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DECEMBER
1941

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BACKGROUND — Parks Air College was founded August 1, 1927, and from the first its development has kept pace with and assisted in the development of commercial aviation.

FACULTY — Parks has a faculty of 82, each especially qualified for his particular field of instruction.

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AIR TRAILS

DECEMBER, 1941 — VOLUME XVII NO. 3
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FEATURES

DEPARTMENT

MODEL SECTION

FULL-COLOR COVER PHOTO OF STANDARD U. S. FIGHTERS
BY RUDY ARNOLD

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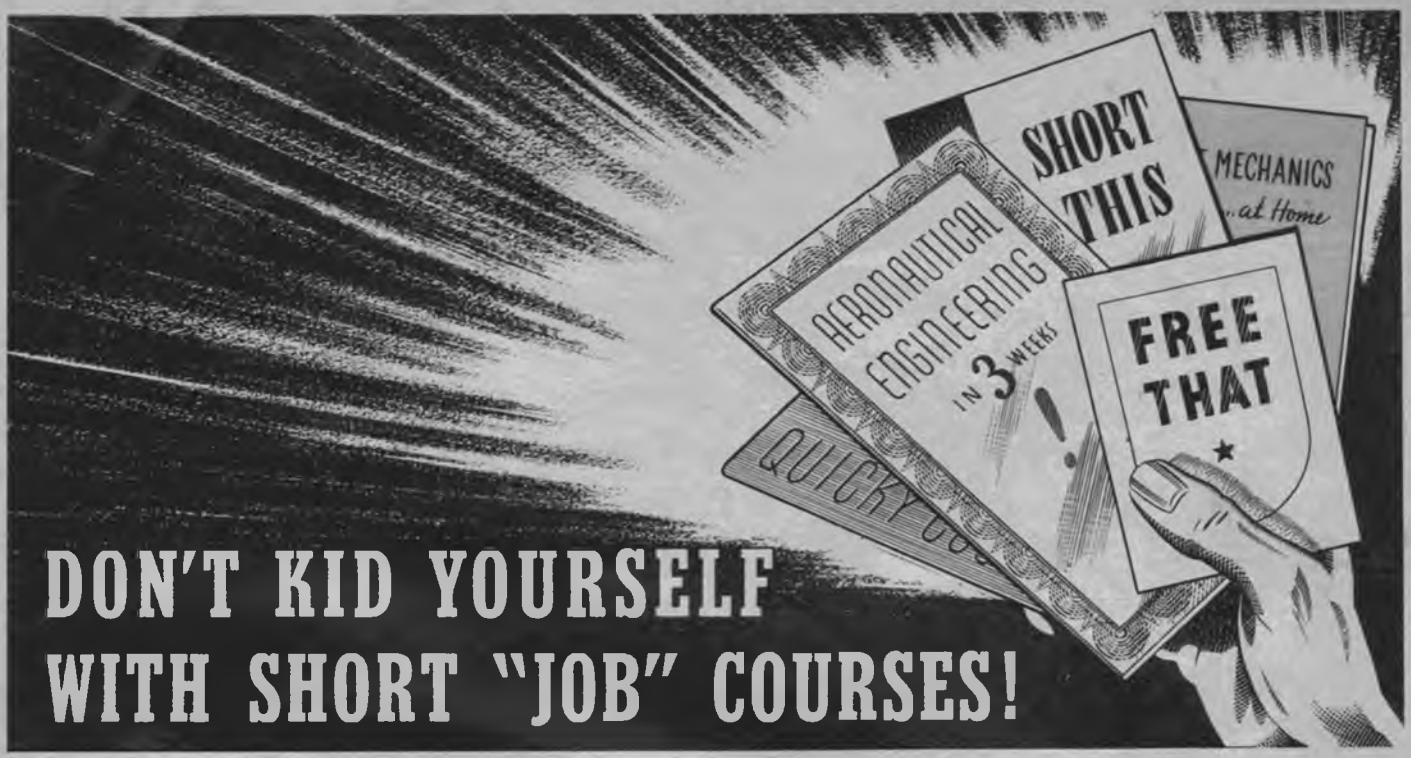

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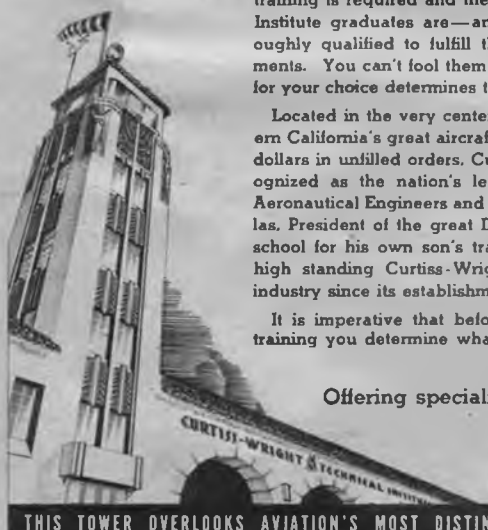

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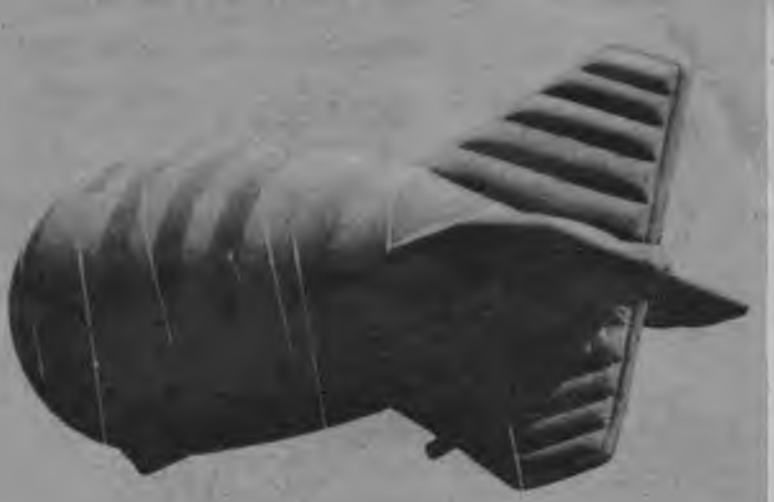

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Laying out the balloon before it is inflated. Coast guard artillery and the air corps are training 3,000 men at Fort Davis, in North Carolina.

20,000 cubic feet of helium is fed into each barrage balloon from 150 of these gas cylinders. T-shaped pipe in foreground leads to the balloon.

Hanging on the ropes. Balloon is ready for ascension and sand bags are being removed. Balloons prevent dive bombers from coming real low.

Left above—Curiosity killed a cat. Supervisor crawls into balloon to look for leaks. Right—A rigger marks leak with chalk for subsequent patching.

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Name_____ Age_____

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QUESTION: Could you tell me whether the Vought-Sikorsky XF4U-1, the Grumman Skyrocket, North American XP-51 Apache and the Vultee Vanguard have been put into production in a big way? Has any of them been discarded? C. C., Indianapolis, Ind.

Answer: Sorry, but we have no information in regard to production figures of the above-mentioned airplanes.

Question: Is it true that one must belong to the National Aeronautic Association in order to set an official record with a model? How can one join the N. A. A. and the Academy of Model Aeronautics? G. N., Los Angeles, Calif.

Answer: Yes, you must belong to the National Aeronautic Association in order to make official any records established by model planes. Write to the headquarters of these organizations at the Willard Hotel, Washington, D. C., for membership application blanks.

Question: I would like to know what the world's gliding records are. Would a glider with a wing span of 35 feet be any good? B. D., Fairmount, W. Va.

Answer: In our July, 1941, issue of Air Trails we published an article on all records established by gliders. Send 15 cents for it to Mr. Clifford of our circulation department. If properly designed and built there is no reason why a glider with a 35-foot wing span should not be good.

Question: What does a student's permit entitle its holder to? Could a person who wears glasses get a private pilot's certificate? On an average, what would a private pilot's certificate cost? J. H. D., Cochranton, Pa.

Answer: A student pilot's certificate permits its holder to fly solo or solo cross country, provided that he has had at least 8 hours of dual instruction. On these flights he is not permitted to carry any passengers. If the person's vision is brought close to normal by use of eyeglasses, he can then qualify for a private certificate. The average cost of a private certificate is between $250 and $300.

Question: Could you tell me what would happen to the Sikorsky helicopter if its engine would suddenly stop in flight? H. C. and K. H., Ozone Park, N. Y.

Answer: There is a clutch arrangement on the Sikorsky helicopter between the engine and the main rotor which disengages the rotor from the engine and lets it freewheel through air pressure; the main motor is connected to the tail rotors, so that they also turn, and therefore the whole ship can be landed safely under full control.

Question: How old does one have to be in order to receive flight instructions? Is the North American Apache as good as the Curtiss P-40? L. S., Riggs, Calif.

Answer: The minimum age at which one can get flying instructions is 16. Sorry, we cannot answer your last question. Only a person who has flown both types of airplanes would be qualified to judge.

Question: Please tell me and my friend what is the streamlined object under the SBC-4 dive bomber pictured in Air Progress for 1940. M. S. and R. O. W., Kansas City, Kan.

