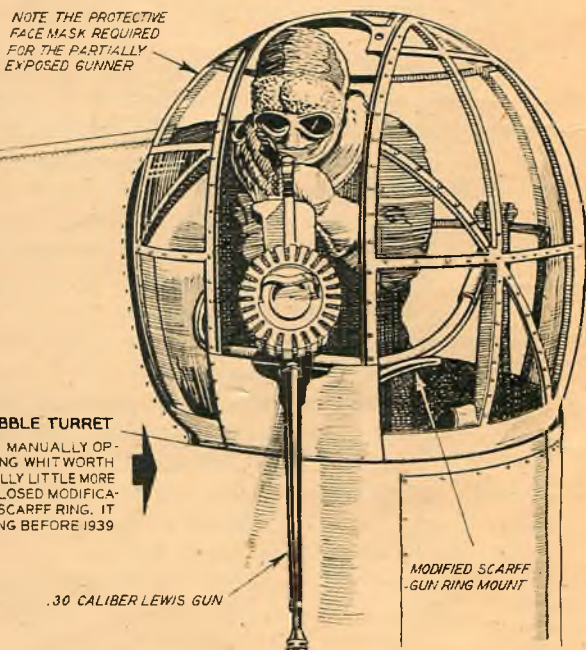
# Air Progress



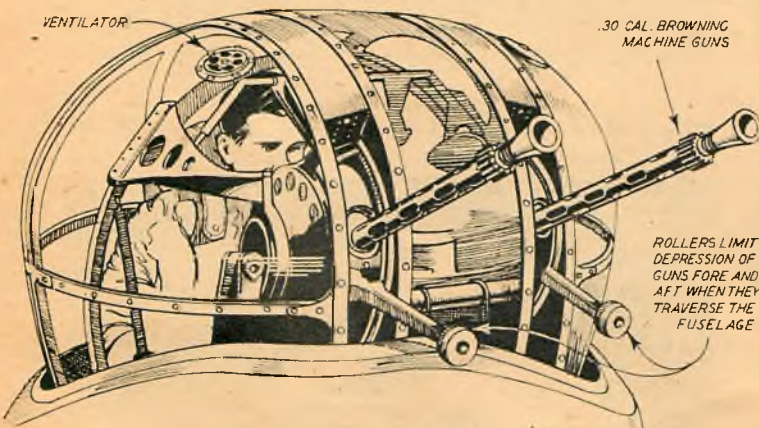
TYPICAL SCARFF TYPE RING  
BASIC ELEMENT OF MOST EARLY MAN-  
UALLY OPERATED GUN TURRETS



FRAZER-NASH SEMI-ENCLOSED ARMORED TURRET  
THIS HYDRAULICALLY OPERATED TURRET APPEARED IN 1936.  
IT AFFORDED THE GUNNER SOME PROTECTION AGAINST THE  
SLIPSTREAM AND, IN LESSER DEGREE, FROM ENEMY GUNFIRE



EARLY TYPE BUBBLE TURRET  
THIS SINGLE-GUN MANUALLY OPERATED  
ARMSTRONG WHITWORTH TURRET WAS ACTUALLY LITTLE MORE  
THAN A SEMI-ENCLOSED MODIFICATION OF THE OLD SCARFF RING. IT  
WAS OBSOLETE LONG BEFORE 1939



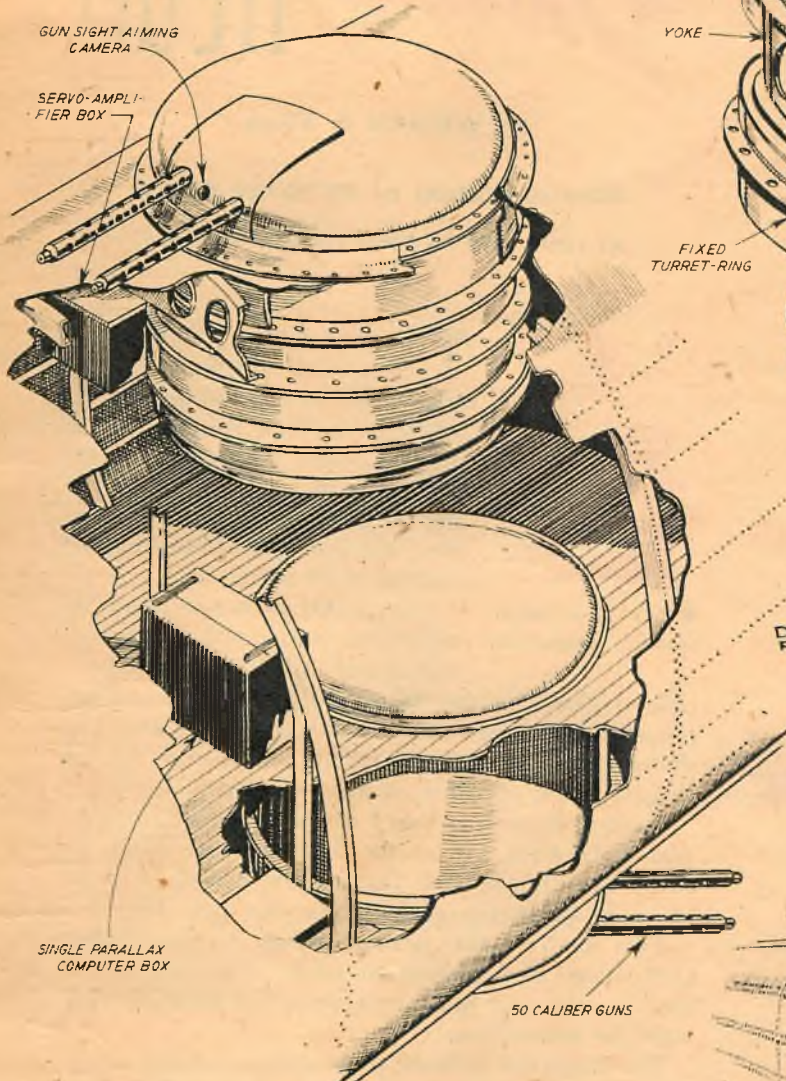
IMPROVED TWIN-GUN BUBBLE TYPE TOP TURRET  
COMPLETELY MECHANIZED TURRETS OF THIS TYPE WERE FIRST  
INTRODUCED DURING WORLD WAR 2. ELECTRO-HYDRAULICALLY  
OPERATED, WITH SERVO-FED AMMUNITION BELTS AND REFLECTOR SIGHTS, THEY REVOLUTIONIZED TURRET DESIGN

The very first military airplanes had no provisions for armament, except of the most primitive kind. During the early days of World War I, when the average top speed of even the fastest planes was not more than 80 mph it was possible to employ primitive fixed gun mounts, but as the war progressed and air speeds mounted the fixed mount was found inadequate. This led to the invention of the Scarff ring, a manually operated rotating mount which permitted the gunner to swing his guns in a complete circle and elevate or depress them with the minimum of exertion.

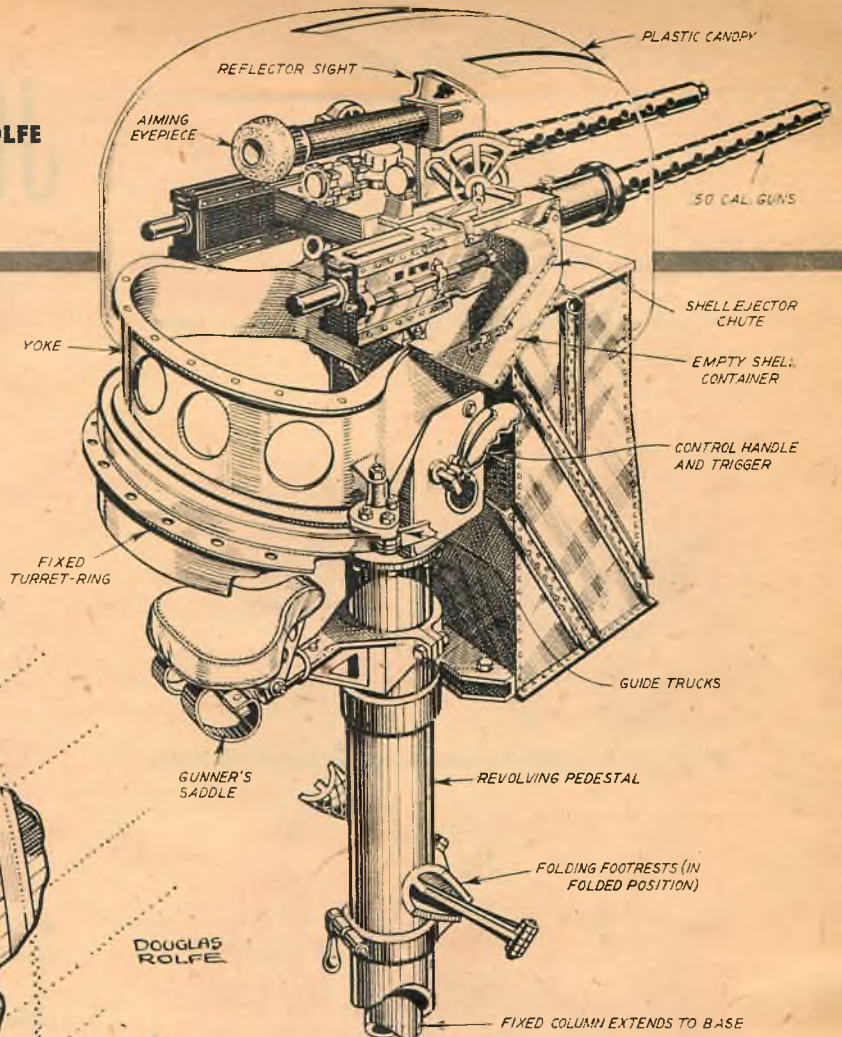
As air speeds again mounted it was found that open gun mounts were as useless as the old fixed mounts. Slip-

# DEVELOPMENT OF GUN TURRETS

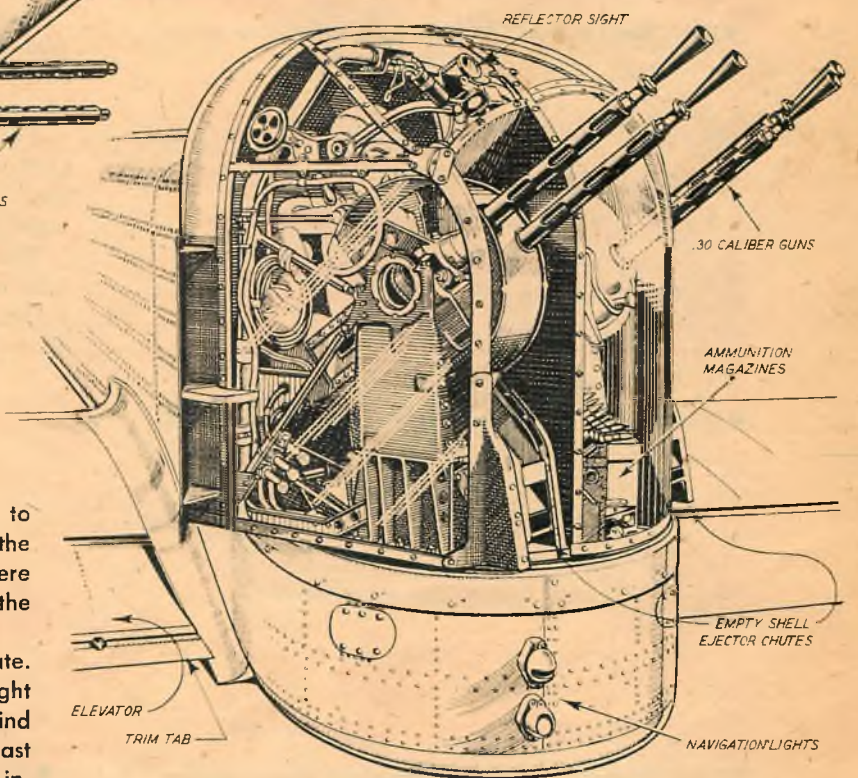
BY DOUGLAS ROLFE



**B-29 REMOTELY-CONTROLLED TURRET INSTALLATION**  
GENERAL ARRANGEMENT OF THE FORWARD UPPER AND LOWER GUN TURRETS WHICH ARE AIMED, TRAINED, AND FIRED BY REMOTE CONTROL



**TYPICAL U.S. TYPE TWIN-GUN TURRET ASSEMBLY**  
TOP TURRETS SUCH AS THIS PROTECTED OUR ATTACK PLANES AND MEDIUM BOMBERS FROM ENEMY ATTACK IN LAST WAR



**TYPICAL BRITISH TYPE MULTI-GUN TAIL TURRET**  
FORMIDABLE BATTERIES OF MACHINE GUNS MOUNTED IN THIS MANNER PUT A STING INTO THE TAIL OF THE HEAVY BOMBERS USED BY THE ROYAL AIR FORCE OVER GERMANY

stream pressure alone made it difficult for the gunner to man his guns with accuracy. This difficulty led to the development of enclosed mounts, many of which were merely blisters with manually operated guns such as the Armstrong Whitworth turret.

In the old days open sights were deemed adequate. Then appeared the ring-bead sight and, later, a sight which was supposed to provide compensation for wind and drift. The reflector sight, developed during the last war, is still generally employed but the remarkable increase in air speeds since the war suggests that this form of sight is obsolescent.

# JET PROPULSION

## *Isn't* NEW!

BY WILLIAM R. SUDA

EXPERIMENTATION IN JET POWER BEGAN  
AS LONG AGO AS TWO THOUSAND YEARS



● Rocket arrow used by Chinese in Pien King battle.



● DeRontana rocket disguised as animal fooled the enemy.



● XS-1, Chinese style. Did not achieve the same results.



● First proposal for steam turbine was by Branca, 1629.



● Isaac Newton's proposed jet-propelled steam carriage.



● Hero's aeolipile:  
reaction propulsion.

THE notion that jet propulsion and guided missiles are comparatively recent innovations of warfare has been fostered by the secrecy which surrounded all experiments and developments during the last war. In reality, however, the principle of jet-propelled missiles is an ancient one.

Over 2,000 years ago Hero, an ancient Alexandrian philosopher conceived and utilized the same principle employed in the steam and gas turbine and jet-propelled planes of today in his "aeolipile." But since slaves were less expensive there was no use for the weapon and it remained in the toy stage.

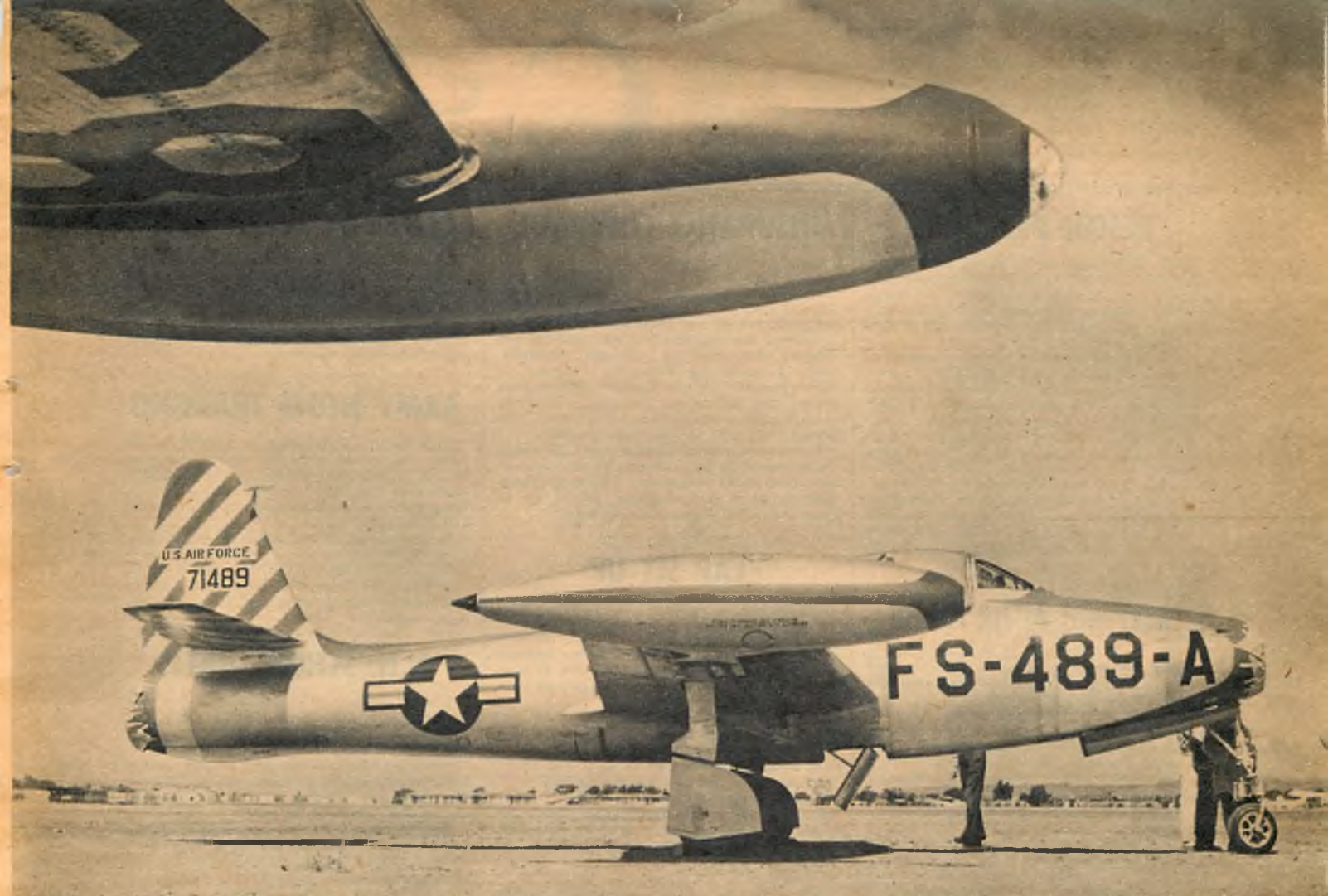
Nothing more was heard of the principle until the year 1232 when, during the battle of Pien King, between the Chinese and Tartars, the defenders of the city used a rocket-propelled arrow for their defense.

Two hundred years later an Italian engineer, Joanes DeRontana, used rockets on wheels disguised as rabbits, pigeons and fish which propelled themselves toward the enemy lines.

The distinction of being the first jet-propelled human falls to a Chinese gentleman and scholar, Wan Hoo. Forty-four years before the conquest by the Manchus, Wan Hoo attached 47 rockets and (Turn to page 107)



● Congreve's rocket, mentioned in Star Spangled Banner.



● Above: E-84 by Bill Noonan, San Diego, Calif. Taken with Ansco Automatic reflex, Eastman Plus X film developed in DK-60A; K2 filter; 1/200 at f/16; printed on Kodabromide F2, developed in Atkinson A72. Clouds partially hid sun.

● Below: Erwin Stein shown with towline glider in photo by Eugene Licker, Paterson, N. J. Argoflex with Kodak Super XX film; 1/200 sec. at f/11; light yellow filter. Defender #2 paper; diffusion-type enlarger; Wollensak f/4.5 4 1/2" lens.



## CONTEST RULES

This competition is open to all photographers—amateur or professional. No distinction is made between either class of entrant. Payment of ten dollars will be made on or before publication to those whose photographs are selected to appear in the Air Pix competition.

Entries may be concerned with any phase of aviation or aeromodelling. These should be glossy prints not less than 5 by 7 inches in size. Prints should be well wrapped and protected in the mails by stiff cardboard. Entries must be accompanied by the name and address of photographer and sufficient stamps to cover return postage.

Include full data on the subject, camera and film used, exposure, lens setting, and conditions under which the picture was made. Give details concerning equipment for enlargement, printing paper, and all other pertinent information. Air Trails does not assume responsibility for entries. The editors regret they cannot enter into correspondence concerning contributions.





## RESCUE PRACTICE

Nebraska Wing CAP is leaving nothing undone which will help to build up its membership, and has found that simulated search and rescue missions, bombing maneuvers and other events stimulate the interest that produces new Cadets and Senior members.

In its recent Scribner Air Base maneuver, Crete, Grand Island, Norfolk, Hastings, Lincoln, O'Neill, York, Kearney and Omaha Squadrons participated. Each plane carried either a CAP Cadet or Member as an official observer.

The bombing maneuver turned out to be exceptionally accurate, while the search and rescue mission quickly located a bailed out pilot lying in a field with his parachute.

At Albion, the squadron put on a breakfast flight followed by a program of spot landings, balloon busting, simulated bombing and other events with prizes awarded to winners of each contest.

## CADET UNIT OF THE MONTH

The CAP Cadet unit at the San Angelo, Texas, Senior High School is hailed as the ideal CAP high school cooperative aviation education setup in the nation.

One of the first schools in the state to establish CAP instruction as part of the high school curriculum, CAP subjects have been taught since 1942.

Instructors such as principal John Bishop and Ralph W. Emerson are largely responsible for the course being among the most popular.

The San Angelo unit now has two dismantled plane engines, a turbo unit, a movie projector and equipment, navigation devices, link trainer and a BT-13. The basic trainer was purchased for \$75 salvage and is kept at a nearby airfield. All of the equipment is loaned by the San Angelo CAP unit.

Cadets also have access to a PT-17 and an L-4 for orientation and observation training. Instruction at the high school runs about 150 hours a year, including actual orientation flights. Moreover each course is independent of the other and recognized by the State Department of Education as a science course.

The local newspaper is strongly behind the project, and 40 other Texas high schools now have courses similar to San Angelo's. In addition high schools from many different sections of the nation are modeling their aviation education after that of the "CAP Cadet Unit of the Month."

## INSURANCE COVERAGE

Cadets and Observers of the CAP are now covered individually by \$50,000 liability insurance, while the airframe of the L-4's used by the units of CAP are insured for \$50,000 to \$500,000 public liability and \$50,000 property damage.

National Headquarters of CAP requested and obtained bids from all insurance companies, finally selecting the Indemnity Company of North America. While National Headquarters devised the instructions and policy regarding the insurance coverage, each Wing handles the matter direct with the insurance company.

Policies are written specifically to CAP needs. Cadets cannot fly as passengers in the L-4's unless covered by insurance. National Headquarters stated that insurance policies are in effect now in all Wings in the 48 states.

## CAP SET-UP

In response to requests from various groups and persons throughout the nation desiring to form units of the Civil Air Patrol, National Headquarters announced the following information designed to help those who wish to start CAP units, or become members of existing components of CAP.

A *Flight* is the smallest unit of the CAP, and is generally made up of less than 50 Senior members, and also can include Cadets.

A *Squadron* is made up of 50 to 150 Senior CAP members, and also includes Cadets.

A *Group* generally consists of three to five squadrons, and comes directly under jurisdiction of the *Wing* which takes in an entire state area, the District of Columbia and the territories of Alaska and Hawaii. All Wing Commands are now organized.

While Groups are activated usually by the Wings, if a group of former veterans desire to start Flights or Squadrons, the procedure is to write to the Wing Commander of that state or territory. The Wing Command has the authority to authorize, issue orders, and activate a Flight, Squadron or Group.

Requirements for Cadets were listed as simply ages 15 through 17, parents consent to join, and good citizenship. There are no specific physical requirements except good health. Requirements for Senior members are age 18 and above, American citizenship, an interest in aviation, and good health.

Anyone desiring to join the CAP, either as a Cadet or Senior member, can write *Air Trails*, Box 489, Elizabeth, N.J. *Air Trails* will forward such requests to the proper Wing Command for action.

## CADET AT WEST POINT

It pays to be a Cadet in the Civil Air Patrol, contends ex-Cadet Squadron Commander of the Bucyrus, Ohio, unit, John Ralph.

A member of the Bucyrus Squadron for 27 months, Ralph is now in West Point, the U. S. Military Academy. Although in a different outfit, he's still a Cadet.

## ARMY NOTES TRAINING

CAP Cadets if inducted or enlisted in the Army will receive credit for their Patrol work and, it is indicated—although not yet officially confirmed—they will receive consideration in being placed in work according to their interest and training.

In preparation of the Soldier's Qualification Card, the Adjutant General's regulation reads:

"For CAP Cadets hereafter enlisted or inducted into the Army, a notation will be entered in 'Remarks' that a course in CAP training has been completed."

## N.H. SCHOOLS HELP

New Hampshire Wing CAP has met with considerable success in establishing CAP preflight training courses in the high schools of that state.

Four schools have already or will shortly inaugurate preflight training courses, and the New Hampshire Wing hopes to extend the training to other schools in the state.

Although there is no direct connection between school aeronautics courses and the CAP, the opportunity to form CAP units in the New Hampshire schools which have aeronautics courses is being rapidly extended. Such assistance is already in effect at high schools in Claremont, Keene, Nashua, Manchester, Rochester and Derry.

In adjoining Vermont, officials report that 23 high schools have active aeronautics course with units of Cadets or cooperation with CAP.

## SPEAK UP!

Montgomery, Alabama, Squadron has a cogent note to pass along to all pilots. But hear their story first.

Late in September an Aeronca Champion took off from Montgomery for Gadsden. Its fuel supply exhausted, the pilot sent a distress call

(Turn to page 87)

## SPONSORED BY COLORADO WING CAP, BREAKFAST FLIGHT ATTRACTS 175 PLANES



### Is It Worth The Effort?

With his K-1 flying suit (note AOPA insignia) over his street clothes, Maj. Howell takes a last look in the mirror still somewhat reluctant to leave a comfortable bed at this hour, and wondering if there are any changes in last night's weather report. The Major lives in Grand Junction, Colo., 190 miles from Denver. With favorable winds and good weather it should take him two hours to reach Denver.



### Off With The Shackles

At the field, Major Howell and Ruth unleash the tie-down ropes of the Ercoupe. Plane pre-flighted to assure everything in working order. Though distance to Lowry Field is not great, territory is rugged. Bald Mountain, rising close to 14,000 ft., is on direct course. He will fly over some of the roughest country in the U.S.

### Gosh, It's Early

At 4:30 a.m. Maj. Rex G. Howell, C.O. of Group Four, Colorado Wing CAP, is awake. Today he is making the breakfast flight to Lowry Air Force Base, Denver, Colo. It's tough to get up this early, Major, but these flights are fun, and breakfast will taste mighty good.



### A Hasty Hug

"Good-bye, Janie, I'll be home early," says Maj. Howell to his younger daughter, before being driven by his elder daughter, Ruth, to the Grand Junction airport where he keeps his Ercoupe. In his hands he carries a set of earphones, as his plane is fully equipped with radio, including VHF. It's still mighty early in the morn.



# NEWS



JOIN THE CAP CADETS!  
MEMBERSHIP OPEN TO ALL  
BOYS AND GIRLS BETWEEN  
THE AGES OF 15 AND 17

## NEW RATING PROGRAM

National Headquarters CAP has announced the new CAP pilot and observer emblems, and the aeronautical rating program by which emblems for the various ratings can be obtained. The new emblems differ from those currently in use, and are now more in conformance with standard U.S. Air Force emblems.

Qualifications for the emblems have been outlined by National Headquarters as follows:

**CAP Observer**—Required to have completed 25 hours of ground instruction and 20 hours of flight training as an observer.

**CAP Senior Observer**—Applicants must meet all requirements necessary to participate in CAP; have been active Senior CAP member for two or more years; have a minimum of 170 hours CAP certified observer time.

In the Observer rating the CAP Aeronautical Rating Board checks the qualifications and makes recommendations to the Wing Commander and AF-CAP Liaison Officer who have the authority to issue a certificate. Qualifications for Senior Observer are sent to National Headquarters, and part of the requirements for CAP service may be waived in the case of former members of the Armed Forces.

**CAP Pilot**—Each pilot must hold a currently effective CAA certificate in the grade of Private Pilot or higher, and must have completed the CAP 25-hours ground-flight training course, and be recommended by the Aeronautical Rating Board to the unit commander for a certificate.

**CAP Senior Pilot**—Senior pilots must have met all requirements for pilot ratings and, in addition, have been a member of CAP for two or more years; have a minimum of 1,500 hours of certificated pilot time.

**CAP Command Pilot**—Command pilots must have met or satisfied all the requirements for Senior Pilot and, in addition, have been an active Senior member for at least four years; have 2,500 hours of certificated pilot time.

Records of both Senior and Command pilots are forwarded to National Headquarters for review and final approval, and part of the requirements may be waived in the case of former members of the Armed Forces.

## SURPLUS PURCHASES

New regulations issued by the War Assets Administration now enables Wings of the Civil Air Patrol to purchase aircraft, parts, radio equipment, Link trainers, jeeps, trucks or ambulance planes at 95% discount from fair value at sales offerings where priority rights and privileges are recognized.

## EXCHANGE PLAN EXTENDED

### SQUADRON OF THE MONTH

"The story that was written can't be told with words, it can only be told through the gratitude and praise from those who were ministered to by the Reno, Nevada, Squadron CAP."

Those are the words of a prominent radio commentator in Nevada, and are the basis on which the Reno unit is nominated as "CAP Squadron of the Month."

A tremendous 3-alarm fire brought every member of the Reno Squadron on the run from their flight practice in that city one Sunday morning not long ago. While the fire and subsequent explosion took five lives and injured 150, the rescue and first aid work of the Reno unit was credited with saving many lives, and easing the pain of others.

With hospitals jammed by injured and those overcome by smoke, the Reno unit used their truck-trailer as a first aid station, dispensed coffee and blankets, manned fire hoses, directed snarled and tangled traffic, and helped police keep gaping crowds from danger. Many nearly asphyxiated firefighters were treated so effectively by CAPers they returned to fight the ravaging fire.

The fire showed clearly Reno's need for an ambulance plane. A drive is now under way in that area to raise funds to purchase an L-5 type ambulance plane.

"If that organization (Reno Squadron) were to disband tomorrow," said the radio commenter, "their existence since early 1941 would be justified a thousand times over by the heroic deeds performed when we, the people of Reno, needed them most."

## ILL. SQUAD ON TV

A CAP Wing, Group or Squadron can get just about all the public attention it desires, if it can offer something new and original.

Illinois Wing Squadron 613-1 of Harlem conceived, devised and set into operation a half-hour 13-week television show over Chicago Station WGN-TV.

The show featured musical entertainment by prominent weekly guests, including Don Ameche, plus that all-important commercial announcement on behalf of CAP.

## SUCCESS OF CANADIAN-U.S.

### CADET "SWAP" RESPONSIBLE

TO advance airmindedness among young men and women in all the allied nations, the Civil Air Patrol will eventually exchange Cadets with a number of foreign countries, National Headquarters CAP has disclosed to *Air Trails*.

Augmenting last summer's program of an exchange of Cadets with Canada, CAP Commanding General Lucas V. Beau revealed that CAP has approved a Cadet exchange program for the summer of 1949 with both Canada and England. Twenty-five Cadets of each country will be exchanged with 50 American CAP Cadets.

According to Gen. Beau, the program was agreed upon by the Air Training Corps of England who will select the 25 English Cadets, and with the Air Cadet League of Canada who will select the 25 Royal Canadian Air Cadets. The 50 American CAP Cadets will be chosen from candidacies proposed by CAP Wings.

A directive from National Headquarters, CAP, Bolling Field Air Force Base, Washington, D. C., will go forward shortly to all Wing commands requesting them to select their outstanding Cadets. Selection will be based entirely upon the merit of the individual Cadets and, among other requisites, according to their conduct, interest in aviation, CAPC study and training, and good citizenship.

National CAP Headquarters officials reported that last summer's exchange with the Air Cadet League of Canada was so successful and American CAP Cadets participating so enthusiastic, they anticipate this year's competition for the honors to be unusually keen.

Gen. Beau also disclosed that the CAP will handle all of the air lift between the two countries, flying the Cadets between the United States and Canada in U.S. Air Force planes.

The success of last year's exchange between CAP and Air Cadet League of Canada has been felt almost around the world. Both France and Switzerland have advanced proposals to exchange five Cadets each from their respective countries with a similar number of American Cadets.

National Headquarters has indicated that the French and Swiss proposals are being given serious consideration, although not yet approved.

... AMONG ENTHUSIASTIC PARTICIPANTS IS MAJOR REX HOWELL, C.O. OF GROUP FOUR



And A Pint of Oil . . .

After a pleasant early morning flight, Maj. Howell lands at Lowry Field. A USAF sergeant services his plane, "The Littlest Angel," so it will be ready whenever the Major decides to leave. All ships are gassed and checked directly after their landing.



It's Sure Good

Hangar flying over a hearty breakfast in Lowry Field cafeteria, Maj. Howell and friend Thomas J. Clark discuss their respective flights. Breakfast tastes great after two hours at high altitude. These flights are not only for fun; participants discuss state aviation problems and plan on improvements. The Wing also acts as host at breakfast to many of Colorado's airminded civilians. 350 of whom attended this event.



Homeward Bound

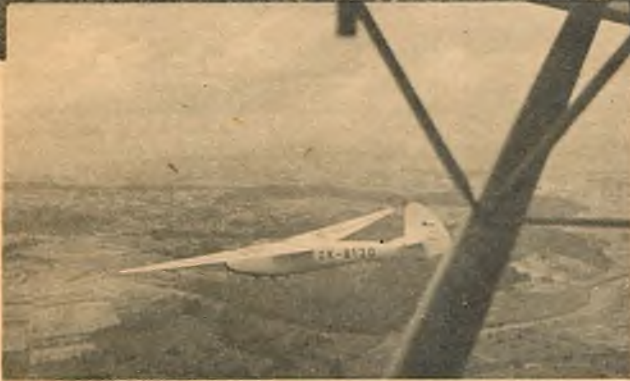
So, having obtained latest weather report, and being cleared for take-off by Lowry control tower, Maj. Howell lifts his Ercoupe from the runway for the homeward trip. Flying over rugged territory is nothing new to Colorado Wing CAP pilots. During the war they operated a scheduled lightplane courier service for the AF, carrying mail and personnel over the Rocky Mountain states.

Some Plane!

Breakfast flight included a tour of Lowry Base facilities, among which is the largest aerial and ground photo-school in the country. Howell and Clark are inspecting with interest the complex cockpit of an F-80 jet fighter undergoing routine maintenance check. Behind them are seen the tall fins of three Boeing B-29's.



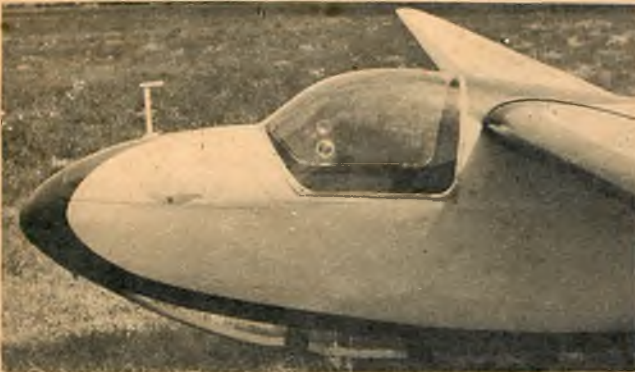




## AIR TRAILS

# Solo Club

● Like most European countries, Czechoslovakia considers the sport of gliding a very important part of aviation, both civilian and military. Inasmuch as most enterprises have been nationalized in Czechoslovakia, all pre-war aero clubs have now coalesced into the network of National Aero Clubs. One of the best of the large number of gliders in that country is the Zlin 25 "Sobaj," illustrated here. This excellent example of high-performance sailplane is of all-wood construction with a wing span of 49.12 ft., and wing area of 150.7 sq. ft. The empty weight is only 364 lbs. An excellent performer, its glide ratio is 1 to 27, and the sinking speed at 37.5 mph is a bare 2.13 ft. per second. It seems that despite heavy war damages, Europe has not relinquished its lead in motorless sport and still offers plenty of competition to our designers and enthusiasts here in America.



YESTERDAY morning the local airport was covered with a dank mist. The sock was limp and there wasn't a sign of life. But inside Joe's office a cosy fire was going and assorted weathered-in pilots were draped over the leather furniture. Lazy spirals of cigarette smoke were wafted ceilingward.

"How's things up this way, Joe?" asked a Florida-bound Luscombe pilot.

"Pretty quiet," answered Joe. "Outside of students on XC, we don't see nearly as many ships as we used to. Plenty go by overhead. Might be because they build in more range these days. Guess they can make it into the big city without gassing up."

"How about your G.I. training," queried a voice from the divan, "or are they giving you a bad time, too, with that Public Law 862?" As Joe shrugged his shoulders, the voice went on, "Saw an article in one of the national magazines that classes flying training along with chicken sexing and dancing lessons."