Answer: The streamlined object beneath the SBC-4 is an auxiliary gas tank.

Question: Now that the navy has taken over Floyd Bennett Field, Brooklyn, N. Y., are there any private airplanes there? If not, where did they go? Is Rudy Arnold still located there? M. M., Brooklyn, N. Y.

Answer: There are no private airplanes at Floyd Bennett Field; they have gone to different airports located in the vicinity of New York City, such as Sunrise Airport, Flushing, Roosevelt Field, et cetera. Rudy Arnold's address is now P. O. Box 60, Sheepshead Bay Sta., Brooklyn, N. Y.

Question: From three different sources I have found the specifications of the Messerschmitt Me-109 to be as follows: Span 32 ft. 6 in., length 32 ft.; span 34 ft., length 30 ft.; span 32 ft. 6 in., length 28 ft. 10 in. Which is correct? W. K., Cleveland, Ohio.

Answer: The correct dimensions of the Messerschmitt Me-109 are: Wing span 32 ft. 6 in., length 32 ft.

Question: Please give me the following specifications of the Ercoupe: Rate of climb, fuel capacity, ceiling, maximum range, baggage capacity, wing span and landing speed. What instruments does it carry? G. H., Toledo, Ore.

Answer: The rate of climb of the Ercoupe is 800 ft. per min.; fuel capacity 14 gals.; service ceiling 14,000 ft.; maximum range 350 miles; baggage capacity 40 lbs.; wing span 30 ft.; landing speed 45 m. p. h. The ship is equipped with the following instruments: Compass, altimeter, air-speed indicator, tachometer, oil-pressure gauge, oil-temperature gauge.

Question: I am inclosing a picture of an airplane on which it states that the ship shown is a British Spitfire. Unfortunately, it does not resemble any Spitfire that I have ever seen. Could you tell me if the caption is correct or whether the picture is of some other type of plane? J. I. S., San Francisco, Calif.

Answer: The plane pictured on the clipping which you sent us is not a Spitfire but a Miles Master advanced trainer powered by a 710 h.p. Rolls-Royce Kestrel.

Question: Could you give me any information regarding the Republic's Thunderbolt fighter? E. H., Atlanta, Ga.

Answer: Sorry, the information on this ship is restricted. All we know is that it is powered by a 1,800 h.p. engine and is supposed to have a ceiling close to 40,000 ft.

Question: I am interested in gliding. Can you tell me the names and addresses of the soaring clubs within reasonable distance of Mount Vernon, N. Y.? R. L., Mount Vernon, N. Y.

Answer: The soaring club nearest you is the Airhoppers Gliding and Soaring Club. For further information write to its secretary, Peter Sutherland, 314 East 51st St., New York City.

Question: What are the prices of the following aircraft: Bell Airacobra, Consolidated B-24, Lockheed P-38, Lockheed Hudson, Consolidated Catalina and Bell Airacuda? Is the Bell Airacuda in service with the British? C. P., Beaupaire, Canada.

Answer: Sorry, we do not know the prices of these ships. Fighter aircraft may cost anywhere from $50,000 to $80,000, bombers from $150,000 to close to $500,000. There are no Bell Airacuda planes in service with the British.

Question: In the January, 1938, issue of Air Trails you published a scale drawing of the Boeing Clipper. In this drawing the ship had only one rudder in the tail assembly. I recently saw pictures of the ship and it had triple rudders. Why is this? R. F., Los Angeles, Calif.

Answer: The first model of the Boeing Clipper came out with only one rudder. However, it was found insufficient, so two more were added.

Question: I would like to build a secondary glider. How can I obtain a license for it? L. E., Petaluma, Calif.

Answer: Your best bet is to purchase a kit of an approved glider. Then if you build it according to manufacturer's specifications under the supervision of a licensed mechanic, a license will be granted for it upon visual inspection by a representative of the Civil Aeronautics Authority. At the present writing the only approved glider available in kit form is the Briegleb BG-6. You can buy it from the Briegleb Aircraft Co., 16005 Bassett St., Van Nuys, Calif.

Question: Could you tell me what is meant by a "dead-stick" landing? What is the highest altitude reached by a man in a single-place plane? Can bombers fly higher than 45,000 50,000 feet? C. W., Worcester, Mass.

Answer: A dead-stick landing means that an airplane is landed with the engine stopped and the propeller standing still. Col. Mario Pezzi of Italy holds the world's altitude record in a single-place plane—56,032 ft. Bombers cannot as yet reach altitudes of 45,000, 50,000 feet.

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Every day we receive requests from the Aviation Industry for men we have trained to do specific jobs.

This *proves* that the instruction provided at ROOSEVELT AVIATION SCHOOL meets all the requirements of the Industry.

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A. T. DECEMBER, 1941

DOUGLAS CITY

The Douglas plant at Santa Monica, Calif., is a real community all its own. Come take a look.

Noon-hour wrestling in "Punch Bowl" helps employees wrestle with job problems.

One of Douglas City's trains rounds the busy corner of 27th Street and Avenue D.

Douglas Club. Everybody here is named Douglas, all members of the community, including the flagship. Fifth from right is Donald Douglas, president.

CONTINUED ON NEXT PAGE

Thousands of employees take advantage of the city's school system to learn more about their individual jobs. Douglas has own educational department.

On one particular street of Douglas City are three of the four giant hydraulic presses developed by this company. They press over 44,000 parts a day.

DOUGLAS CITY

Continued from Preceding Page

Bowling right along, literally, Douglas City employees keep making records, whether in sports or production. C. Aubrey Smith congratulates winners.

Through seventy trunk lines over 100,000 calls a week from all parts of the country and abroad keep these Douglas City operators busier than two bees.

No need to page Dr. Kildare here, for Douglas City has own hospital ready and able to handle any sort of situation demanding medical attention.

Headquarters. The Douglas City police, co-operating closely with the army, F. B. I., and other government agencies, runs vast plant-protection system.

One-way street. Here American and British production lines carry DB-7s down Douglas City street and out the door for flight testing from field beyond.

Lunch hour. L. to R., Donald Douglas, president; Carl Cover, vice president; W. H. Ball, assistant to president; A. M. Rochlen, public-relations head.

Douglas City has own band, and a good one. Composed entirely of employees, this marching band is a familiar sight whenever parades are in order.

Welcome breadline. Feeding thousands of employees every noon is a problem ably handled by trained staffs and ample cafeterias within the city.

Standing room only. The popularity of many annual Santa Monica plant dances is attested to by crowds. These are held at nearby country clubs.

This resulted from several small bombs dropped during a daylight raid on Cologne power plant. From now on the order will be bigger bombs from high altitude.

BRITAIN WILL ATTACK!

New ships, equipment, strategy, says this English authority, portend an R. A. F. bombing program of which current raids are mere rehearsals.

BY WILLIAM COURTENAY

The author, left, shown with the distinguished Antarctic explorer, Admiral Sir Edward R. G. R. Evans.

WILLIAM COURTENAY *is one of Britain's foremost aëronautical journalists. He is the aviation editor of the London Daily Sketch and Allied Newspapers, the biggest group of papers in the British Empire. A pilot himself, he has been closely associated with the development of English aviation for twenty-five years, and has had a colorful and romantic career as soldier, airman, traveler and lecturer. He saw active service under Allenby in the Near East during the last war, and served as a pilot in the first R. A. F. As a newspaperman specializing in aviation, he helped the late Amy Johnson and her husband, J. A. Mollison, in the preparation; organization and management of many of their long-distance flights across the Atlantic, to the Cape of Good Hope and to Australia. He made several flights to India. On the side of civil aviation, he did much to help develop interest in airport sites in Britain. In 1938 he helped form London's Balloon Barrage defenses. He was mobilized with the R. A. F. during the "Munich crises" of September, 1938, when London was given its first protective barrage, and again in August, 1939, for the present war. He served two years, from the spring of 1938, and commanded a flight in the defense of London.*

TWO years of war have taught us in Britain something of the nature of the proposition we are up against if air bombing is to be depended upon to bring decision in this war.

The old principle that the infantry soldier must finally go in with the bayonet may still be true. But he may not necessarily have to go in by fighting his way over trenches, barbed wire, and by being withered like the corn before the sickle. He may go purely as an occupying force. We know that air power cannot occupy territory. The Royal Air Force cannot "put the bailiffs in" at Berlin. That is a job for an occupying force of infantrymen.

But can the Royal Air Force bomb Germany into surrender and submission? Can long-distance bombing by itself, without the aid of a field army, compel Germany to relax her tentacles from the grip on ill-gotten gains? Can continued persistent and merciless bombing of the industrial targets in the heart of Germany so smash the morale of her people and so break her heart that she collapses? That

For the attack. The new Boeing 17-E, redesigned Flying Fortress for future English air offensive.

is what the Royal Air Force is out to test. It is the first full-scale test in war of a new theory. Two years of war have so far only served to reveal the magnitude of the task.

Throughout these two years, bombing raids have for the most part been carried out by small medium bombers"of the British Blenheim class. Their bomb loads have been limited to four 250-pounders or two 500-pounders. A number of heavier bombers in the Wellington, Whitley and Hampden class were used last winter. They carry loads of a ton or more, also divided into small-category bombs.