"I'd like to meet the joker that wrote that," growled a leather-jacketed Beech pilot who was chauffering around some money-bags contractor. This guy, it developed, had begun on Cubs, then Waco's in the CPTP, and ended up pushing B-24 tankers (Turn to page 82)

### HOW TO BECOME A SOLO CLUB MEMBER

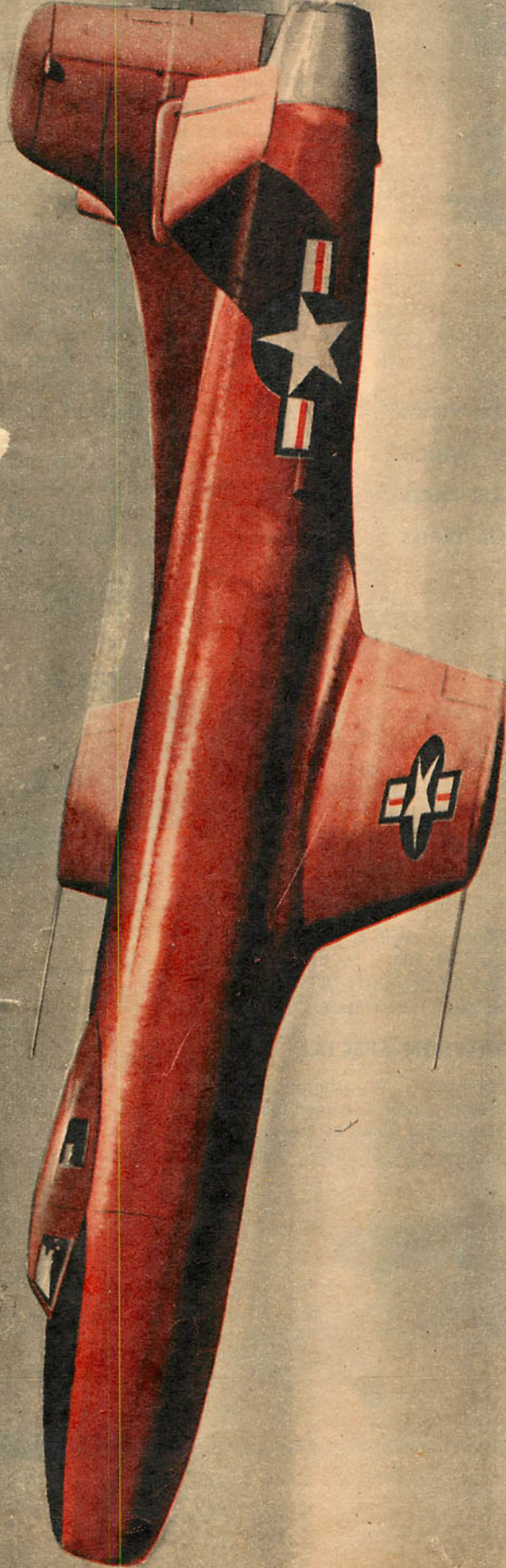
This club is open only to those who have actually soloed a heavier-than-air craft, either powered or motorless. It does not matter where or when the flight was made. Applicants must furnish the membership committee with a satisfactory proof of their qualification for acceptance. There are no dues. Once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

To obtain sterling silver Solo Club wings and life membership card, send coupon, with 50c, to Solo Club Membership Committee, Air Trails Pictorial, Box 489, Elizabeth, N. J.

#### 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.....



# SKYSTREAK

By ALFRED OWLES  
An Air Trails Air-Pix

# Goodyear Round Up

## PART I

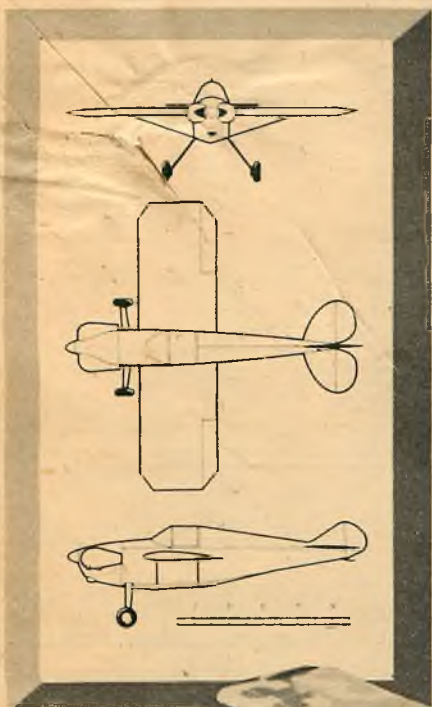
FIRST OF A SERIES OF PHOTOS AND THREE-VIEWS  
OF GOODYEAR MIDGET RACING PLANES WHICH  
PARTICIPATED IN THE '48 NATIONAL AIR RACES  
FROM DATA SPECIALLY PREPARED FOR AIR TRAILS

SO much interest has been shown in the Goodyear event during the last two National Air Races that *Air Trails* commissioned Peter M. Bowers to take photographs and make three-view drawings of all entries in the 1948 event.

Mr. Bowers, who has authored a number of articles, both model and full scale, works at Boeing's Wichita, Kan., plant, and has all the qualifications for the job—a difficult one, since it involved measuring the little craft over the objections, sometimes, of pilots and owners who thought him to be a spy of an unimaginative competitor for the 1949 Goodyear races.

Nevertheless, he came through without trouble and we present here what we consider the only complete three-view coverage of the fascinating midget racing planes. (Additional 3-views will appear in forthcoming issues.) They are shown in no particular order of their speeds or accomplishments and we do not go into any specific technical details as to airfoils or angles of incidence, because the boys who build and fly them are pretty close-mouthed about it all—and you cannot blame them. Each one has his own pet ideas and tricks which, like a poker fan, he plays close to the chest.

Interesting features of the racers are illustrated here. The Anderson Special No. 63, flown by Bruce Raymond (who won the Tinnerman Trophy in an F-51), had an unorthodox diamond-shaped fuselage, (Turn to page 74)

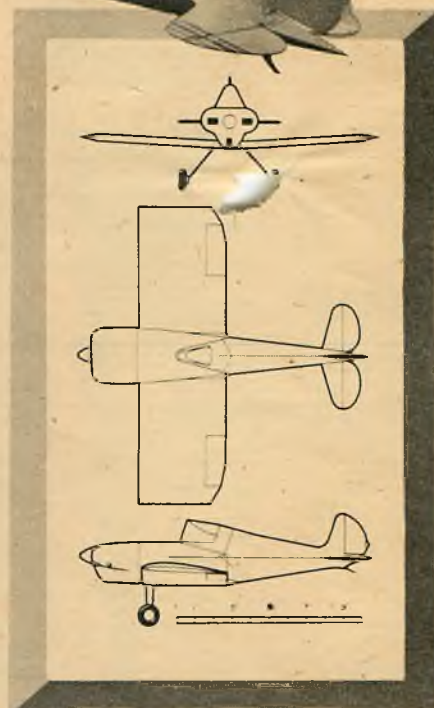


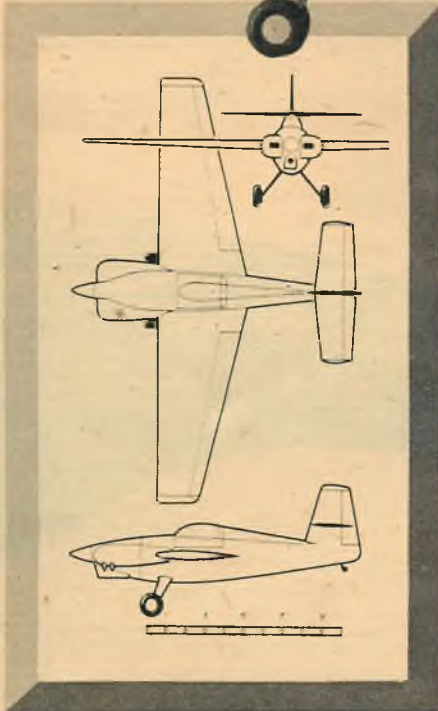
### ANDERSON SPECIAL

● Built by Alvin E. Anderson of Elmhurst, Ill., flown by Bruce Raymond. Span 15', length 16' 6". Yellow with red trim. Best speed, 130.9 mph.

### DAWSON SPECIAL

● Builders G. W. Johnson and C. R. Dawson, Coeur D'Alene, Ida., owner C. E. Henley, flown by Dawson. Span 16', length 17' 6". Green, yellow trim.



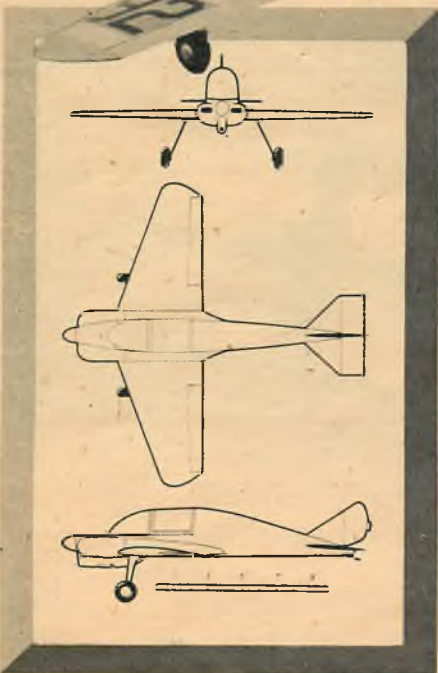
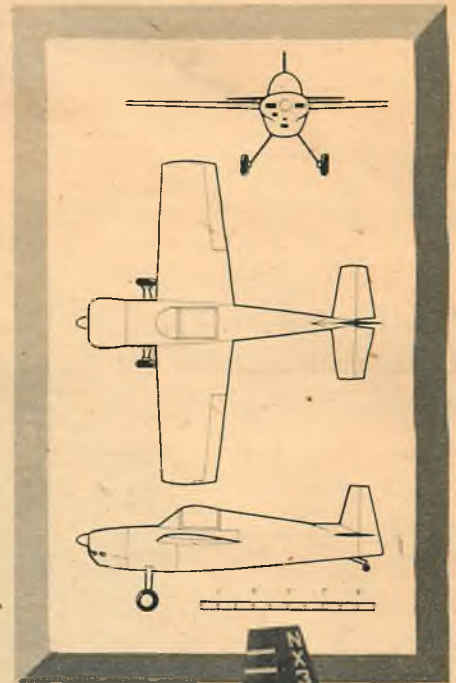


### FOSS SPECIAL

● Owner-pilot Al Foss, Rosemead, Calif. Span 20' 8" length 14' 11". Color, natural aluminum, maroon trim. Took 7th in consolation at 125.2 mph.

### LEIGHNOR SPECIAL

● Owner William C. Leighnor, Hutchinson, Kan., pilot H. E. Bangerter. Span 18' 7", length 17' 5". Maroon with silver lettering. Speed 148.2 mph.

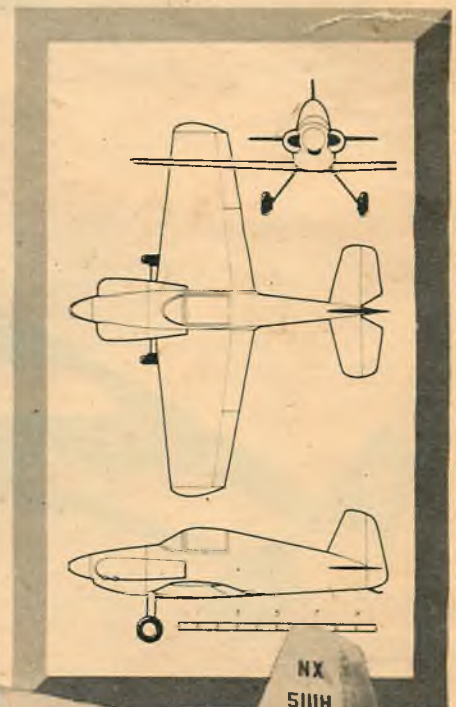


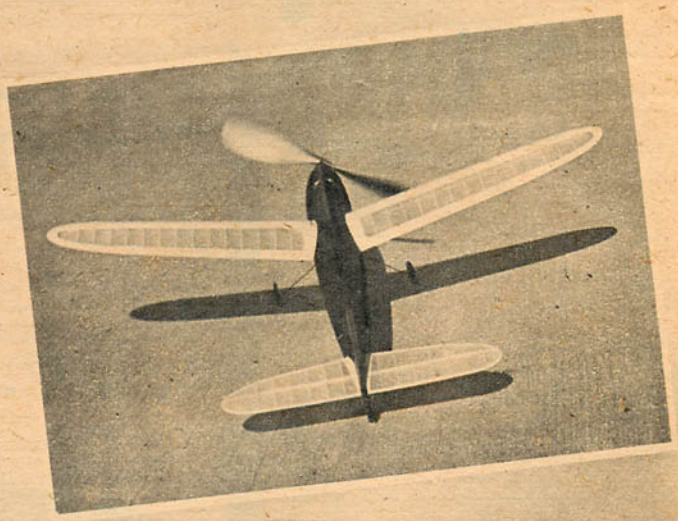
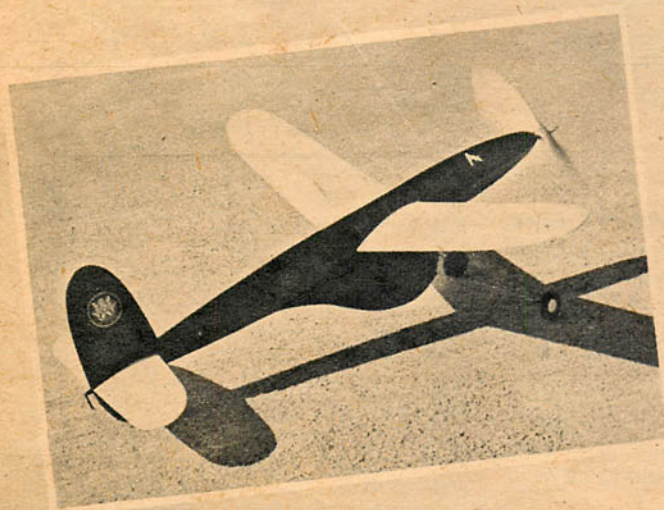
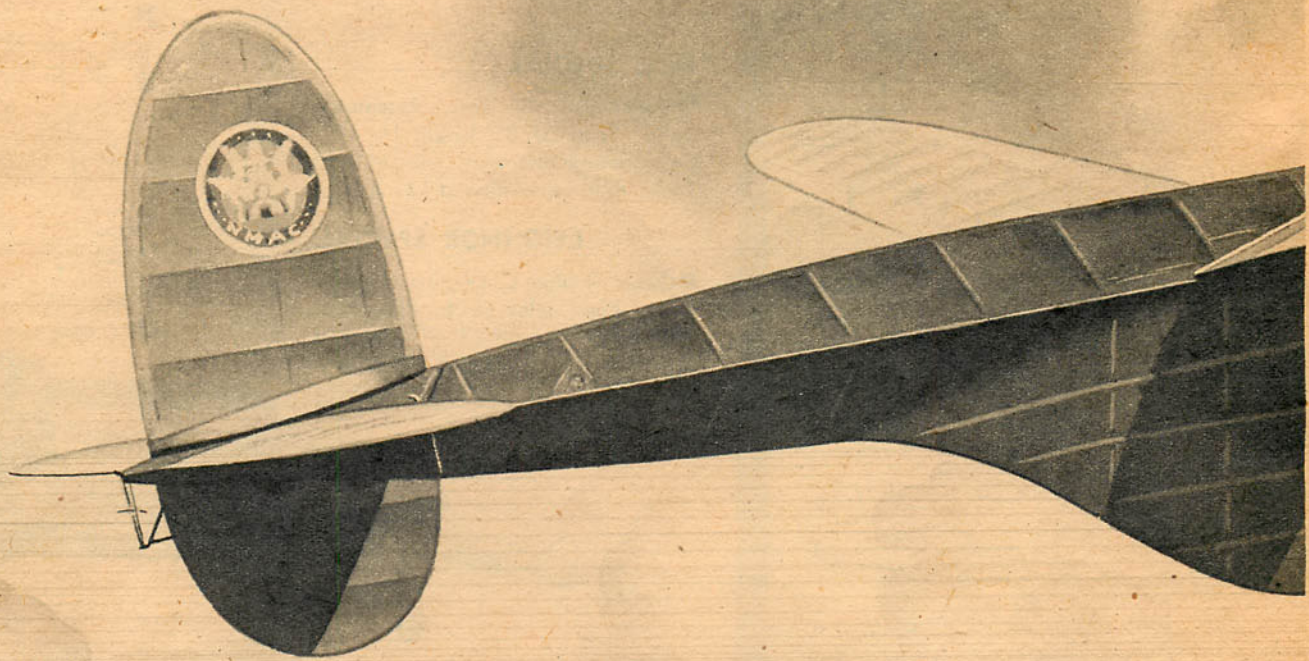
### FALCK SPECIAL

● Built and flown by William F. Falck, Warwick, N. Y. Span 17' 8", length 17'. Color, silver with red trim. Placed 2nd in consolation race at 141.5 mph.

### LONG LA-1

● Built and flown by David E. Long, chief design engineer, Piper Aircraft Corp. Span 18' 6", length 16'. Aluminum with blue trim. Speed 155.2 mph.





S. CALHOUN SMITH

## WAKEFIELD WINNER

# Jaguar

BY E. W. EVANS

THE winning of the Wakefield Trophy, has always been—as to many others—my ambition. The possibility of the British Trials taking place during 1947 gave me food for thought.

During my service in the R.A.F. modeling for me was very limited, but at least nothing could prevent my weighing the finer points of Wakefield design. Decisions were made for the 1947 entry over a period of some months and eventually the design was completed. Factors governing the design were: high power-to-rate ratio, practical streamlining, freedom from gadgets, and a large structural safety factor.

The original Jaguar was made and test flights indicated that things were going well. The glide was particularly pleasing. Turns of around 1,050 gave me a power run of about 90 seconds. Successes came in thick and fast, and although the Trials were not held that year I managed 2nd place in the Gutteridge Trophy Wakefield Contest which I won in 1948. Friends of mine made similar models and things were getting hot for me to handle, but that's how it should be.

The 1948 trials were flown in the worst weather I have ever known; the wind was almost frightening. Roy Chesterton came out on top after handling his Jaguar with great skill. A three-piece wing didn't help me much, caused through landing in a tree at 45 mph, and trying to beat the clock on the repair was asking too much.

*(Turn to page 99)*

SEE PAGES 51 THROUGH 59 FOR PLANS OF THIS FINE LORD WAKEFIELD CUP WINNER. HERE DESIGNER EVANS DESCRIBES THE DEVELOPMENT AND DESIGN OF JAGUAR

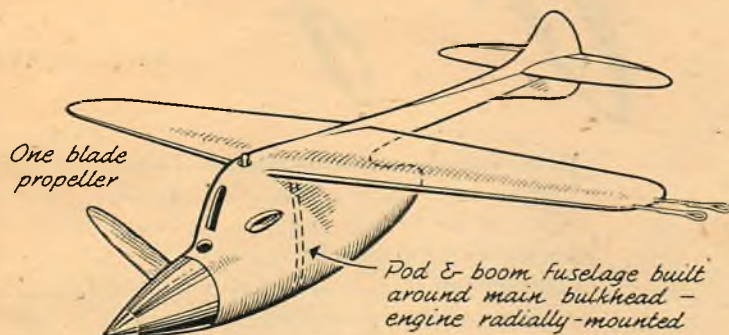


● Roy Chesterton (left) winner of the 1948 Lord Wakefield cup with the famous old "mug." Holding Jaguar is the justifiably happy designer, Evans.

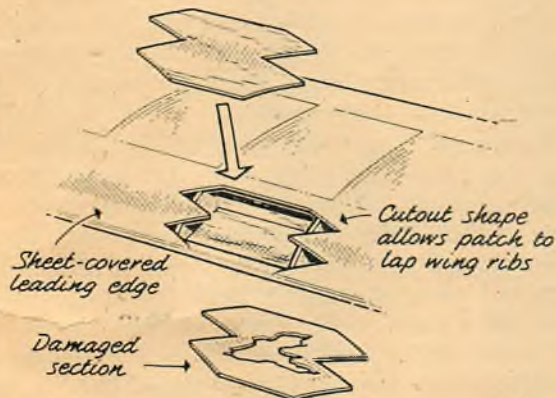


# Sketch Book

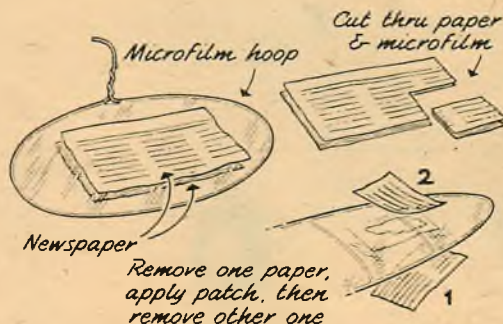
HAVE YOU DEVELOPED SOMETHING NEW IN CONSTRUCTION, CONTROL, OR FLYING THAT MIGHT INTEREST OTHER MODELERS? SEND A ROUGH SKETCH—WE'LL REDRAW IT AND PAY \$2 FOR EACH ONE ACCEPTED



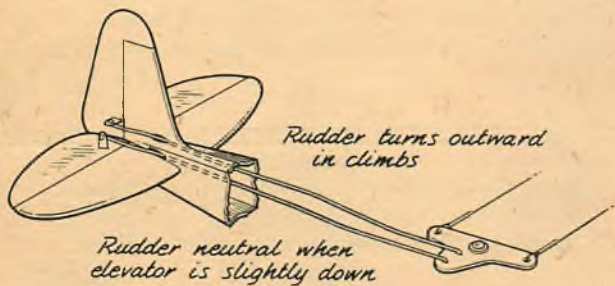
● Compact functional design is evident in speed model dreamed up by Bill Shellman and James LaPointe, Detroit, Mich. Body is chiefly a plywood former with hollowed blocks fore and aft. Incidentally, fellows, don't forget an air outlet! By the way—Sketchbook is open to an occasional "dream design" that has not been tried out in actual tests. Sort of Airmen of Vision along model lines.



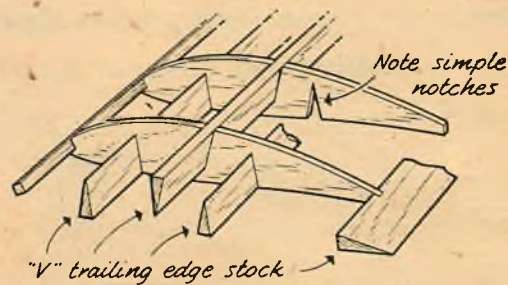
● Tom Wardlaw, Kansas City, Mo., veteran free-flyer, patches gas model wings with leading edge sheet covering. Lapping ribs gives flush-fitting patch.



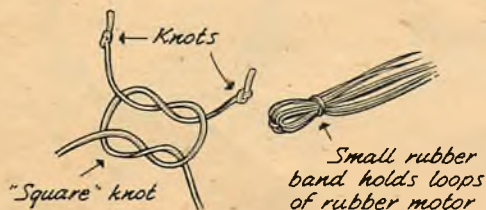
● Microfilm patching material is held by static electricity between newspaper layers. When needed, cut to size through paper. By Dick Baxter, Detroit, Mich.



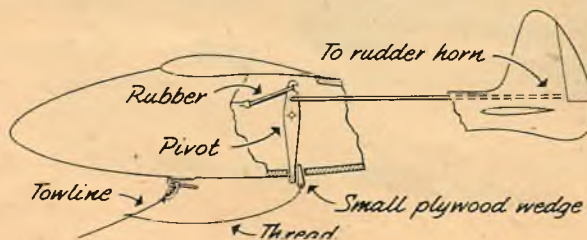
● Joseph Johnson, Greenfield, Mass., uses additional pushrod to rudder horn on flying scale control models to assure an outward pull in climbing maneuvers.



● Wing spars of tapered trailing edge stock suggested by John Maloney, Warren, O. Points of maximum fibre tension are thus heavier and stronger.



● Lubed rubber strands tied securely by first knotting ends; small rubber bands secure loop ends for easier handling. From Merwin Bristol, Oak Park, Ill.



● From French Morocco, North Africa, comes idea by Paul Fredericq for rubber-loaded mechanism to turn the rudder of your towline glider for circling glide.



# AERONCA C-3

BY CHARLES HOLLINGER

**S**HE was known as the "Flying Bathtub" in the old days. Yet today there are still a few putt-putting around the country after more than fifteen years' service.

The original C-3's were built in 1933 and our model is a faithful replica even to the dummy cylinder, exhaust manifold and all the flying wires. When comparing flying performances, however, the real ship isn't in the same class because the model executes consecutive outside loops and vertical eights as smoothly as any stunt ship. Inverted flight is a snap regardless of the high wing and dihedral.

Some of the free-flight boys say it's a crime to put lines on such a natural free-flight scale model. They

have a point, for one could search a long while for a better-proportioned scale job capable of stable flight without lines. For those wishing to make a free-flyer of the Aeronca I would recommend substituting a .19" displ. motor, building up the tail surfaces and changing the wing section shown to a Clark Y.

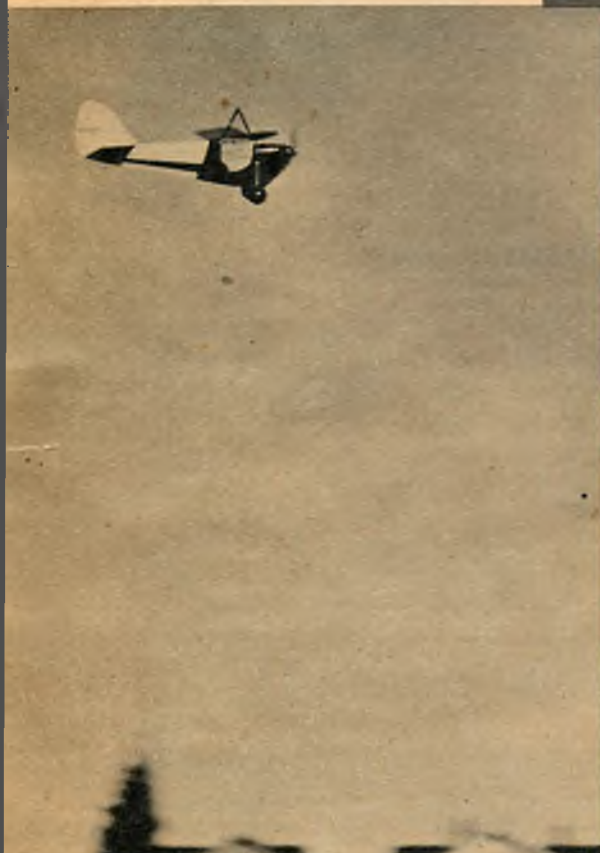
The construction is standard throughout most of the ship making for an easily-built model. Cut formers 2, 3, 4 & 5 from  $\frac{1}{8}$ " sheet and assemble on to the  $\frac{1}{8}$ " x  $\frac{1}{4}$ " longerons, making sure they are slanted correctly according to the side view. Now cement the  $\frac{3}{32}$ " sheet sides to these formers. Cut former #1 from a piece of  $\frac{1}{8}$ " plywood. The motor (Turn to page 77)



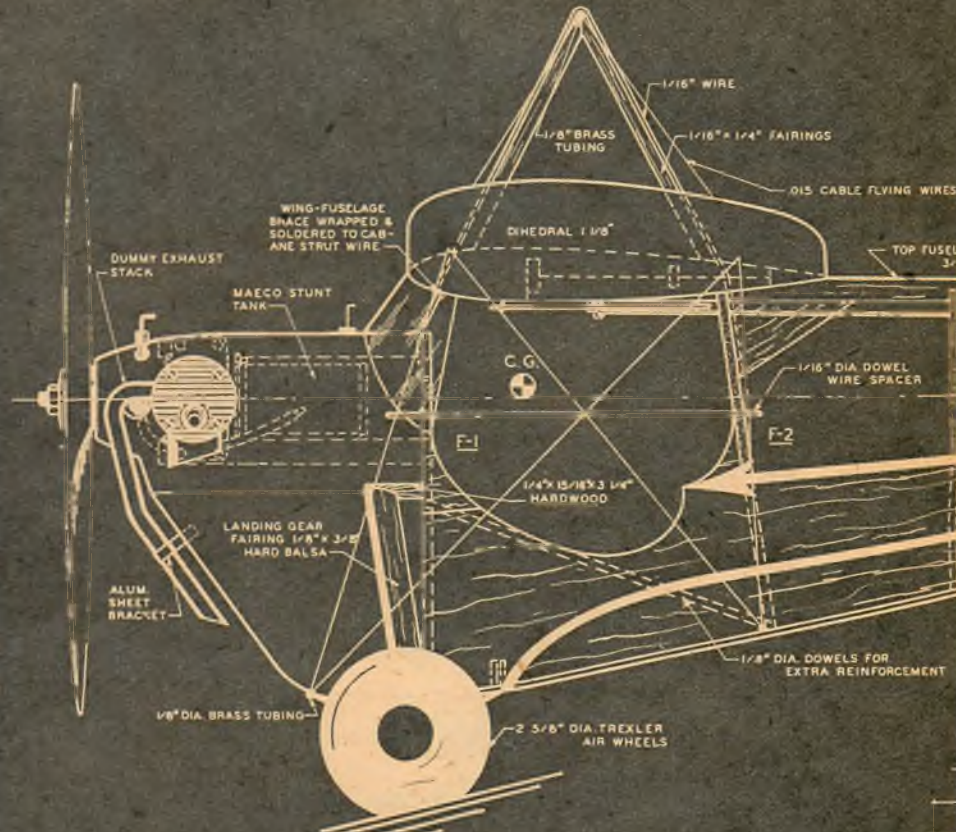
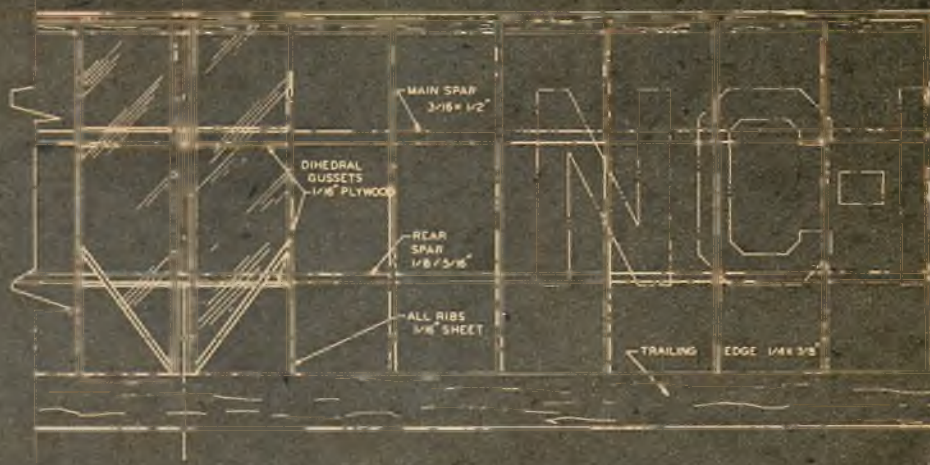




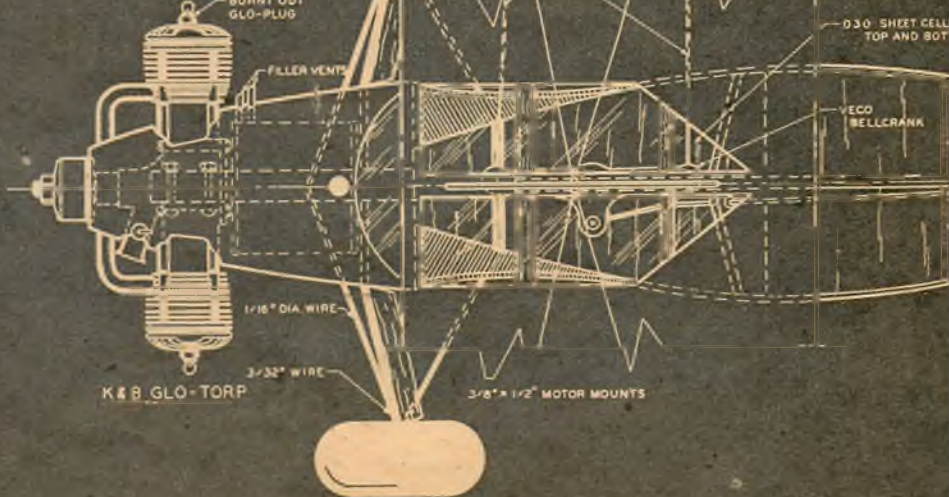
● You'll have something to boast of when you build your Aeronca.

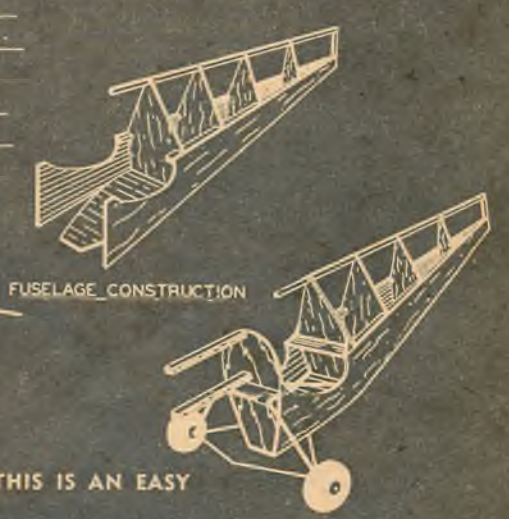
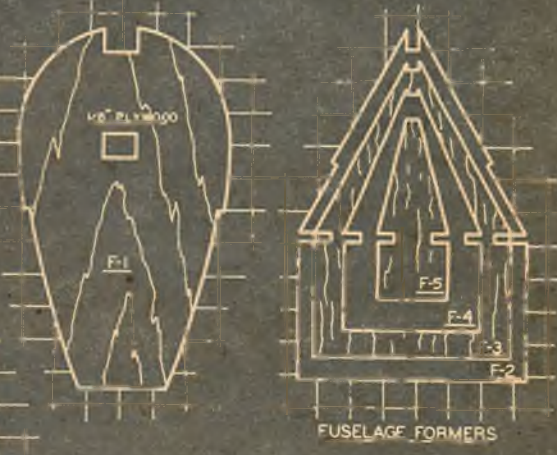
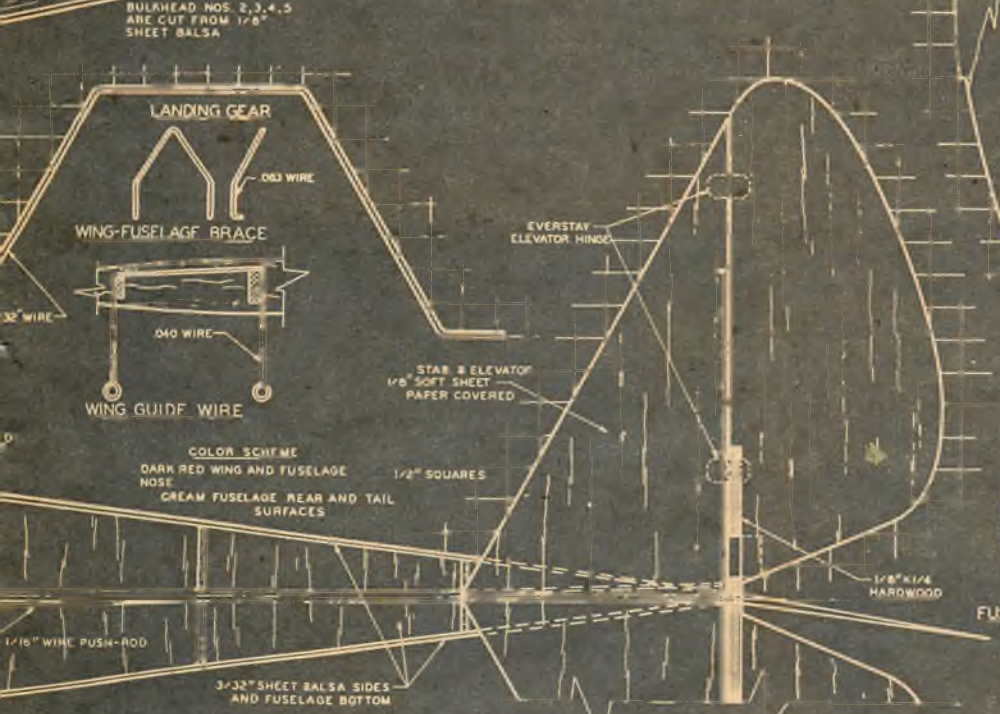
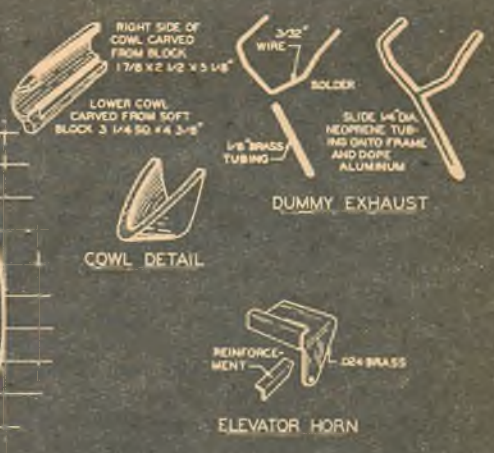
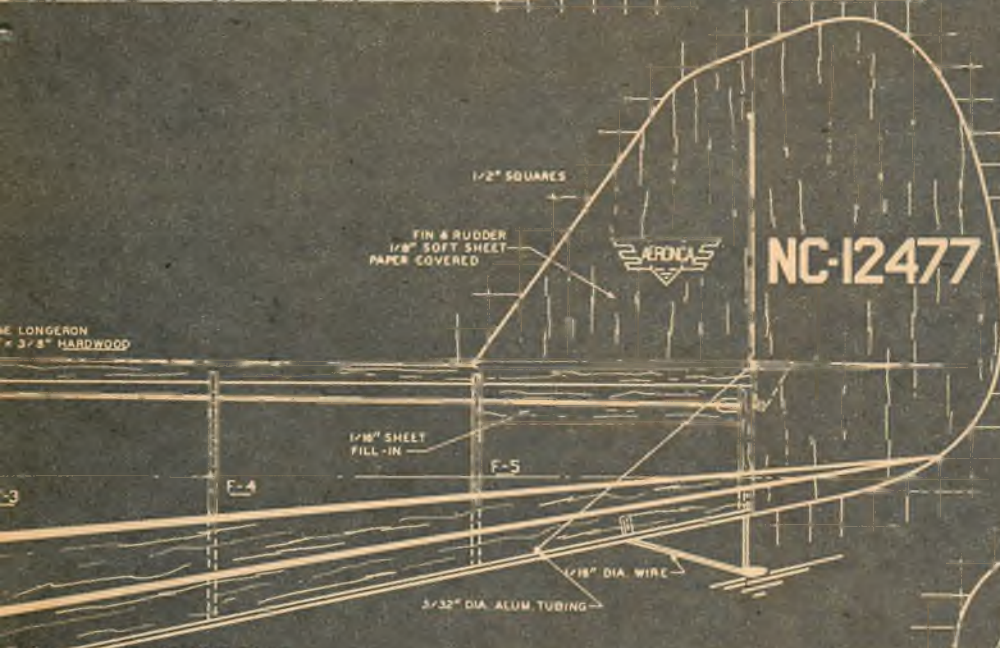
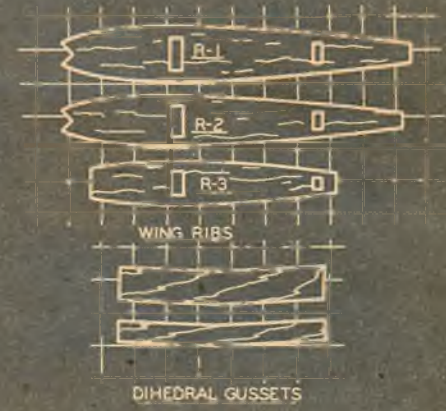
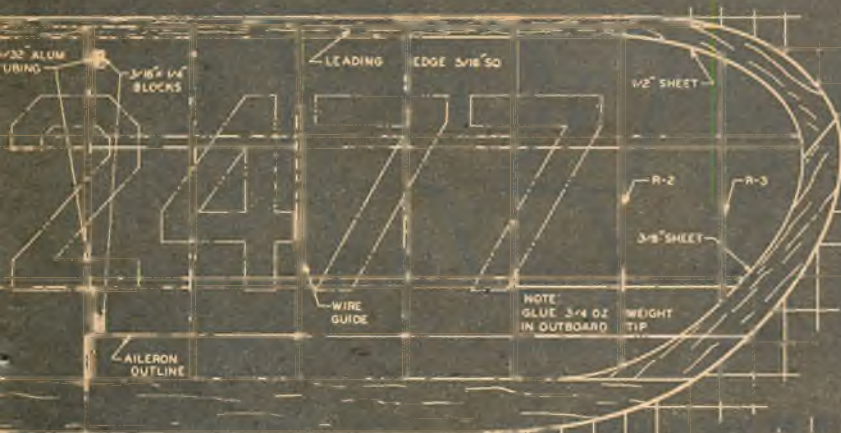


● Above: actual flight photo made by the flyer from center of circle.



DUMMY CYLINDER BUILT UP OF ALTERNATE LAYERS OF 1/16 SHEET BALSAL AND THIN CARD-BOARD CARVE CRANKCASE FROM HARD SCRAP BALSAL.





**FULL-SIZE PLANS** DESPITE THE BRACING, THIS IS AN EASY MODEL TO SCALE UP TO WORKING SIZE. HOWEVER, IF YOU CAN HOLD OFF LONG ENOUGH TO SEND FOR FULL-SIZE PLANS, AIR TRAILS HAS THEM AVAILABLE FOR YOU.



CONDUCTED BY VAL A. LUCE

**J**IM WALKER is worried. In his travels throughout the country last year, Jim saw case after case where safety precautions for control-line flying were non-existent—not only in the smaller meets, but in large ones, too. And Jim isn't the only one that's worried. Any of you who were present at the speed flyers meeting at Olathe, presided over by Frank Greene, will agree that the main subject discussed was that of safety, and that for once all modelers from all sections of the country felt the same way about something.

In one of Jim's letters to Russ Nichols at AMA Headquarters he suggests enclosing control-line circles by a wire fence 15 feet high and not more than 20 feet larger than the circle diameter. This may seem expensively drastic at first blush, but Jim has a couple of assistants working on costs and dimensions, one of whom—Keith Storey—is no beginner at control-line speed. Jim cites the strong element of danger to contestants who range themselves right at the very edge of a circle while a speed flight is in progress. We concur in this, having seen speed models in flight *over the heads* of contestants lying around the circles at two of the largest meets we attended last summer.

Jim also points out that there are some accidents which cannot be prevented by pull tests. He says, "Most of the accidents and near accidents that I have observed have been caused by the flyer running too far from the pylon and flying into the contestants seated around the flying circle. I have seen a plane lost by the flyer losing his grip on the handle, and have even seen injuries caused by parts of the plane flying into the crowd after it had crashed into the ground." Jim also tells of a flyer

whose model flew apart in the air and injured a spectator's foot after just missing a small child. This flyer is so frightened he refuses to fly control-line again.

To quote again from Jim's letter, "At most contests it is impossible to keep the crowd behind screens, and of course none of the contestants would think of being any place but a few feet outside the flying circle. The thought apparently is that if they get beamed it doesn't count. This is why we feel that the flyer himself should be enclosed so that no one could possibly get into the wire enclosure without getting hit. I feel so strongly about this that I am not enthusiastic about accepting any more invitations to demonstrate at a contest, unless they have taken this or some other step towards safeguarding the spectators to prevent an accident that will put us all in the dog house."

While it is agreed that a spectator at a ball game getting beamed by a line drive wouldn't cause baseball to be outlawed, it must be remembered that model flying is not so much a part of the national picture as baseball. The average uninitiated person comes out to see "toy airplanes flying on a string" and is startled to see 14-year-old kids topping 100 mph with their streamlined bullets, powered by engines the efficiency of which is amazing. Because of the difference between their preconceived ideas and what they actually see, they assume that greater danger is present than actually exists. Any accident, no matter how minor, then becomes a sound reason for banning *all* model flying. By the same token, those of us who are used to speed flying tend to become more than a little careless and expose ourselves to great hazards thoughtlessly.

With all of the foregoing in mind, this column earnestly asks

● Right: Bob Perkins, Clarksburg, W. Va., took top honors at 3rd National Capital Model Air Show in D. C. He also placed high at the Nats, won a 1st at Plymouth meet.

● Below: Carl Lindsey, Kansas City, Mo., won 1st place in open class towline glider competition at the '48 Nats. His time, 12:51.5. Shown with winning model and Jasco cup.

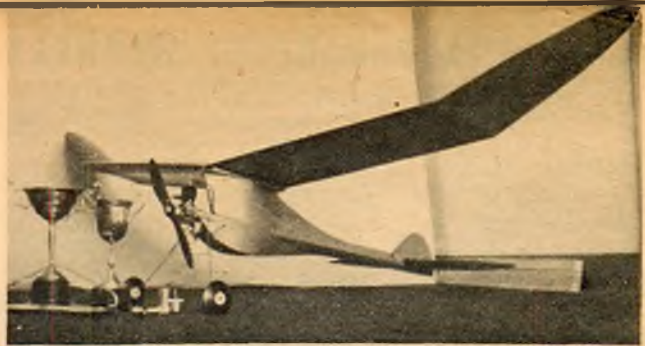


that its readers knock off building for a while and spend a little time thinking about this problem. If you have *any* safety suggestions please send them in to us. Even those that seem "screwballish" might lead to some sensible suggestions. We cannot afford at this time to close our eyes to the situation—much as we hate to admit to the public that some danger does exist. Model flying is a sport-science that deserves to continue, and it's possible that *your* idea may be the one that keeps it going.

**Of M.P.H. and Megacycles:** Jim's letters also bring up the subject of radio-control model plane racing as a new event for the Nationals. Flights, either R.O.G. or hand-launched, would be over a closed course, the ends of which would be marked with two pylons. Similar to the Goodyear Trophy Race at the National Air Races, the event would be run off in heats, with two or more models in each heat, and with a final for the winners of each heat. Should such an event be run, thereby proving to the public that model aviation has grown up, Jim's brother, Lawrence Walker, stands ready, willing and able to sponsor it.

**Don't Go Away:** Jim's idea production plant is still working. He proposes to stir up some interest in Precision Free-Flight Gas—or what do *you* call it?—similar to what the boys in Southern California have been flying. Ships would be semi-scale with heavy wing and power loading. Before flying, a contestant would file a flight plan with the judges, listing the expected flight time, the number and direction of circles he believes the plane will make and the point at which he intends to land. Points would be awarded as follows: ten for each second on the ground after the model is released for R.O.G. take-off (so as to simulate full scale run), ten for each circle if all made in the same direction or fifteen for each circle if model changes direction of turn after at least two full circles have been made. For each circle more or less than the number called for on the flight plan five points would be deducted, and for each second of duration after take-off two points would be given, less one point for each second over or under the planned flight time. For a spot landing right on the nose 100 points would be given, less one point for each five feet away.

Jim says that he discussed the event with Dan (Elf) Calkin, who got excited about it. Dan thought that maybe the point system was a little complicated and suggested that merely the number of circles be tabulated and that the model be required to land within a certain area or no score would be given. To show that he isn't fooling, Jim tells us that 500 bucks and a trophy will be put up for both this event (Turn to page 101)



● Ray Harwood of Victoria, Australia, Model Power Plane Society, built this Barker .60-powered Westerner which won all but one of many nationwide meets in which it flew.



● Modified version of Tucker's Hotrock powered by Drone Diesel. Built by member of Zombie's club. Taken at annual rally of Northern Heights Flying Club held in England.



● Ernie Pfeffer, Oceanside, N. Y., holding "Lizzi" which is powered by an Italian diesel. On floor is radio-controlled Custom Cavalier. Pfeffer has \$3,000 in models and motors.

● Left: Portion of beauty event lineup of entries at Southwest Championship meet held in Dallas. Scowling is J. W. Jones, who began to smile when he placed among winners.

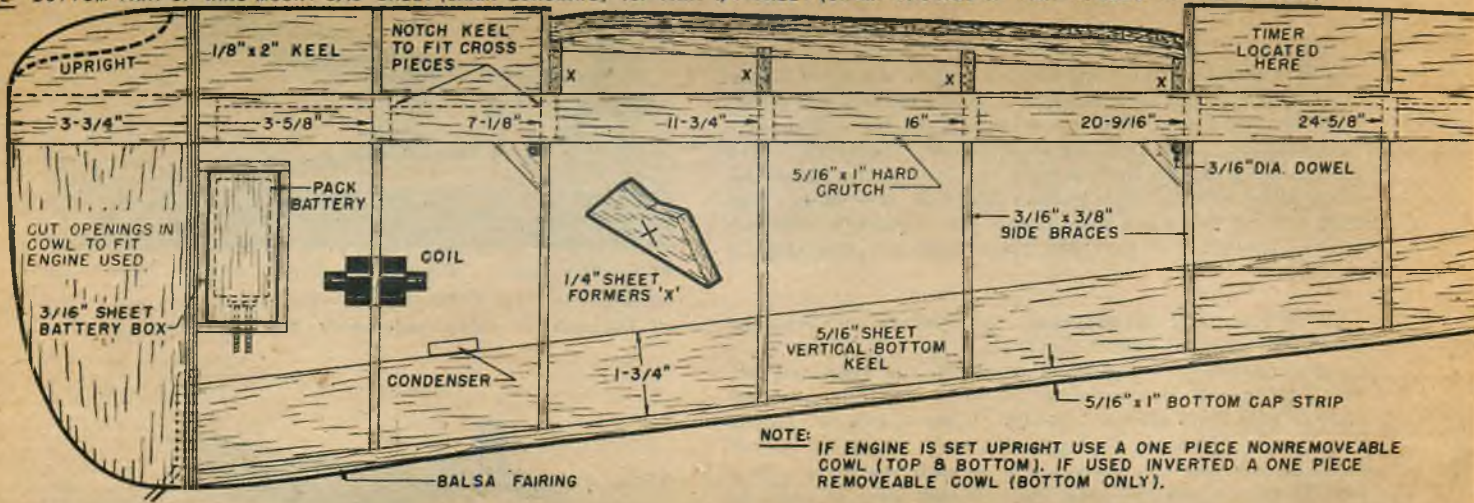
● Below: H. D. Cuss turned up at the Northern Heights rally held in England with this Grumman Tigercat powered by a pair of Mills .08 diesels. Modified by H. D. Cuss.

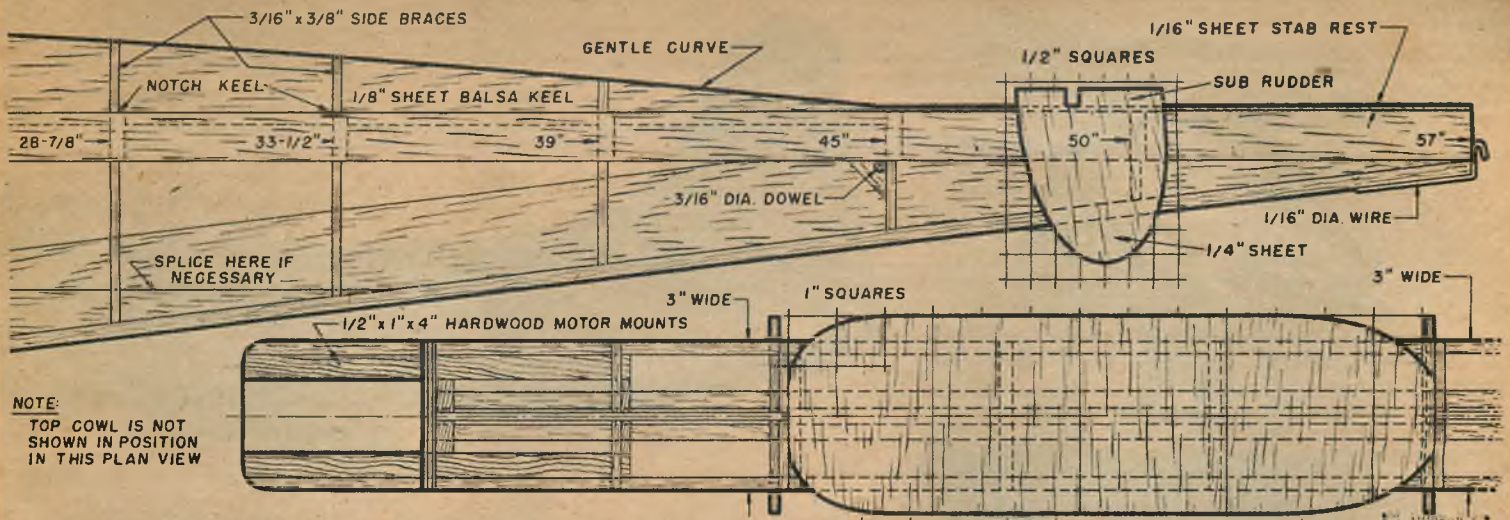




# AIR TRAILS PARADE OF WINNERS—Another National Meet Prize Plane

NOTE: BOTTOM PART OF WING MOUNT 3/16" SHEET (GRAIN LONGWAYS) TOP PART 1/4" SHEET (GRAIN CROSSED AT RIGHT ANGLES TO THE BOTTOM)



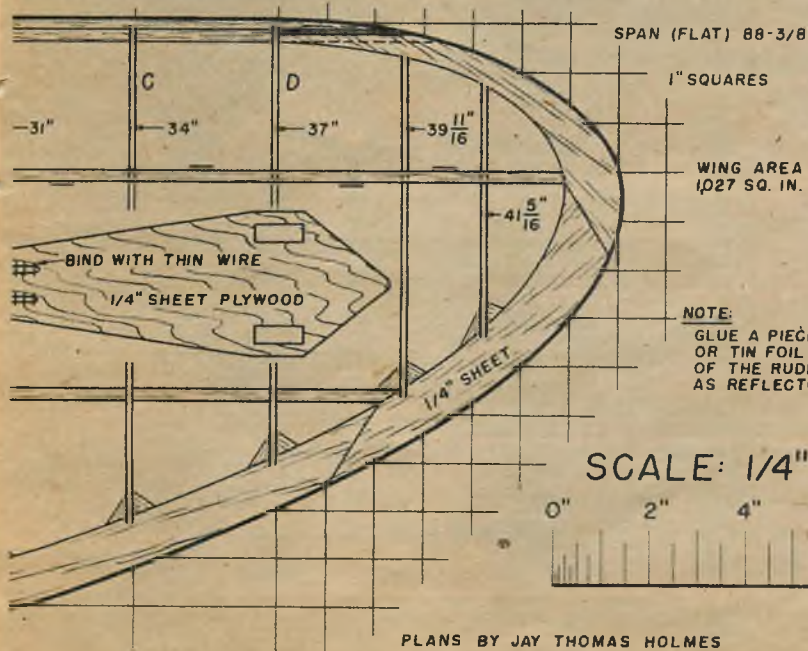
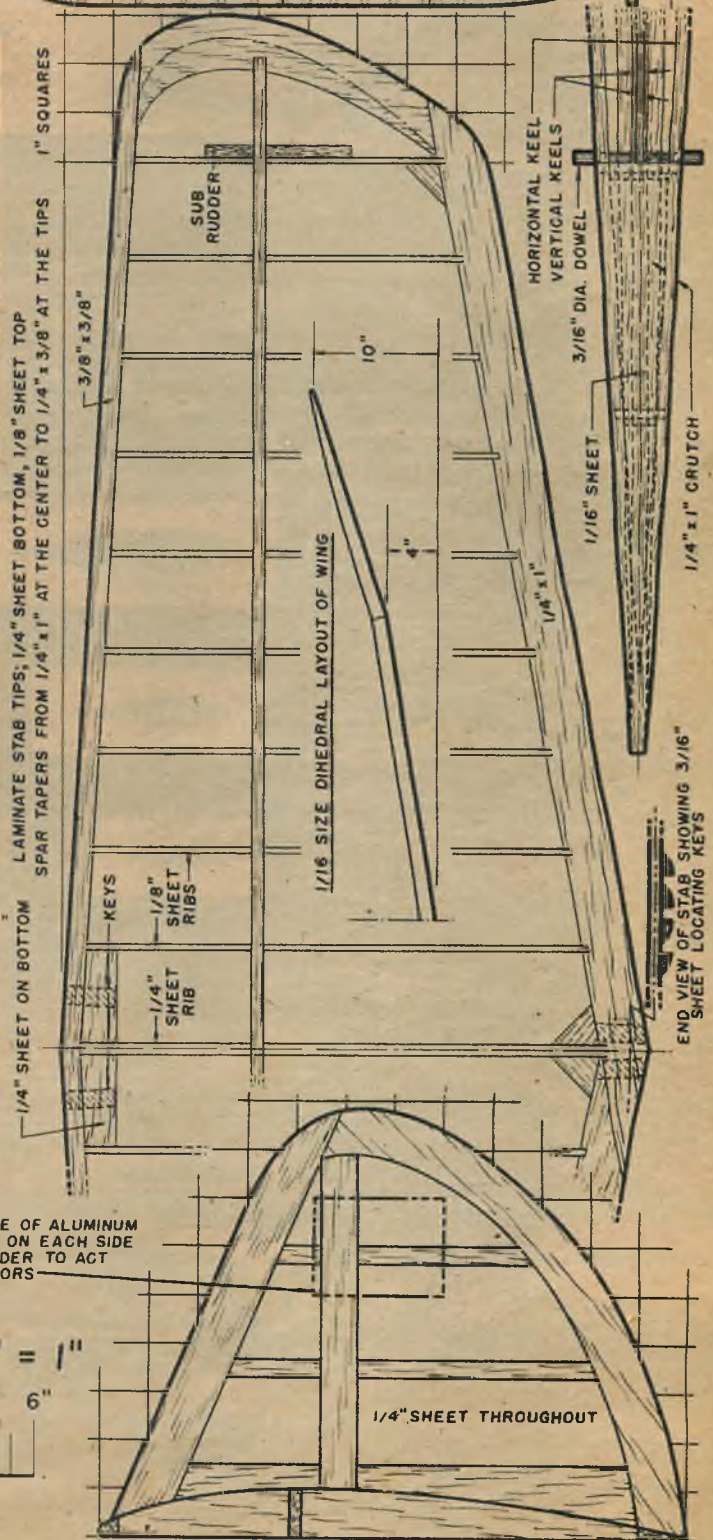


NOTE:  
 TOP COWL IS NOT SHOWN IN POSITION IN THIS PLAN VIEW



● Jerry Brofman, three-time victor in free-flight events at National contests, with his latest prize-winning ship.

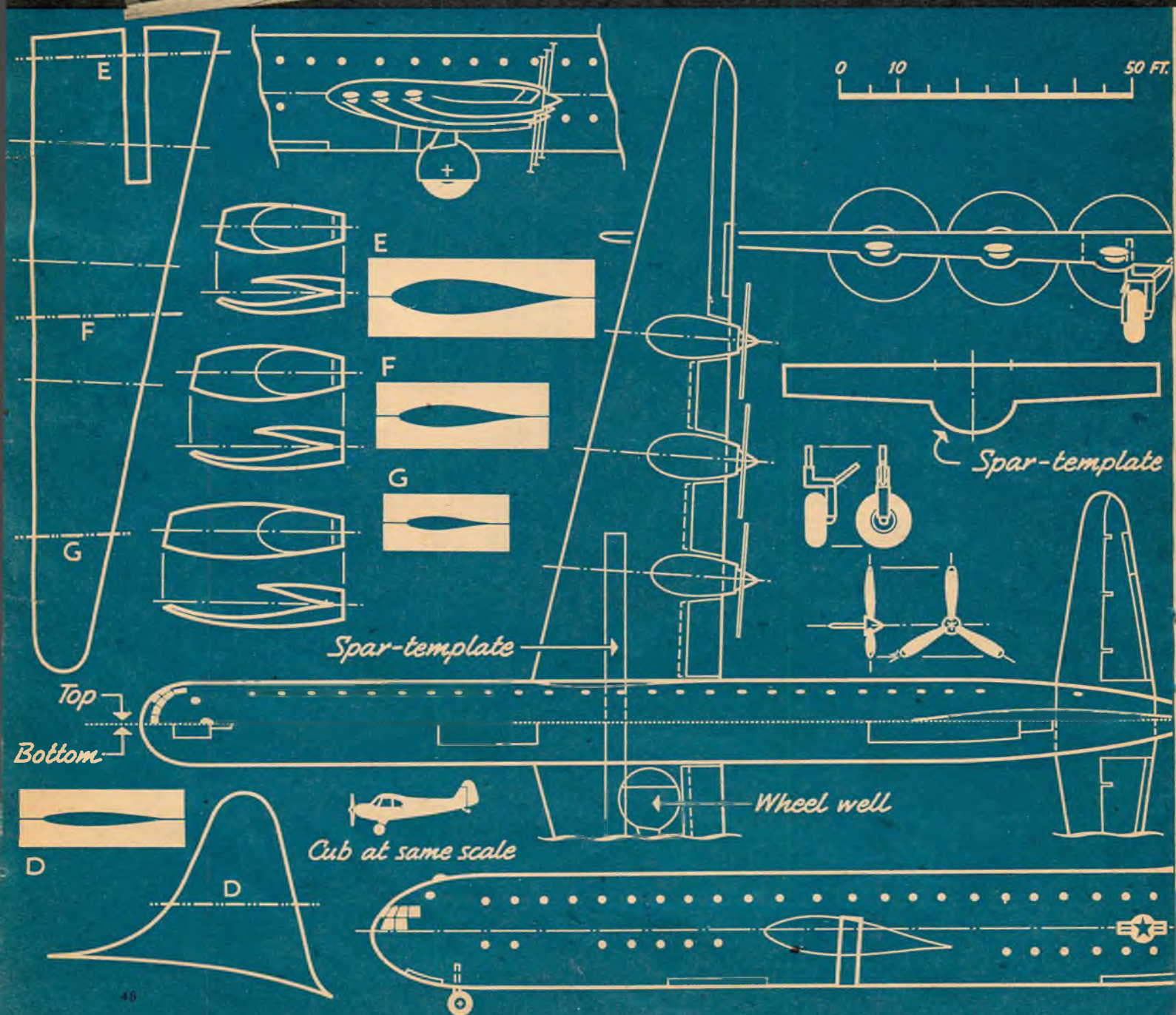
FREE-FLIGHT DESIGN AND CONTEST FLYING ARE FAR FROM DEAD, ACCORDING TO THIS WELL KNOWN PROPONENT OF NON-PYLON TYPE CONTEST JOBS



SCALE: 1/4" = 1"  
 0" 2" 4" 6"



WITH A CAPACITY OF 10 FREIGHT CARS THIS GIANT FLIES  
100,000 LBS. OF CARGO OR 400 FULLY EQUIPPED TROOPS





BY H. A. THOMAS

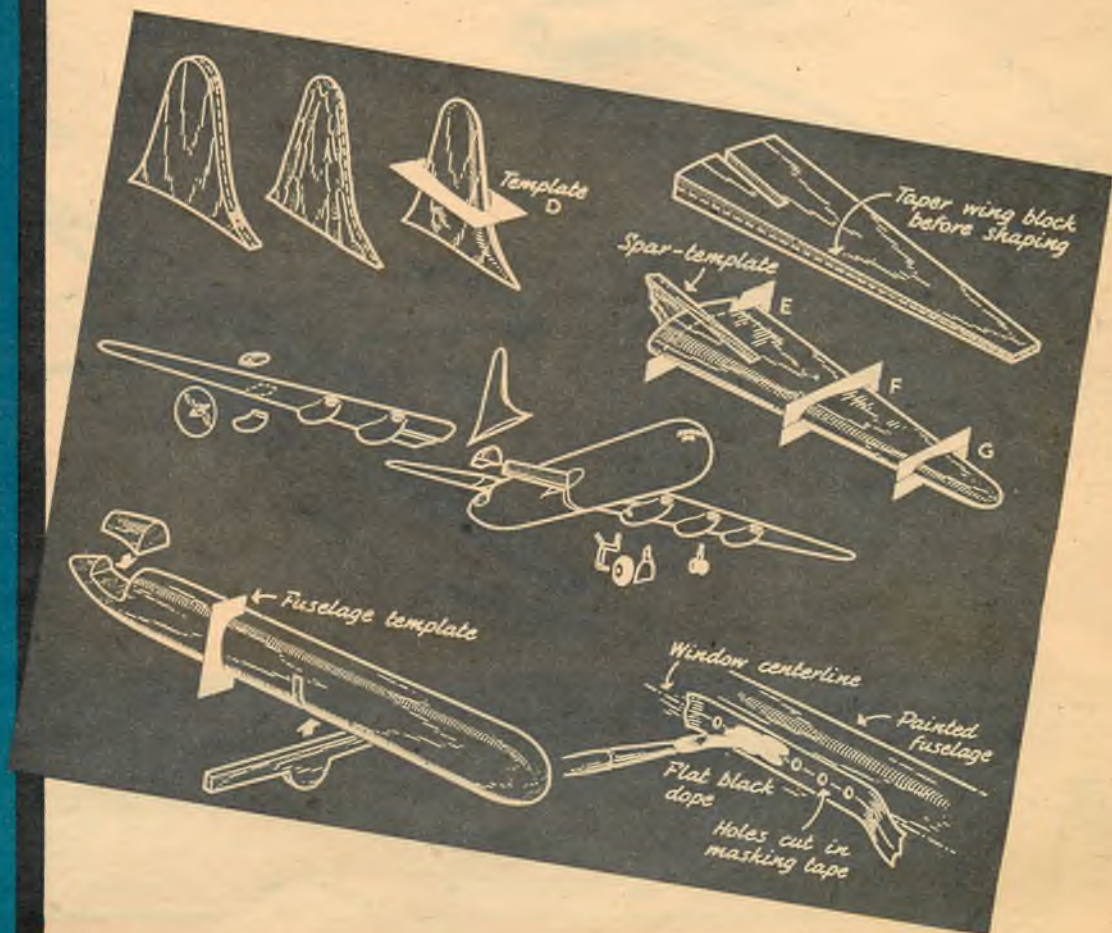
HERE is a sort of half-sister to the giant B-36 bomber—an ideal companion model for the solid published in the September, 1948, issue of *Air Trails*. Select firm balsa, not pulpy nor unnecessarily hard in texture, for all parts. Start with the fuselage; bandsaw body block to side and top outline. Carve to approximate shape. Sand with progressively finer grades of sandpaper, checking with the templates. Cut tail to outline, shape and sand to conform to the templates, then cement accurately in position.

Cement spar-template into fuselage slot. Shape wing panels and wing-fuselage junctures. Any gaps or cracks can be filled later. The thickness taper from root to tip is an important first step in shaping wings. After carving away excess wood, mount wings permanently to spar-template and body, and do final smoothing after cement hardens, using a sandpaper block.

Follow plans closely in shaping the six engine nacelles and note alignment of these is not precisely parallel to fuselage center-line. Each nacelle is a separate job of fitting to the tapering wing surfaces; minor inaccuracies can be filled with dope-talc putty. Since propellers are extremely small, it may be wise to use celluloid discs to simulate the revolving propellers. The spinners are glued onto these discs which are held to the model by pins.

Make gear struts of paper clip wire and build them up by paper strip wrapping. Wheels may be plastic or balsa. Aluminum sheet is used for wheel well covers. Air vents, at front of each engine nacelle, may be scored, recessed or simulated later by painting.

Dope entire model, then give it two liberal coatings of dope and talc cut with lacquer thinner. Sand most of the coats away; remaining portion will cover grain, blemishes and low spots. A third coat is smoothed carefully with fine emery paper. Finish coats of silver can be brushed or sprayed. In either case the dope should be thinned. Windows are masked with Scotch Tape strips for flat black painting—add talc to black dope to reduce gloss. Tires, propeller blades, and recessed parts are finished black. Add AAF decals to wings and fuselage sides.

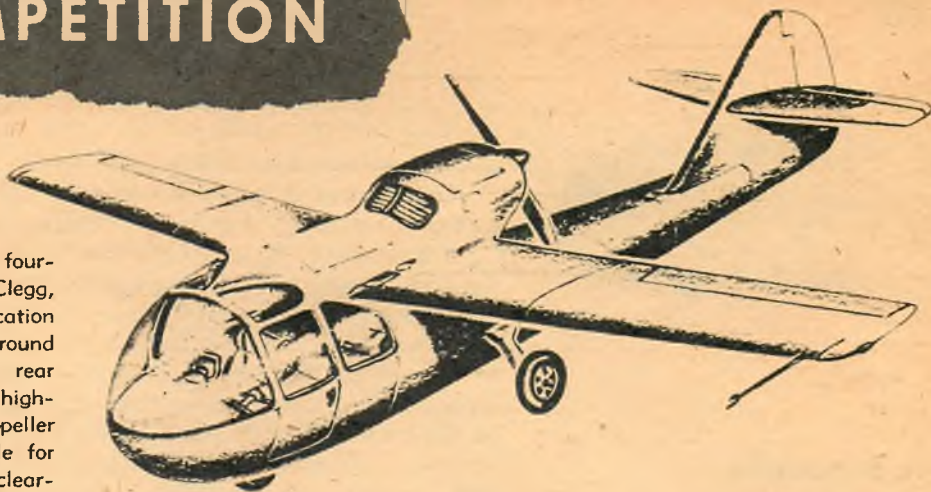




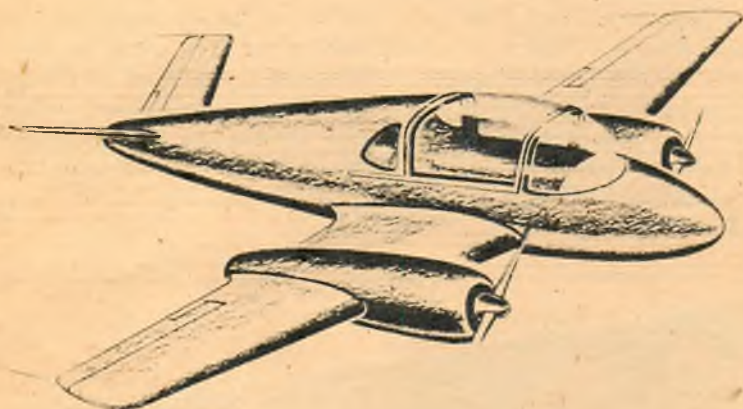
# Airmen of Vision

## DESIGN COMPETITION

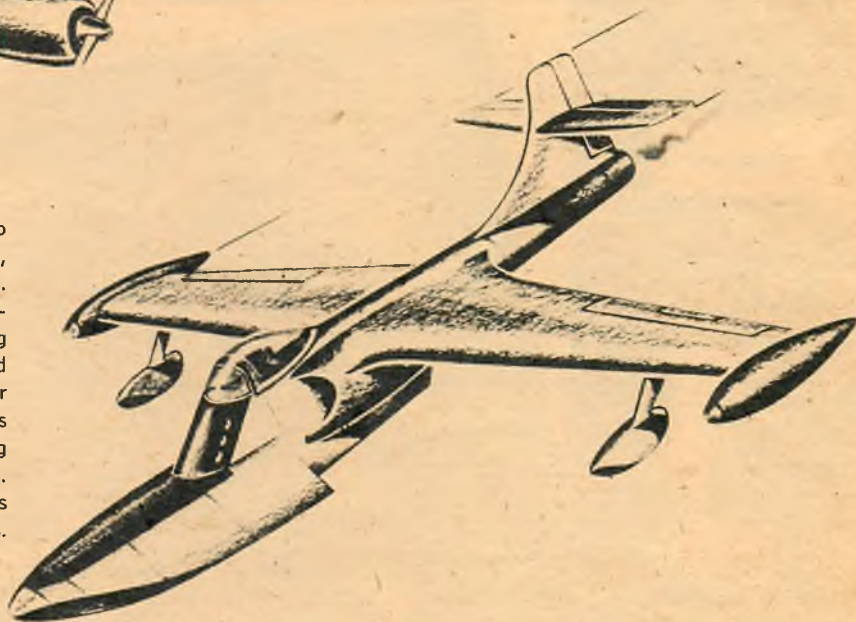
● First prize (amateur entry) a four-place personal plane by M. R. Clegg, Los Angeles, Calif. Pusher location of 125-hp engine gives good all-round visibility with the exception of rear vision, a common fault with all high-wing aircraft. Three-bladed propeller installation would be more suitable for this type as it would afford more clearance between prop and fuselage. Wing span is 38.5', wing area 214 sq. ft., top speed 125 mph, stalls at 49 mph.



● From Utrecht, Holland, comes this second prize winner entered by amateur P. van de Dijk. It's a neat twin-engine personal plane that can carry 4 to 5 people. Plane was designed around 150-hp turbo-prop engines, which do not yet exist but will eventually come into use. Plane is of all-metal construction with a span of 33 ft. Butterfly arrangement of tail surface is to keep it out of engine exhaust. Calculated top speed is 250 mph; cruising, 200 mph.



● Third prize (amateur entry) goes to Martin H. Williams, Bridgeport, Conn., for his jet-powered amphibian fighter. The configuration is similar to the erstwhile Loeining and Grumman flying boats, though use of jet engine permitted a slimmer and aerodynamically cleaner hull. Engine air intakes are on both sides of fuselage. Auxiliary fuel tanks on wing tips are equipped with navigation lights. Speed, 675 mph, a trifle high. Carries six .50-cal. machine guns and rockets.



50

In response to many requests Air Trails has opened its columns to model builders and full scale airplane designers who are interested in presenting simplified plans for aircraft of the future.

There will be no formal rules or regulations governing the competition other than the following:

1. Three-view sketches of the proposed aircraft will be required. These sketches may be of any size convenient for handling except that they must not be less than 8 1/4 by 11 inches for the entire three views.

2. Sketches may be submitted in pencil or as inked drawings. If possible sketches of the complete airplane preferably in three-quarter front and/or rear position should be included.

3. If any entrant wishes he may submit photos of a completed model of his proposed design.

4. Each entry must be accompanied by information concerning the type of power plant(s) utilized, together with estimated performance, dimensions and explanations of any unusual features.

5. Entries will not be returned and for that reason those participating in the

competition should make certain that they retain copies of all material sent to this publication.