In recent months, however, we have developed bombs weighing 2,000 pounds and 4,000 pounds. These are the "big beautiful bombs" to which Lord Beaverbrook referred in a recent broadcast from England. They are the bombs which at last are beginning to do serious and worth-while damage. The fact is that all past experience suggests that the casualties incurred on long-distance raids merely to drop 250 or 500-pounders are not worth while. The damage they inflict is, of course, not inconsiderable: it can never be decisive. Britain is therefore wedded henceforth to a policy of bombing Germany hard and bombing her with bombs of such caliber and destructive power that every raid will show an appreciable advance toward the goal of the collapse of the Nazi regime. This is one of the outstanding lessons of the air war, and this is the new policy of which the first steps are already discernible.

Two things are required to implement this policy. One is the development of the worth-while bomb of immense destructive power. The other is the development of the bomber capable of carrying a fair load of them. The only bombers for the future, therefore, if strategic bombing is to help to bring decision, are the four-engined ships able to carry loads of up to five tons or even more.

Britain's task in bombing Germany is in many respects considerably handicapped compared with Germany's task in bombing Britain. Nazi air squadrons are based on the coast of northern France, only a hundred miles from London, and within easy reach of all British cities. They are able to carry limited fuel loads and big bomb loads. The raiders can easily be recalled by wireless at night if weather deteriorates over their landing fields and a quick return in the dark

Armorers sealing Spitfire wing cannon against rain. New models carry wing cannon in connection with multiple machine guns.

High patroller. The Bristol Beaufighter, popular as night fighter, may prove effective as stratoguard against high-flying invaders.

German reception committee. These Heinkel He 113 night fighters are cleaned-up version of earlier models used against British.

BRITAIN WILL ATTACK!

Continued from preceding page

This two-thousand-pound armor-piercing bomb is small compared to others now being perfected.

is essential. This often happened last winter, when I was in London and raids were canceled at midnight although another eight hours of darkness still lay over Britain.

The R. A. F. airmen, on the other hand, have 1,200 miles to fly from British air bases to Berlin and back, and 800-mile round trips to visit Rhine or Ruhr target areas. They have to carry heavy fuel loads, and consequently the bomb loads are lighter, unless the ships grow in size and carrying capacity. When bad weather closes in round Britain's coasts on winter nights, it is too late to recall the bombers. They may be three hours' flight from home. They must fight their way back through fog to safe anchorage.

Since fog and low clouds may often obscure view of the targets, British pilots are always given three pinpoints on their maps. First is the primary target which at all hazards the pilot is expected to reach and to bomb if it is humanly possible. This target is selected not necessarily by the air staff. In many cases it is chosen by the minister of economic warfare, who learns from his secret agents that Germany is short of a certain commodity; that blockade is effectively keeping it out; that without it her war effort will flag; and that her own production of it is centered at only a few given points. The destruction of them is obviously a good military prize.

The pilot has a secondary target of military value in case he cannot locate the first, or in the event bad weather or enemy opposition from ground or air prevent him from getting through. And finally he has a "last resort" target. If all else fails, he can unload his bombs on this third objective, which is never quite as important as the first two. But it does at least mean that he does not hazard a valuable aircraft and a crew of perhaps five on a perilous 1,200-mile return trip only to jettison his bombs in the North Sea after an unsuccessful sortie.

The planning of bombing raids involves the most intricate staff work on both sides. Not only must supplies of fuel and bombs be "laid on" at the various starting grounds, but every squadron warned for duty must learn to work to a split second of timing. The operational side of the job is very similar to the routing of airliners. Imagine a force of a hundred airliners which must leave La Guardia Airport within a period of say three hours at night; with the airport darkened; with enemy aircraft known to be overhead waiting to pounce on the slightest glimmer of light; with the pilots and crews strangers to the field and to each other; and with the knowledge that while they are leaving, a vast force of aircraft will be homing from other compass bearings for the same airport for landing in the dark.

In such circumstances the whole problem depends on perfect discipline and perfect timing to avoid collisions and to assure that traffic-control systems will work. No radio messages will be received from the pilots during the long flights. No friendly stations will send signals of aircraft passing on time and on course. No friendly weather reports come out of Europe to correct forecasts made some hours earlier. "Wireless silence" must be maintained by pilots until near their own coast on the homeward run. And the homeward-bound bombers will contain wounded men who will need urgent attention in the groping darkness amid the mass of other aircraft arriving.

This gives a fairly good picture, I think, of how the air raids must be launched and controlled. And while pilots *(Turn to page 24)*

The new Handley-Page Halifax designed for use in Britain's planned long-range attack raids. Trend is toward four-engine heavy-duty bombers.

STIRLING CREW

We now take you inside one of Britain's Stirlings, her latest long-range bomber.

Left, R. A. F. means Range and Firepower when applied to new British Stirling. Above, Pilot and copilot of the giant four-engined heavy bomber.

Stirling navigator plots course and position with aid of complicated gadgets. Ready for any emergency, he wears life jacket and 'chute.

The bombardier in the nose of the Stirling lies amidst a maze of switches, bomb releases, sights and levers. His is the all-important job.

Looking for trouble, this nose gunner sits in the big ship's nose turret and keeps eyes ahead for enemy opposition. Note oxygen bottles overhead.

Power-and-speech department. The engineer, left, and radioman, right, are at their posts the entire flight. Phones keep all crew men in touch.

JOBS
AFTER THE WAR

Lots of work ahead. Post-war expansion in air freight and passenger carrying will call for more trained maintenance men.

Night check. Vast fleets of military planes now and in the future will demand thousands of skilled aviation workers.

Are you hesitating to train for aircraft work because of fear the "boom" will end when peace comes? Read this!

BY JAMES ROLLINS

The future for the trained aeronautical worker is always bright. Here a skilled technician is checking the automatic pilot.

A LOT of young men are wondering today if aviation jobs really offer a good future.

"This boom can't last forever," they say. "What about the lay-offs that will come when the war is over?"

The answer to that question can be quite simple and direct: The lay-offs will not come for several years, and when they do come, they will affect only a part of the aviation industry. Several kinds of aviation work will actually expand rapidly after the war, rather than shrink in size. There are ways to get around the lay-offs even if you are working in a job where most of the depression will occur.

Before going into these points in detail, one underlying statement must be emphasized. Aviation is closely tied up with national defense. Any young man who is preparing for a job in aviation or who takes a job in any kind of aviation work is serving his country. In England today it is fully recognized that men building Spitfires and Hurricanes are serving England in their way fully as well as the men in uniform who service and fly those ships. The same is true here. In any job connected with national defense, the interests of the country should come first. The immediate task is to "Get 'em into the blue!" as the signs in the Vultee factory urge, rather than worrying about lay-offs that may not come for a long time.

It is natural, however, for anyone to be concerned about his future. It is safe to say that, entirely aside from the patriotic angle, aviation jobs offer a good future. The present boom in building airplanes will continue for several years. The war will not be a short one. It has already gone on for over two years, and every indication points to a continuation for several years more. If the worst happens, and Germany defeats Russia and then takes England, the war would still go on. This country, either in or out of the war, would continue its airplane building. If Germany eventually loses, the war will still be a long one, and we will continue to build airplanes. If some type of truce is made, it is a certainty that we will continue to build up our air force. It will never again be allowed to decline to the state it was in a few years ago. All this means that jobs in plane factories will go on for several years. *(Turn to page 26)*

AVIATORS PASS IT—CAN YOU?

By making these simple tests right at home you can find out—whether you'd pass the standard physical exam for army or navy flying. Highly revealing and a lot of fun besides.

BY JOHN R. HOYT

THE young men who fly the complicated airplanes of 1941 pass a strenuous physical examination twice a year. Before being admitted to the army or navy flying schools, they pass an even stiffer preliminary examination, a hurdle that prevents thirty-two percent to fifty percent of otherwise qualified men from becoming military pilots.

Everyone wonders why a few get by while some husky college athlete is turned down. What do the doctors fail them on—what are the tests they give that are so terrible? Is there any rhyme or reason in holding such a high standard? And finally everyone wants to know:

"Can *I* meet those standards?"

Anyone who *can* meet them is physically above par, and barring some chronic ailment or systemic deficiency, would be a good risk in any insurance agency. It is rather simple to go through

the fundamental tests, as you'd find if you'd walk into a flight surgeon's office and ask to be given a "flight physical examination."

The emphasis is on eyes in aviation, so the first test is an eye examination, conducted with a complicated apparatus and completed with a pupil dilation that leaves almost every applicant owlish and starry-eyed. The apparatus, called a pharometer, consists of lenses that measure the accommodation of the muscles and the amount of divergence of the eyes. But it isn't absolutely necessary to have these lenses in order to test eyesight. It can be done fairly well with an eye chart.

To make an eye-chart, obtain ten letters one half inch square, ten three eighths inch square, and ten nine thirty-second inches square. The half inchers should be read from thirty feet, the next from twenty feet, and the smallest from fifteen feet. Test yourself by covering one eye and reading the letters from the specified distance. Cover the other eye and read the line backward; if each letter is read without a mistake, your vision may be termed "20-20." If from thirty feet you can read the smaller letters, your vision is probably very good so far as far vision is concerned.