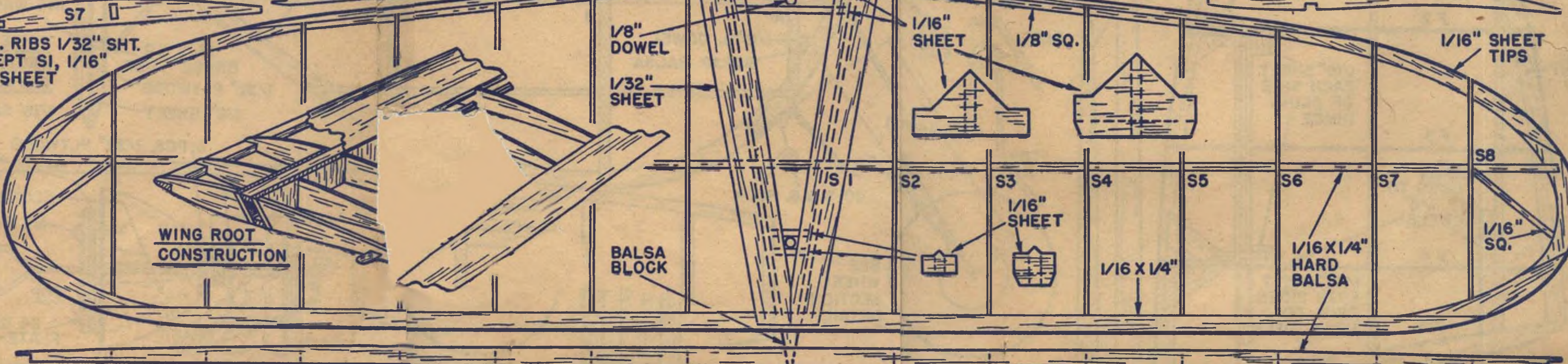
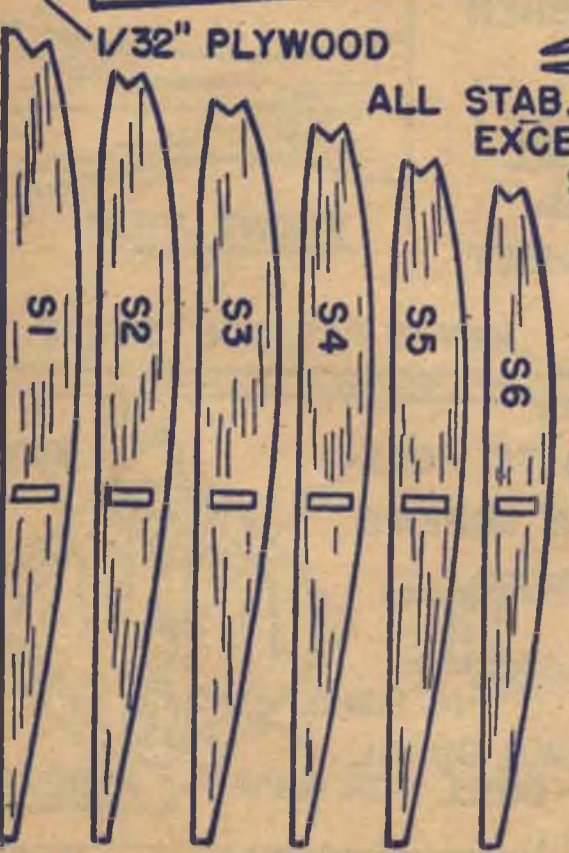
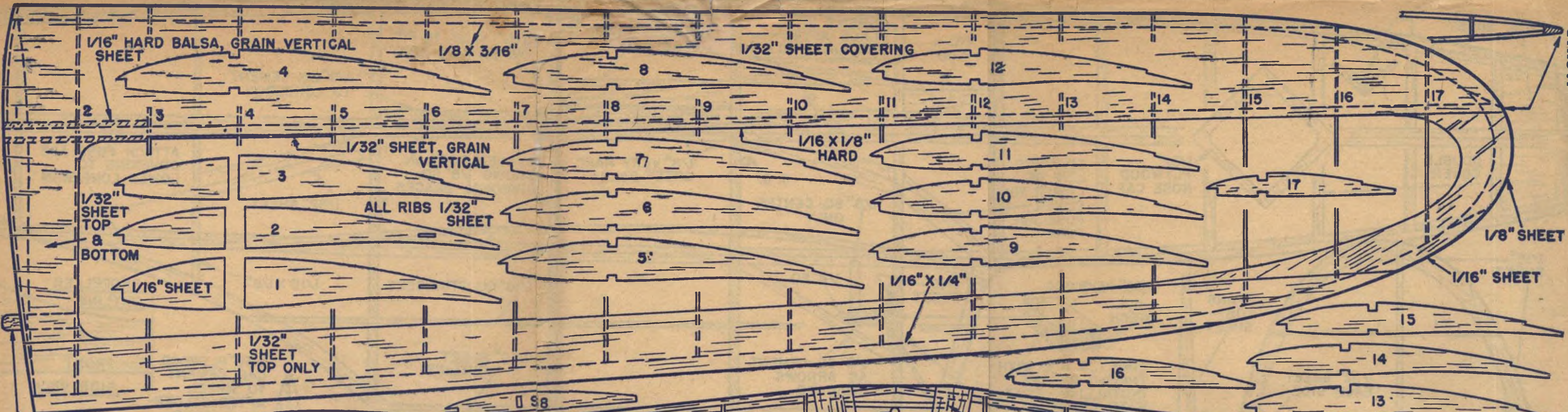
6. Because of the large number of entries anticipated, the editors cannot enter into correspondence concerning designs submitted.

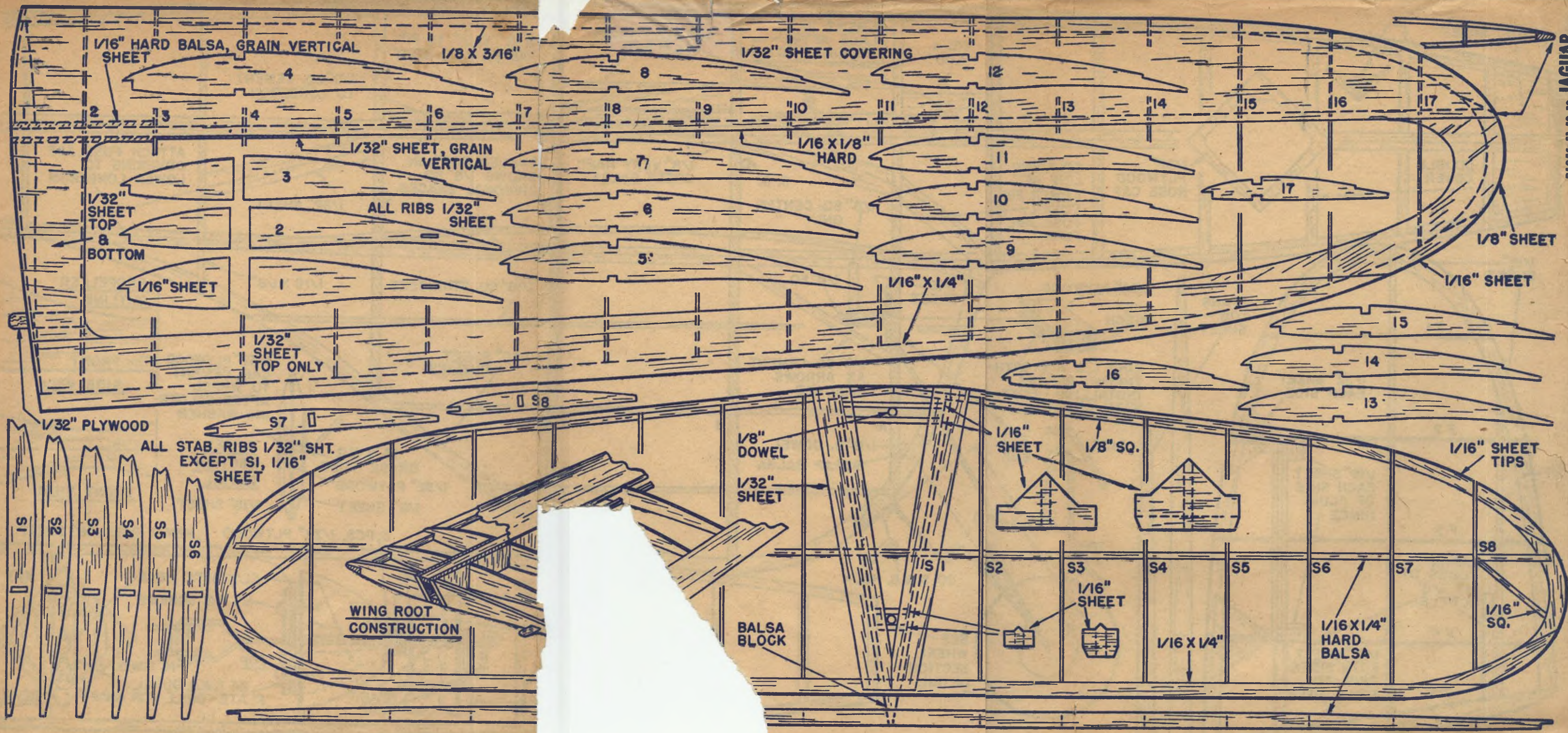
Designs may be of any type within the realm of reason: commercial aircraft, military planes—both small pursuit craft and large bombers and troop transports, planes for the private flyer and single-place sporting craft.

Entries will be designated as either professional or amateur. A professional entrant is one who earns his or her living or works part time in any of the many places of the full size aircraft business. Amateurs are all others including model builders, private pilots and the individual generally interested in aviation. Each entrant must classify himself. Additional data as to age, occupation or schooling, and aspirations will be welcomed.

The best entry each month will be prepared for publication by recognized aviation illustrators. An award of \$25.00 will be presented to the individual whose entry is judged by the editors as the most practical or of the greatest significance. Awards of \$5.00 will go to runners-up.

An annual trophy award will be made for the outstanding design of the year.





1/16" HARD Balsa, GRAIN VERTICAL SHEET

1/8 X 3/16"

1/32" SHEET COVERING

1/32" SHEET, GRAIN VERTICAL

1/16 X 1/8" HARD

1/32" SHEET TOP & BOTTOM

ALL RIBS 1/32" SHEET

1/16" SHEET

1/32" SHEET TOP ONLY

1/16" X 1/4"

1/8" SHEET

1/16" SHEET

1/32" PLYWOOD

ALL STAB. RIBS 1/32" SHT. EXCEPT S1, 1/16" SHEET

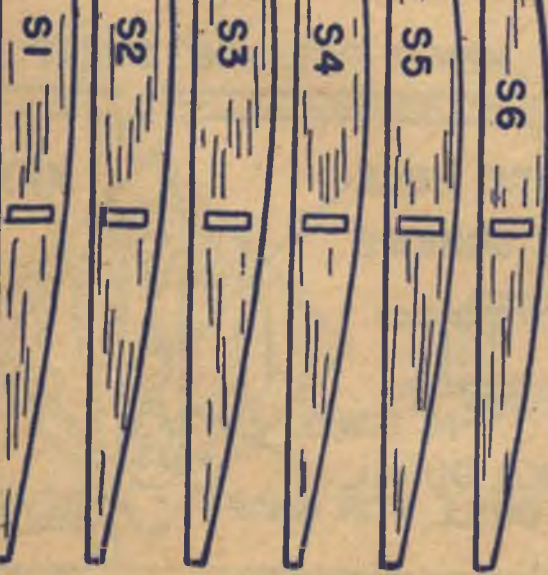
1/8" DOWEL

1/32" SHEET

1/16" SHEET

1/8" SQ.

1/16" SHEET TIPS



WING ROOT CONSTRUCTION

BALSA BLOCK

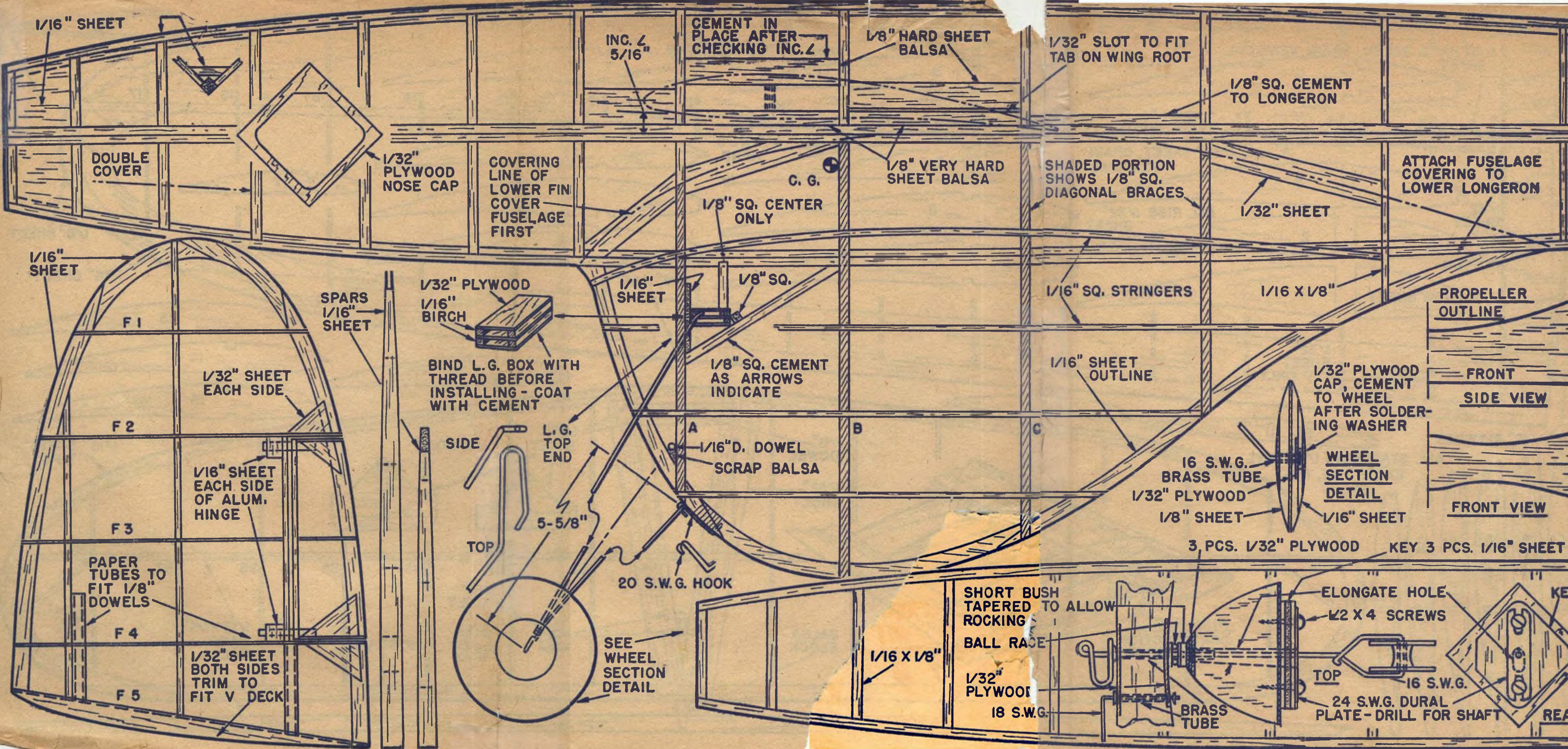
1/16" SHEET

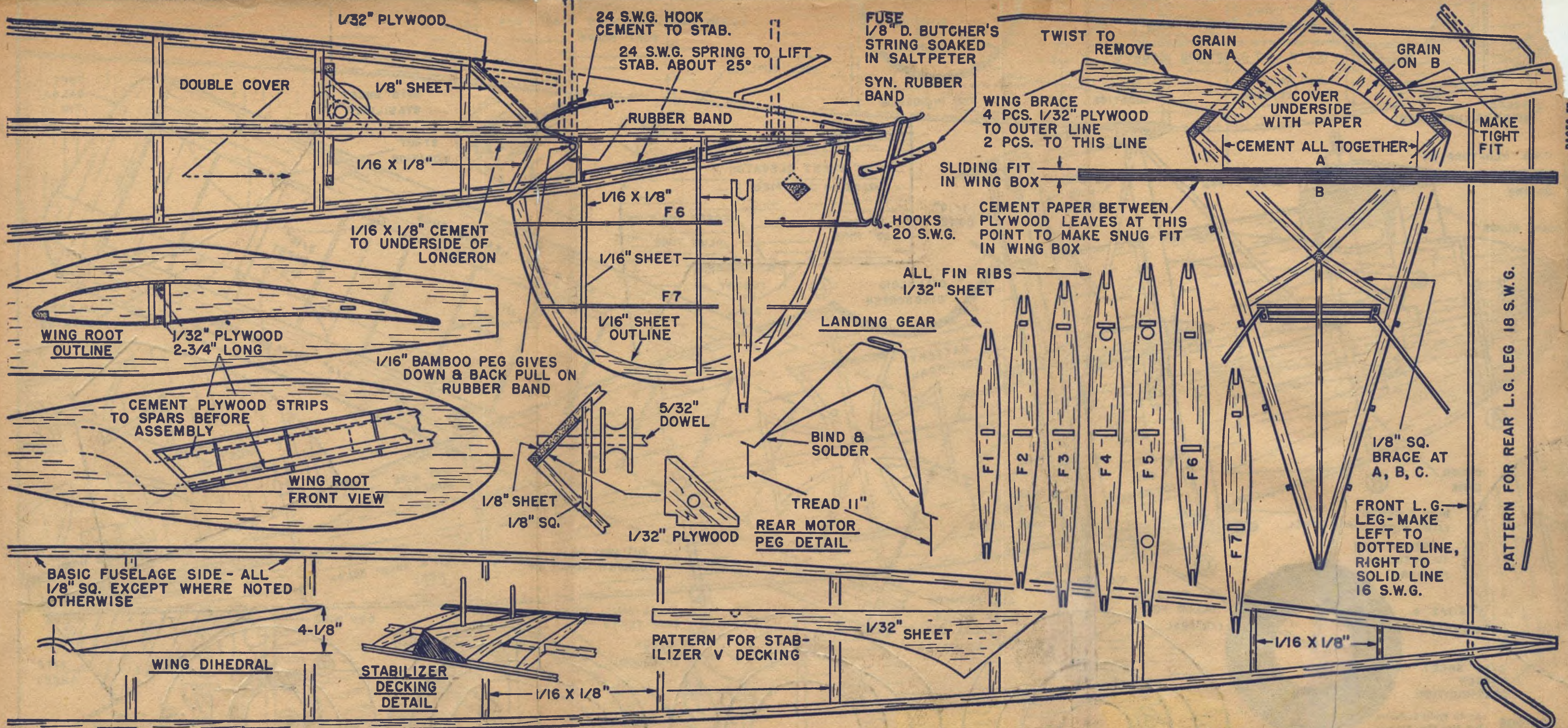
1/16 X 1/4"

1/16 X 1/4" HARD Balsa

1/16" SQ.







1/32" PLYWOOD

24 S.W.G. HOOK  
CEMENT TO STAB.

FUSE  
1/8" D. BUTCHER'S  
STRING SOAKED  
IN SALTPETER

24 S.W.G. SPRING TO LIFT  
STAB. ABOUT 25°

TWIST TO  
REMOVE

GRAIN  
ON A

GRAIN  
ON B

DOUBLE COVER

1/8" SHEET

RUBBER BAND

SYN. RUBBER  
BAND

WING BRACE  
4 PCS. 1/32" PLYWOOD  
TO OUTER LINE  
2 PCS. TO THIS LINE

COVER  
UNDERSIDE  
WITH PAPER

MAKE  
TIGHT  
FIT

1/16 X 1/8"

1/16 X 1/8"  
F6

SLIDING FIT  
IN WING BOX

←CEMENT ALL TOGETHER  
A

1/16 X 1/8" CEMENT  
TO UNDERSIDE OF  
LONGERON

1/16" SHEET

HOOKS  
20 S.W.G.

CEMENT PAPER BETWEEN  
PLYWOOD LEAVES AT THIS  
POINT TO MAKE SNUG FIT  
IN WING BOX

B

WING ROOT  
OUTLINE

1/32" PLYWOOD  
2-3/4" LONG

1/16" SHEET

ALL FIN RIBS  
1/32" SHEET

LANDING GEAR

1/16" BAMBOO PEG GIVES  
DOWN & BACK PULL ON  
RUBBER BAND

5/32" DOWEL

BIND &  
SOLDER

1/8" SQ.  
BRACE AT  
A, B, C.

CEMENT PLYWOOD STRIPS  
TO SPARS BEFORE  
ASSEMBLY

WING ROOT  
FRONT VIEW

1/8" SHEET  
1/8" SQ.

1/32" PLYWOOD

TREAD 11"  
REAR MOTOR  
PEG DETAIL

FRONT L.G.  
LEG- MAKE  
LEFT TO  
DOTTED LINE,  
RIGHT TO  
SOLID LINE  
16 S.W.G.

BASIC FUSELAGE SIDE - ALL  
1/8" SQ. EXCEPT WHERE NOTED  
OTHERWISE

4-1/8"

WING DIHEDRAL

STABILIZER  
DECKING  
DETAIL

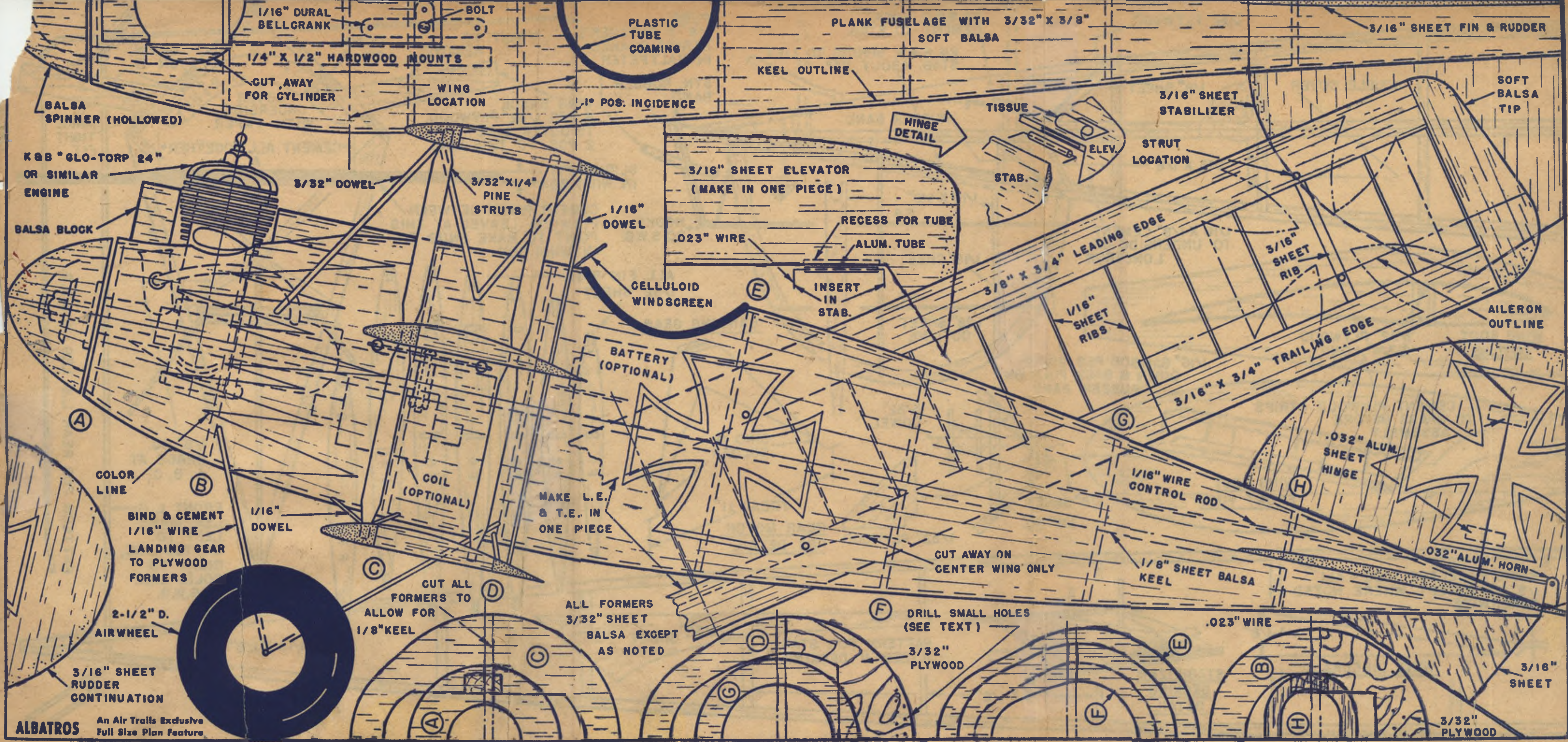
1/16 X 1/8"

PATTERN FOR STAB-  
ILIZER V DECKING

1/32" SHEET

1/16 X 1/8"

PATTERN FOR REAR L.G. LEG 18 S.W.G.



# Albatros Triplane



HERE'S A FAMOUS WORLD WAR I FIGHTER TO PLEASE THE MOST DISCRIMINATING CONTROL-LINE FLYING-SCALE FAN

BY WALTER A. MUSCIANO

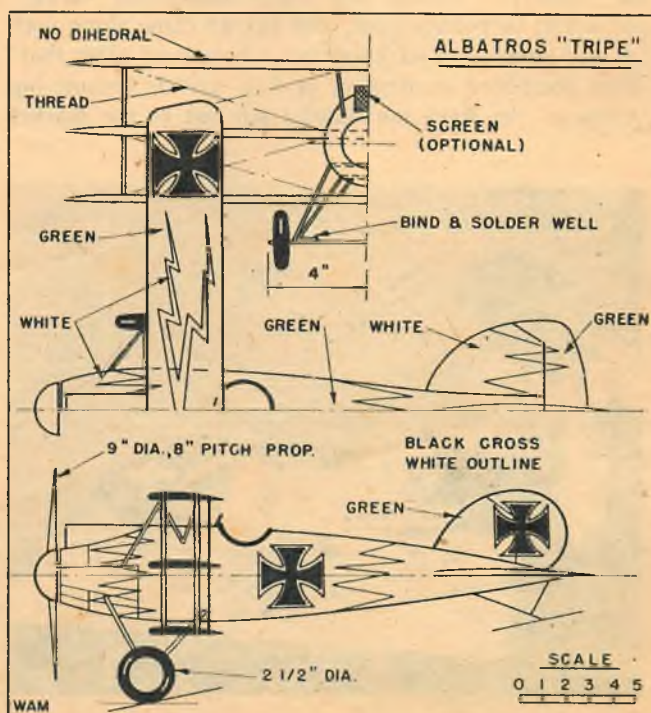
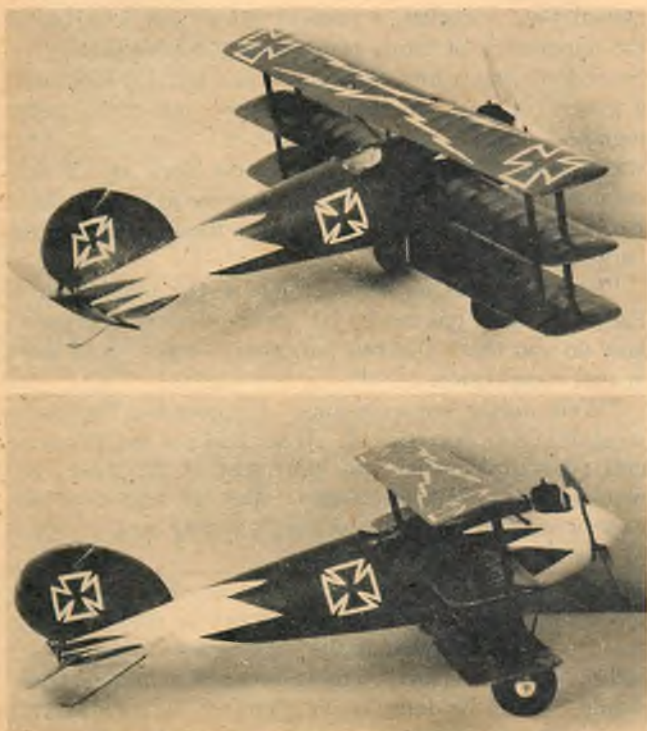
THE 1948 Nationals proved that modelers are showing a decided interest in control-line scale models. Copies of ships from the ancient strut and wire braced jobs to the latest sleek fighters made their appearance, but alas, the triplane was ignored. Why should the very mention of triplane make some model builders shudder?

This Albatros Triplane is the fourth 3-winger the author has built and flown, all successfully. Each plane handled with characteristics similar to biplanes. The extra work on that extra wing pays dividends in "glamorous" appearance and spectator interest, for a triplane always draws a crowd, especially when it flies.

This "bullet-nosed" scout plane caused more damage to the Allies in World War I than is generally known,

and French and English pilots were quick to admit that they respected this tiny product of the famous "Albatros Werke." Designed late in 1916, the plane was powered by a 160-hp Mercedes six-cylinder in-line liquid-cooled engine. This power plant produced speeds in excess of 136 mph—excellent for that period. The fuselage was of monocoque wood construction, a type of construction popularized in the much later Lockheed designs.

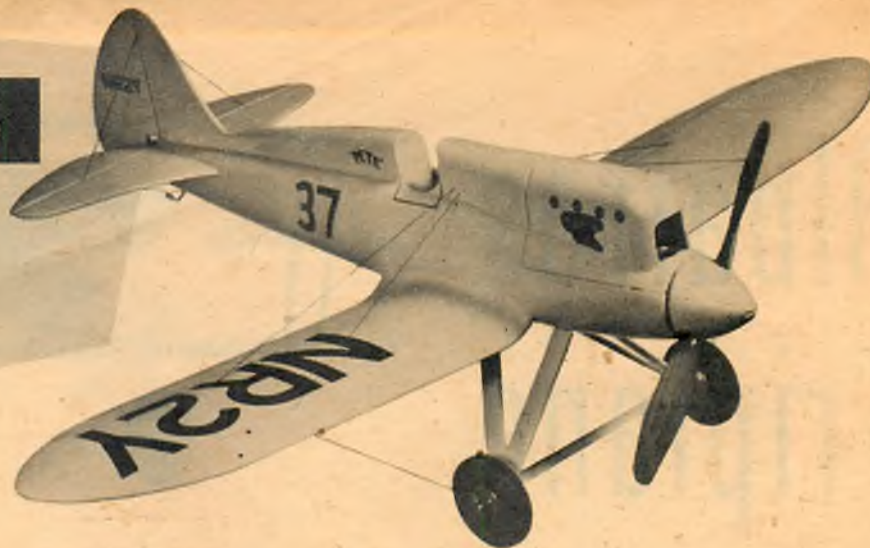
In spite of its fine record, it is said that the wings of this craft were not designed to withstand the strain produced by the speeds at which the plane could dive, thereby causing many accidents through loss of one or two of its wings during a high veloc- (Turn to page 80)





## Model of the Month

# STERLING PETE



**BEN HOWARD, HIMSELF WOULD HAVE A DIFFICULT TIME  
DISTINGUISHING BETWEEN THE BIG AND LITTLE PETE**

**S**TERLING Models, of Philadelphia, producers of the well known Howard Pete, is another of the rising generation of post-war model manufacturers whose perfectionist approach to kit design is warming the hearts of discriminating builders who know a good thing when they see it.

Selling at \$5.95, the Sterling Pete is convincingly accurate, even to the difficult-to-make-easy gull-wing. It is cleverly engineered, both from the standpoint of its carved parts and the features that make it easy to put together. It is a sturdy, good-looking airplane. Behind the Pete kit, and Sterling itself for that matter, is a unique story.

The model industry is almost as old as aviation itself, flying models having been on the market since a few years after the Wrights. After Lindbergh flew to Paris in 1927, kit manufacturers blossomed out all over the country. When, five years later, this "craze" seemed to be petering out, Bill Brown came along with his gas engine. You know what happened after that! With the added excitement of war, models became big business. In 1946 the bottom fell out of the market

as wartime merchandise, piling up on the dealers' shelves, backed up on some manufacturers with catastrophic results. This was the time Sterling decided to go into the kit manufacturing business. Even their best friends told them they were crazy!

"When I came out of the Army," Ed Manulkin, of Sterling, will tell you, "I had, for the first time since leaving school, the chance to do exactly what I pleased. I had always wanted to go into the model industry, but didn't know precisely where." Accepting a job with a large eastern distributor, Ed became sales manager within a month. During the following two years Manulkin soaked up information. What kind of merchandise did the distributor like to see? How about the dealers? And, most important of all, how about his lordship the balsa butcher?

Presiding over shipping and packing was a chap named Pete Timchal, a general stock man who knew the importance of filling orders and shipping promptly. Since Pete was a first class machinist and Ed had been a general aircraft mechanic, the two put their heads together. And so Sterling was born. Their first item was a portable, adjustable engine test block for all size engines. These mounts are still moving at a good rate. Encouraged with this initial success, the boys elected to barge into the kit field.

"Everyone told us we were out of our minds," says Ed. "So many gas model kits on the dealers' shelves—how do you think you can put others there? And look at that competition . . .!"

"Well, maybe we were nuts," Ed goes on, "but subsequent events bore us out. If we had put out the general type of kit that was prevalent at the time, we wouldn't be in business today. But we had excellent experience and could see several exciting new avenues of attack."

Both Ed and Pete arrived at this objective: their models must be prefabricated as much as possible. All the drudge work—that is the carving and hollowing of heavy blocks, the sort of thing you and I hate to do—would have to be done by the manu-

(Turn to page 72)



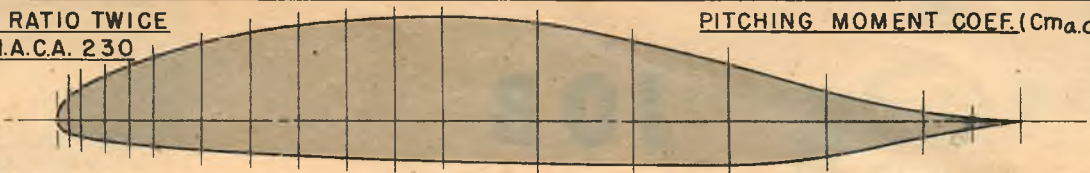
# FLYING WING AIRFOILS

## NACA "H" SERIES

BY ROBERT L. BROWN

LIFT-DRAG RATIO TWICE  
THAT OF N.A.C.A. 230  
SERIES

PITCHING MOMENT COEFF. ( $C_{m.a.c.}$ ) = .002

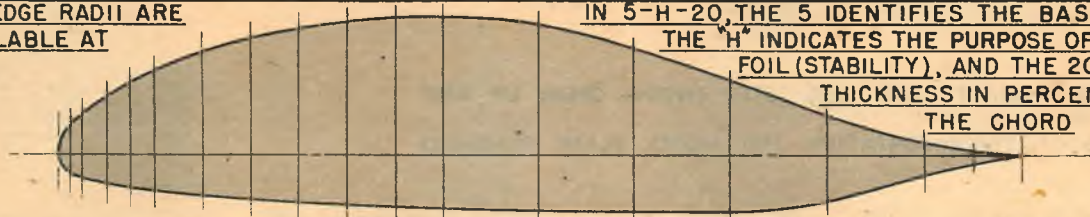


5-H-15

STA.	0	1.25	2.5	5	7.5	10	15	20	25	30	35	40	50	60	70	80	90	95	100
UPP'R. ORD.	0	2.3	3.2	4.6	5.7	6.5	8.0	9.1	9.8	10.3	10.6	10.8	10.1	8.3	5.9	3.1	1.0	0.4	0
L'WR. ORD.	0	-1.4	-1.8	-2.2	-2.4	-2.7	-3.1	-3.4	-3.6	-3.8	-4.0	-4.1	-4.3	-4.4	-4.4	-3.6	-1.6	-0.70	0

LEADING EDGE RADII ARE  
NOT AVAILABLE AT  
PRESENT

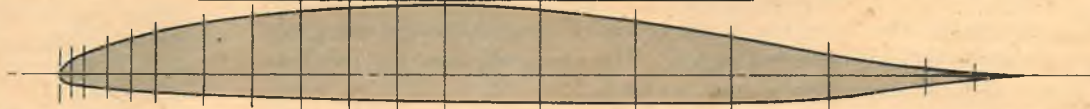
IN 5-H-20, THE 5 IDENTIFIES THE BASIC SHAPE,  
THE "H" INDICATES THE PURPOSE OF THE AIR-  
FOIL (STABILITY), AND THE 20 IS THE  
THICKNESS IN PERCENT OF  
THE CHORD



5-H-20

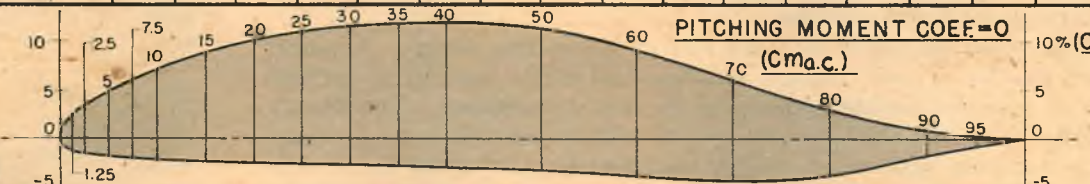
STA.	0	1.25	2.5	5	7.5	10	15	20	25	30	35	40	50	60	70	80	90	95	100
UPP'R. ORD.	0	3.1	4.3	6.1	7.6	8.7	10.7	12.1	13.1	13.7	14.1	14.4	13.5	11.1	7.9	4.1	1.3	.53	0
L'WR. ORD.	0	-1.9	-2.4	-2.9	-3.2	-3.6	-4.1	-4.5	-4.8	-5.0	-5.3	-5.5	-5.7	-5.9	-5.9	-4.8	-2.1	-.93	0

REF: N.A.C.A. REPORT C.B. NO. 3113 (L-452)



5-H-10

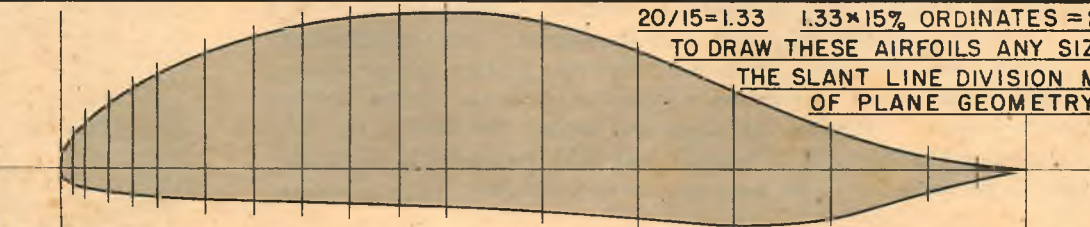
STA.	0	1.25	2.5	5	7.5	10	15	20	25	30	35	40	50	60	70	80	90	95	100
UPP'R. ORD.	0	1.5	2.1	3.1	3.8	4.3	5.3	6.1	6.5	6.9	7.1	7.2	6.7	5.5	3.9	2.0	.67	.27	0
L'WR. ORD.	0	-.93	-1.2	-1.5	-1.6	-1.8	-2.1	-2.3	-2.4	-2.5	-2.6	-2.7	-2.8	-2.9	-2.9	-2.4	-1.1	-.47	0



6-H-15

STA.	0	1.25	2.5	5	7.5	10	15	20	25	30	35	40	50	60	70	80	90	95	100
UPP'R. ORD.	0	2.5	3.5	5.0	6.2	7.2	9.0	10.1	11.0	11.6	11.9	12.1	11.3	9.1	6.0	3.1	.90	.40	0
L'WR. ORD.	0	-1.1	-1.4	-1.7	-1.9	-2.1	-2.3	-2.4	-2.5	-2.7	-2.8	-2.9	-3.2	-3.8	-4.3	-3.8	-1.7	-.80	0

20/15 = 1.33 1.33 \* 15% ORDINATES = 20% ORD.  
TO DRAW THESE AIRFOILS ANY SIZE, USE  
THE SLANT LINE DIVISION METHOD  
OF PLANE GEOMETRY



6-H-20

STA.	0	1.25	2.5	5	7.5	10	15	20	25	30	35	40	50	60	70	80	90	95	100
UPP'R. ORD.	0	3.3	4.7	6.7	8.3	9.6	12.0	13.5	14.7	15.5	15.9	16.1	15.1	12.1	8.0	4.1	1.2	.53	0
L'WR. ORD.	0	-1.5	-1.9	-2.3	-2.5	-2.8	-3.1	-3.2	-3.3	-3.6	-3.7	-3.9	-4.3	-5.1	-5.7	-5.1	-2.3	-1.1	0



6-H-10

STA.	0	1.25	2.5	5	7.5	10	15	20	25	30	35	40	50	60	70	80	90	95	100
UPP'R. ORD.	0	1.6	2.3	3.3	4.1	4.8	6.0	6.7	7.3	7.7	7.9	8.1	7.5	6.1	4.0	2.1	.60	.27	0
L'WR. ORD.	0	-.73	-.93	-1.1	-1.3	-1.4	-1.5	-1.6	-1.7	-1.8	-1.9	-1.9	-2.1	-2.5	-2.9	-2.5	-1.1	-.53	0

NOTE: ALL DIMENSIONS ARE IN PERCENTAGE OF THE CHORD





● Henry Struck and his "Jetex Job" glider.

# JETEX JOB

BY HENRY STRUCK

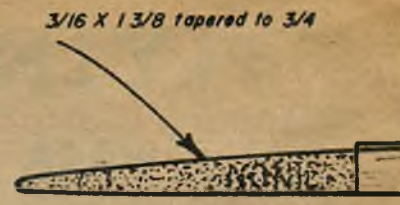
**THE NEW ENGLISH SOLID FUEL JETEX ENGINE OPENS UP NEW  
AVENUES OF EXPERIMENTATION FOR MODEL PLANE DESIGNERS**

ANYONE who has thrilled to the smooth, rushing flight of a jet fighter and longed for similar power for his models should find the new British Jetex units of special interest. The Jetex is actually a rocket-type engine, since the oxygen required to support combustion is contained within a solid fuel charge which is ignited within the container. There are no moving parts and only the lighting of a plastic fuse is necessary to set the "engine" in action. Considered quite safe in operation, the Jetex has a spring-loaded cover to permit the gases to escape should the jet exit become clogged. The fuel itself does not continue burning in the open air when lighted with a match.

Radically new and exciting designs are possible with this power supply. The reduction of drag assumes prime importance, as the ratio of the exhaust velocity to the model velocity determines the efficiency at which the motor is operating. Weight must be kept at a minimum, to permit the model to accelerate rapidly, without wasting the thrust available.

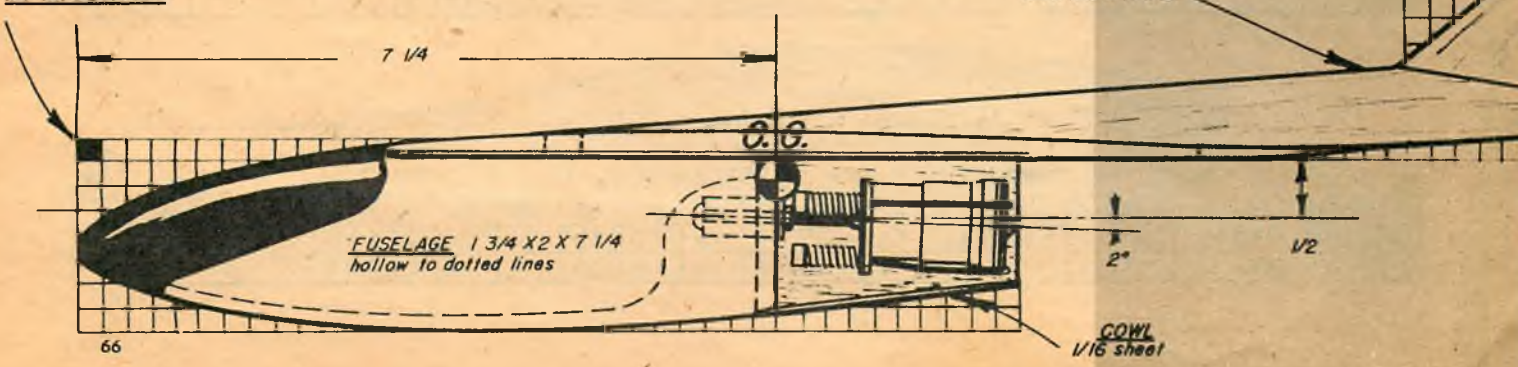
The Jetex unit fits neatly into the idea of a low-drag design. A pusher installation produces a sleek fuselage, with the small engine diameter of one inch fully cowled, provided cooling airflow over the unit is maintained. The absence of a propeller eliminates the long landing gear problem, as well as the breakage of propellers and the business of wearing one's fingers out twisting them. The lack of torque simplifies control, especially in tailless designs, while the constant and equal thrust obtained from each charge makes twin-engine types practical.

Only a few simple steps are necessary to operate the Jetex unit. Remove it from the model, where it may be mounted either on a single screw or in a spring clip—both of which are furnished with the engine. Snap off the cover and drop a charge into the case. Press the coiled plastic wick against the top of the charge with the disc of wire mesh (a supply of wicks and circular meshes comes with the engine). Replace the cover and replace the unit in the ship. Light the wick (with a cigarette or match) and hold the model in flight attitude. There is no need for haste since several seconds are (Turn to page 78)



**NO DIHEDRAL NECESSARY!**  
5° Sweepback = 1° Dihedral  
note droop wing Boeing XB-47

1/4 IN. SQUARES



TYPICAL WING SECTION - shape slots after assembly

RAISE trailing edge  
1/8 in. for trim angle

3/32 X 1 1/2

1/8

RIBS 1/16 X 1/4

FIT tail boom between  
1/4 sq. center ribs

BOTTOM surface  
1/16 sheet

3/8

9 1/4

PRONE PILOT POSITION  
color nose black to  
represent window area

7 SPACES  
at 1 1/2

COWL 1/16 sheet  
soak in hot water,  
wrap around 2 in.  
diam. until dry

3/8 X 1 DOWEL  
drill to fit JETEX mounting  
screw. Glue into drive fit  
hole in fuselage

JETEX 100  
JET POWER UNIT

8

3 1/4



# Record Riser

BY HARVEY S. ROBBERS

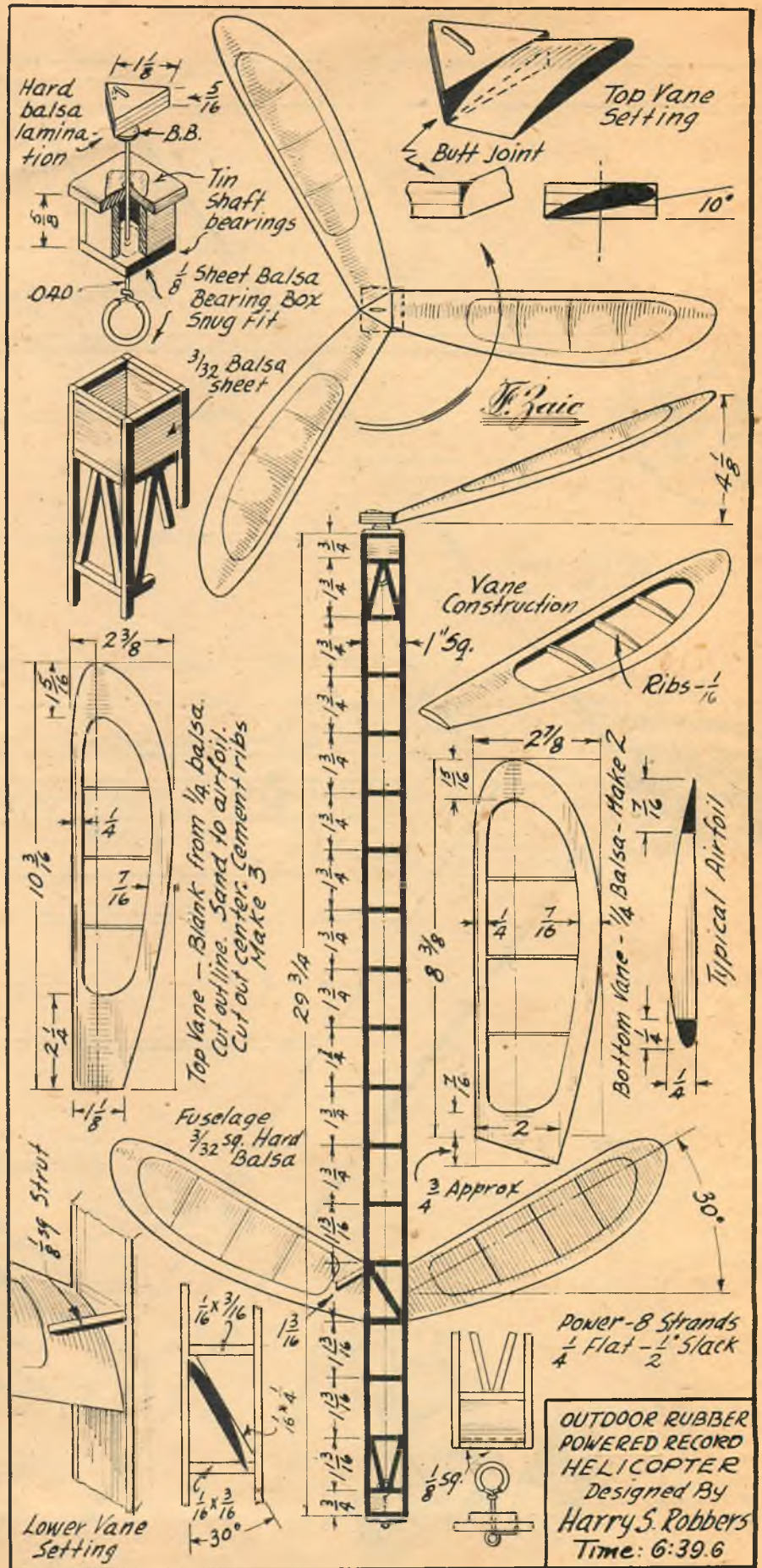
**W**HOOSH! Whirling vanes rapidly become a pin point in the sky as all the latent power of ten strands of rubber goes into the efforts of a helicopter getting as high as possible in the shortest length of time. It is a thrilling sight as this highly stable model passes rubber and gas-powered model planes with express-like speed. Simple to build, this helicopter affords a lot of pleasant flying, particularly in calm air when it will land within one hundred feet of the launching point.

Referring to the plans, the fuselage is a simple built-up square tube constructed of  $\frac{3}{32}$ " square hard balsa. Be sure that both nose block and tail block are snugly fitted. The nose block must fit for its full length so that the drive shaft is maintained concentric with the axis of the fuselage. Note also that the tail block incorporates a wire loop for winding the motor. Single-cover the fuselage with tissue, steam-shrink, and apply two coats of clear dope.

All vanes are to be cut from one-quarter sheet stock of light, fine-grained balsa. Sand in the airfoil before removing center section of the vane. After removing the center section insert the ribs. A simple trick is to cement in rectangular shaped ribs. Cut the center section which was removed and fit loosely between the ribs. Using these as a guide, sand the top of the ribs down to shape. Single-cover all the vanes with tissue, shrink, and apply two coats of clear dope. The hub for the revolving vanes is of veneered, hard balsa.

In assembling vanes be very careful that the angles noted in the (Turn to page 107)

● The author with record-holding 'copter.



# Announcing NEW LOW PRICES

ON

## *HERKIMER* "OK" MINATURE *ENGINES*

**NOW ONLY . . . . \$ 9<sup>95</sup>**

The famous "O. K." HOT HEAD, built to "take it," and to start at a flip of the prop

The record-breaking "O. K." BANTAM (champion of many contests) in a new, never-before-offered glow plug model

The "O. K." SUPER 60, ball-bearing equipped, with glow-plug ignition

All 3 models with glow plug, less tank

**NOW ONLY . . . . . \$ 11<sup>95</sup>**

The "O. K." BANTAM, champion Class A model

The "O. K." SUPER 29, quick-starting Class B model

The "O. K." SUPER 60, high-speed Class D model

Used chiefly for free-flight, these 3 spark ignition models are equipped with plug and gas tank at the surprisingly low price of only \$11.95.

### **ALSO PRICED ATTRACTIVELY LOW**

The "O. K." CO., pioneer compressed gas engine only \$ 4.95

The "O. K." TWIN, for radio control and experimental only \$49.00

See your dealer or write today for catalog and hook-up instructions

## **HERKIMER TOOL & MODEL WORKS, INC.**

132 HARTER STREET, HERKIMER, N. Y.

CANADA: Herkimer "OK" Engine Co., 511 Harman Bldg., Toronto

EXPORT: 120 Wall Street, New York 5, N.Y., (All cables: Concordia, N.Y.)

# ACCIDENT PREVENTION CODE FOR CLUBS

ACCIDENTS DON'T JUST HAPPEN—THEY ARE CAUSED,  
AS THIS INSURANCE EXPERT SO APTLY REMINDS US

BY C. D. CALKINS

**M**ANY model aircraft clubs have an insurance plan whereby Public Liability and Property Damage coverage is made available to members at a relatively low fee. It is obvious there are some hazards in this otherwise excellent and fascinating hobby or it would not be advisable to carry insurance protection. Just as important to individual members is the loss or destruction of their ships as a result of avoidable accidents.

In the accident prevention field, safety engineers have a saying, long since proven true, that "Accidents don't happen—they are caused!" This, too, holds true of model aircraft flying, the difference being that modeling is a spontaneous activity, done for diversion and pleasure, with the result that the average modeler doesn't have his mind on such unfortunate occurrences as accidents.

The need for such attention on the part of model clubs, and individuals as well, was rather graphically illustrated when in a single afternoon we saw seven ships washed out in control-line flying. Two of the planes disintegrated in a mid-air collision when one of the "pilots" moved into the other's flying circle. One ship struck another one on the ground as it was taxiing for the take-off, because the flyer and plane handler did not check their flying circle and move out to where they

were clear of the many planes on the ground. The fifth plane was wrecked when two pilots and their plane handlers overlapped their flying circles; just after taking off the plane struck the plane handler of the other pilot as he was standing watching his pal's ship struggle off the turf. A small boy wandered into the flying circle of the sixth plane just as it was coming in for a landing, and the impact neatly removed a wing, luckily with no injury to the youngster. The seventh plane was stepped on by a spectator, because there was no control over the on-lookers.

These, you must admit, are needless accidents, all preventable by a little organization, application of a few rules, proper use of facilities, proper training, and some control of the participants. The one fact to be remembered in the several collision cases is that it was mere chance there was no injury.

Model flying is an activity for both youngsters and grownups, and from a group standpoint it is almost always under at least the partial supervision of grownups. It appears, perhaps, that as grownups many of us are not properly fulfilling our places in one of the greatest combatant forces against juvenile delinquency if we don't see to it that our hobby is one safe enough for youngsters to participate in (Turn to page 88)



## TWIN-ENGINE TECHNIQUES

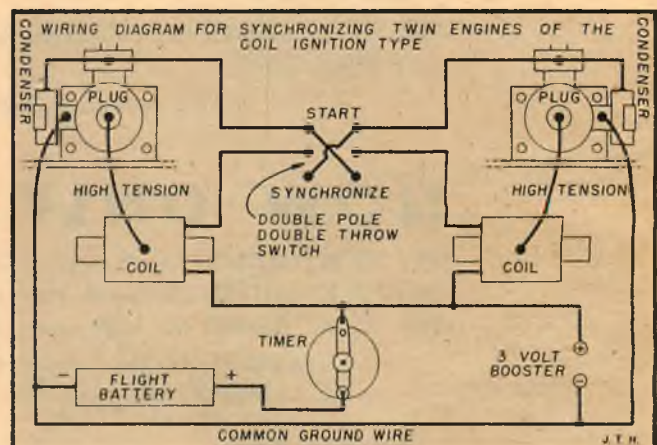
BY J. F. CONWAY

OPERATING MODELS POWERED BY TWO ENGINES ISN'T  
HARD IF YOU FOLLOW THE SYSTEM DESCRIBED HERE

**H**AVE you observed adventurous modelers with twin-engine ships who always seem to experience engine difficulties? If so, here is the answer to the essential problem of two engines in a free-flight or control-line plane. The diagram shows a positive means of two-engine synchronization. After many months of experimentation this wiring system proved to be the most reliable and economical means of synchronization. It is of extreme simplicity, but a few items require careful attention.

Twin-engined models for free-flight are rare indeed. The many single-engine free-flight concepts on thrust line, center of gravity and surface location differ greatly. But while the plane you build for free-flight will be experimental, you may be certain there is no danger of one engine stopping or slowing up.

The engines used should be of the same make, bore and stroke, to insure equal power output. Synchronization of the



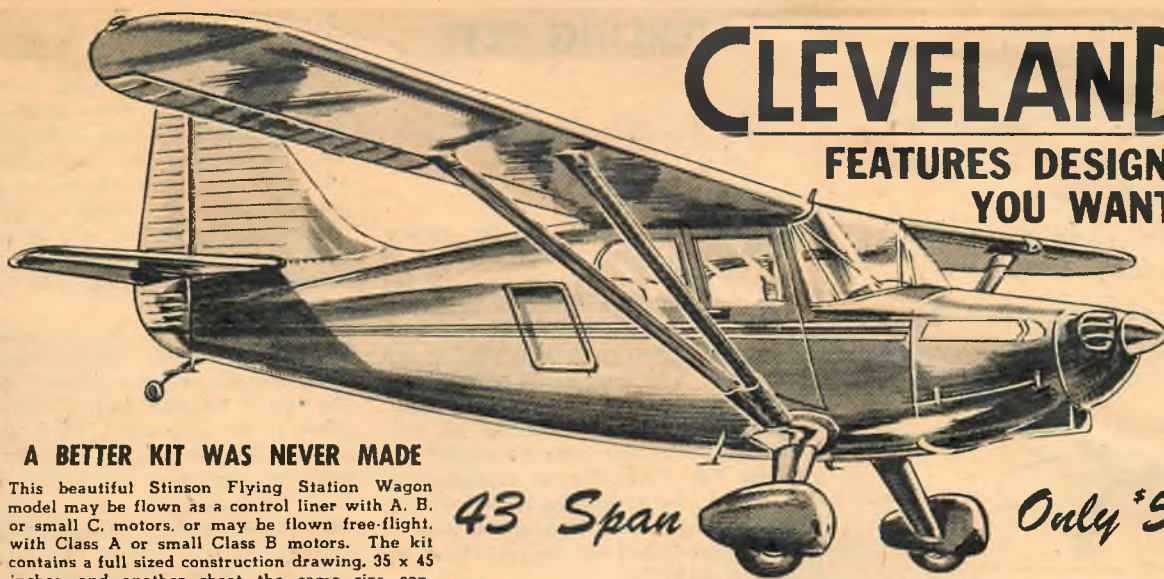
shaft rpm is what this system controls. Age difference is not important unless the maker has changed the engine design.

The propellers should be of the same diameter and pitch. Preferably, two machine-cut propellers by any one manufacturer will work nicely, for it is necessary that the thrust of the two-engine propeller combinations be equal. This prevents the tendency to turn caused by a difference in thrust.

If this system is used for tandem engines or control-line ships, generally the above two items may be disregarded. However, for a conventional configuration of a medium-bomber such as the B-25 or the Black Widow, the torque effects are important. This may be compensated for by a few degrees of down-thrust on the right hand engine. For counterclockwise rotation as viewed looking aft, the amount of down-thrust is directly dependent upon the propellers and distance (Turn to page 86)

# CLEVELAND

FEATURES DESIGNS  
YOU WANT!









## A BETTER KIT WAS NEVER MADE

This beautiful Stinson Flying Station Wagon model may be flown as a control liner with A. B. or small C. motors, or may be flown free-flight, with Class A or small Class B motors. The kit contains a full sized construction drawing, 35 x 45 inches, and another sheet the same size containing as much information regarding the full size airplane as could be crammed into it, including accurate data on the wing slots, full sized templates for laying out even the corrugations on the ailerons, flaps, rudder, fin, and elevators, etc. Many clear photographs of the prototype have been included in the assembly drawings. As a control line job, it is an outstanding performer that somehow almost gives you the thrill that comes only with free-flight models. In addition to ample and precise instructional material and plans, the kit contains many bandsawed parts, for the various curved assemblies, such as the wheel shoes (which are also routed out), the motor hood, stabilizer and elevators. This complete kit does not contain power unit, or dope and cement. GP-114 \$5.50

43 Span











Only \$5.50

## THE STINSON FLYING STATION WAGON

 REPUBLIC SEABEE Span 28" ... \$2.25	 LOCKHEED F-80 "20 1/2" SHOOTING STAR \$2.75	 BEECH BONANZA Span 25 1/2" ... \$1.50	 FOKKER D-7 Span 21 1/2" \$1.75
<b>"M" KITS—AIR-ISTOCRATS OF THE MODEL WORLD</b>			
They replace world-famous "SF" kits, but are exactly the same, except for the omission of liquids, and consequently lower price. Full sized plans with amazing detail, high grade selected material, and dependable, thorough, model engineering are featured in these beautiful kits. Though simple to build, they are the most realistic in the world, and when powered by rubber, C-O-2, or gas (when "briefed up", they make marvelous control liners)—they are hard to tell from the real thing in flight. Avoid imitations of these superb products of our 30 years of model designing and kit manufacture. Get the REAL THING.			
		 RYAN NAVION Span 25 1/2" \$1.75	 BAYLES' GEE-BEE Span 17 1/2" \$1.75



## POPULAR 30" SPAN, ONE DOLLAR SCALE FLYERS

These conveniently sized, popularly priced scale models are flight-engineered, and have won immense popularity wherever realism, flying ability, and low prices are sought. Their full sized plans are complete, easy to follow, and accurate. 30" span is ideal for rubber or C-O-2 motors, and for the ease with which they are built and flown.


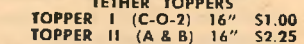
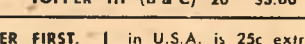
 AERONCA CHIEF	 GLOBE SWIFT	 STINSON VOYAGER
 BEECHCRAFT BONANZA	 FOKKER D-8	 F-80 SHOOTING STAR
 PIPER CUB	 LUSCOMBE SILHOUETTE	 ERCO ERCOUBE
<b>EA. \$1</b>		
 GRUMMAN PANTHER		

 THERMALIER 35" \$1.00	 FLEETSTER 32" \$1.25	 LANCER 32" \$1.00
--	---	--

**IMPORTANT NOTE:**  
The wide variety of designs in the C-D lines constantly changes to meet modelers' demands. Send a nickel (or two 3c stamps) for our current illustrated catalog.

 B-26 MARAUDER 48 3/4" \$9.50	 F-61 BLACK WIDOW 49 1/2" \$14.50
<b>BIG 3/4" SCALE SHIPS</b>	

**CONTEST AND SPORT ENDURANCE JOBS**  
These three endurance models are specifically designed for the tiny, powerful C-O-2 motor, but may be flown with rubber power. They all have great natural endurance. Our test models have flown out of sight repeatedly.

 TETHER TOPPERS TOPPER I (C-O-2) 16" \$1.00	 TOPPER II (A & B) 16" \$2.25	 TOPPER III (B & C) 20" \$3.00
---	--	---

 ALBATROSS 10 ft. \$4.00	 CONDOR 6 ft. \$1.00	 EAGLET 4 ft. 65c
<b>C-D GIANT SOARING GLIDERS</b>		
They Soar For Hours!		

**HOW TO ORDER:** SEE YOUR LOCAL HOBBY DEALER FIRST. HE HAS THESE MODELS AND OTHER CLEVELAND DESIGNS AS WELL. If you are then unable to get C-D's, do not accept substitutes or imitations, but order direct, including 25c for packing-postage. Minimum order \$1.00. No. C.O.D.'s. Special Delivery

in U.S.A. is 25c extra. (Ohio residents: add 3% sales tax). Military men stationed outside continental U.S., Possessions, Canadian and all foreign customers, add 20% for special handling, etc. in addition to 25c packing-postage charge.  
**SEND 5c or (2) 3c STAMPS FOR VERY LATEST ILLUSTRATED CATALOG**

CLEVELAND MODEL & SUPPLY CO., 4515B2 Lorain Ave., Cleveland 2, Ohio. World's Finest Models, Since 1919



## LOU ANDREWS

High scorer in stunt events  
1948 Internationals.

International Open Stunt  
Champion, 1948.

New England Open Stunt  
Champion, 1948.

Connecticut Open Stunt  
Champion, 1946-47-48.



### TRIXTER INVERT

Two Trixter Invert Juniors, 40" wingspan, powered with Ohlsson 23, were used in winning the Internationals.

The Trixter Invert Senior, 47" wingspan, powered with Atwood Champ, was used to win the New England title.

Both the Junior and Senior Inverts were used in winning the 1948 Connecticut title.



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This is the ideal control line model for the beginner and the sport flyer.

This model is excellent for exhibition stunt flying where two or more wish to fly together from the same circle. Kit A-B has 25" wingspan, Kit C 34" wing.

### TRIXTER INVERT & TRIXTER TRAINER KITS

Easy to build. Sturdy construction. Easy to fly. Ask your dealer for them.

LICENSED UNDER JIM WALKER U-CONTROL,  
UNITED STATES PATENT NO. 2,292,416.

PAUL K. GUILLOW  
WAKEFIELD, MASS.

## STERLING PETE

(Continued from page 64)

factorer. This went for the cutting of bulkheads, ribs, tail surfaces, and so on. Finished parts would have to fall into place without trimming or squeezing. Plans would have to be full size with plenty of isometrics showing step-by-step assembly. No secrets would be held back, even to that nifty finish you love to touch.

"We decided to concentrate on control-line scale—this being a natural," explains Ed. "No dihedral necessary, no weight needed to balance, no lengthening the landing gear. You could build a model that looked like the real thing and have it fly!"

First choice of the Sterling boys was that perennial favorite, the Monocoupe. This kit carried out all their objectives. From experience they knew, too, the value to the dealer of the properly attractive package, or "silent salesman," as it is called in the industry. Wire gears were accurately bent and so placed in the box as not to be forced out of shape. Sterling, believes Manulkin, was the first to put an aluminum cowling in a \$4.95 kit. Good balsa, gas model Silkspan, nice decals—everything they themselves would want in a kit if they were buying it. So it was no surprise to the partners when the Monocoupe kit was a success. And it is still going strong.

But as good as the Monocoupe was, the Howard Pete goes it a couple better. A survey of builders indicated a marked preference for this colorful, old-time racer. Many conferences followed, some of them into the wee hours of the morning. Pete (the airplane, not the partner!) was a far more intricate deal than the Monocoupe, if it was to be produced with the same goal in mind.

With Pete (Timchal, that is!), Bill Hawkes, the designer, and Ed mulling over design and engineering, it was six months before things looked right. Once Bill Hawkes woke in the night and quickly scribbled down the simple solution to the difficult gull-wing problem. Early the next morning the three went into a huddle and found the idea good. The first big decision was to carve the fuselage; a step that eats up lumber and adds to manufacturing cost, for you can't steal on outside dimensions in scale. Not only was the fuselage carved to outside dimensions, but it was hollowed out, leaving the walls just the right thickness for lightness and strength.

Some of the design features are highly ingenious. There is a unique system for adapting the engine mounts to Class B, C, or D engines. Because the scale struts of the landing gear intersected the fuselage too close together in the front view to permit a strong bond with conventional attachment, the boys came up with a method of mounting two separate wheel axles in the fuselage. They did this with a foolproof gimmick and provided simple

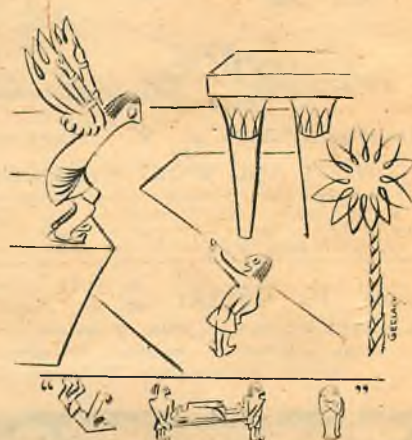
shock absorbing features as well. Key bulkheads and plywood pieces that mount the gear and carry the wing panels fall nicely into notches provided in the blocks. Top and bottom fuselage shells fit snugly onto the crutch. By placing the coil and other equipment where it could be reached under the engine streamlined cowling, and by the use of a split engine cowl that permits access to the engine, Sterling was able to build their fuselage into a one-piece unit.

Hawkes' solution of the gull-wing headache involved cutting chordwise notches of the proper depth and width in the tops of the wide leading and trailing edges at the wing root. Three plywood joiners are built into the fuselage, fitting into the accurately cut notches in the lower fuselage shell: one at the trailing edge to glue flush to its forward surface, another similarly located to glue to the rear face of the leading edge, and the third to run along the rear face of the main spar. With the fore and aft cuts in the wing leading and trailing edges, it is a simple matter to bend the edges up to match the contours of the plywood joiners, and to glue the butt end of the edges to the fuselage.

Meticulous attention to detail makes the Pete kit impressive. The turtle back is carved, as are the wing leading and trailing edges. A scale spinner was made. Builders report that the ship can be assembled in four evenings. For finishing, four coats of clear dope are brushed on, followed by four of Duco automobile primer, sanded smooth with 400 wet-or-dry paper with water. Top finish is four coats of lacquer, preferably sprayed on and hand-rubbed with super-fine compound.

The Sterling Pete makes up into a good looking airplane. An upright engine permits full cowling and use of .29 maximum displacement engines would qualify the Pete for those West Coast semi-scale races—even if Pete is actual scale. The finished airplane is reported to handle nicely. Both the Monocoupe and Pete are excellent subjects for beauty and scale events.

Sterling did not skimp on the plans which are as large as many large free-flight model plans. Sketches detail the wing, fuselage, tail, final assembly, and many other fine points.





**PAUL MANTZ**  
**Ace Flyer and Hobbyist**  
**says:**  
**"Fellows, the new**  
**McCoy 19 is really**  
**a terrific engine"**

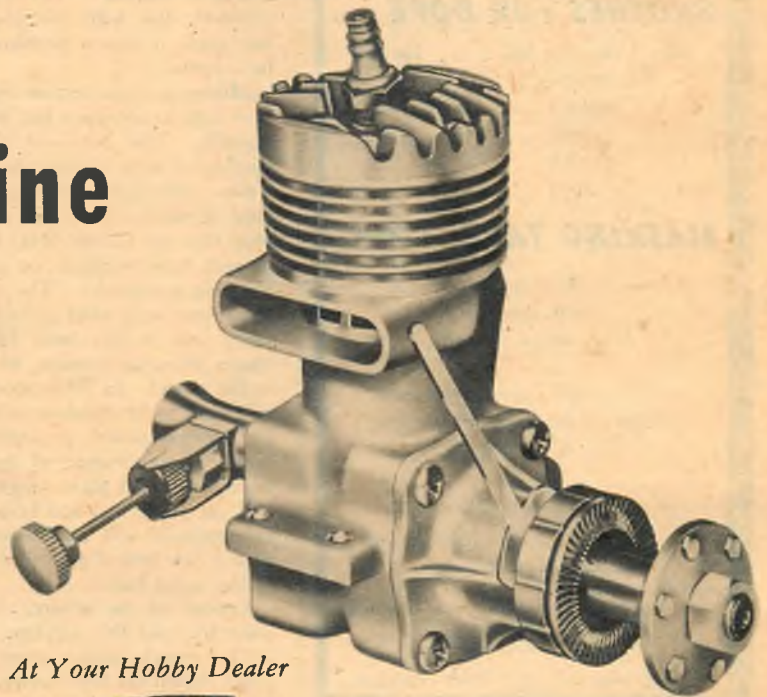
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## JOHN E. CLEMENS

2114 Greenville Ave.  
DALLAS 6, TEXAS

# GOODYEAR ROUND UP

(Continued from page 36)

very broad, low-aspect ratio wing, and a high cockpit enclosure.

The Foss ship was noted for its high set horizontal tail, which kept it well out of the wing wake. A very neat design, but unfortunately it was lacking in speed, coming in seventh in the consolation race at an average speed of 125 mph.

Very simple and straightforward was No. 42—the Leighnor Special, from Wichita, Kan., designed by the aeronautical class of the University of Wichita. It had a welded tubing fuselage, fabric-covered. The wing was wood structure, covered with plywood.

The hump-backed Falck Special, No. 92, featured an all-metal wing with sweptback leading edge and straight trailing edge, single-piece elevator. Shallow main fuselage construction necessitated the superstructure which gave the plane the hump-backed feature. Pilot sat so high in his cockpit that the toes of his shoes could be seen through the plexiglas

windshield.

The most interesting plane featured here, in our consideration, is the Long LA-1. Its designer and pilot, David E. Long, is chief engineer of Piper Aircraft Corp., Lock Haven, Pa. The "P-Shooter" was an all-metal low-wing monoplane featuring a laminar flow type airfoil. Taking into consideration its designer's affiliation and experience, the little plane would make an excellent private sport job. It had the substantiality of a private plane and performance of a racer. It may be remembered that soon after V-J day there was quite a bit of talk among various manufacturers about putting on the market a single-place, low-powered, high-performance plane for pilots with sporting blood. Several were brought out but were not successful. We believe there is a limited market for such a plane, just as among sporting motorists there is a demand for sport cars. The LA-1 would certainly fill the bill.

## COSMIC RAVE I

(Continued from page 47)

with its 1,000 square inches of high lift, and comparatively high-drag wing has a wonderful glide that will utilize even the slightest thermal. The climb was the problem, and with the 15-second motor run used, it was a problem that had to be solved.

Minimum cross-section was used which does help to a degree, but this was hardly enough. The foremost factor of the climb of a large airplane lies in the longitudinal fuselage moments, especially the nose moment. You will notice immediately that the Cosmic Rave has one of the longest nose moments on a modern fast climbing gas model. The long nose moment has been used in my designs for years and it has been found that the longer the nose moment, the more inertia in the model. In other words, the model will hold to its climbing course, and utilize far less power to combat the inertia found in an airplane at the start of its flight. This in plain language means it will get going fast and keep going. This arrangement will also assure a pull-out with a few feet of gained altitude, instead of the usual loss.

Enough of the lecture. If you fellows want to build this airplane, here's how.

The crutch tapers from 3" wide at point shown on top fuselage view to V-shape as shown at aft end on fuselage top view. After you have scaled the plans to their full working size, start the fuselage by building the crutch of 3/16" x 1" for long lengths and 3/8" x 1" for cross

braces, directly upon the plans. While this is drying cut the top keels from 1/8" hard sheet and the top few formers from the type of sheet balsa indicated.

Now cement the top keels directly to the crutch while it is still on the plans. Next the top triangular gussets—one against each side of the keel behind the firewall, one set in front of the wing platform and one set behind the wing platform—the 3/16" x 3/8" side braces and the 1/4" sheet formers "X" are cemented in place.

While this whole assembly is drying, the 1/4" plywood firewall can be cut to shape. Don't forget to notch the firewall for the engine mounts.

Remove the top fuselage assembly, when dry, and securely cement the firewall in place. This operation will be eased if small "C" clamps are used.

While the firewall is drying, cut the vertical bottom keel, making sure that you use a hard sheet of *unwarped* straight grained balsa. Cement this keel to the fuselage after the firewall has dried, by attaching the front of the keel to the firewall, and the rear to the rear of the fuselage crutch cross braces—line up by eye. The bottom capstrip of medium hard balsa is cemented directly to the bottom of the lower vertical keel. Hold in place with pins.

The main fuselage side braces of hard 3/16" x 3/8" are cemented in their indicated position from the crutch to the bottom vertical keel and capstrip. The

# COMET



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engine mounts are cemented into the notches on the firewall, and to the inside of the crutch.

Bend the landing gear as shown on plans, making sure to use a sponge rubber wheel because once the gear is attached to the airplane, the wheel *cannot be removed*. Attach the landing gear to the firewall by drilling  $\frac{3}{32}$ " holes, and using "J" bolts as fasteners.

The battery box which uses a plug-in type battery that cannot vibrate, is cemented directly to the back of the firewall and can now be attached with the rest of the ignition. Enough can never be said about the importance of a "solid" ignition system. However, allow me to point out the fact that in this airplane the ignition system is not accessible, except by cutting the covering. This means that you must make it good the first time.

Use heavy stranded, well-insulated wire, and cover all the solder joints with neoprene rubber tubing. Remember, the reliability of the airplane depends greatly upon its engine operating at peak performance and that a chain is only as strong as its weakest link. Don't make a poor ignition system your weakest link.

The fuselage should be given three coats of cement at all wood joints. Finish by sanding well. It is advisable to cover the fuselage with silk or nylon, and to dope at least ten coats of clear and two of color. If Silkspan is used, three coats of clear, and two of color should be applied.

The tail surfaces are almost self explanatory in the plans. Be sure to use hard, unwarping balsa for the spars and leading edges. Medium hard should be used for the ribs, and outline edges. Build the surfaces strong and true, so that warpage will be at a minimum. Cover the tail surfaces with Silkspan, and clear dope four times. Do not use colored dope on these or the wing surfaces, as weight will be increased excessively. For visibility and appearance it is suggested that you use dyed Silkspan. Tintex will do nicely.

The wing of the Cosmic Rave, as with any other high-performance airplane, should be constructed with the utmost of care and perfection. The airfoil section should be accurately traced to plywood or sheet metal template, and this template should be used to draw the section onto the medium hard balsa ribs. Sand all the main ribs at the same time by holding them together with pins or a "C" clamp. Lightening holes are used on the tip ribs as indicated.

Select good hard straight-grained balsa for the spars, leading and trailing edges. Start the construction of the wing by pinning the rear bottom spar in place on the plans. Next pin all the trailing edges in place. Slip the ribs onto the spar and trailing edge and cement in place. Now cement the top front spar and the leading edge to the ribs. When all the sections are dried, remove from the plans and cement the front bottom spar into place.

Cut the dihedral gussets from hard balsa and plywood at an angle indicated

by the front dihedral view. First join the two tip sections to the center sections, blocking up the tips to the proper dihedral angle. Next join the two halves at the center section with the plywood and balsa gussets, and allow to dry overnight. "C" clamps will also come in handy at these gusset joints. Note the  $\frac{1}{16}$ " sheet spar braces which prevent warpage from longitudinal sheer strains. Finish the wing by covering the center section with medium  $\frac{1}{16}$ " sheet balsa.