Now test the near vision just as a pilot is tested—that is, holding some fine print a half inch from the eye and moving it slowly away from the eye until it becomes perfectly legible. Print from the want ads of a newspaper will do, as it is quite fine; at the age of ten, one should read fine print at a distance of one inch; aged twenty, four inches; thirty, five and a half inches; forty years, about a foot. Of course, the distance will vary according to the print used, but the net result will indicate whether or not your near vision is good or if hyperopia (farsightedness) exists.

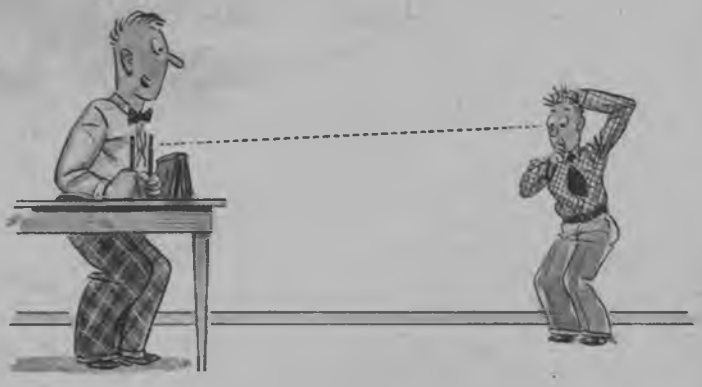
Just because one's eyesight is neither myopic (short-sighted) or hyperopic (farsighted) does not mean it is perfect. The muscular accommodation must be excellent, too, and a pilot must be able to shift his eyes from the distant horizon to his instrument panel countless times during each flight. A test has been devised to determine the strength of the muscles, and this test can easily be conducted in the home. Take an ordinary ruler and a lead pencil. Place one end of the ruler on the bridge of the nose so that the ruler measures distance directly ahead and away from the eye. Now hold the pencil vertically and move it toward the eyes. If someone is available to assist in the examination, it will be evident that the eyes go out of focus at a point varying from one half inch to two and one half inches. (This is a good eye exercise if done moderately, and will bring weak eye muscles up to normal within ten days.) A "normal" distance varies according to the distance between the eyes, measured from pupil to pupil; that is, the eyes should focus on the pencil until it is as close (or closer) than the distance between one's eyes.

So far the tests have not measured performance, but now comes a test that is very essential to fliers. In making landings, a pilot must be able to judge depth and distance, and so a *depth-perception* test was worked out that is not only valuable, but simple. It can be done in one's living room with nothing more than a couple of pencils, a table, and a stack of books. Try it on your friends!

Have someone seated at a table hold two pencils, preferably similar in shape and color, upright in each hand. His hands should be hidden behind a pile of books so that only the pencils are visible to the person taking the test, who is seated about twenty feet away. Thus two uprights, three inches apart but exactly abreast of each other, are all that the applicant sees.

Begin the test by moving one pencil away from the applicant, who should then direct the pencil holder to move the pencil back in position. Direct the movement with orders such as "Up two inches," or "Back half an inch," until once more the pencils are abreast. An error of over thirty millimeters (about one and a quarter inches) is disqualifying; in fact, with normal vision, anyone should be able to place the pencils on a line with each other with a little practice.

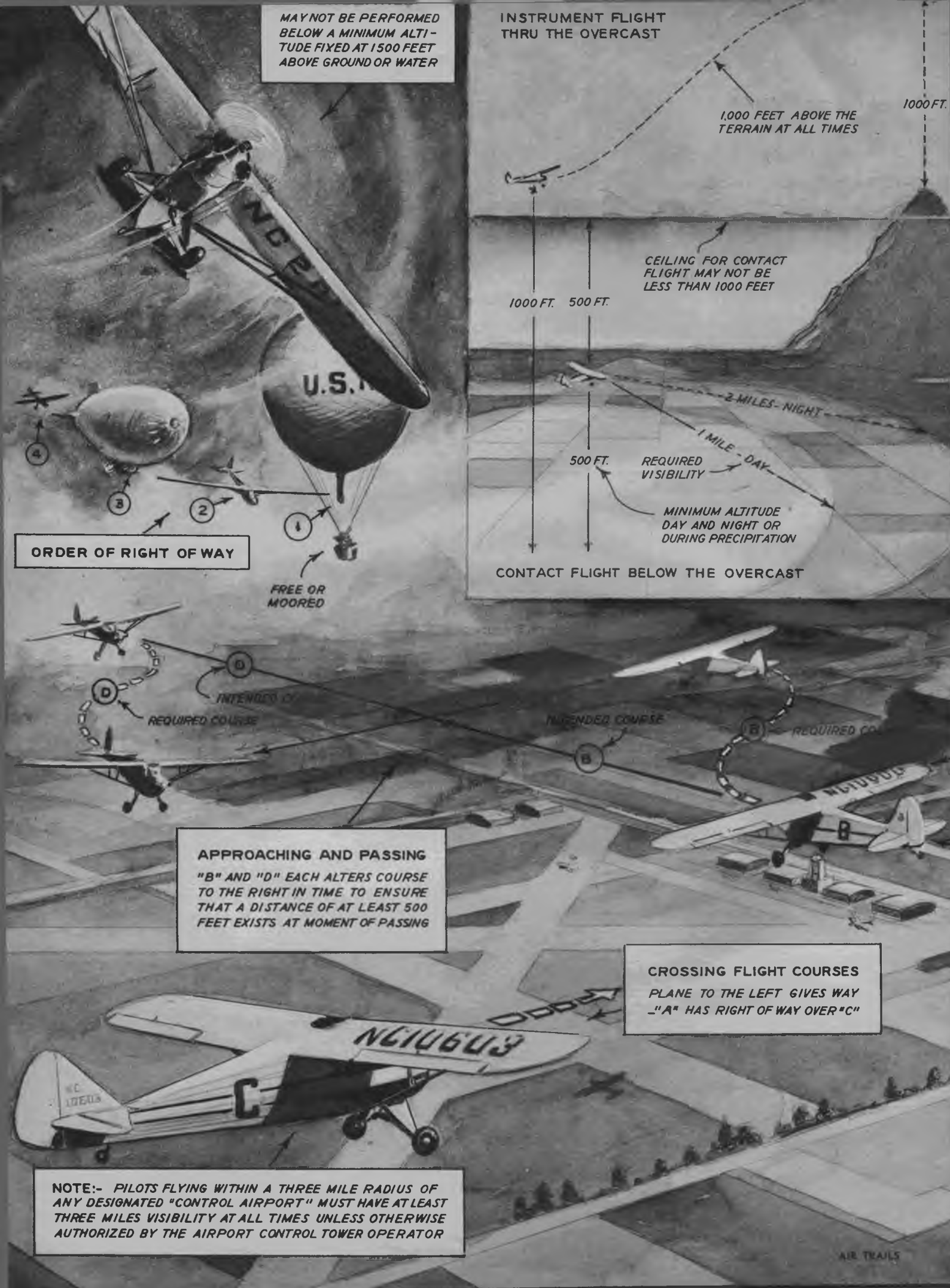
Practice, however, will do little good on the color test. The air services now use a Stilling chart to test color blindness, and the chart is foolproof. It consists of hundreds of dots, so arranged that if one is green-red blind, he sees a figure such as "77." If



you are blue-yellow blind, you may see no number at all, while still another page will have a number for *normal* people, designed to trip up cheaters.

However, unless you are aiming at self-deception and are willing to fool yourself, some colored yarns will do. Mix them up, separate the green, red, blue, yellow and brown. A friend can check your choice if there is any doubt in your mind!

The last of the eye tests are very simple. Have *(Turn to page 28)*


MAY NOT BE PERFORMED BELOW A MINIMUM ALTITUDE FIXED AT 1500 FEET ABOVE GROUND OR WATER
INSTRUMENT FLIGHT THRU THE OVERCAST
1,000 FEET ABOVE THE TERRAIN AT ALL TIMES
1000 FT.
CEILING FOR CONTACT FLIGHT MAY NOT BE LESS THAN 1000 FEET
1000 FT.
500 FT.
2 MILES - NIGHT
1 MILE - DAY
500 FT.
REQUIRED VISIBILITY
MINIMUM ALTITUDE DAY AND NIGHT OR DURING PRECIPITATION
CONTACT FLIGHT BELOW THE OVERCAST
ORDER OF RIGHT OF WAY
FREE OR MOORED
INTENDED COURSE
REQUIRED COURSE
APPROACHING AND PASSING
"B" AND "D" EACH ALTERS COURSE TO THE RIGHT IN TIME TO ENSURE THAT A DISTANCE OF AT LEAST 500 FEET EXISTS AT MOMENT OF PASSING
CROSSING FLIGHT COURSES
PLANE TO THE LEFT GIVES WAY - "A" HAS RIGHT OF WAY OVER "C"
NOTE:- PILOTS FLYING WITHIN A THREE MILE RADIUS OF ANY DESIGNATED "CONTROL AIRPORT" MUST HAVE AT LEAST THREE MILES VISIBILITY AT ALL TIMES UNLESS OTHERWISE AUTHORIZED BY THE AIRPORT CONTROL TOWER OPERATOR
AIR TRAILS

C.A.A. AIR TRAFFIC RULES

1. BOWLUS BABY ALBATROSS BA-100

2. BRIEGLEB BG-7

3. CINEMA II

7. BOWLUS BA-102

8. MIDWEST MI-1

9. FRANKLIN PS-2

10. STEVENS FRANKLIN

GLIDER PARADE

BY ALEXIS DAWYDOFF

THE spotlight which World War II events have turned on gliding has brought us a flood of inquiries regarding types of ships built and flown in this country. On these pages we present the aristocrats of motorless craft, most of them designed and made in the U. S. A few "foreigners" have crept in among them, but even they were constructed over here from plans purchased abroad. The prices listed by the various manufacturers are subject to change.

1. BOWLUS BABY ALBATROSS BA-100

Sailplane manufactured by Bowlus Sailplanes, Inc., San Fernando, Calif. A. T. C. pending. Construction: wooden pod fuselage; wings, single spar wood structure; leading edge, plywood covered, remaining portion of wing fabric covered; tail boom, dural-spun tube; tail surfaces, wood, fabric covered.

Span	44 ft. 6 in.	Gross weight	585 lbs.
Length	19 ft. 4 in.	Gliding angle	20:1
Wing area	155.6 sq. ft.	Sinking speed	2.5 ft. per sec.
Aspect ratio	12.85	Maximum placard speed	65 m. p. h.
Weight, empty	310 lbs.	Stalling speed	28 m. p. h.

Standard equipment: wheel and brake, air-speed indicator, safety belt. Spoilers optional. Price complete, around $900. Ship comes in kit form almost complete, requiring only an assembly job. Kit, $425.

2. BRIEGLEB BG-7

In order to achieve a high-performance sailplane at low cost, a set of tapered wings has been designed by the Briegleb Co. to fit the standard BG-6 utility fuselage.

Span	40 ft. 3 in.	Gross weight	465 lbs.
Wing area	123 sq. ft.	Gliding angle	20:1
Aspect ratio	13.1	Sinking speed	2.8 ft. per sec.
Weight, empty	250 lbs.	Maximum towing speed	81 m. p. h.
		Stalling speed	34 m. p. h.

The ship has the same equipment as the BG-6, and in addition has spoilers built into the wings to facilitate landing. Price of complete sailplane, $750. Kit from $255. Tapered wings and struts finished for converting BG-6 to BG-7, $395. Conversion kit, including plans and instructions, $180. Plans for complete BG-7, $25. Plans and instructions for converting BG-6 to BG-7, $15.

3. CINEMA II

Two-place sailplane manufactured by Frankfort Sailplane Co., Joliet, Ill. A. T. C. No. 7. Construction: metal-tubing fuselage, wooden wings, fabric covered.

Span	46 ft. 3 in.	Gross weight	790 lbs.
Length	24 ft. 8 in.	Gliding angle	22:1
Wing area	188 sq. ft.	Sinking speed	3 ft. per sec.
Aspect ratio	10.96	Maximum towing speed	80 m. p. h.
Weight, empty	410 lbs.	Stalling speed	30 m. p. h.

This ship is stressed for normal aerobatics. Standard equipment consists of air-speed indicator, wheel, brake and safety belt. Price, $1,250 at factory. No kits or plans available.

4. SCHWEIZER SGU 1-7

Single-place utility glider manufactured by Schweizer Aircraft Corp., Elmira, N. Y. No A. T. C. Fuselage construction: metal tubing, fabric covered. Wing structure: metal spar and ribs, leading edge covered with duralumin up to spar, fabric from there on to trailing edge; tail surfaces, dural and tubing structure, fabric covered.

Span	36 ft. 6 in.	Gross weight	430 lbs.
Length	18 ft.	Gliding angle	17:1
Wing area	132 sq. ft.	Sinking speed	3.5 ft. per sec.
Aspect ratio	10	Maximum towing speed	72 m. p. h.
Weight, empty	230 lbs.	Stalling speed	32 m. p. h.

Standard equipment: wheel and brake, air-speed indicator, safety belt. Price, $850 at factory. No kits or plans available.

5. SCHWEIZER SGS 2-8

Two-place sailplane manufactured by Schweizer Aircraft Corp., Elmira, N. Y. A. T. C. No. 5. Construction, same as the SGU 1-7.

Span	52 ft.	Gross weight	860 lbs.
Length	25 ft.	Gliding angle	23:1
Wing area	214 sq. ft.	Sinking speed	2.5 ft. per sec.
Aspect ratio	12.8	Maximum placard speed	72 m. p. h.
Weight, empty	460 lbs.	Stalling speed	35 m. p. h.

Standard equipment same as the utility, plus spoilers. Ship is stressed for all normal aerobatics. Price, $1,800 at factory; kit, $1,400. No plans available.

6. BRIEGLEB BG-6

Utility glider manufactured by Briegleb Aircraft Co., Inc., Van Nuys, Calif. A. T. C., No. 6. Construction: metal-tubing fuselage and tail surfaces, wooden wings, fabric covered.

Span	32 ft. 3 in.	Gross weight	425 lbs.
Length	18 11/16 ft.	Gliding angle	16:1
Wing area	117 sq. ft.	Sinking speed	3 ft. per sec.
Aspect ratio	8.8	Maximum towing speed	72 m. p. h.
Weight, empty	235 lbs.	Stalling speed	32 m. p. h.

The standard equipment consists of air-speed indicator, landing wheel and brake, elevator trimming device, additional wing-tip skids and safety belt. Price, $650. Can be purchased in kit form from $235 up. Plans, $25.

7. BOWLUS BA-102

Two-place sailplane manufactured by Bowlus Sailplanes, Inc., San Fernando, Calif. No A. T. C. Construction same as Baby Albatross.

Span	44 ft. 6 in.	Gross weight	750 lbs.
Length	19 ft. 4 in.	Gliding angle	20:1
Wing area	155.6 sq. ft.	Sinking speed	3 ft. per sec.
Aspect ratio	12.85	Maximum placard speed	65 m. p. h.
Weight, empty	350 lbs.	Stalling speed	32 m. p. h.

Standard equipment same as Baby Albatross. No price on this ship quoted by the Bowlus Co.

11. A. B. C.

12. G-2

4. SCHWEIZER SGU 1-7

5. SCHWEIZER SGS 2-8

6. BRIEGLEB BG-6

8. MIDWEST MI-1

Intermediary sailplane manufactured by Midwest Sailplanes, Highland Park, Mich. A. T. C. pending. Fuselage of metal tubing, fabric covered; wing of wood construction monospar with a stressed plywood leading edge, braced by a single strut.

Span	46 ft.	Gross weight	480 lbs.
Length	23 ft. 10 in.	Gliding angle	21:1
Wing area	172 sq. ft.	Sinking speed	2.4 ft. per sec.
Aspect ratio	12.3	Maximum placard speed	80 m. p. h.
Weight, empty	290 lbs.	Stalling speed	28 m. p. h.

Standard equipment: altimeter, air-speed indicator, wheel and brake, safety belt. Ship is stressed for normal aerobatics. Available also with utility wing for training purposes.

9. FRANKLIN PS-2

Single-place utility glider designed and built by R. E. Franklin, Ypsilanti, Mich. This ship, the backbone of American gliding, is still the most popular training ship with clubs and schools. Although not manufactured any longer, used models are occasionally available. It features a metal-tube, fabric-covered fuselage with wings of wood construction.

Span	36 ft.	Weight, empty	220 lbs.
Length	22 ft.	Gross weight	400 lbs.
Wing area	188 sq. ft.	Gliding angle	14:1
Aspect ratio	7.2	Sinking speed	3.5 ft. per sec.

Another modification of this ship was equipped with a wing of forty-foot span which considerably bettered its performance.

10. STEVENS FRANKLIN

Intermediary sailplane that has a standard Franklin fuselage fitted with gull wings designed by Stevens Institute of Technology, Hoboken, N. J.

Span	45 ft.	Weight, empty	325 lbs.
Length	22 ft.	Gross weight	550 lbs.
Wing area	180 sq. ft.	Gliding angle	16:1
Aspect ratio	11.5	Sinking speed	3 ft. per sec.

11. A. B. C.

Sailplane designed and built by Arthur B. Schiltz, Berkley, Mich. Construction: fuselage, metal tubing, fabric covered; wings, wood construction, fabric covered.

Span	48.5 ft.	Weight, empty	300 lbs.
Length	18 ft.	Gross weight	470 lbs.
Wing area	175 sq. ft.	Gliding angle	16:1
Aspect ratio	13.2	Sinking speed	2.8 ft. per sec.

Ship not in production. Plans available, $35.

12. G-2

Sailplane manufactured by Aero Industries Technical Institute, Los Angeles, Calif. This ship was built by the students of the Aero I. T. I. It has a metal monocoque fuselage covered with stressed skin Alclad. Wings are of single-spar wood construction.