Sand the wing smooth and remove every nick and glue drop. Silkspan is the recommended wing covering with four coats of clear dope, and no colored dope.

The engine is mounted with no down-thrust or sidethrust. Remember that with the extra long nose moment of the Cosmic Rave there is a decided torque effect that is desired. The rudder is offset to the right (all adjustments are given when looking from the rear of the airplane towards the nose) to counteract the torque while under power and produce right circle in the glide. On some airplanes a little wash-in on the tip of the left wing may be required to help the rudder, especially during the glide. The Cosmic Rave should climb to the left under power, and glide to the right. Start testing with medium power, and increase gradually, while offsetting the rudder to the right with each increase in power as needed. With engines heavier than the Super Cyclone, some positive incidence in the wing, and negative in the elevator may be required. On calm days a little negative incidence (about  $\frac{1}{16}$ " ) in the elevator will produce a very flat thermal-seeking glide.

This airplane is one of the easiest to adjust that I have ever flown. The first official flight at the Nationals was its maiden flight, and this was made during 28 mph winds. Yes, the Cosmic Rave flew and won right off the work-table.

The same design was built as a .299 airplane using a length of 36" and span of 50" with a wing area of 480 sq. in. It performed well, including a 35-minute out-of-sight test flight on 10-second engine run at the Olathe Nationals. Although it has not been tried, it is believed that the Cosmic Rave would perform excellently using 350 sq. in. for .199 engines, and using 250 sq. in. for .09 engines—each ship proportionately smaller than the original.

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- Page 63—Michael

## AERONCA C-3

(Continued from page 41)

mounts are glued solidly to this former and allowed to dry. Notch the hardwood top fuselage stringer so the wing spars and trailing edge can seat properly; cement in place.

The next step is to get a rag and soak it in hot water. Partially wring it out and rub onto the outside of the fuselage sides from former #2 forward. This makes for much easier bending when gluing former #1 to the sides. The bottom of the fuselage is covered with  $\frac{3}{32}$ " sheet with the grain running crosswise. Don't forget the two  $\frac{1}{8}$ " dowels between formers #1 and #2. The landing gear is bent and mounted to the fuselage. Form the wing-fuselage brace from  $\frac{1}{16}$ " dia. wire and mount securely to former #1.

Cut the tail surfaces from  $\frac{1}{8}$ " soft quarter-grained stock. The shaped elevators are joined together with the  $\frac{1}{8}$ " x  $\frac{1}{4}$ " hardwood strip. Cover the tail surfaces with white tissue or Silkspan and set these surfaces under magazines over night so they won't warp. Use fairly heavy brass sheet for the elevator horn; solder the small reinforcement to it. Cloth hinges may be used if desired, though the metal ones are stronger and look neater. The stabilizer is now cemented to the fuselage.

Bend cabane strut from  $\frac{1}{16}$ " dia. wire and mount to former #2. The bellcrank is bolted to the top fuselage stringer and the push rod is connected to the elevator horn.

The cowl is next and requires some large balsa blocks. If possible, bandsaw these to outline shape then fit the two top ones to the motor mounts and temporarily cement in place. Do the same to the bottom block. Now completely shape the cowl using a knife and finishing with sandpaper. Separate the blocks and hollow out the lower one only. When mounting the motor use lock washers because you won't be able to get at the bolts to tighten them once the cowl is in place. Be sure that the tank is perfectly level with the needle valve so the motor will run well inverted. Fit the two upper cowl sections around the motor and tank, and glue securely.

Build the wing in two separate sections using hard spar stock. All the wing ribs are of  $\frac{1}{16}$ " sheet—preferably hard for the four center ones. Slip the tips in place and sand to shape. The two completed sections are joined together by the plywood gussets using  $1\frac{1}{8}$ " dihedral under each tip. Add the aluminum tubing lengths through which the flying wires will pass. Be sure to add the three-quarter ounce weight in the outboard wing tip to balance the weight of the flying wires. Dope the center section of the wing which will be visible, and cover with celluloid.

Apply double layers of Silkspan to the fuselage and a single layer over the cowl. Cover the wing with a single layer and clear-dope the complete ship. Our model

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**THE MEGOW CORP**

PHILADELPHIA 22, PA.

was colored dark red and cream with black separation stripes making a very classy color scheme. To make the dark red, mix about a fifty-fifty mixture of maroon and vermilion. After the model has been completely colored and the license numbers painted, spray on a coat of Aero Gloss clear or acetate-butylate dope to fuel-proof your finish. These finishes will not stop the regular glow fuels containing nitromethane but most motors will put out a reasonably good amount of power on straight alcohol, amyl acetate and castor mixes—so use them.

Now that the ship is doped it is time to assemble the wing to the fuselage. Open the cabane strut at the front slightly and slip the wing in place. Wrap and solder the cabane strut to the wing-fuselage brace. Take some regular .015" cable and solder one end to the brass tubing which connects with the landing gear at the nose. Then run it through the aluminum tubing at the wing leading edge and from there up to the brass tube in the cabane strut where it is soldered, then through the other wing and back to where it started—pull tight and solder. Proceed with the wiring by checking with the drawings and photos. **Warning:** Do not substitute the regular single strand steel flying wire for the cable because it will crystallize and break from vibration while flying.

Before taking your new ship out to fly for the first time check for the location of the center of gravity. The model will fly nicely with the balance point within half an inch either way of the point shown on the plans. Of course the further forward or aft the c.g. is, the trickier she will be to fly.

## JETEX JOB

(Continued from page 66)

necessary for the fuel to generate full pressure. This moment is indicated by a steady hissing sound, and model is launched.

No batteries, props, cranking or pumping. No fuel dripping off your elbow. No screaming and roaring.

The ship illustrated was designed to test the ability of the Jetex unit, rather than to achieve the ultimate in performance. It is built to nearly the maximum weight of 3 ounces specified by the engine manufacturer. Sensitive to the slightest adjustment it has turned in many excellent flights. Upon being launched in the conventional manner—not hurled into the air—the model gathers speed steadily and climbs swiftly throughout the engine run of 20 seconds. The compact design can absorb much punishment without damage and is extremely simple to construct.

The wing is built first. It is a straight taper with 37° of sweepback, which is the equivalent of about 7° of dihedral. Lay out the planform on a flat surface to the dimensions given on the drawings. Mark off the tips in 1/4" squares and plot the



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outline. Shape the leading edges from a pair of soft balsa strips  $\frac{3}{16}$ " x  $1\frac{3}{8}$ " at the center, tapered to  $\frac{3}{4}$ " at the tip. Bevel the trailing edges from  $\frac{3}{32}$ " x  $1\frac{1}{2}$ " soft balsa. Pin the strips to the plan, blocking up the trailing edge  $\frac{1}{8}$ ". The extension merely attaches the tail surfaces to the wing. Longitudinal stability cannot be achieved in any design without an angle of trim to handle the pitching of the wing. Fit the tips of  $\frac{3}{16}$ " sheet and the ribs of  $\frac{1}{16}$ " x  $\frac{1}{4}$ " slats. Reinforce the leading edge joint with a block of  $\frac{3}{16}$ " sheet and install the center ribs of  $\frac{1}{4}$ " square stock. Remove the wing from the plan and blend the rib slats to the leading and trailing edges with knife and sandpaper. Fill in the center of the wing on the bottom surface with  $\frac{1}{16}$ " sheet to support the fuselage.

Select a soft block of balsa  $1\frac{3}{4}$ " x 2" x  $7\frac{1}{4}$ " for the fuselage. Lay out the top and side views on the block using the  $\frac{1}{4}$ " squares to obtain the necessary dimensions. Shape the fuselage from a flat topped section under the wing, to a rounded section at the nose. Hollow out the block to a thickness of about  $\frac{3}{8}$ ", leaving the nose and tail ends about 1" thick. A gouge will make light work of the job of scooping out the fuselage. Drill a 1" length of  $\frac{3}{8}$ " dowel and insert the Jetex mounting screw, locking it tightly with a nut. Drill or carve an  $1\frac{1}{32}$ " hole in the rear of the fuselage and drive the dowel into it with plenty of cement or "Weldwood" glue. Cement the fuselage to the bottom of the wing. Shape the tail boom to a triangular section of  $\frac{1}{4}$ " x  $\frac{7}{8}$ " x  $\frac{1}{2}$ " medium balsa, fitting the forward portion between the center ribs. Cut the fin from  $\frac{1}{16}$ " sheet balsa and cement it to the tail boom.

Sand the entire ship carefully to remove any bumps that might spoil the finish. Apply a couple of coats of clear dope and sand smooth. Cover the wing with light tissue, spray with water and dope when dry. Screw the Jetex unit in place and balance the model. Add ballast to the nose if necessary to bring the C.G.  $7\frac{1}{4}$ " from the front.

Glide the model, launching it smartly. Adjust any tendency to stall by bending down the trailing edge, or to dive by bending up the trailing edge. Spiralling can be controlled by bending up the trailing edge of the wing tip on the outside of the turn. To correct a left spiral bend up the right tip, and vice versa. Only a slight amount of adjustment is required, due to the high speed and the sensitivity of the controls. Make the first flights with the solid fuel charges sawed in half, making further adjustments to the trailing edge if necessary to obtain a wide climbing circle. When the model is flying smoothly under full charge, a cowl formed of  $\frac{1}{16}$ " sheet can be fitted around the engine to improve the appearance. By looking into the cowl from the front through the air scoops, the end of the mounting screw may be observed while engaging the motor unit.

Without the usual elaborate process required to install the power plant, the Jetex may be quickly shifted from one model to another.

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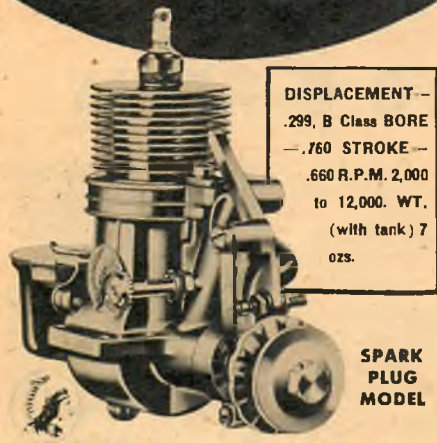
Stroboscope sequence shows vertical approach balloon bursting





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# ALBATROS

(Continued from page 63)

ity dive. But then you can't have everything! Unlike its big brother, the model "Tripe" can take abuse.

In model form the Albatros leaves little to be desired as a moderately fast sport job or scale entree. The 235 square inches of total projected wing area provide enough surface for loops. Construction is very simple. Even the planked fuselage goes together with a minimum of effort. The three wings are identical except for the slight cut in the center wing. Engines from .10 to .35 cu. in. are recommended.

Begin construction by cutting the 1/8" sheet horizontal keel. To this is cemented the engine mounts. The distance between these mounts will depend on the size of your engine. While this is drying, cut out the fuselage formers from the specified stock. Drill 1/16" holes in the plywood formers as the plan indicates. Cut out the stabilizer and elevator and sand to shape. Cement the stabilizer to the keel and add the formers. Now add the hinges and horn to the elevator and install the bellcrank in the fuselage. It will be noted that a 1 1/2" bellcrank was used on the prototype model; however, a 2" Veco bellcrank should operate successfully provided it does not interfere with the engine used. Do not alter the pivot point location. The control horn should be secured with a 1/16" bolt and cement.

Bend the landing gear and assemble it before securing same to fuselage. Bind the landing gear joints with soft, fine wire (the tinned wire from milk bottle tops is ideal) and solder well. Wrap the landing gear to the plywood bulkheads with strong thread and apply liberal quantities of cement. Install the control rod. If electric ignition is to be used, install it now.

As already mentioned the wings are a "snap." Beveled trailing edges were used on the original but are not necessary. First cut 69 rectangles of 1/16" balsa and 6 of 3/16" balsa measuring 3/8" x 1 3/4" then cut the leading and trailing edges to proper length and mark off the rib locations. Pin down the leading and trailing edges on the work bench and slip these rectangles between them. Cement liberally. Cut six wing tips roughly to shape from soft balsa and cement to the ends of each wing. When these structures are thoroughly dry, remove from the bench and go over the joints with cement once again. Meanwhile cut an accurate airfoil template from heavy card and using this as a guide carefully slice the ribs, tips and leading and trailing edges to shape. Sand well. Cut the recess in the center wing and cover all wings with gas model Silkspan. Water and dope once. The center wing is now installed.

This involves cutting into the center wing center section and removing 3/32" from the front and rear of the three center ribs as well as a strip of covering the same width. This is done to enable the leading and trailing edges to come in contact with formers "C" and "D" thus providing a firm support for the wing. Do not cut more than is required for the formers to slide through the wing. Once set in its proper location the wing should be well cemented to the formers. The fuselage is now covered.

Use plenty of cement when planking. Begin by cementing strips 90 degrees apart, i.e., top, bottom and each fuselage side. Pins are used to hold planking strips in place until dry. Continue by adding strips on each side of those already in place. From now on taper the



strips in order to cover the rear of the fuselage in the same proportion as the mid-section. When planking is complete and cement is dry, sand the fuselage until smooth to approximately  $\frac{1}{16}$ " wall thickness and apply a coat of clear dope. Sand when dry.

Cut out the fin and rudder, sand to a streamline cross section and cement to the fuselage. Add the tail skid and sub-fin. Apply one coat of wood filler and set aside to dry. Dope the wings twice again.

At this time the spinner can be cut from soft balsa—a lathe can come in very handy here, but the author used a razor blade. Also cut the interplane struts from pine strips. Note that these are cut in one piece and extend from top to bottom through the center wing. Sand to a streamline shape. The cabane struts are cut from dowel and sanded slightly flat.

Sandpaper the fuselage until smooth and then carefully cut the openings for the cockpit and engine cylinder. Small size plastic fuel line tube was used for the coaming. The model is painted before assembly.

The model in the photos is forest green with white trim. Crosses are black. The builder does not have to adhere to this color scheme because almost any variety of gay colors is suitable. Paint the light colors first, mask off, paint darker shades last. Three coats should produce a fine finish with an application of rubbing compound after the last coat is thoroughly dry.

Insert the interplane struts through the holes in the  $\frac{3}{16}$ " ribs in the center wing and cement well. Add the dowel cabane struts to the fuselage and be sure they are stuck into the fuselage at least  $\frac{1}{8}$ ". Use plenty of cement. With a sharp tool make holes in the bottom of the top wing and top of the bottom wing to receive the struts. Add the top wing. The bottom wing must be cut before it can be installed. Using a very sharp razor blade, cut away two thin strips of the trailing edge of the bottom wing in way of the landing gear strut. Save these strips. Install the wing by sliding it through the landing gear (spanwise) and cut tissue in way of the wire strut until the wing is in place. Cement well and when dry replace the strips in the trailing edge and patch the tissue. Repaint and rub down the patch. Rigging can be added at this time.

The model handles well on forty-five foot lines of .012"-dia. stranded steel wire. Because of the large wheels, the Albatros Tripe can be flown from comparatively rough terrain. However, a smooth surface is recommended. The model may have a tendency to roll towards the circle center when flying high. This can be remedied by the addition of about  $\frac{1}{2}$  ounce of lead weight to the outboard tip. Other than the above, no adjustments were required on the original model. Be sure to offset the rudder about  $\frac{1}{2}$ " to keep the lines taut.

Balance the model  $\frac{1}{2}$ " forward of the bellerank pivot.

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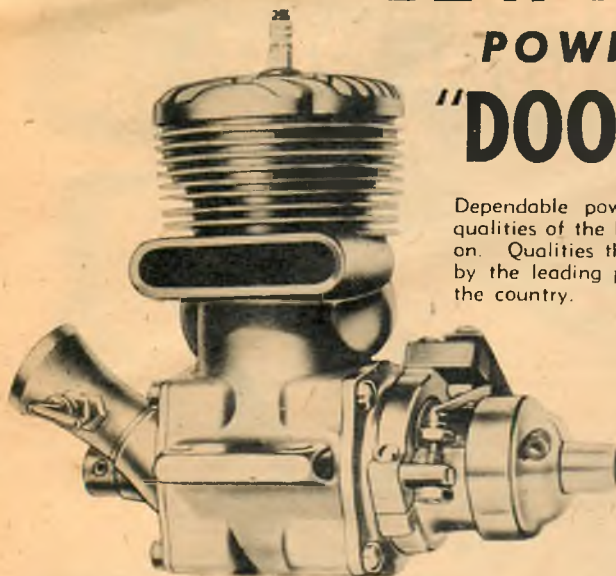
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## SOLO CLUB

(Continued from page 34)

over the hump, a most efficient way of going to glory in a flash.

"Let me tell you what we are doing about this G.I. problem in Florida. Recently, our Aviation Supervisor got together with the Aviation Directors from Alabama, Mississippi, and South Carolina, to see what could be done about getting a proper interpretation of Public Law 862 which is being misused to curtail veteran training.

"We found that while Florida and South Carolina are getting one-third of their applications approved, Alabama and Tennessee had no approvals. Well, as you know, the AMVETS in their Chicago convention offered to lead a court fight to settle the matter. Florida and 17 other state Aviation Associations responded with funds to finance the case.

"The Aviation Division of the Florida State Chamber of Commerce is polling its membership with a stiff resolution. The Aviation Committee of the Department of Florida, American Legion, is distributing strong resolutions throughout the state.

"The Aviation Division (Fla.) hopes to compile a memo to be made available to interested veterans. This memo is a guide in writing application letters and presents a 'complete justification.' It is a sad commentary that these people we are up against are so unfamiliar with the role played by aircraft in the modern world, that a veteran actually must be able to win an essay contest before he can enroll in the course of his choice!"

Then spoke up one of the local boys with about 30 Cub hours for his private. "I hope I don't sound naive, but does CAA plan to do anything for private flying? I keep reading about all the millions being spent for the federal airport program, but that's mostly big stuff, isn't it? How about us little guys?"

"Maybe I can help answer that, son," broke in a white-haired businessman pilot who went with a blue Stinson 165 that had dropped in overnight. "I was in Philadelphia a few nights ago and heard D. W. Rentzel, new administrator for the CAA, speak to the Institute of the Aeronautical Sciences. CAA is doing some great work for air transport that we can't afford to be indifferent about just because we fly light stuff. Mostly, Rentzel was talking about simplifying regulations, streamlining the CAA, and working out a more logical CAA-CAB relationship. Seems that CAA does the enforcing, but CAB makes the regulations. Puts CAB in, the silly position of having to sit as judge, jury, and investigating agency over those who violate its own regulations. Besides, CAB has no close contact with people who design and make planes, or folks like us who fly them, or use new developments and devices. When this is

worked out," finished the Stinson man, "all industry will benefit."

"Yeah, but didn't he get down to cases about private flying?" persisted the student.

"I see you are wearing a Solo Club pin," said the businessman. "So you probably saw that article in *Air Trails* about pilot inability to recognize an on-coming stall. Rentzel had something to say about that. He stressed CAA studies in the relationship of personnel and design. He said that the National Research Council found that the average pilot, veteran or novice, cannot detect the approach of a stall, that the airplane itself is a poor stall warning instrument, and that a simple stall warning instrument can detect and warn the pilot more accurately and quickly than he can be warned in any other way. That's one important example of work CAA is doing for us, since two out of three accidents occur because pilots fail to recognize a stall or to recover promptly.

"Rentzel also said we need more airports, especially small ones. That's a good sign. CAA is seeking to improve service to all members of the flying public, from puddle jumper to transport operator. And that's a good sign."

"Speaking of CAA," chimed in the Bonanza pilot, "has anyone seen their new booklet 'Terrain Flying'? It's good."

"Terrain flying?" asked the student.

"Yes, I have a copy in the ship. You can have a look. It has 80 pages, is illustrated, and pocket size. I got mine by sending twenty-five cents to the Superintendent of Documents, in Washington, D.C. Has chapters called Alleghenies, Rocky Mountain Region, Swamp Areas, Desert Regions, Bad Lands, Cut-Over Lands, Forests and Frozen Wastes, Ocean, Bay and Lake Shores, Cities and Towns, and something on flying in Alaska and Mexico. Plenty of hints, such as downdrafts in the Rockies, emergency landings in swamps, haze in the Alleghenies, smog that bedevils Pittsburgh and Los Angeles."

"Not much use to me," griped the student. "I haven't been 100 miles from here yet!"

"One of these days, Chuck," commented Joe, walking around and filling the coffee cups from the big blue enameled pot he always keeps simmering for visitors, "you'll take a trip away from the flat farm land. When you see your first real mountains, or swamps, or deserts, you'll be glad you read that booklet."

"Okay, I'll get one," Chuck gave in, for Joe is an oldtimer everyone respects.

"Say, looks like the sun is coming through," drawled a Cessna 140 pilot from Texas. "Maybe I can get out of here by noon after all. There's a second annual air tour going on in Missouri for the next two days. Everybody is flying into Waynesville, in the center of the state. If I can make it on the way home, I might cop the prize for the pilot coming from the most distant point. If you fellows can catch some of these air tours, you should do it. Lots of fun. Spot landing contests and so on. This one even has a prize for the biggest trout

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COMPLETE WITH MOTOR



### SCIENTIFIC BUCKEYE CABIN CRUISER

Carved Hull and Deck  
Class "B", length 17", beam 5-1/16", weight with engine 32 ozs., torpedo type hull speeds over 40 m.p.h. for engines of .099 to .49.

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Speedboat with carved hull. Class "E", length 17", beam 5 1/4". weight 2 lbs., for engines of .099 to .49.

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caught. Free transportation, modern lodges, tourist courts. Good food. Reasonable, too."

"We've got something to beat that back in New Jersey," said the Stinson man with a twinkle in his eye. "It's a drive-in theatre at Monmouth."

"I'll bite," said Texas, "what's so unusual about that?"

"Besides space for 900 cars, there is a hard surface parking area for 25 airplanes adjacent to the nearby air field. At each airplane space, there's a sound post with individual volume controls."

"Great day in the morning," groaned the ex-army fly boy, "what is aviation coming to?"

"Hate to keep talking shop," broke in the student, looking at the ex-military pilot, "but how about that Bonanza of yours. Don't you have to be careful?"

The Bonanza pusher smiled. "Don't believe everything you hear. Beech has been sending out letters describing fatal accidents to other Bonanza owners to help them not to make similar errors in judgment. For example, fast, clean airplanes should not be flown on instruments by amateur or greenhorn pilots who don't have much instrument time or who are out of practice. Loss of control will get you into bad trouble, quick. Unfortunately, these letters have been used as a basis of condemnation of the airplane and its structural safety."

"Didn't know about that," drawled the Texan, "but I stopped off at the National Air Races. Bevo Howard put on ten minutes of aerobatics every day in a Bonanza. Stock model, they claim. Why, the man did slow rolls, a very slow roll, four-point roll, then an eight-point roll, two inverted slow rolls, a Cuban eight followed by a slow roll, snap roll in the top of a loop followed by a loop, inverted flight, Immelman followed by a snap, then made a beaut of a short landing. Its no panty waist airplane."

"You can do that in a Bonanza!" exclaimed the student.

"Whoa!" said Joe. "The point, Chuck, is that the airplane, properly handled, is plenty strong. Fast, slick ships should not be mishandled. They pick up speed very fast if you don't watch what you are doing and the recovery puts a heavy load on the structure."

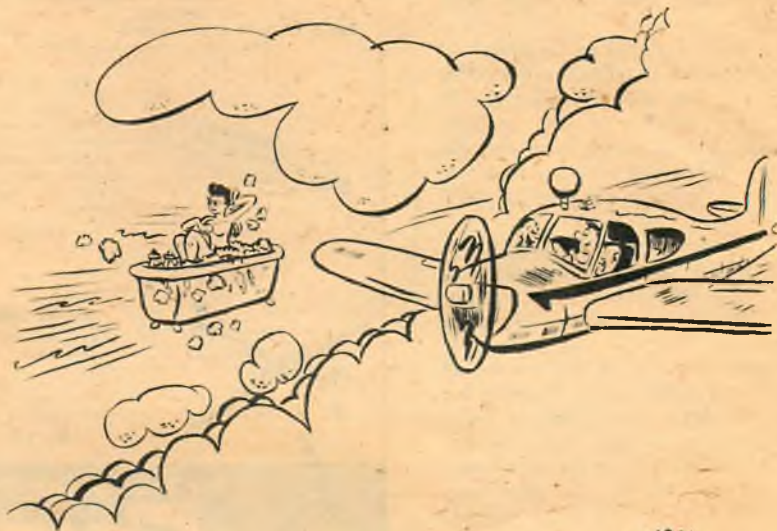
"Howard is a master pilot," commented the Cessna owner, "and his smooth technique puts no undue stresses on the airplane. He simply knows his ships so well that he can do these maneuvers at comparatively slow speeds. It doesn't mean that other Bonanza owners should wring out their airplanes. With limited stunting experience they will surely exceed the recommended placarded speed by a margin greater than 10%."

The Stinson pilot stood up and stretched. "Not to go from the sublime to the ridiculous, but has anyone heard about traffic direction at Idlewild? No? Well, it seems that radio was a mess because pilots talked so many languages. So Westinghouse dopes out an answer. Incoming pilots see either a green arrow or a flashing red cross at the end of the runway. From the time the pilot lands until he reaches the unloading area, colored lights do the signaling job. Goes the railroad switch yards one better."

Joe, too, stood up. "Hate to flash a red light on this hangar flying session but it looks as if we can help you get started. Visibility will be okay in another ten minutes."

**News of Schools:** Discount any talk you may have heard about the Embury-Riddle school down in Florida shifting base of operations. The outfit continues at Opa Locka. Navy reactivation plans had some folks thinking E-R might relocate nearby—'tain't so.

**News of Members:** "I sure was glad to read your article 'Needed: More Flying Clubs,'" Herbert Gray tells us. "I finally did solo and almost went broke doing it!" Herb soloed an Ercoupe after



"Well, I think we've finally found a topper for the flying saucer stories!"



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Catalog No.	Description	Price
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1 B 099	099 engine with ball bearing crankshaft	15.50
1 B 199	199 engine with ball bearing crankshaft	18.50

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E 8040.1H	Improved Arden Glow Plug (long)	85c
E 8035	Replaceable glow plug element (hot), 2 for	65c
E 8037	Replaceable glow plug element (cold), 2 for	85c
B015	Arden Glow Plug Adapter	25c
A-1350	Engine Exhaust Stack for 099 engine	35c
B-2350	Engine Exhaust Stack for 199 engine	45c
E 7002	Battery Connecting Cord Kit	35c

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take-off strip. A lot of good people have got their come-uppance doing this, Wendell, so please don't be offended. When you turn back after motor failure on take-off, you invariably slow up, stretching the glide, and making a slow turn. Mix with gusts and you ask for it. Lucky you didn't get higher, Wendell, or that spin would really have developed so that, if you hit nose first, instead of on that right wing, we'd be minus a good fellow member. The evidence suggests an ordinary stall out of turn, with a spin developing over the top. There's another kind of spin, the one out the bottom, frequently with power, that causes most of the fatalities. These develop when the ship is forced around the turn with rudder at low altitude, with ailerons crossed to prevent overbanking. A quick aileron movement then to bring up a low wing in a gust and usually its a spin out the bottom, winding so viciously with power that very, very few people live to tell what struck them.

Robert Fraser, Sudbury, Canada, has a mean problem. He was one of 225 Air Cadets who received RCAF scholarships. During July he was given a 60-hour course in navigation, meteorology, and airmanship, with 17 hours in actual flying on Tiger Moths. Fraser's problem is that local ships are floatplanes!

From well below the border, Brazil to be exact, Landuphlo Moneiro, Filho, who served during the war as a mechanic then as pilot, now holds civilian license (Civilian Turismo License Pilot) 6016. Having flown various types of ships he is now

looking forward to a trip to the United States and a fling at the Swift 125.

**Bulletin Board:** Silvaire Cropmaster is name of new Luscombe designed specifically for aerial spraying, to be available next spring. Based on the Observer design, it will have a 90-hp Continental and a stall speed of under 40 mph. Spray tanks will be part of the design, but nozzles and other equipment are removable for operation as an NC airplane.

Recently awarded its ATC, the Mooney-18, tiny, single-seat, lightplane is priced at \$1,600. Powered by a 26.5 Crosley motor, the M-18 recently flew coast to coast on \$12 worth of fuel. Its 59-pound Cobra engine provides 35 road miles to the gallon, and a range of 400 miles on eight gallons of gas. Spanning 27 feet the Mooney is made of metal, plywood and fabric. Rate of climb is claimed 450 feet a minute, sea level cruise 85, top better than 100, and service ceiling 12,000 feet.

The 1949 edition of the Florida air map is just off the press. Last year's supply of 10,000 was quickly exhausted. Maps free this year. For information address Florida State Improvement Commission, P.O. Box 149, Tallahassee, Florida, and mention the *Air Trails Solo Club*.

California Aviation Trades Association reported working with Rep. B. W. Gearhart, of that state, to draft a flight training bill for presentation to the new congress. Aim is a national flight training program to keep new crop of pilots coming along.

## TWIN-ENGINE TECHNIQUES

(Continued from page 70)

between the engine center lines. It would be ideal if engines were counter-rotated but this is theoretically and practically impossible with this ignition system. Both engines must turn in the same direction.

The current drain on the batteries is double that of a single-engine system, so pen-lite cells and small battery packs are not recommended. Two large flashlight batteries, size D, with #6 dry cell boosters for starting, will give good performance.

Patience is the keynote in obtaining easy starting and reliable operation of this system. With the boosters properly connected, throw the DPDT switch to the *start* position. Start the engine that ordinarily gives you the most difficulty or takes longer to warm up. Adjust it to an even-running speed and then start the other engine. Bring the second engine up to the speed of the first and set the needle valves of both engines to their best *rich* setting at high speed. When this is accomplished, match the speed of one engine with the other by means of the ignition timer. You will be able to tell this by the beat of the exhaust. When the beat disappears or is of low frequency throw the "double-pole-double-throw" switch to *synchronize*. Do not be discouraged if both engines stop. Return the switch and restart. A few practices at starting and adjusting the timers will accustom you to the beat and the best time to synchronize. Once the engines are

running in synchronism, the speed may be adjusted by either ignition timer. Both engines are locked to each other just as if they were mechanically geared; hence if either slows down, stops or speeds up, the other will do exactly the same or both will stop. Do not attempt to start engines with the switch in synchronized position.

It has been noticed that the total thrust from both engines is slightly more than double that of either single engine, thus the system will give you slightly higher performance than you expect. This may not be true of every pair of engines but it does show that you will obtain greater efficiency from both your engines when used this way.

The DPDT switch must be toggle acting. War surplus or radio stores carry them if not your model dealer. The importance of a snap action is apparent when you try to synchronize the engine.

If the cost of two new engines seems exorbitant to you, why not team up with another modeler who owns one like yours? Twin-engine planes generally are more intricate, so a teammate to help you build and fly is a big asset.

With this system the prospects for radio-control are ideal, particularly with respect to engine speed control. Only one timer need be moved to regulate both engines through their speed range, while the other timer is set for the lower speed.

## SPEAK UP!

(Continued from page 32)

and then believing that "silence is golden" no more was heard from the pilot.

Two L-4's of the Montgomery Squadron, led by Maj. Sims and Capt. Womack, flew more than 10 hours seeking the distressed plane. It had disappeared. It seems that the distressed pilot landed in a cotton field uninjured, but failed to report his whereabouts.

"Any pilot who reads this, take a note of advice—let someone know if you land at a field other than your destination," the Montgomery Squadron declares.

## PARENT RELATIONS

The Cadet unit of the Dearborn Squadron 639-4, Michigan Wing CAP, is rated one of the most active, best uniformed and disciplined in the nation.

To help make it so, much of the credit goes to two model letters titled "A Word to New Cadets," and "A Word to Parents," issued by Squadron Commander Maj. John Dobrei.

Examples of brevity, clarity and sincerity, the letter to new Cadets outlines in a straight-from-the-shoulder manner the basic concept of CAP, what to expect of it and "what it may expect of you."

The letter to the parents is equally honest and sincere, and stresses the value and benefits of the CAPC program. The concluding paragraph declares:

"Because aviation is going to develop tremendously in the years to come, your children will be flying, just as the boys and girls of the past generation made the change from the horse to the automobile. The more they can learn about aviation now, the better they will be prepared for the world of tomorrow."

## PATROL WEEK

The drive is on among a number of CAP Wings for an officially proclaimed Civil Air Patrol week in the United States. Although not yet Federally proclaimed, several states have authorized CAP Weeks.

Among the states to proclaim a CAP Week are Mississippi and California. While California boasted that its state-proclaimed CAP Week last June was the first in CAP history, Mississippi promptly challenged the claim and offered evidence that its Governor had named such a week in April, 1946.

## CADET CAPT. HONORED

The Henry Ford Trade School CAP Squadron at Dearborn, Mich., is a pretty proud outfit these days. Its Cadet Capt. Floyd Hansen not only was valedictorian of his class but was awarded the Lawrence Institute of Technology scholarship.

Cadet Capt. Hansen also received an American Legion award and was selected as the Squadron's representative to be one of the nation's 24 CAP Cadets to attend a Canadian encampment on an exchange program with the Royal Canadian Air Cadets last summer.

## A FAIR PLUG

The Bucyrus (Ohio) Squadron CAP started out recently to help publicize the local county fair and wound up publicizing itself with the result that many new members joined the unit.

An 800,000,000 candlepower searchlight was one of CAP's chief attractions at the fair, but while it focused attention on the fair it and other exhibits of radio and radar devices attracted many potential members who later joined the local squadron.

## CAP FIRE FIGHTERS

State and Federal forestry officials throughout the nation are hailing CAP Seniors and Cadets for their important work last fall in helping to decrease forest fires by spotting and reporting them, and in many instances helping to fight them.

In Minnesota, according to reports received, all squadrons participated in a cooperative plan with the State Division of Forestry to report all running fires observed during training flights, also all fires of any kind seen burning within known danger areas. Radio communications between planes in flight and Ranger stations were worked out cooperatively resulting in the saving of many fine stands of timber, Minnesota officials reported.

## NEW INDIANA SQUADRONS

Indiana Wing CAP has growing pains, but they're pleasant ones and are designed to put Indiana among the foremost states in CAP and Cadet membership and activities.

Shortly, or perhaps by this time, new Squadrons should be forming for New Albany-Jeffersonville. Both Evansville (under Capt. Gerald K. Ashby) and Franklin units expect to re-activate with substantial programs for both Seniors and Cadets.

Group 527 of Indianapolis, under the stimulus of many vets and the cooperation of Fairbanks Memorial Post No. 1587, Veterans of Foreign Wars, has sponsored 40 Cadets in a Model Aircraft Building Club.



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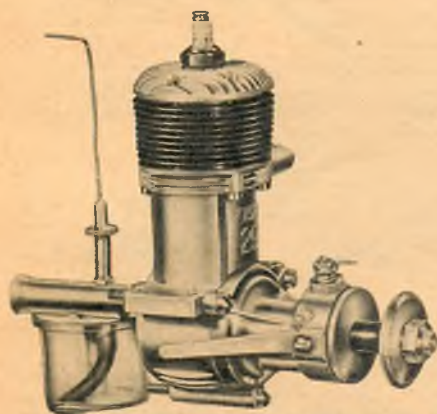
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## ACCIDENT PREVENTION

(Continued from page 70)

and, at the same time, help them formulate good social habits they will carry through life.

This appears a very lofty goal but the facts indicate some very serious injuries and property damage as a result of our hobby. Local aircraft model clubs cannot take the chance of getting a public "black eye" as a result of injury to someone participating in the activity, or as a result of injury to an onlooker. In addition to this, the modeler can count on a longer life for the plane he spent so much time, money, and effort on, instead of taking it home in a basket after an unnecessary accident.

Another reason why more attention to safety on the model aircraft field is necessary, is the 100-plus-mph speeds many control-line jobs now turn up.

With these factors in mind, the following is recommended as a Model Aircraft Club Safety Code:

### Flying Fields, Facilities, Ground Rules

1. That the area be sufficiently large to allow two, three, or four 120-foot flying circles without interference or overlap.

2. That each circle be marked with a center area 20 feet in diameter in which the "pilot" is to remain at all times. (This will eliminate mid-air crashes caused when one ship wanders into another's flying circle as a result of movement of the "pilot," and still allow some whipping room to bring in clip-wing jobs.)

3. That a fence, cable, or rope be stretched around the flying area to keep spectators within bounds.

4. That outside the fence, pit benches be installed near each entrance to a flying ring. This will enable modelers to make repairs, check and test their planes and at the same time protect them from being trampled upon. These benches should be of various sizes to accommodate different size planes and different heights, too, to accommodate the little shavers.

5. That appropriate signs be erected to inform modelers and spectators of the rules which govern the use of the facilities.

6. That clubs appoint Grounds Committees (designated by arm bands) to help enforce such rules.

7. That only one pilot and one plane handler be allowed at a time in each flying ring.

8. That all speed-jobs be required to use strength-tested lines.

9. That standard-length lines be required and that different diameter flying circles be established accordingly if more than one length line is used, allowing in each case 25% greater space between circles to allow for pilot error.

10. That where model flying fields are established, they be under club jurisdiction and/or local playground or recreational department control so as to enable enforcement of safety regulations.

11. That a club Safety Committee be appointed to enforce rules and to inspect each ship to assure that it is airworthy before being permitted to fly.

These are suggested basic safety rules for club flying activities, the adoption of which

will make control-line flying much less hazardous and, hence, more enjoyable for all.

For the individual, here are some other precautions each modeler should take to assure the safety of his own product and for his own personal safety:

1. Be sure control lines to bellcranks are properly connected and that control bases are properly supported, braced, and firmly in place.

2. Be sure connections are tested and checked regularly. Also, control lines should be inspected for kinks, nicks, and flaws.