Span	45 ft.	Gross weight	450 lbs.
Length	20 ft.	Gliding angle	17:1
Wing area	170 sq. ft.	Sinking speed	2.5 ft. per sec.
Aspect ratio	13	Maximum placard speed	75 m. p. h.
Weight, empty	280 lbs.	Stalling speed	24.5 m. p. h.

Model not available for sale.

13. KIRBY KITE

Sailplane built by Herman Kursawe and Frank Schellhorn of Airhoppers Gliding and Soaring Club, New York City. Plans for this ship were obtained from Slingsby Sailplanes, Ltd., Kirbymoorside, England.

Span	47 ft.	Gross weight	500 lbs.
Length	20 ft.	Gliding angle	18:1
Wing area	157 sq. ft.	Sinking speed	2.5 ft. per sec.
Aspect ratio	14	Best cruising speed	35 m. p. h.
Weight, empty	300 lbs.	Stalling speed	22 m. p. h.

Plans for this sailplane can be purchased from Slingsby for $40.

14. KESTREL

Sailplane built by Leslie Barton, T. Nilon, and S. Hrusdinsky of Newark, N. J. Plans were purchased from Dunstable Sailplane Co., England. Construction is entirely of wood.

Span	40 ft.	Weight, empty	245 lbs.
Length	20 ft.	Gross weight	415 lbs.
Wing area	158 sq. ft.	Gliding angle	18:1
Aspect ratio	11	Sinking speed	2.9 ft. per sec.

15. LAWRENCE YELLOW PERIL

High-performance sailplane designed and built by Donald Lawrence, Caldwell, N. J. Fuselage of metal tubing, fabric covered; wings, all wood, fabric covered; equipped with spoilers.

Span	53 ft. 9 in.	Gross weight	700 lbs.
Length	21 ft.	Gliding angle	24:1
Wing area	171 sq. ft.	Sinking speed	2.5 ft. per sec.
Aspect ratio	17	Maximum placard speed	120 m. p. h.
Weight, empty	500 lbs.	Stalling speed	32 m. p. h.

Ship not being manufactured. Full complement of instruments.

16. ROSS-STEPHENS RS-1 ZANONIA

High-performance sailplane manufactured by Ross-Stephens Aircraft Co., Montebello, Calif. All-wood construction; monocoque fuselage, plywood covered. Spoilers operated individually by heel pressure on rudder pedals.

Span	46 ft.	Gross weight	500 lbs.
Length	26 ft. 10 in.	Gliding angle	28.5:1
Wing area	124.4 sq. ft.	Sinking speed	2.5 ft. per sec.
Aspect ratio	17	Maximum placard speed	90 m. p. h.
Weight, empty	330 lbs.	Stalling speed	40 m. p. h.

Ship not in production. Above model owned by National Soaring Champion John Robinson, and with which he established a new American distance record of 290 miles. Equipped with full complement of instruments; altimeter, air-speed indicator, electric turn indicator, venturi bank-and-turn indicator, pellet and dial-type variometers, compass and clock.

17. YANKEE DOODLE DLS-3

High-performance sailplane built by Lawrence Institute of Technology, Highland Park, Mich. Construction: metal-tubing fuselage, fabric covered; wings all wood, fabric covered; equipped with dive brakes. Data for A. T. C. has been submitted.

Span	46 ft. 6 in.	Gross weight	540 lbs.
Length	20 ft.	Gliding angle	30:1
Wing area	142 sq. ft.	Sinking speed	2.7 ft. per sec.
Aspect ratio	15.25	Maximum placard speed	125 m. p. h.
Weight, empty	340 lbs.	Stalling speed	45 m. p. h.

Ship stressed for unlimited aerobatics. Instruments consist of air-speed indicator, altimeter, compass, variometer, turn and bank and gyro-driven pitch indicator.

18. VOLMER J-10

Two-place sailplane manufactured by Volmer Sailplanes, 1010 Mariposa Ave., Glendale, Calif. A. T. C. pending. Fuselage of mixed metal tubing and wood construction, fabric covered; wings, all wood, fabric covered.

Span	55 ft.	Gross weight	800 lbs.
Length	25 ft.	Gliding angle	25:1
Wing area	180 sq. ft.	Sinking speed	2.5 ft. per sec.
Aspect ratio	17	Maximum placard speed	106 m. p. h.
Weight, empty	430 lbs.	Stalling speed	46 m. p. h.

Ship is equipped with both spoilers and flaps. Price, $1,500 completed, at factory. Kits, $800. Plans will be available soon.

18. VOLMER J-10

17. YANKEE DOODLE DLS-3

16. ROSS-STEPHENS RS-1 ZANONIA

15. LAWRENCE YELLOW PERIL

13. KIRBY KITE

14. KESTREL

Britain Will Attack!

(Continued from page 16)

and airmen, many hundreds of them for a big raid, are mobilized at starting points and have to be housed and fed during their wait, the air officer commander-in-chief of the bomber command may deem it advisable to cancel the whole show if weather forecasts indicate that while the hundreds of aircraft are homeward bound in the small hours of the morning, fog will roll up to cut them off from safe landing. For it is the weather over the airdromes to which the bombers must return which governs the night's operations, much more than weather conditions over the target areas.

But when all is ready, the ceremony known as "briefing" takes place. Pilots, navigators, air gunners and wireless operators repair to a given center at the airfield. The station commander presides at this conference on the night's operations. Intelligence officers with reports from all over Europe give pilots information concerning the target; position of enemy "flak"; obstacles to avoid; landmarks to look for; special objectives to identify the target. At this powwow the whole technical problem of the operation is discussed and canvassed, and pilots arrange how they will approach the target and how they will make good their getaway.

Thus, when engines are warmed up in the dark and each in turn takes off according to the predetermined timetable, every man knows the exact compass course he will steer; the height at which he will fly; when he will commence his "run in" to the target area; how many seconds he will remain over it exposed to danger; the course to steer for the homeward run; and the time he is due to circle his station preparatory for landing. If all goes with clockwork precision, the whole operation should end successfully, barring the gaps caused by the casualties.

Obviously, then, all this intricate staff work and the hazard of the long flight are only really worth while if worth-while results are to be secured. And to secure them, the big bomber carrying a big load is required. That is the lesson.

I lived in London through all the seven months of last winter's bombing raids and spent many nights with the fighter and bomber squadrons. I learned that when Germany put forward her maximum effort and sent raiders over every half minute from many directions for twelve hours or more through the night—using perhaps 400 aircraft—that this appeared to be saturation point. Damage was done to streets and utilities enough to cause serious inconvenience to traffic next morning, apart from the casualties caused to people and buildings. But the Nazis never seemed able to keep the bombing up with this intensity for as many as seven nights running. And therein lay our good fortune. The fact is that the weather is never dependable for seven nights in succession over Britain in winter to enable a vast effort like this to be mobilized and kept in action night after night.

The big bomber like the Boeing Flying Fortress led the way to something new. That is the exploitation of the stratosphere. I saw these bombers going into action at 31,000 feet to bomb the German battleships *Gneisendu* and *Scharnhorst*, and with the uncanny Sperry bomb sight the bombs found their targets. I saw them go off to bomb targets at Cologne in broad daylight, without fighter escorts. They rose to 37,000 feet with full war load and were still climbing. They dropped their bombs while seven miles from the targets. One and a quarter minutes later they passed over Cologne to see the bombs bursting with accuracy.

It was essential for Britain to indulge in a daylight bombing policy last summer. There are up to eighteen hours of daylight between May and September each day. If we had relied only on night bombing, then throughout the summer Germany would have escaped almost scot-free in the west, because after deducting two hours for flights to the Rhine and two hours for the homeward run, British bombers could only have been over German targets for two hours out of the six. The Boeing Fortress pioneered the way to daylight bombing and has shown that where the protection of altitude and of good fire power are obtained, it is safe to send bombers unescorted hundreds of miles from their bases into the heart of enemy territory. Thus last summer we were able to bomb by day and by night.

The Flying Fortress has taken bombing to over 30,000 feet. Where is the limit? I shall come to that point presently. In all the years between the two wars in which I have flown with the R. A. F. on maneuvers and in defense exercises, no effort was made to achieve high altitude. But the Germans sought it with the Messerschmitt and now all sides see its importance.

A few days before I flew across the Atlantic to America, I was invited by the British Air Ministry to take a look at Germany's latest Messerschmitt, the Me.109F2 single-seat fighter. We had captured one intact. I sat in the cockpit and tried the controls and noted all its points with a pilot's eye for the gadgets. The earlier Me.109E lacked good maneuverability. So the Nazis tried to improve on it by taking the guns out of the wings, lightening the wing loading, increasing the wing area slightly, and by concentrating the guns around the engine and the center of gravity. The four machine guns or two machine guns and two cannons in the wing have given place to one cannon gun firing through the air-screw hub and two machine guns aligned closely to the engine. The new cannon is of 20-mm. caliber, and not 15-mm., like its predecessors. It fires at the astonishing rate of 900 rounds per minute. This aircraft is formidable, without doubt, and it can climb to 39,000 feet.

Our aim in the new Spitfire has been to place two cannon guns in the wings; keep six of the machine guns there also, out of the original eight; and while preserving superior fire power to the Nazi, operate at an altitude higher than he can. Upon the whole, we have succeeded, but it is the Nazi who has set the pace for the race to the stratosphere with the fighter.

Obviously, there is tactical advantage in altitude. The fighter able to operate at a higher ceiling than a rival is able to dive at higher speed over the tail of his opponent to shoot him out of the sky. He is able also to dive on the bomber, choosing the "blind spots." So the bomber is forced by competition to seek high altitudes to give itself a sporting chance from attack by fighters in daylight.

Much has been written about the escort fighter. We have been using vast umbrellas of Spitfire fighters to protect small formations of that class of British bomber which could not venture over Germany in daylight without protection. But the Spitfire is an interceptor of limited range. The ideal fighter for full escort duties must have a range of over 1,500 miles if it is to escort bombers from Britain to Berlin and back in daylight. Even then a wise enemy, knowing that fighters carry limited ammunition supplies, will harass the bomber formations and their fighter escorts from airfields all the way out and back, with the objective of exhausting the ammunition supply of the fighters. When that is achieved, then the fighter becomes easy prey.

For this reason I am more inclined to the view that the new long-range fighters being built in the U. S. A. for Britain may be used for a very different purpose, and that we shall rely on vast fleets of high-altitude bombers for daylight raids. These will not require escorts if well armed.

But Germany also will be exploiting the stratosphere. There is no monopoly. She will send high-altitude bombers to Britain, and if they are able to rise above our fighters and if they possess fire power adequate for their defense, a new vulnerability for Britain will arise. The new fighter may therefore be employed at a new duty on "standing patrol." The high-altitude bomber is able to sneak in unobserved and unheard from the ground at 35,000 to 40,000 feet. The fighter will have to range these skies above the cloud layers on sentry-go all around Britain's coasts to save the time required in the climb and to be at altitude ready to pounce on the stratosphere bomber. This is a new task I foresee, and a vast force of fighters is needed to cope with it.

What, then, is the limit of height? We already know that pilots suffer fatigue over 30,000 feet on long patrols, even where oxygen is sipped under pressure from bottles. The pressurized cabin is of course the answer. It is coming, and I think it is coming for fighters and bombers. Then aircraft will be able to range at 50,000 feet and higher, with crews living in hermetically sealed

(Turn to page 26)

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"We are at the point where leadership is at a premium," is the way one aviation employer describes the acute problem of finding sufficient personnel with correct training. This is *important news* to you who are seeking your place in the fastest growing industry in all the world. It means you should now chart your course for leadership.

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ENGINEERING ★ MECHANICS ★ FLYING

Britain Will Attack!

(Continued from page 24)

cabins where air is drawn in under suction and where living conditions approximate those of sea level to 6,000 feet.

There is still one final problem which faces us in Britain and which faces all air powers. That is the problem of locating the enemy in the darkness. We have achieved some considerable measure of success by devices which pick up the enemy and direct aircraft to the track on which he is flying. These devices began to show promise last March. By May, when a full moon during the first eleven nights tempted the Nazis to fly in large numbers over Britain, they lost 246 aircraft culminating in a loss of thirty-three on May 11th. They have not been back in big numbers since that night.

But that is "cat's-eye" interception. The pilot finally sees the bomber when directed to within a couple of hundred yards of him. On dark nights he cannot see his prey, and unless he can see him he cannot open fire. This suggests that some form of illumination is needed to light up the track of the suspected bomber so that the fighter can find him on dark nights. I believe this is the right solution. Given it, night bombing over Britain can be made too expensive. I should not be surprised if this is not the line of research in several countries.

Britain is therefore crouching to spring on her enemy this winter, now that she has gathered experience of the best methods of attack. She will attack with the ferocity of the lion, using a fleet of powerful big bombers carrying great loads. Night after night, as weather permits, and day after day, we shall see this rising in a crescendo of effort. The pace will depend upon how quickly the big bombers are turned out in Britain and in the United States.

If, therefore, bombing of Germany —what we term strategic bombing— from British bases is to secure decision and cause the complete collapse of the Nazi regime ending in the restoration of liberty to the German people no less than to their victims, then the R. A. F. needs a mighty force of aircraft for the task. If these are supplied to build up the bombing front to the striking power which the magnitude of the task demands, then it is not unreasonable to hope that air power can smash the power of Hitler and break the heart of his Nazi empire.

Jobs After The War

(Continued from page 18)

After the war, aviation will undoubtedly have a slump compared with what it will be at the height of the present boom, but it will never go back to the size it was in the mid-1930s. That much is agreed by everyone. There will continue to be activity along several lines.

In the manufacturing field there will continue to be orders for replacements. There will be many thousands of American-built airplanes, engines, instruments and other accessories in various parts of the world. Many of these ships will continue to be flown, and replacement parts will be needed. Wing sections, tail groups, landing gear and other parts will have to be built. The building of replacements for airplanes in service will give employment to thousands of men.

There will be new types of airplanes to be built. By the end of the war it is probable that new types of fighters and bombers will have been built that will outmode most of today's crop of planes. If there is an armed truce, or when Germany is defeated and dismembered, the rest of the world is still going to want the latest and best airplanes. It seems a certainty that the airplane factories in this country that can look farthest ahead and build new military designs will continue to get orders.

In the commercial field there will be several new kinds of airplanes. Transport planes do not wear out—they become outmoded by better planes. Ford Trimotors are still flying. The Boeing 247-D's did not wear out on United Airlines. They were replaced by Douglas DC-3s, and the Boeings were sold to other air lines. Today the DC-3 and the Lockheed Lodestar are excellent airplanes, but after the war is over they will be replaced by faster, more comfortable airplanes. The market for new transport planes will be a large one because air-line travel is still in its infancy, both here and abroad. Before the war it was generally admitted that U. S. transports were the best in the world, and this favorable condition will probably remain and keep some of our production men busy.

Building new planes for transoceanic flying will also provide jobs for many men. Pan American Airways has already ordered some of the new four-engined Lockheed Constellations. Undoubtedly other long-range airplanes will be designed for international air routes. The war has provided a great stimulation to transoceanic travel, and many airplanes will be needed for such work after the war.

The building of cargo ships is another field which will be active after the war. A number of factors, including cheap aluminum, available factory space and machines, will bring down the price of airplanes. Other factors will lower air freight costs. It is generally expected by transport experts that the volume of air mail, air express and air freight will grow by leaps and bounds after the war, both in this country and abroad. There is a vast market for cargo planes in South America right now, and this market will be extended after the war.

There has been much speculation about airplanes for the private pilot after the war. It is obvious that the sale of private planes will be greater than at any time in the past. Thousands of pilots are now being trained for the army and navy in addition to those who have learned in the Civilian Pilot Training Program. As it was after the last war, some of these men will give up flying, but the majority will want to keep up their licenses. Some will rent planes, but many more will want their own ships.

It seems probable that new types of private planes will be designed which will outmode all of today's airplanes. When a pilot has been flying fast combat ships it is likely that he will want more speed, range and comfort than is in many of the private airplanes of today. This demand for improved airplanes will build a new market, and give jobs to many factory mechanics.

As commercial and private flying increase, the number of jobs at airports servicing these airplanes will also increase. Under the present military stimulus, airports throughout the country are being improved and many new fields are being built. With new air lines, feeder lines, cargo services and a greatly expanded private flying activity, the number of new jobs at airports will be considerable.

There are now, in round figures, about 500,000 men employed in building airplanes and accessories. This number will probably increase to around 750,000 in the next year or two. A number of new plants are not yet in full production, and other factories are not yet built. Thus there are still many opportunities for jobs. The employment curve is still very much on the way up, and it will go up for some time yet before it levels off and then starts down.

Eventually there *will* be factory lay-offs. They may come in two years or four years—or if the war drags on or if an armed truce is declared, the lay-off period may not come for six years. It is natural that young men planning to go into factory work, or those already at work, should try to analyze their own chances of being caught in the lay-off that will some day come.

There have been lay-off periods in the aircraft industries before. What firms have done before is a good indication of what they will do again. When it is necessary to reduce the number of employees, most firms tend to respect seniority rights and keep their oldest workers. But in aircraft plants, thousands of new men have been hired at about the same time. This means that a large number of men will have approximately the same seniority, and some other method of choice must be decided upon. In such a case, the men who are retained will be those who are most valuable to the firm. This is inevitably the rule in all business firms. If *you* were the manager of a factory and had to lay off a certain portion of your men, it would be natural—and good business, as well—to want to keep the men who were the best producers.

Consequently, the moral is quite clear. If you are helping to build airplanes now, or are planning to get a job in an aircraft plant, learn to do your job so well that your work is outstanding. There are always so many men who are content to do just a fair job that anyone who does a top-notch job is immediately conspicuous. This does not mean handshaking the boss, or currying favors from your supervisors. Such methods may work for a short time, but in the long run are always discovered.

Doing an outstanding job means, in the first place, turning out a good performance. Building and servicing airplanes is a race against time, and there are two basic rules which must be lived up to: Get it done well, and get it done fast. But getting a job done well is often a matter of understanding it, and to understand a complex job requires considerable thought and study. Men in

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Feeling that there is a definite need for a means of recognizing those pilots who have experienced the supreme thrill of their first adventure alone into the blue on man-made wings, Air Trails has formulated and founded the SOLO CLUB.