3. Never prepare or use fuel mixtures in a closed room. Remember, such fuels are highly inflammable and explosive.

4. Never paint or dope models in a closed room. Be sure of good ventilation as such preparations are inflammable and explosive too.

5. Be sure electric soldering irons are disconnected when not in use. The prevalent use of basements or attics for model work makes it necessary to be on the lookout for fire hazards at all times.

6. Never start engines around small children. Keep children away from the sharp tools of the modelers trade—or better yet, keep them away from children.

7. Check props for cracks and flaws before starting engines, and be sure spinner nut is tight. Keep all persons away from the right and left of a spinning prop, so that if it breaks, flying parts will not strike them.

8. Run engines in the open—never in an improperly ventilated area. Remember, carbon monoxide is a by-product of all gasoline engines, and carbon monoxide is deadly.

9. Check your lines, gear, and your ship carefully each time before you fly. Something may have frayed, broken, or vibrated loose during the last flight.

10. Be sure your plane handler knows what he is doing and won't release the plane before everyone is in the clear.

11. Check your entire flight circle carefully before ordering your handler to release the ship. Being sure of clearance might save your ship—and save you embarrassment and a damage suit as well.

12. Remember at all times, you fly models for fun so don't ruin that fun by doing anything that may injure someone—and that includes yourself, too!

## WE FLY THE MINNOW

(Continued from page 25)

been able to figure out why—it was decided to put the wheel pants on my ship. Sometimes pants will produce more drag than they're worth, so it was pretty much of a gamble whether or not they would do any good. They weren't even test-flown on the West Coast and we had no idea how they would perform.

When my wife Evelyn and the two youngsters, "Scooter" and Renee, drove into the Cleveland Airport with the "Minnow" on a trailer, Tony LeVier and our ground crew assembled and test-hopped the ship. I took an airliner East at the last minute after doing spin tests on the two-place TF80-C and flying jet demonstration hops for nearly 30 West Coast aviation writers.



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**3 COLOR "COILITEER" DECAL**

LeVier first test-flew the "Minnow" without pants. Then he added one pant and checked the wide-open speed. The ship picked up a couple of miles per hour so he added the other pant and the "Minnow" stepped-out even faster. Naturally, we left them on.

Here's an example of how critical of small details we were on these little ships. There was a one-inch hole in each pant for tire inflation. Each hole was covered with Scotch Tape before the race. LeVier is a great believer in taping up all holes and wing fittings since it helped him gain second place in the 1946 Thompson race in an out-classed P-38.

I was actually flying the Goodyear with one strike against me. I weigh 170 pounds and all the other pilots with the exception of Art Chester are much lighter. Last year's winner, Bill Brennan, weighs only 111 pounds after a big dinner. That weight or lack of it is a prime factor in getting off the ground and around the initial pylon first. The rules covering these midgets specify a weight of at least 500 pounds empty to assure rugged air frames. The three Cosmic Winds are about 65 pounds overweight, but they'll withstand 9 G's in a pull-out. During the race, we pulled 4½ to 5 G's in the turns, but much of that was caused by rough air.

A large part of the experimental work on a midget racer is spent in getting the right propeller. Since all the engines are 188-cubic-inch Continentals and all the ships turn about 3,300 rpm wide open, the correct choice of propeller makes a lot of difference. Sensenich made our props to a top speed and rpm specification. We had considered a three-bladed paddle, but the extra expense in construction vetoed the idea. Tip speeds on the double-bladed props approach the speed of sound, but they are cheaper to experiment with and change than the three-bladed model. With a high-pitch, "club" prop suitable for cruising, these all-metal Cosmic Winds will turn over 200 mph, but they take a long, slow roll on take-off. It is fast acceleration, not top speed, that wins midget plane races just as it wins midget auto contests.

Since we first completed the Cosmic Winds, we've done a lot of research work. Wind tunnel testing is too expensive, so we "tuft-tested" the whole plane. We tried to get photographs to show the pattern of the tufts of twine in flight, but it never seemed to work out, so we had to use pilot and observer reports from other airplanes flown in close formation. These tests resulted in some minor aerodynamic changes and a cowling modification.

I did all the original test-flying on these ships. LeVier was in the hospital at the time with injuries following the crash of an experimental plane. While he is a cracker-jack engineer, Fulkerson has only a private license, so I was elected. I'd had some previous experience in test-hopping homemade airplanes. Back in Milwaukee, Wis., shortly after I'd learned to fly, I did the test-flying on a ship called the Miller Special. It had the lower wings from an old Swallow,

the tail group from a Great Lakes, a Waco 9 fuselage and a Cirrus-4 engine. It folded up in the air and I bailed out.

There were no such problems with the Cosmic Wind. After the first flights we changed the center of gravity slightly for better handling characteristics and that was about all.

We worked so late a year ago getting my plane ready for the races that I had to air-freight it back on Slick Airways and barely assembled it in time for the first qualifying race. That year I finished third behind Bill Brennan and Art Chester, so I know what it's like to sit back in the prop wash and battle it out with the also-rans.

This year it was different. I qualified second-fastest in the one-lap time trials. That put me in the fourth and fastest "heat" race with Art Chester. Only two of the six starters were to be transferred into the main event, the Goodyear Trophy Race. I started in number-two position outside Art Chester and knew that I would have to beat him out to win.

I got off to a good start and beat Chester into the first pylon. From there on out I was able to stay in front. In 8 laps I had lapped all the entrants except Chester and won with the fastest time of any race: 174.287 mph. The air was glassy-smooth that day and both Chester's time and mine were faster than the winners of the three previous heat races.

That victory put me on the pole for the big race. The weather Labor Day was gusty, coming across the runway from the left as we lined up before 80,000 spectators. Chester was next to me, then Bill Brennan, Steve Whitman, Phil Quigley, Bill Robinson in Tony LeVier's ship, Bob Downey in Glenn Fulkerson's midget, Dave Long and W. L. Lefevers.

Shortly before this race, LeVier had surprised us all by announcing that he was through with racing. Since he is Chief Engineering Test Pilot for Lockheed, the company had asked that he give up competitive flying. So Tony sat on the sidelines and rooted like a horse owner with three hay-burners in the Santa Anita Handicap.

Bill Robinson is a flight mechanic for Lockheed and Bob Downey was a former Lockheed test pilot who now owns a paint store in nearby Whittier, California.

Starts in the Goodyear are made with all planes lined up across the starting line with the fastest plane on the side nearest the pylons. The starter, Earl Steinhaur, is out in front between the center planes with his big red and white flags. At the five-minute red warning flag I started my engine and fussed around the pint-sized cockpit as the temperature gages crept up to normal. It was crowded in the cockpit with parachute, crash helmet, shoulder harness and me.

Sitting there on the pole I knew that I should win, but those last few minutes before take-off always make you chew your finger nails. I looked out and watched LeVier. He looked just like a mother hen with three little chickens on the loose.

There were people running all over the field as starting time approached. Some bird-brained photographer, within one minute of take-off time, was still taking pictures of Steve Whitman's plane, three down the line from me. He was directly in my line-of-sight to the starter and I couldn't see the flags at all. It was just 10 seconds before the start when one of Whitman's ground crew finally grabbed the cameraman and yanked him out of the way. I breathed one quick sigh of relief and the race was on.

When the big flags dropped, my two 230-pound ground crew men, McNemece and Yates, gave a mighty heave on the wing tips and the full-throttled engine picked me into the air within a hundred yards. Next year each contestant will probably have two husky football-playing assistants to speed his start since a good strong shove at the beginning of your roll makes quite a little difference. With the throttle wide open, there is still not enough torque on my "Minnow" to need any right brake to hold the plane straight. My one worry as I bounced down the rough take-off ramp was that my wheel pants might snag in a hole or rut. There was only  $\frac{3}{4}$  of an inch clearance.

Nothing dug in, however, and I made it into the first pylon in front of the pack. That first turn, like all those that followed, were made right on the ground. While there is a top altitude limit of 500 feet for this pint-sized course, the pilot in front always tries to stay as close to the ground as possible so that no other ship can get past underneath him.



It was full throttle all the way. With the gusty cross wind, I was plenty busy in that little cockpit. The course was laid out in a rectangle with the end pylons only 880 feet apart. The east turn on the downwind end of the course worked out as one big vertical turn because of the wind drift. On the downwind side of the pylons, we all cut close and let the wind blow us clear while on the upwind side we flew quite wide.

I almost made one bad mistake on the 8th lap. I was coming up fast behind Dave Long, Piper's Chief Design Engineer, who was doing a beautiful job of flying his slightly slower Pea Shooter. I caught up with him on one of the short straightaways and planned to swing wide and pass him on the outside. The rule book says that you must either go over or around the ship you are overtaking and miss him by at least 100 feet. Then you must be at least 100 feet in front of him before you can cut back in.

Somewhere along the line, Long saw me coming up fast. Since he was holding down next to last spot anyhow, he decided to move over and let me pass on the inside. He moved over all right—just as I steamed up on the outside. I had to swing very wide of the pylon to get around him.

From the ground it looked as though Whitman and possibly Chester had passed inside me, but I had barely enough lead to cut back into the next pylon still ahead of the Oshkosh Airport Manager.

I believe that it was looking over my shoulder after we came out of that turn to see just how close Whitman really was that I cut my lip. A strong gust bounced me against the side of the ship and my face hit the canopy hard enough to make it bleed.

I made two laps of the course with one magneto shut off, but no one ever knew about it. Maynard Gifford, my mechanic, had put 12 little strips of tape across the top of the instrument panel, one for each lap of the race. Each time I crossed the finish line I pulled a piece of tape off the panel. About the 9th lap, I was getting over close to the right hand side of the panel and accidentally flipped the left mag switch off as I jerked the tape loose. I was busy and didn't notice it as the mag snapped off. The smooth-running little engine didn't drop enough revs to show up on the tachometer and it wasn't until two laps later that I found my mistake. I reached up to pull the tape on the eleventh lap (one more to go)

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and nearly shut off my one remaining magneto. Then I noticed that one toggle switch was up and the other down and kicked the left mag back into the "on" position. Next year you can bet that we won't put the tape that close to the switches.

The finish was so close that I didn't even come off the throttle after the checkered flag waved in my face. I flew an extra lap and then pulled up in an exuberant zoom to lose speed. I finally got the Minnow slowed down to a walk and headed in for a landing and that ever-loving \$7320.

As I taxied into the winner's circle, LeVier greeted me with an affectionate hug. My wife told me that he had worked harder than anyone else on the ground, "pulling" for his three airplanes.

"I couldn't have been happier," said LeVier, "if I'd won it myself."

P. W. Litchfield presented the Good-year Trophy, an 18-inch sterling silver tray that'll be swell for serving sandwiches and coffee at our home just three blocks from the Van Nuys Airport in the San Fernando Valley.

Phil Coleman, Chief Aerodynamicist at Lockheed, flew home the night after the race and walked into the design section at the factory the next morning with a big grin. "We won," he said. And he was right, for it was Lockheed's win just as much as it was mine.

According to the set-up we have for "LeVier and Associates," the pilot of the winning plane gets 25% of the purse. Then the expenses for the pilots, mechanics and ground crew men are paid and the remainder of the money is used to pay-off the men that helped design and build the three racers. We've won about \$18,000 to date at Cleveland and Miami, but we're still more than \$25,000 in the hole. We won't get our original investment back for a couple of years unless more races are run.

We get together once a month and talk over what we'll do next with the ships. LeVier is president and I keep the books and write the checks.

Along with the rest of the Professional Race Pilots Association, I'd like to see a series of regional midget races where we could compete more often and put on a program with less expense. Here in Southern California, for instance, there are nearly enough planes right now to put on a complete program. We could race weekends without taking expensive time off from our jobs. Art Chester, president of the Race Pilots Assn., has been working along that line ever since he, LeVier, Harry Crosby, Keith Reider, Steve Whitman and a handful of old time pilots dreamed up this midget plane class back in 1938 and 1939. After the war they talked Goodyear into sponsoring it for three years at \$25,000 per year.

Any regional event would necessarily have to be controlled by the Race Pilot Association or the National Aeronautic Association to assure that there would be sufficient entries and that all safety rules were enforced. Otherwise the sport could degenerate into a winged Roman Holiday.

It's not the speed that counts. The fans love the split-second competition of evenly matched machines plus the close-to-the-course ringside view of these tiny speedways. Another point greatly in favor of these little planes comes from the sports promoter's pocketbook. Our whole event can be flown, as it was at Cleveland, within the boundary of the airport where non-paying spectators don't get the free-for-nothing view of the contest that they do when a longer closed-course race is flown in heavier planes. After all, the promoter must show a profit to pay us a share of the prize money.

I'd like to see some extra-curricular competition between the different aircraft companies. It would be a cinch for designers, engineers and pilots of nearby aircraft factories such as North American, Douglas, Northrop, Consolidated and Ryan, to build up competing planes on their own time just as we did here at Lockheed: I'm sure that the industry would learn a lot about building little airplanes that would eventually aid pri-

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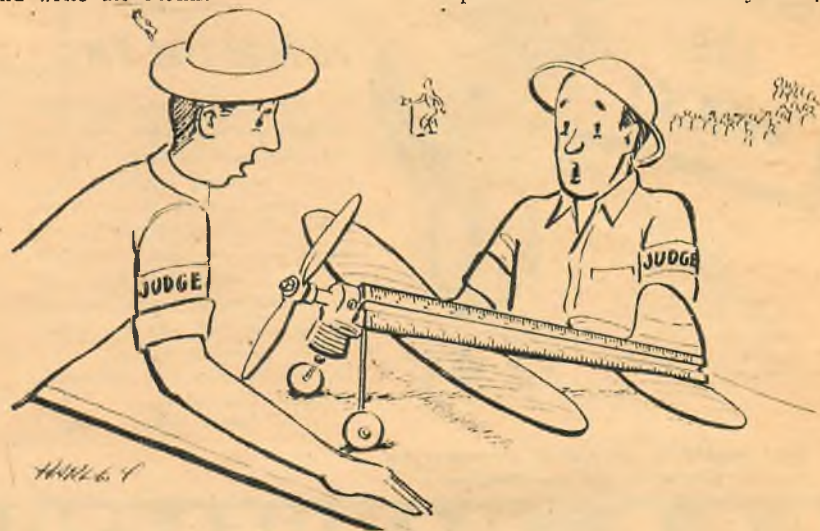
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"That's what he said—flying scale."

vate flying. We would have the good-natured rivalry of competition and the general flying public would get a better run for its money when we raced.

I don't mean to detract in any way from the swell job that Chester, Whitman and the rest of the "back-yard" builders are doing. Just look at the records these little ships have made, and as often as not, the home-made ships have been out in front. They've done a grand job, but we could all do an even better one with the brains of the industry behind us.

Next year we'll make some minor changes in the propeller, the cowlings, the canopy and the fillets. Who knows, we might even build a new single Super Cosmic Wind. That 2¼ seconds is too slim a margin of victory.

## THE REDS AREN'T STALLIN'

(Continued from page 23)

able to take the Jumo 004-H and BMW-003 turbojets and develop them further, without starting at the beginning and learning the ABC's of jet propulsion. Their scientists could continue—not start—atomic experimentation, because they already had some of the world's ranking nuclear physicists and a couple of the most powerful cyclotrons in existence. They were able to go right on with the experiments on the A-9 and A-10 (winged V-2) rockets and other missiles because of earlier rocket savvy. Russians used them as anti-tank and artillery weapons before the Germans ever did.

If, by U.S. and British shop standards, we considered Russian airframe workmanship crude, albeit sturdy, they were certainly given enough of our equipment under lend-lease to learn how to build beautiful, efficient airplanes. (Among the samples of our best work were the P-39K and L, P-47D-30, P-63A, A-20C and K, and the B-25G and H models. We sent more than 10,000 such planes, including some 700 twin-engined transports to put the USSR in the airline business.)

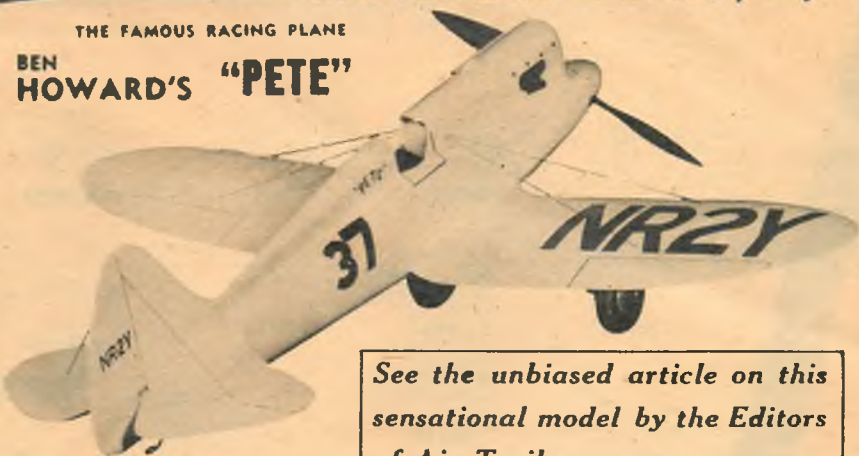
The rumors of postwar progress started late in 1946; but the first real evidence came by way of Finland. Early in the spring of 1947 came a Soviet claim of a new world speed record of 660.7 miles per hour, and this was followed shortly by the appearance of what was obviously a hand-built model of the LA-9. Finnish observers were permitted to climb all over the ship and construction details were discussed, ostensibly for propaganda motives. Then news that they didn't sponsor filtered out of Czechoslovakia. American and other observers were permitted to witness a quick fly-by of about 100 jets of six types during the May Day and Aviation Day (August 3) demonstrations of 1947. And information about the copied B-29 bomber was confirmed by its public debut.

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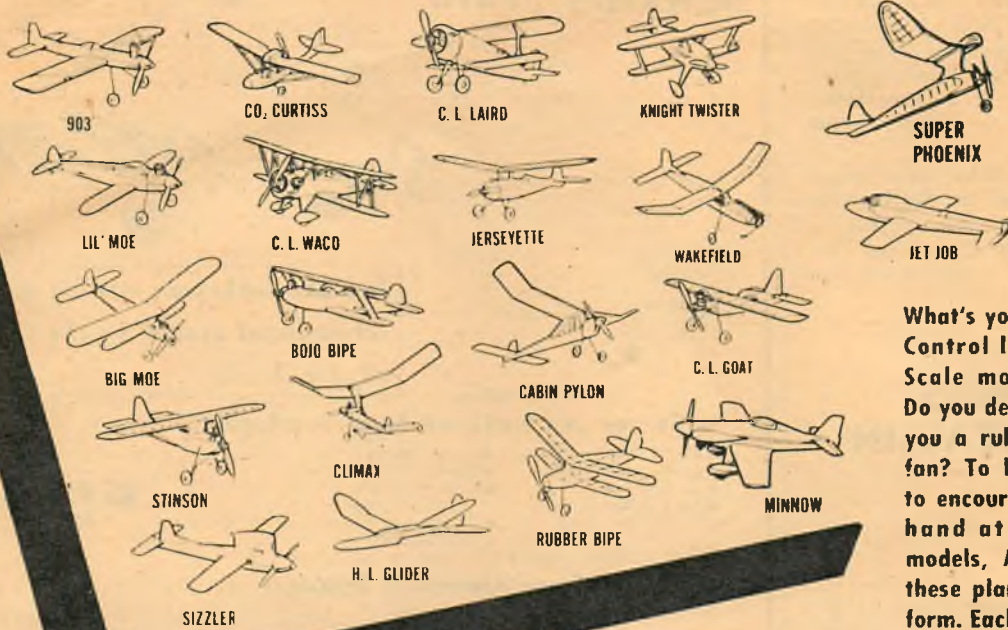
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Lil' Moe—control line half. Multi-Moe combo  
Big Moe—smart biplane free flight beauty
- #103 } Sizzler—hot rack speed job by Bill Seidler  
Laird—control line scale Super Solution  
H. L. Glider—championship "Fizzle" glider  
Jerseyette—Ehling's Class A free flyer
- #104 } Wakefield—McCullough's fine rubber powered ship  
C. L. Goat—trainer for control line novice  
Knight Twister—most popular of U-control jobs
- #105 } Jet Job—for Dyna-Jet engine  
Rubber Biplane—24" sport flyer  
Cabin Pylon—Iq. A or sm. B free flight
- #106 } Super Phoenix—Cl. A free flight  
Minnow—Cl. D scale U-control

Soon afterward came more intelligence about their first supersonic flight. Our original skepticism was changed by more reliable intelligence that seemed to corroborate the information. The Red press made a big splash of the news that a jet had flown over Moscow on May Day, 1948, at the speed of sound. And by that time, too, we had learned that several of the planes seen in the exhibitions of the year before were in production.

In the meantime, our friend Kostikoff seems to have lost his identity as an individual, since the Soviet turbojets on which there is any information bear the name of Chelomey or are known to be British exports. Whether this is the name of a new "trust" or another individual is a moot question. What appears to have happened is that the Russian and German engineers combined the best features of their own turbojet with those of the Jumo BMW designs to produce the Chelomey engines. Their progress is most significant, because of the cumulative effect of a number of little things rather than one or two revolutionary innovations.

Their largest production turbojet, for example, the 6,000-pound-thrust Chelomey, is reported to be equipped with variable-pitch stators in its compressor assembly. If this is true, they are further along than we are. U.S. researchers have been working another angle—that of varying the pitch of the rotors instead of the stators. Since it would appear simpler to control the movement of stationary parts than ones which revolve at high speeds, the Soviet engineers would appear to be on firm ground. Their engines feature the annular combustion chamber which was probably developed from that of the German BMW turbojet. The annular burner—currently under development and being produced by Westinghouse in the U.S. and Metrovick in England—is considered more efficient than the separate burner "cans" because the former keeps interior air turbulence to a minimum and thereby stabilizes combustion. Reports of parabolic blade design and gimmicks such as the "surge inhibitor" indicate sound thinking on the problems of internal aerodynamics, whether or not these items have been perfected.

What is being done in the USSR with their imported British turbojets is the cause of some speculation. Original contracts were negotiated with Rolls Royce in January, 1946, but the final shipment on the order of 55 Nene and Derwent V engines was not made until January, 1948. Pressure was put on Rolls by the British Board of Trade to stop export; but the question remains of whether or not the Soviet engineers have been able to duplicate the engine for production. Reports persist that the latest YAK-17 models are Nene-powered. Moreover they are supposed to be fitted with afterburners, as are some of the Chelomey turbojet installations. (This is significant, if true. Afterburning is still under experiment in the U.S., and the first two planes to use

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the device are just starting into production.)

In the power range between the Nene and the big Chelomey is the most popular Red turbojet, the 4,000-pound thrust power plant used in the MIG-7 and -9, YAK-15, the Tupolev storm plane, and perhaps others. Water injection has been tried, but it is not known whether or not this is being used operationally.

On the upper end, of the Russians' power scale, the only project about which anything is known is a big 13-stage Chelomey engine which has been reported test-flown at between 7,500-8,000 pounds thrust.

Airframe progress follows the trend of engine development: sound thinking about a collection of small items, rather than any single sensational gimmick. At least one production model, the LA-9, features "sandwich" wing construction: thin sheets of *deskaba*, or Russian duraluminum, sandwiched between them a layer of plywood. Only a shade heavier than a comparable all-metal structure, these wings are claimed to be much stronger, more rigid to stretching and bending stresses, and considerably more bullet-resistant. They are reported to hold intact after being riddled with machine gun fire. This construction parallels the "Metalite" balsa-metal sandwich developed here by Chance Vought.

Something new for the Soviets is the use of shoulder wing locations on the Ilyushin four-jet bomber, a new fighter designed by either Gurevich or Mikoyan, and the Tupolev storm plane. Whether or not any better visibility results—and it might—this wing mounting was apparently used on the storm plane for that purpose, on the fighter to make room for the power plant, and on the bomber to allow space for wheel retraction and continuous bomb bay area.

Rather conventional planform is evidenced in the wing structures, with airfoils of thin, laminar-flow section. With one exception, there is little evidence of pronounced sweepback or droop "cathedral" growing into popularity here and well developed by the Germans. The interesting exception is the Red supersonic research job.

At least three versions of this plane flew, and there are reports that a couple of less-successful models crashed in the attempt. The supersonic job is thought to be the combination of the German DSF-346 airframe—almost completed at home—and the Chelomey jet. One modification features straight-through airflow and the other, well-designed side intakes. (The latter are not so flush as the NACA inlets being tested on an experimental F-80, nor so protruding as the intakes on Britain's Attacker jet.) The third is believed to be rocket-powered with a larger version of the Walter HWK-509 engine. This ship was probably the first one through the sonic barrier. One of its more marked features is the T-tail, with the stabilizer mounted on top of the sweptback fin.

The story is around that the Soviets believed—as did some American and German scientists—that transonic speeds

could be reached most easily by a plane with a sweptwing configuration. They are supposed to have worked exclusively in this direction, putting up with some delay and accident in the course of their research. Had they been certain the barrier could be crossed with a straight-winged plane—as we proved with the X-1 a little later on—the Reds, so the story goes, might have turned the trick months sooner than they did.

Armament of the planes in service includes cannon and machine guns in varying combinations; but one cannon and two machine guns seem to be the popular arms equipment. (By U.S. standards, this is light armament, notwithstanding the fact that Red ordnance is known to be excellent and perhaps superior to our cannon models.) The Soviets have the war-proven V-JA 32-mm cannon, used so tellingly on the Stormoviks, and known for its armor-punching ability. The long-barreled V-JA 37-mm is a recent development and is claimed to be one of several new hypervelocity arms. Their SH-VAK 20-mm gun is widely used in combination with the Beresin VBK machine gun of 12.7 mm. Russian ordnance men and engineers are supposed to have copied our RCT fire-control system, but there is conflicting information about the extent of its use in the big Tupolev bombers now in service. Some bombers are said to have the central turret system, others use flexibly mounted guns instead.

The designation of these heavy bombers is not revealed, but the transport design is called the TU-70. It accommodates 70 passengers, or 100 airborne troops less comfortably, in the pressurized cabin. Tupolev used the 141-foot B-29 wing just as he found it, but added 20 feet to the length of the fuselage and altered the nose lines. Getting both the transport and bomber versions into production simultaneously must have indeed amounted to a major triumph in USSR aero circles. It is well known how they placed orders with an American company for B-29 wheel assemblies and had this wheel deal scotched at the last minute by USAF procurement officers. It has been suggested that they might have been having trouble making the wheel and brake assemblies, or even in producing the big tires, but this is not suggested by the time element. They might have ordered much sooner. Moreover, experts say that there are more difficult things about the B-29 than the wheels.

Indeed, there are several puzzling aspects surrounding the Soviet production picture. At the war's end they were operating 35 known plants for the output of airframes and engines. About 750,000 workers were employed in these plants, with probably another 50,000 making more indirect contributions. The best Russian figure was some 40,000 planes in the 1944-45 year; but in airframe weight this was estimated as only 20 percent of U.S. airframe capacity.

Our military leaders revealed some time ago that the Reds were geared to produce between 75,000 and 100,000 planes per year. There is the feeling now that

this estimate may have been rather high, notwithstanding the supervision of some of the top Nazi industrial planners, the marriage of some of the Russian trusts to the German combines, and the added facilities in the Ural and Vladivostok regions. Experts say that if Soviet production gets anywhere near the 100,000 mark, it means that she has found enough new sources of primary aluminum to double her known sources; either that or she has made some startling metallurgical advances that permit the use of some other secondary metal, with the pure aluminum used only for sweetening.

As far as is known, production follows closely the system used during the war. The top agency—similar in function to our Munitions Board—is the Commissariat of Defense. Immediately under this is the War Aircraft Trust with its widespread system of sub-contracting and tie-in with German and Czech plants which were not moved to the USSR. All aircraft accessories are produced through trusts or chain factories. For instance, the Rubber Trust turns out tires, fuel cells, de-icers, and fittings. Radios, wiring, lights, magnetos, and other items are turned out through the Electro Trust. Gun sights and instruments are the responsibility of the Fine Mechanics Trust. Ordnance, along with ammunition, is produced by the Arms Trust.

For the training of personnel such as supervisors and foremen, an Academy of Aircraft Industry was established early in 1947. Russian manpower is one of its strongest assets, and perhaps they figure that if we could teach housewives how to build airplanes in a couple of weeks, so can they produce a local facsimile of "Rosie the Riveter." The size of the plants themselves is something we are trying to find out. The largest known factory is the one at Gorki, with better than 1,350,000 sq. feet devoted to final assembly. This compares in size with the Curtiss-Wright plant in Columbus, Ohio.

The rapid expansion of *Aeroflot*, the Soviet airline, is significant because it shows their awareness of air lift as a substitute for their notably poor communications on the surface. In August, 1947, route mileage was placed at 93,000. Latest information puts *Aeroflot* holdings at 137,400 miles, and the Soviets have just recently started scheduled night flights over these airways.

But in the case of both airlines and air forces, the qualitative factors usually outweigh the numerical ones, particularly in the operational sense. The question of the relative effectiveness in combat of the Red Air Force against the USAF-Navy team is outside the scope of this review, but some consideration must be given the uses to which the Russian planes and other items discussed here might be put.

Composition usually provides good clues as to intents and purposes. The best information here suggests that Red Air Force make-up closely follows upon its wartime organization. There were

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sixteen units, roughly comparable to the numbered air forces of our AAF. Each of these consisted of an Army-Cooperation Corps and Heavy Air Corps. The former was composed of a brigade (three wings) of fighters, of storm planes, and of reconnaissance and general-purpose aircraft. Two bomber brigades and one parachute brigade constituted a Heavy Air Corps. Special fighter wings were used for "protective support" missions of a roving nature.

By AAF and RAF standards, the heavy Red air units demonstrated poor operational savvy. Their maximum-effort raids involved about 200 bombers on visits to Berlin and targets along the Baltic and in Rumania and Hungary. The Red air crews got hits; but they seemed to get them the hard way, being continually hampered by poor communications and coordination. This is the inspiration for the opinion of some USAF officers that the Soviet strategic bombing know-how is highly questionable. Others, however, feel that they must have gained much from AAF techniques and from the contributions of German radio and radar experts; and that with plenty of B-29's to play around with they should be learning fast. The Russian tac outfits were as good as the heavy units were poor, largely because they held a greater need for storm tactics and worked harder at them.

When Chief Marshal Alexander Novikov took over command of the air force in 1942, he made this observation in an official organ: "We must, of necessity, commit the air force to the close support of ground troops. We need planes which will affect the military situation immediately: fighters to destroy the enemy bombers and fighters, and storm planes to destroy the tanks, guns, and communications. There is not the time for anything else. We have long-range bombers (TB-7) but not the time to train larger numbers of air crews. And we cannot wait for the effects of strategic bombing to be felt up here in the front lines. We must hit the Nazi's front lines and send him back."

Novikov's aerial philosophy made a lot of sense, particularly in 1942, when even the AAF and RAF high commands were prone to argue about the merits of strategic bombing. There have been rumors for some time about the formation of something similar to our Strategic Air Command. But the Reds will have to do a lot more than just copy B-29's to bat in the same league with our expert SAC, whose crews are better equipped and trained than any of the wartime AAF units. There is no room for complacency, however. The planes have range enough to reach parts of America, and they can duplicate the most important task ever assigned our Superfort—that of carrying the A-bomb—as soon as they stockpile atomic bombs in the USSR.

It is entirely another story where the "falcons" of the Red Air Force fighter outfits are concerned. Their combat pilots equalled or excelled—with inferior aircraft—any during the war. There was

a long roster of aces that included Pokryshkin (59 German planes), Rechkalov (44), Guliaev (36), Lavitsky (35), and Babek (33). It was Savitski, with a 22-plane score, who flew the prototype YAK jet over Berlin in several "experimental combat" flights in May and June, 1944, deliberately engaging Luftwaffe jets. Now a Lieut. General and considered one of the most able Russ tacticians, it is known that Savitski's findings have been incorporated in the combat texts of the Moscow Aviation Institute. In the hands of pilots tutored by these aces and others, the brood of excellent jet interceptors and frontier fighters may well be able to form a formidable picket around vital targets in the USSR. Delivery of A-bombs by an outside force may well prove a costly proposition on each and every attempt.

This is equally true because of the character and extent of guided missile activity, where the German scientists are said to be more than earning their extra rations. It is a well-known fact that if the Germans had gotten their V weapons and anti-air missiles into production a little sooner, we might still be fighting. And it is almost equally well known that the German-Russian team is going on from the point where V-E Day interrupted the imaginative German research.

We've heard a lot of controversy about the existence of a fabulous "Atomgrad"—an atomic city roughly comparable to our Los Alamos Laboratory. A refugee scientist now in the U.S. reported recently that such a city does exist near the Mongolian border in Turkestan. The place is said to be under the immediate supervision of the MVD secret police; and about two-thirds of Atomgrad's 400,000 population is supposed to be either outright slave labor or folks in "protective" custody. In fact, the leading Soviet atom expert, Dr. Peter Kapitza, is said to have been exiled to Atomgrad for his failure to produce more quick results in his experiments.

They have been working a long time. The Soviets commenced atomic research in 1940, when intelligence discovered German progress in this endeavor. Their first large cyclotron was built in Khar'kov but moved to Atomgrad in September, 1945. As far as we know, their experiments to date have involved relatively weak bombs which were developed under great difficulty; but they appear to be working intelligently. Russian cosmic research is reputedly ahead of America's. The Reds were the first to split atoms with cosmic rays about three years ago. They are also known to be very active in ionosphere research, and if they get anywhere at all, this can be extremely dangerous.

Fortunately, America's high command is alert. We didn't know about the Japanese Zero and Baka Bomb until these were thrust upon us. It cost a lot of Yanks their lives to find out how to combat these weapons. But this time, we are finding out some of the things we shall be up against if the Reds keep on misbehaving. And being forewarned is being forearmed.

# JAGUAR

(Continued from page 39)

When Roy left for America I knew that this model was capable of winning the Trophy, though contest flying is too treacherous to bet your shirt on.

The story of his flights makes interesting reading—the consistency proves beyond all doubt that it was a fair result, which has not always been the case. Competition results over the past 18 months for the Jaguar model shows form which is not easily overlooked.

Building the Jaguar is not over difficult, but results will be in proportion to craftsmanship and knowledge of trimming. Average duration should be between 4 and 5 minutes because we manage that in England in our dirty weather. Thermal soaring seems to be too easy, but the high normal duration will be more reliable.

**Fuselage:** This is made on the box principle and accuracy here will give you a correct start. Note that some of the cross pieces are 1/8" x 1/16" and are used both flat-wise and edgewise. It is recommended that one side be built over the other to produce precision accuracy. Leave the longerons an inch or so over at the front end which will be useful for binding a rubber band around when assembling the sides together. A pin pushed through each will prevent the band rolling off. Select your wood with care, rather harder for the longerons, and cross-pieces at the front.

Sheet in the nose before trimming the longerons to length. If the sides are made exactly alike and the fuselage is kept square with a temporary diagonal brace at the widest point, no difficulty should be experienced in keeping it true. The temporary 1/4" x 1/8" brace is lightly glued in position to hold the lower front fin outline vertical and the diagonal braces added. Reference to the drawing will show that these are of varying lengths at their point of attachment to the fuselage.

The undercarriage box may be made and installed, not forgetting to bind with cotton to provide greater strength. This should be allowed to overhang the diagonal braces by 1/16" which will bring it flush with the stringers when fitted. The remaining undercarriage bracing may be seen from the drawing. Final details may be added such as wire hook, peg, etc.

Select a firm piece of wood for the nose block and make sure the seating is perfect before cementing in place the plywood reinforcement and key piece. It is recommended that the final shape be dressed with the nose block in position on the fuselage. A side thrust adjuster will provide an easy and positive adjustment, and gives a neater appearance. Details of this may be seen from the drawing.

**Undercarriage:** This should next be made from the patterns supplied. Note that one leg is slightly longer than the other, as one fits in the lower and one the upper box. Check your fuselage carefully when fitting this unit to make sure it stands perfectly upright. Lay over two longerons a straight piece of balsa 3 feet long and measure up either side from a surface table. If care is taken over this, it will simplify fitting of the wing and tail unit into correct alignment. Wheels should be made, and fitted before the hub caps are cemented in place.

**Propeller:** Select a medium hard block and cut out to both plan and side elevation.

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Drill the bearing hole to accommodate tightly, 16 S.W.G. brass tube. Both halves must track perfectly when revolved. Carve the blank giving about 1/8" under-camber. A half round and flat sanding block will give you assistance in producing a perfect finish. Coat with clear dope several times and lightly sandpaper between each. Fit the plywood reinforcement at the center to carry the bearings. Your propeller should balance perfectly in all directions. Good propellers are difficult to make so extend yourself to the limit. Keep the blades as thin as practical. The free-wheel mechanism may be made and fitted. Note that the cupwasher is soldered to the shaft at the back of the propeller. This prevents the pull of the tensioned motor being absorbed by the propeller when free-wheeling.

**Wing:** The construction of this is perhaps rather more difficult than some, and is also much lighter in weight. The spars should be of very hard balsa. Note that these are lined at the root with strips of 1/32" plywood before building is commenced. Reference to the drawing should make the work straightforward. Note that the wing boxes are formed before gluing in the root ribs. The 1/32" sheet covering takes only time and care.

**Wing Fixing:** Having completed the wings, cut out the pieces for the 1/32" plywood wing brace as shown on the plan. These should be rather oversize to allow for fitting to the boxes. It is recommended that each of the four main pieces be marked "front" to avoid mistakes when cementing these together at the center section. Fit each carefully into the appropriate wing box so that no movement is present vertically. The grain direction should be noted when cutting the banana-shaped reinforcement pieces. If made accurately this will give a tip rise of 4-1/8" to each wing.

The lower wing runners may now be cemented to the fuselage using the wing brace to obtain the necessary angle. Cement in place the upper rear runner leaving 1/32" gaps to accommodate tightly the plywood wing tab. Slip the wing brace through the fuselage and place in position the wing halves. Next check the angle of incidence (5/16" rise from a base line); see that both sides are identical when measured vertically from a surface table. If necessary, correction can be made by adjusting the lower wing brace runner. When all is well, cement in place the upper runner which should be shaped to fit the angle produced by wing brace. No movement vertically is an essential requirement.

**Tail Group:** If you decide to fit a dethermalizer, slope forward the cutaway portion of the fuselage. The longerons are sanded off to half their diagonal thickness and reinforced underneath with pieces of 1/8" x 1/16" balsa wood. The stabilizer is of straightforward construction. Temporarily strap this into place on the fuselage when building on the V decking. The locating pieces which fit between the fuselage longerons should prevent any side movement, otherwise rudder adjustments will be inconsistent. The upper and lower fin may now be completed. Details of the dethermalizer unit should be apparent from the drawing. Butchers' string is soaked in a cold saltpeter solution for 15 minutes and hung up to dry naturally for the fuse. Check the burning rate carefully, if possible in a 14-mph wind.

**Covering:** This should be carried out in Jap tissue or a good substitute. All wood parts including the propeller and nose block should be covered and given two coats of clear dope. Remember that warps in the surfaces cannot be corrected on the flying field. Colored dopes should be used only on the nose block and undercarriage to avoid unnecessary weight.

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Attention to the glide is of major importance when trimming this model. A right hand circle of 150' diameter should be aimed at. Only when you feel you cannot improve this should the power be increased. With increased power, attention must be concentrated on the side thrust which should be adjusted to produce a slow righthand circle. Great care in combining the power and side thrust adjustments is necessary to obtain maximum performance. With full turns the model should leap off at an alarming angle, gently turning to the right as the power diminishes.

Two planes I have made to these plans weighed slightly less than 8 1/4 ozs., and both are still flying.

#### JAGUAR'S RECORD

1947	
Contest	Place
Flight Cup	6th
N.M.A.C. Wakefield Contest	1st
N.M.A.C. Rally (Open)	1st
M. E. Cup (Open)	1st
Eaton Bray (Wakefield)	2nd
Midland Rally (Open)	1st and 2nd
Gutteridge Trophy	2nd
1948	
Flight Cup (Open)	5th
M. E. Cup (Open)	3rd
Weston Cup (Wakefield)	1st
Midland Rally (Wakefield)	1st
Eaton Bray (Wakefield)	1st
Worcester Rally (Open)	2nd
Wakefield Trials	1st
Gutteridge Trophy (Wakefield)	1st and 2nd
Nottingham Rally (Open)	1st, 2nd, 3rd
Wakefield Trophy	Winner

## DOPE CAN

(Continued from page 45)

and for the radio-control racing event. We're sure Jim is open to suggestions for rules for both events, so send 'em along to us and we'll see that Jim gets 'em. Radio-control speed will appeal to the more expert enthusiasts, we're sure, and if you're flat footed from chasing crates cross-country you'll go for the deal of calling your shots in. free-flight.

**To Keep the Record Straight:** Ye Oldie and Half-Shottie Conductor of the Dope Can was listed on page 42 of the December, 1948, issue of *Air Trails* in the "Plymouth International Contest" story as owner and co-designer of the Super Cyke-powered "Alex the Great" free-flight job. Sorry, but it ain't so! The job and credit for its design belongs to Dick Vickrey. Herr Luce's only participation was in form of one or two comments during test stage.

**Future Champion Has Super Champion:** And wants a suggestion as to what control-line kit model will go with it. Our suggestion is that he look through the ads in this issue for a stunt ship big enough to take the .62 engine he has, and pick out one that tickles his fancy. When the elevator is installed, though, stops should also be installed to limit its travel so that the ship won't be too "touchy." After a little practice he'll get the feel of control-line flying, and the stops can then be removed. Being the only modeler in his town, he's just busting with model talk that has to come out,



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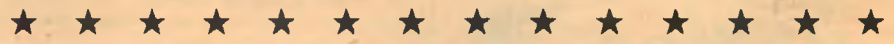
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<b>BABY STUNT</b> CLASS A-B, 36-S, 6C	<b>\$350</b>
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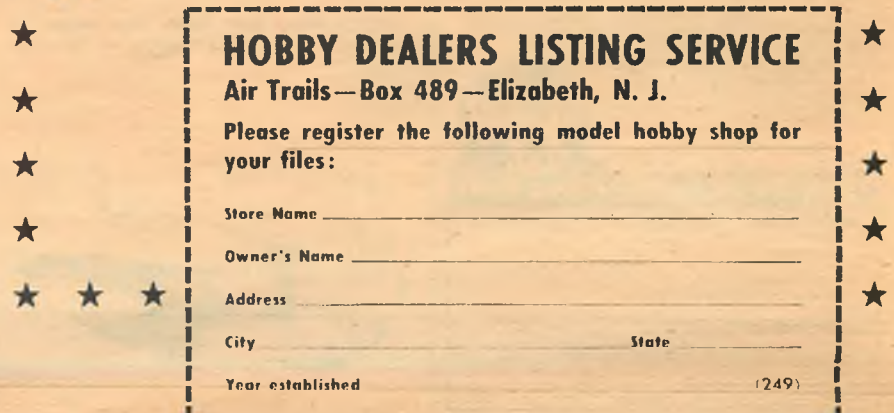
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and if you're about 14 or 15 he asks that you drop him a line. His name and address: Howard Longpre, Route 1, Box 94A, Watertown, Minn.

**Somber Note:** There was no letter in the envelope received from Robert Combs, Jr., of Wilmington, Del.—just a newspaper clipping that told its own story. A young flyer from Tuscaloosa, Ala., flew his control-liner too close to high tension wires. The result: 44,000 volts threw him four feet into the air, blistered his feet where the charge grounded through the nails in his shoes, burned his hand severely and blistered his lower lip. He's lucky, though, compared with the two modelers previously reported in these pages who lost their lives under the same circumstances. Possibly disfigured for life, the chap becomes a living reminder that we should take every possible safety precaution. If you can't remember AMA's safety rules, think of him before you fly.

**What'll Ya Have?** Speed, duration, or both? At the annual meet of the San Francisco Recreation Department, a 100-yard speed course was laid out. Speed models were to be rubber-powered and have a wing loading of less than 4 oz. per 100 square inches. Not too significant is the news that only two models made it, but what really raises the eyebrows is that Frank Devlin's modified "Werlewind," not satisfied with winning, added an extra fillip by crossing the finish line, picking up a thermal and flying out of sight!

**Hand Me My Six Shooter:** The Nevada Aveites Model Club sends along a completed Club Roster form, in which Contest Director-Secretary Ralph Wilson advises that the club meets the second and fourth Friday of every month at its clubhouse, and that the average age of its 32 members is 22 years. Club sponsor is Youhtown Inc., with a City Hall address—behind which there must be a story—and in addition to ten club contests a year at their own field—Youhtown—the group runs the widely known All Western States U-Control Contest the third Saturday and Sunday of October. If you live in the Las Vegas area and want to join a live organization, particularly if you're interested in control-line, contact Mr. Wilson at 520 N. 11th St. Say, that six shooter deal might be the way to break ties!

**Young Flyers Were Hot Last Summer:** Of the 25 places won in AMA-sanctioned meets attended by the Bristol (Pa.) Aeromodelers, 22 were won by Junior and Senior members. Organized in December, 1947, the club has already "grown out of" two meeting places; the latest is a combination meeting place and workshop where novices can easily be put on the right track. Interesting is the club's intention to run free-flight events only at their Second Annual Meet this year. The membership feels that speed flying awards are always won by the same small group who, the club feels, have the advantage of use of machine shops, plenty of money, plenty of time—or all three—and that the "little fellow" doesn't have a chance. Similar thoughts have reached us via the grapevine from other sections. Could this be the beginning of a trend? Or could the answer be the practice followed by many of running separate events for ball bearing and plain bearing engines? Latest group to join this parade is the Canal Zone Model Airplane Club, in their contest at Balboa last September 5.

**OCD's Have New Look:** New names appear as Editors and Publishers of the Oak-



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land (Calif.) Cloud Dusters' "Propwash." Manny Andrade (Outdoor Cabin winner at Olathe) and Pete Demos (whose 2nd in Indoor Cabin ain't bad, either) are giving "Mom" Robbers a well-deserved rest. Also new for the Dusters is the meeting schedule, which gives each member a chance to act as host. We detect a sinister plot here, since each wife or mother as the case may be will probably try to outdo the others in the matter of refreshments for the gang.

**Klasy Konekticut Kontest:** A newsy letter from Willard Ballou tells us that the Southington Meet was a peacheroo, in spite of a gale. Although engine runs were cut to 10 seconds, Hank Struck's gas job hid itself in the woods and prevented him from completing his officials. All age groups were combined for scoring, except that the hand-launched glider event was limited to Juniors, but trophies were awarded for Junior high times in each event as well as for high times for Senior-Open combined. Willard's son Glen hauled home the *Air Trails* Trophy for best Junior time in rubber, and flew the same Class C cabin job with which he established a national record at the Connecticut State Championships. Designed by Glen's pop, the ship is a simplified version of the model which has flown long and faithfully for Willard. Chester Orrill's high time of the meet—8:53—is really sumpin' in such a gale, particularly since it was made in Class A gas.

**\$\$\$ County Stuff:** The "Prop Spinner News," voice of the Kiwanis Aero Club of Doylestown, Pa., member of the oh-so-active Bucks County Federation of Model Clubs, tells us that the meet held by the club last Aug. 29 ain't nuthin' to what this year's meet will be. When it is remembered that prizes amounted to \$1,250—in Bucks County, what else?—and attracted 212 contestants, you control-liners within traveling distance of Doylestown can't afford to miss it. Everybody has a chance, too! Contestants last year voted overwhelmingly in favor of the "Professional" rule enforced by the Federation that "all members of the model industry, manufacturers, distributors and dealers shall fly in a class of their own, for a prize not to exceed one dollar." Best proof that the rule is effective is in the fact that it's working successfully in Mercer County and Bedminster in New Jersey, as well as in West Chester and Bucks County, Pennsylvania.

**Don't Take It For Granite:** That Vermonters always have little to say. Leonard Korzun, Publicity Hound for the Rutland "Prop Busters," gives us what he calls a "short" history of modeling there. He only takes five pages for the "short" history; what if he gave us a detailed account! Seriously, though, it appears that he is the guy who's responsible for putting the club on its feet again, after it had folded early in '48. On his own hook, Korzun contacted the Green Mountain Modelers (about whom we wrote in a previous issue), adopted their point system and general set-up, and got the Busters going again. Haste was made slowly at first, since the fellows were wary of signing up with a flopperoo, but by the middle of October the membership numbered 15 active flyers. The membership is agog about running a meet this year, and although they know what events they like, they want the meet to attract out-of-state entrants. So, says Leonard, howabout some of you guys interested in attending such a contest writing him and letting him know what you want in the way of events? His address: Cuttingsville, Vt. (P.S.—just to make sure that the "Prop Busters" hit the column, Joseph Noonan wrote us, too! It seems that he and Robert Monahan worked with Korzun in the club reorganization program.)

**East Side, West Side:** Go the members of the "East Side American Airlines Gas Model Club," performing in air shows. In addition to staging a show of their own for the benefit of orphans and polio victims in the vicinity of Cleveland, the club put on a pip of a request demonstration of the Municipal Airport on Air Force Day. Unique was their All CO<sub>2</sub> Free-Flight Contest on October 24, which featured trophy prizes down to 10th place.

**Off On The Right Foote:** Jack Volponi, who reports the activities of the "East Bay Aeronauts" of Oakland, Calif., says that Don

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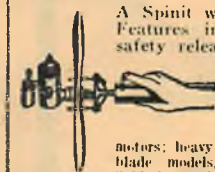


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Foot's new free-flight job (remember his "Westerner" in *Air Trails* a few years back?) has surpassed the guy who used a broomstick for a fuselage by using a thin aluminum tube. Jack reports that the ship, which Don calls "Foot's Pipdream," has a glide that's terrific and by the time this is read should have the climb ironed out. Record certificate holder Volponi is happy to say that free-flight is on the upgrade again after taking a beating from control-line, and that a high point was reached in the E.B.A.A. Annual Free-Flight Meet held at the Livermore Naval Air Station last November 7. Enclosed with Jack's letter were some shots of Joe Peco's beautiful 9-foot radio-controlled Cub Cruiser. Just to show that the job actually flies, Jack sends along a picture of the ship in the air. Super stability gives quick recovery from spiral dives, he says. Control unit is a new one which will hit the market soon.

**Ocie Can You Say It!** A brief but effective story is told on the covers of the August and September issues of Ocie Randall's "Fresno Model News." The August issue says, briefly, "Fresno Plymouth Team: Carl Randall, Thomas Diel, Fred Morgan, J. Whitlatch. Good luck, Gang!" On the cover of the September issue: "Fresno's Plymouth Team Scores a Clean Sweep!—Carl Randall, 1st F.F. Gas, Class D Sr.; Tom Diel, 1st F.F. Gas, Class D Jr.; Fred Morgan, 1st F.F. Gas, Class B Jr.; Jim Whitlatch, 2nd U-C Speed, Class D Sr.; 3rd U-C Speed, Class C Sr." Editor Randall also reports the results of the first Fresno-Bakersfield Challenge Match, which saw the 6-man Fresno team on top over the five Bakersfield boys who could post times. Bakersfield put in some intensive testing for the return go, which was held on October 24.

**Maine Topic:** In the "Tale-Spinner" of the Augusta "Flying Maniacs" is their contest record for 1948, and well might they be proud of it! With the club only six months old, the "Maniacs" walked off with the State Championship last June 27, after begging to be permitted to compete. Asks Stan Davis, "Is 25 firsts out of a possible 53 proof enough?" Off-hand, Stan, we'd say it was.

**Cummings Comes Out On Top:** A note from Andy Peterson advises that after a re-check, Frank Cummings was declared high-point contestant at the Plymouth Meet. Little known facts: "Mellogroovy" Cummings is a sizzler on the bass fiddle, and would be with Nat "King" Cole today if Mom hadn't nixed the idea, for which model aviation thanks her.

**Thumbs Up:** For the "Thermal Thumbers" of Los Angeles. The second in their series of novice contests was held October 17. Lending a helping hand again was Cal-Aero Technical Institute, who donated perpetual trophies for champs in the Junior and Senior age groups. A big hand for the "Thumbers," 1947 National Club Champs, who turn out en masse to give the beginners the benefit of their experience. Club Secretary Salisbury also tells us that they relax every once in a while with such things as a "living room" contest at Bill "Sweet William" Sweet's house. High time with the 15-square-inch paper covered rubber jobs under the eight-foot ceiling was 1:37.8 by John Kiener.

**Shuffling Off:** The "Flying Bisons" of Buffalo, we find, done right noble last year. In the money 94 times in 17 contests, including 9 big ones, they collected 44 first places. Most of the hardware was collected by Don Hobel (who cleaned up in free-flight at Detroit), Hank deBolt, Mike and Steve Jordan, Ron Kirk, Len Wagner and Bob Rawe. Watch these and other "Bisons" in '49, says Morris Maltby, club loudspeaker.

**Yulke Production Line:** Includes (a) a shiny new daughter and (b) the "Eastern Flyer," voice of the newly-formed Eastern Association of Model Airplane Clubs. With Doris as editor, the "Flyer" will mirror the doings of the Association, first proposed by Frank Bushey. Frank, whose organizational ideas were proven by the smooth-functioning Connecticut group, envisions the entire country covered, with all sections working together in an integrated National program. It appears that such a program is within sight, what with

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the smoothly-running MidSMAA and CAMC, Don Warner's growing group in the Southeast and Johnny Clemens' work in the Southwest. "Holes" in the pattern as this is written appear to include Ohio and the North Central states, as well as the Northwest, where a strong association once existed. "EAMAC's" purpose, Bushey advises, is the tying together of the work being done by smaller local associations now existing, and assisting in the formation of other local groups of clubs where needed, so that EAMAC will be the representative voice of the entire section.

**We Cotton To The Idea:** Of the Alabama State Exchange Clubs' model program. After a series of small and not so small meets, the State Miniature Air Carnival in Birmingham wound up a very successful season. The meet was directed by John McHugh, who repeated his swell job of '47, and on-the-spot reporting was done by Station WCOV.

**Glowing Tribute:** To the effectiveness of incandescent plugs comes from Robert B. McMullan, who bemoans the fact that his job keeps him hopping around at the expense of his model building. (He writes from Seminole, Tex., and gives his home town club as the "Prop Nuts," of Corsicana.) His "old faithful" is a "Sky Box" with Atwood Glo-Devil. Due to the engine's ability to perform on a rich needle valve setting, McMullan was able to get the feel of the ship at low speed—engine was run two turns open from full power—and as confidence and ability increased more power was gradually applied. Bob tells us he's tried this with a number of engines, and all ran well. Unfortunately, though, this isn't universally true.

**Are Youse Lucky!** If you're a Brooklynite and wanna jern a club. Bernie Liquorman writes that the famous "Sky-Scrapers" will welcome you. Members fly both control-line and free-flight, so don't stay away. Bernie's old friends of pre-war days will be glad to hear that he's working on his Master's degree in Mechanical Engineering and is with an outfit who design and build oil refineries, for which he receives an attractive stipend plus all the oil he can drink. Bernie can be reached at 2154 E. 34th St., Brooklyn 10.

**Little Hope For Fairhope:** Says Billy Manly of his home town in Alabama, where after a promising start a couple of years ago modeling has dropped off. Sponsored by a local sportsmen's club, the "Cloud Clippers" had their own fenced-in flying area, 25 members and a couple of swell Senior Advisors, whom Billy suspects of digging down deep on their own for needed funds at times. So what happens? Instead of growing, membership starts getting progressively smaller. Now there are only three active modelers in town (pop. 2500). Indicative of the kind of support the club was getting is Billy's mention of a club column in the Fairhope weekly paper. With a never-say-die spirit, Billy wants to know how to get rolling again.

One thing particularly noticed in Billy's letter is his mention that members started drifting away during the winter, as so often happens in other clubs. When flying conditions are had, club meetings should be made attractive to keep interest alive. There's usually one "bug" in a club who's all wrapped up in engines, for example, and who needs no urging to expound on the subject to other club members; another might be a fuel specialist; another—or all of the others—might have some definite ideas as to design, and so on. Each of these could be featured at a meeting. It's also a good idea to space meetings a little farther apart when flying is at a low ebb; members then start looking forward to them. Another idea that works well is forgetting models once in a while and getting together just for the fun of it, complete with gal friends if you're of that age and stage. "Keeping in touch" would be easy for Billy with his weekly column. Another project that helps maintain membership, at the same time assisting the club, is the "adoption" of a Junior by each older flyer and helping him over the early tough spots until he's on his own as a full-fledged club member.

**The Boys From Syracuse:** They aren't all boys, we see, since Ellen Caring is listed as



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secretary of the "Syracuse Controliners' Club," with Leonard Bartosowicz as president and Edwin Myers as treasurer. Although as its name implies the club is composed of control-line flyers exclusively, their big meet last August included rubber and free-flight gas. All control-line speed events at the contest, which was a feature of the city's Centennial Celebration and was sponsored by the Plymouth Dealers there, were won by Rochester flyers. However, the club reports that they didn't fly at that one, holding off until September 12, when an all-control-events meet was run by them at the Air Base.

Banners of the "Prop Spinners Club" waved on high over Hicksville, Long Guyland, when they ran their well-known "Northeastern Championships." Prizes, including trophies as well as engines and other merchandise, were up to the high standard which has been building up for seven years. 56 donors of awards are listed in the neat little meet program whipped up for the occasion.

Pip Of A Ship By Tip: "Just a reliable ol' clunk," says Tip Smiley, Des Moines, Iowa, of his 54-inch span cabin job with Forster 29. Despite the fact that almost 100 flights had been made when he took a picture of it, it appears to be in excellent shape. Similar model might prove to be a welcome change to those who are weary of scrambling after contest jobs.

No Need To Stretch A Point to answer a rubber fan's letter. George Kempkes, 525 E. 3rd St., Superior, Neb., builds 'em okay—no warps, surfaces lined up, etc.—but says he can't get his T-56 to turn long enough. Sounds like he hasn't any (or enough) slack, so we'd suggest his making the motor of the required number of strands as shown on the plan about 25% longer than the distance between motor hooks. (Example: if distance between hooks is 20 in., make motor 25 in. long.) Use a good rubber lube, such as 50-50 green soap and glycerine or a vegetable shortening, such as Crisco, and rub it well into the strands. Bend the prop shaft into an "eye" on the front face of the prop, and using a hook clamped in a hand drill for a winder engage it in the "eye." Stretch the motor to about 5 times its length with a helper to hold the ship, pack in about half the turns, then walk slowly in towards the ship while winding the other half. This should help a little, but there are plenty of guys with the know-how who can give George some more tips, so how about writing him?

An Unclouded Future lies ahead for "The Cloudhoppers" of Flushing, N. Y., after the success of their first annual meet last year. A beautiful day, complete with thermals, was their fortunate lot, and W. C. Kimbell, club secretary, tells us his highest time was John Thompson's 21:10.3 in Class D. Ties were broken by rolling a set of galloping dominoes which someone "just happened" to have in his pocket. Those interested in affiliating with a live-wire gang should contact Kimbell at 36-14 165th St. in Flushing. Dues aren't exorbitant, he says, and the bunch has plenty of fun, including a terrific Christmas party.

Out Of The Pittsburgh Smog: And into the light of day at Chanute Field went Lt. Harry G. Vogler, Jr., son of the famous "Pop" and model luminary in his own right. Spark plug of the Chanute M.A.A. with its more than 40 members, Harry ceedee'd the big meet at the field on Air Force Day. Midwesterners have seen the Association in action in every attendable contest in the immediate area and beyond.

"Dear Dope," writes Don Foote, who may not be so far from wrong. Don went for Dick Gould's article, "Covering For Keeps," as the sort of practical informative feature of which he'd like to see more. He offers a P.S. to the article on the subject of nylon, which, he says, is too strong for flight surfaces. For fuselages yes, but for wings uh-uh! A hard landing will often shatter wing structure held rigidly in place by unyielding nylon, so that a wing picked up after such a landing will resemble a limp bag with no holes but full of shattered balsa. Don also says that although nylon may not shrink to the same degree as other materials it is critically affected by

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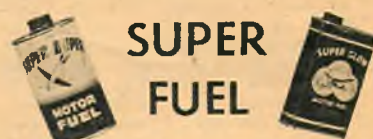
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temperature changes and will cause horrible warps to appear suddenly. Good in light crack-ups and highly resistant to holes as it may be, nylon won't let wing structures flex and take the load when the going is tough. Don cries for action pix and more of 'em. Although no shutter-bug, he enjoyed the "Photo Clinic"—even the poorly-taken fuzzy shots since they showed some action.

#### THE INTERNATIONAL SCENE

• **Canada:** Peter Mann reports the 3rd Annual Contest of the London (Ont.) "Modelaires," a control-line meet sanctioned by the Royal Canadian Flying Clubs Assn. Meet highlight was flying by four-year-old Harvey Shoemaker of one of his dad's stunt ships. A "best ever" meet is planned for this year.

**Switzerland:** And here, readers, is the best-sounding answer to the problem of testing a glow plug job. We have J. L. de Neufize to thank for this one, backed up by his personal experience. Suppose, he supposes, the ship calls for a 12-7 prop; the thing to do is to get one of lower pitch as well, say a 12-5. Make first flights with the 12-7, but with it installed *backwards*—that is, with the cambered side facing aft! This, he tells us, doesn't affect the flight except for slowing down the powered portion and permits detection of spinning characteristics without danger. The engine will be operating at normal speed and setting, too, without the tendency to "die" so often seen. Second stage of test-flying entails use of the low-pitch prop. This is installed conventionally. Speed will increase, natch, but with the first stage of testing successfully completed, no danger should exist. After the second stage is over all that remains is the final smoothing out with the regular prop. This we gotta try; it sure listens good!

**Venezuela:** Jack M. Redding, Jack R. Talbott, Paul Bunke—what sort of Venezuelans are these? Further down in Jack Redding's letter we find that they're Americans and that Camp Roblecito is a camp of the Sociedad Anonima Petroles Los Mercedes, a subsidiary of Texaco. He says he hasn't seen a model shop down there and that materials are therefore tough to get, on top of which they have a long rainy season, during which they fly indoors or "just build." Write modeler Redding at Apartado 26F, Camp Roblecito, % Texpet, Caracas.

**England:** R. Coultas, 4 Harlow Road, Lidget Green, Bradford, Yorkshire, would like to swap info with you and you. . . . So would M. A. Ayres, Carlton Lodge, Princes Risborough, Bucks.

A long, chatty letter from D. W. Evans, Hon. Secretary, "Weston Controliners," 1 Oxford St., Weston Super Mare, Somerset, gives us the gen on control-line there. He believes that their lower speeds, even with hot American engines, is due to climate, with which we won't argue. We also go along with his wish for international competition in categories other than the Wakefield.

**Holland:** W. A. v.d. Linden, 3 Kerklaan, Capelle v/d Ysel nr. Rotterdam, sends along some pages from "Avia," official publication of the Royal Dutch Aero Club, showing him in action at Eaton Bray, England, while representing his country in the Bowden Trophy Competition. Pride and joy dear to his heart is a Hurler "Aristocrat" engine, purchased in 1939 and still going strong. Made in Philadelphia, the "Circle-H" trademark used to be a familiar sight on the contest field, but alas it has passed out of the picture and is no longer being made. Mr. van de Linden, who is 27, expects to visit Toronto and would like very much to be acquainted with at least one free-flight gas flyer there by the time he takes his trip. By the way, his ships are nothing short of beautiful; we have pix to prove it!

P. van de Dijk, Maasstraat 76, Utrecht, President of the Utrecht Model Flying Club, wants you Americans to write to him. With 13 years' experience—he's 27—has built and flown just about every type. Fellow club members are envious of his De Long, for which he's constructing a Fokker D-21 control-liner.

**New Zealand (via O&R):** Ohlsson and Rice send along a request from Gordon Derby, George St., Te Kuiti, North Island, that a modeler here, age 16 or 17, drop Gordon a line.

## RECORD RISER

(Continued from page 68)

plans are followed. These angles are very critical in maintaining stability. All exposed wood should be given a coat of colored dope.

The motor is made up of eight strands of 1/4" wide flat rubber. Its length when new should not allow more than 1/2" of slack. Use plenty of lubrication on the motor as power is the essence of a high, fast climb. In winding your motor up for flight do not stretch it to the utmost as this tends to weaken the over-all power. Wind in approximately 400 turns at this position and put in another 300 as you walk in. If the total weight of your model is not quite up to two ounces this should give you a two-minute flight in calm weather. Be sure in launching the model that you release it from a grip below the lower vanes.

The author has been experimenting with helicopters since 1946, during which time this model has established three National Records. A duplicate of it also holds the Senior National Record. Best flights to date have been between three and four minutes. These have, however, been under good thermal conditions with the attendant light breeze which invariably has brought the model down beyond reach of the author either in a tree or on top of a house. So, if a breeze is blowing, be sure you are in open terrain.

## JET PROPULSION ISN'T NEW!

(Continued from page 30)

two large kites to a chair, sat himself in the chair and had 47 coolies ignite the rockets. Unfortunately posterity has no record of what happened to Wan Hoo.

A quarter of a century later Giovanna Branca perfected a steam engine with a direct application of the jet principle. This engine was the forerunner of the modern steam turbine.

Several years prior to Branca's steam engine Sir Isaac Newton planned a jet-propelled wagon. This wagon was to be propelled by steam emerging from a nozzle in the rear.

In the Paris of 1783 Parisians were astonished when an engineer named Abbe Mollan and a partner lofted a balloon steered and propelled horizontally by jets. A series of holes located around the center of the balloon were covered by flaps attached to strings. By pulling the proper strings, a flap could be released and the balloon propelled in the desired direction—it says here in fine type at the bottom of the history page.

Shortly after Mollan's experiment an Englishman, John Barber, secured a patent for a turbine containing a gas pro-

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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 February, 1949, index.

ducer, a compressor, a turbine wheel and reduction gears, but it never progressed beyond the patent state.

In the latter part of the 18th century the Ruggieri brothers were the experts on pyrotechnic rockets. They shot rockets carrying small animals into the air and landed them safely with parachutes.

The idea of rockets as a military weapon was expanding as is evidenced by the first rocket corps. Organized by India's Prince of Mysore, Hyder Ali, it consisted of 1200 men. They used rockets weighing from six to 12 pounds. Each rocket consisted of a round tube eight inches long and one and a half inches in diameter, packed tightly with powder and guided by long bamboo poles. Range was up to one and a half miles. These missiles were used against the British and inspired British rocket development.

A few years later, when Napoleon prepared to invade England, the British used the William Congreve rocket against his concentrations at Boulogne. They fired 2,000 rockets from the Channel into the city, starting numerous fires and completely halting the invader.

After 1807, when the British, using 25,000 rockets, attacked Copenhagen from the sea and almost completely destroyed the city, rockets were used often and successfully. The British used them against the French fleet at Calais and Bayonne. The city of Danzig was almost completely destroyed in 1813 when the French bombarded the city with rockets. In the decisive battle of Leipzig a considerable number was used by the Germans.

During the War of 1812, the British landed 4,500 men on Chesapeake Bay. Using the William Congreve rocket they caused two American regiments to flee in panic. The British captured Washington and moved on toward Baltimore where they attacked Fort McHenry. The rockets were unsuccessful but resulted in inspiring Francis Scott Key to write "The Star Spangled Banner" with the lines, "The rockets' red glare, the bombs

bursting in air." These rockets had a 2,000-yard range and weighed 32 pounds.

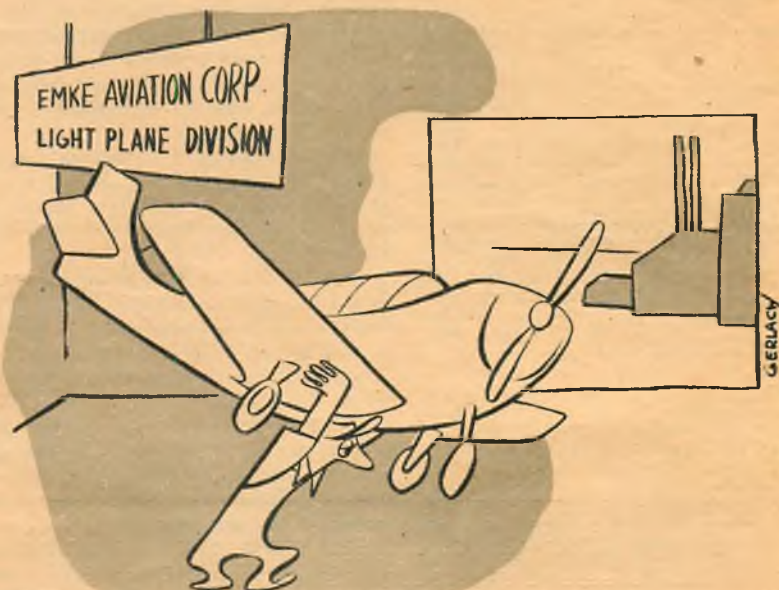
The first U. S. rocket battery was organized at Fort Monroe in 1846, using Hale's tailless rocket. It was designed to rotate by means of three stabilizers in the base. Later Congress authorized ten additional regiments to be equipped with rockets and mountain howitzers. By June, 1847, two thousand rockets had been manufactured and stored in a Washington arsenal. Some of these rockets were used in the Mexican War at the Vera Cruz landing with some success.

The first guided missile was conceived during the Civil War, when the South worked on a torpedo that was unsuccessful. It moved too slowly and allowed ships time to maneuver out of its path.

The torpedo was perfected during the first World War, which also saw development of a pilotless plane flying a pre-set course, which was to be loaded with explosives. It was never used operationally. The Germans used rockets attached to large anchors to pull up barbed wire entanglements. The Russians and French fired rockets by mounting them upright in planes and then flying beneath observation balloons and igniting them.

At the beginning of the 20th century, the leading authority on rockets was Dr. Robert H. Goddard of Clark University in the United States. He experimented with powder rockets and within five years he reached the conclusion that powder rockets were not adaptable for high altitude rocket work. In 1920 he turned to liquid fuels and after five more years of experimentation fired the first successful liquid fuel rocket. Goddard worked out the mathematics for computing thrust and the idea of using step rockets. His text book became the bible of the German rocket scientists.

In 1928 Fritz Von Opel, the German Henry Ford, was experimenting with rocket-propelled automobiles. At a public demonstration his Opel I, propelled by a series of 12 rockets attained a speed of



70 miles per hour. At a later display the Opel II reached a speed of 100 miles per hour, propelled by 44 rockets. The Opel III, set up on a stretch of railroad track reached a speed of 180 miles per hour. In 1929, a German, Herr Valier, perfected an ice sled which was rocket-propelled and which reached the amazing speed of 250 miles per hour.

At Dessau, in 1929, the Junkers Company developed the jet-assisted take-off but kept the results secret. The jet-assisted take-off was used by heavily loaded planes for the mass air raids on London.

The Germans worked out theoretical studies to set up stations in space which would constantly move about the earth at an altitude of about 400 miles. These space stations were to control the world and act as stations for directing guided missiles.

Since the modern rocket carries its own oxygen it has no ceiling. It can as easily travel in the stratosphere as the atmosphere. Recent developments in the field of reaction motors, aerodynamics and remote control of aerial vehicles makes possible entirely new weapons capable of attaining high velocities, great altitudes, long ranges of operation and extreme accuracy.

During the last war landing barges fitted out with 150 banks of rockets were equivalent in fire power to 30 battalions of field artillery. They were a faint whisper of what could come with rocket warfare.

## DALLAS

(Continued from page 27)

veterans who have successfully completed training are now in aviation industry.

As for recognition, the Dallas Aviation School is approved by the Civil Aeronautics Administration, is a member of the Aeronautical Training Society, and is approved by the Texas State Board of Education and the Veterans Administration.

Dormitory and cafeteria facilities are maintained for those students who wish to live at the school, although this is not compulsory and listings are available in private homes. Married students are usually interested in obtaining apartments for their families. Many of these are available in the residential area adjoining the airport.

The Dallas Aviation School is only six miles from metropolitan Dallas. The location is ideal for aviation training; the year-round weather averages about 94% flyable, which naturally means intensive aviation activity.

Part-time jobs are usually available for the student who finds it necessary to work after school hours. Dallas is a booming Southwestern metropolis and the contacts are good. The demand for skilled aviation personnel the past year exceeded by far the ability of the school to supply them. With big industry moving to the Southwest area it looks like Dallas Aviation will continue to have a tremendous training job to do.

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Among the thousands of Drone Diesel Engine owners, is Mr. J. T. Russell, Jr., of Galveston, Texas, whose unsolicited letter states:—"It is my belief that for the modeller that owns one engine, that the Drone Diesel is the engine; that for the modeller that owns several engines that a Drone should be among them for general all around flying. I can think of no other engine that is less subject to failure, that will give more flying hours per \$, than the Drone Diesel."

This is the opinion of a model builder, who is also a hobby shop owner. Handling and selling all types and makes of engines qualifies Mr. Russell to make such observations.

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Developed for those who like stunting with realistic models. **\$3.95**



### HOT-ROCK

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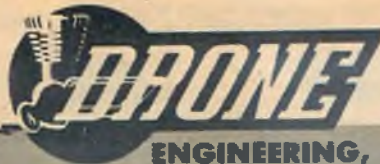


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If our local dealer does not stock Berkeley kits, mail orders will be filled by Berkeley Model Supplies, 138 Greenpoint Ave., Brooklyn 22, New York. Include 25c. packing and postage.

**THE LAST WORD**

Meet the technical editor: AT's Alexis Dawydoff is one of those quiet, capable airmen who are long on experience and ability and short on "when-I-buzzed-her-house" type of activity. Alex is one of the better known sailplane pilots, not only in America but in international gliding circles.

Tall, dark and handsome (he'll murder us when he sees this), most of his waking moments are spent behind the editorial desk, in a glider or power plane, or behind the wheel of a foreign auto.



● Tech Ed A. D.

Please, Please, Please! A suggestion to authors, photographers, in fact, all contributors. When mailing Air Pix, Sketchbook or Airmen of Vision entries to us please label the envelope as follows: Air Pix Competition (or A of V or Sketchbook), Air Trails, P.O. Box 489, Elizabeth, N. J. That insures prompt delivery to the proper department and earlier consideration of your entry.

Now, What's For March? Well, so much interest was whipped up recently by our mis-captioned Mystery Air Force that we're giving all the hot-shot air spotters another set of little-known plane pix and letting them match up the right caption with the right photo. Should be lots of fun because a Thesaurus won't be of any help.

The Short flying boats are the subject of Doug Rolfe's famous Air Progress feature. His drawings stand very high, you know, in the world of aviation illustration.

You'll learn all about the new cross-wind landing gear in the "We Fly" article when Bill Winter takes you aloft in Goodyear's smartly-performing Duck. Three-views of the Duck, too.

The Civil Air Patrol coverage is continued with two pages of CAP news and notes. If you want to join the Patrol drop us a line and we'll forward your request for information to the nearest Wing headquarters. Pete Bowers' Goodyear Racer Round-up is continued in photo and three-view form.

Speaking of models brings us to the model end of matters. On the new gigantic size 12-page insert of full size plans you'll find working drawings for construction of Keith Storey's control-line team racer, the Key; Thomas plans for a solid model of the Fairchild C-119B; a CO<sub>2</sub> quick-built job by Tully Adler; and a perfect Paul Plecan rubber-powered flying scale, the Curtiss Seahawk for R.O.W. or R.O.G. operations.

Bill Winter goes to town on the new West-Coast-sponsored team racing in a most interesting article. For free-flight fans we offer Carl Wheeley's Plymouth contest winner, the Senator. Yessir, and even something for those indoor fans—the new top-place record-holding Class B indoor hand-launched job by Bill Tyler which set a new mark in the Lakewood, N. J., Naval air stock.

—THE EDITOR