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

To obtain your sterling silver SOLO CLUB lapel wings and life membership identification card, comply with any of the following requirements and sign. Send with fifty cents to the SOLO CLUB, Membership Committee, Air Trails, 79 Seventh Ave., New York, N. Y.

Proof of Qualification as a SOLO CLUB Member

1. Dept. of Commerce license and number if held.....
2. F. A. I. license and number if held.....

Or attach any of the following:

3. Evidence of military or naval air-corps service.
4. A letter from your instructor testifying to your solo flight, giving his rating and license number.
5. A notarized statement, preferably with witnesses, giving all details and data of solo flight and plane used.

In submitting the above for membership in the SOLO CLUB, I certify my willingness for the Membership Committee to investigate my application.

Applicant ..... **Age** .....
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Street ..... **City or Town** ..... **State** .....

aircraft factories who have the best chance of holding their jobs when the war is over are those who not only do good work, but who are studying and learning more about aviation. A lot of them are going to night schools. Others are reading technical books and magazines. Some are spending considerable time thinking about their work and trying to improve the methods now in use. But whatever method they use, as they improve themselves, they improve their value to the firm they work for.

Knowing how to read blueprints is one of the first steps in self-improvement. There are hundreds of jobs in an aircraft plant in which a man does not need to know how to read drawings. But if he wants to get ahead, to be of real value to his firm, to understand his job in relation to other jobs around him, and if he wants to protect his own future, he should know how to read drawings. If he is a sheet-metal worker, for example, he should know considerable about the properties of various aluminum alloys, why different rivets are used in different locations, something about heat treating, metal protection, army-navy specifications, and many of the other points covered in basic training courses. Different kinds of aviation work require different kinds of background knowledge. A clerk in an aircraft production department can make himself valuable by one line of study, a beginning draftsman by another line, a stockroom man by still another, and so on. But study and training will improve them all.

If you are not working in aviation now and want to choose a job, the best advice is to get as basic a training as you can. You may be able to take a short course and get a job in two or three months, but you will be better off if you can take a longer course. The more you have learned about aircraft work, the better you will be. The value of sound training has always been emphasized in aviation work. It is of more value today than ever before.

One of the best fields of work open today is in aircraft maintenance and servicing. We are building thousands of airplanes and tens of thousands of gadgets to go on them. All of these airplanes need careful attention if they are to fly efficiently.

The reason that there is such a shortage of maintenance mechanics now is that it takes about a year of training for a man to get a C. A. A. certificate as an airplane and engine mechanic. He must either go to an approved school for a year, or work a year under the supervision of an A. and E. mechanic and then pass a strict examination. Nearly all of the free training offered in national defense schools has been for sheet-metal workers. Because the sheet-metal training has been free, as well as shorter, it has attracted the bulk of the students.

Maintenance men with training now have excellent opportunities in over half a dozen kinds of work. If they enlist in either the army or navy they have a good chance of becoming noncommissioned officers rapidly. The pay and privileges in such jobs are worth careful consideration. Both army and navy also employ thousands of civilian mechanics. The navy uses civilians at its large air stations such as San Diego, Corpus Christi, Jacksonville and elsewhere. These men do overhaul of navy airplanes. The air corps has six huge depots now where it employs civilians in civil service jobs. These are at Middletown, Pa.; Dayton, Ohio; San Antonio, Texas; Sacramento, Calif.; Ogden, Utah, and Mobile, Ala. Other depots are being planned. These are the major overhaul depots for the air corps. Formerly the largest of the depots employed less than 1,500 men. Soon one will have nearly 6,000, which gives an idea of the rapid growth. Qualifications for jobs at these depots can be secured from most post offices or from civil service offices.

There is also a shortage of mechanics at the civilian flight schools where air corps cadets get their primary training. One of the largest of these institutions has about 170 airplanes in use. Naturally, these ships require a lot of attention, and maintenance is done night and day to keep the ships in serviceable condition. There are schools of this type all over the country, and every one of them could use more well-trained mechanics.

There are about 700 operators at airports giving civilian pilot training and private instruction. In fact, there are more light planes in use than ever before, and an increasing number of mechanics are needed to service them. Many of the men who formerly did this kind of work have gone to work for aircraft factories.

Shortages also exist at all air-line bases. A survey of air-line maintenance superintendents reveals that they have practically given up hope of getting as many trained mechanics as they need. They are doing the next best thing, which means getting men with some kind of related experience, such as garage work, and putting them through a training course after they are employed. The field is wide open for maintenance men with the air lines. Despite their difficulty in getting new airplanes, the air lines are adding new routes and flying their ships more hours per day. This means stepping up their maintenance program. After the war there will be a rapid expansion of all air lines and many mechanics will be needed. Specialists, such as instrument men, radio technicians, carburetor specialists and others who are well acquainted with one phase of engine or accessory servicing, are greatly in demand.

Perhaps the most rapidly growing field for maintenance men is in the service departments of airplane companies. These departments receive the new planes from the final assembly department. Service men fill the tanks with gasoline and oil, run up the engines, test the hydraulic system, the instruments, controls and do everything necessary to prepare the ship for the test pilot. If trouble develops in any part of the ship, the service department must overcome it.

Airplanes may be slightly damaged during test hops or in ferry service. If so, they are turned over to the service department rather than sent back to the production line.

The larger U. S. companies today have service men who work closely with the army or navy, and if planes are sold to Canada or abroad, there are service men who are sent along with the airplanes. This is true not only of the airplane firms, but of the engines, instrument and accessory firms as well.

If you are considering aviation work of any kind, secure the best training you can afford. Thorough, basic training in a good school will be a worth-while investment.

Aviators Pass It—Can You?

(Continued from page 19)

someone hold his hand to one side of your face, extending one, two, three fingers. You should be able to count them as far back as a 50° angle from directly ahead. Next, ask him to cover your eyes for a few seconds, then check the pupils: they should contract quickly as the light strikes them. Ask him to hold a pencil in front of you, and then follow it with your eyes as he moves it about; both eyes should maintain a constant focus on the pencil.

If all the above tests are satisfactory and if the lenses and dilations test show no aberrations or astigmatism, the would-be pilot has passed the most difficult hurdle. He is then sent to the heart medico, who gives that organ a test consisting of a series of readings following mild exercise. It is an *index* showing bodily condition, nervous reactions, and expected behavior under varying conditions. And oddly enough, it is so simple that you can administer part of it yourself. (The only part you cannot do is the blood-pressure test.)

Lie down and become completely relaxed. At the end of ten or fifteen minutes, count the pulse for one minute and jot down the number; arise and count the pulse again, jotting down the second number.

Now obtain a chair eighteen inches high and step up on it. Repeat this ten times in fifteen seconds, at the end of that time taking the pulse once more. Check it carefully for *ten* seconds and jot down the figure obtained. Count it for *another ten seconds* and write down the figure. Continue to do this five times, or until the pulse appears to be normal.

Now multiply each figure just obtained by six, which will give the pulse rate per minute. It is now easy to find out just how much the pulse jumped after exercise, and how long it took to become normal. Write down the facts just obtained something like this:

		From	Pts.
Pulse rate lying down	72	Fig. 1A	2
Increase after standing	82	Fig. 1B	2
Pulse rate standing	82	Fig. 1C	2
Increase after exercise	8	Fig. 1D	3
Time for return to normal	45	Fig. 1E	2
		Total	11

Following is the Figure 1 referred to:

FIGURE 1

A Pulse Rate Declining		B Increase in Pulse After Standing Up				
		0-9	10-17	18-25	26-33	34-60
49-61	...3 pts.	...3	3	2	1	1
62-71	...3 "	...3	2	1	0	0
72-81	...2 "	...3	2	0	−1	−1
82-91	...1 "	...2	1	−1	−2	−2
92-101	...0 "	...1	0	−2	−3	−3
102-130	...−1 "	...−1	−1	−3	−3	−3

C Pulse Rate Standing		D Increase in Pulse Rate After Exercise				
		0-11	12-21	22-31	32-41	42-51
62-71	...3 pts.	...3	3	2	1	0
72-81	...3 "	...3	2	1	0	0
82-91	...2 "	...3	2	1	0	−1
92-101	...1 "	...2	1	0	−1	−2
102-111	...1 "	...1	0	−1	−2	−3
112-121	...0 "	...1	−1	−2	−3	−3
122-131	...0 "	...0	−2	−3	−3	−3
132-150	...1 "	...0	−3	−3	−3	−3

E Time Required for Pulse Rate to Return to Normal		Score	
0-29	sec....3	0—4	Poor
30-59	sec....2	4—7	Fair
7—10	Satisfactory	60-99	sec....1
100-130	sec....0	10—13	Good
		13—15	Excellent

Eleven points is a very good score on a basis of fifteen being perfect. A score of six or lower would be disqualifying for aviation, so it is easy to determine just how you'd stack up in this portion of the flight physical. If the score is only one or two points there is no cause for alarm, however, because the figure is merely an *index* of the circulatory efficiency of the cardio-respiratory system, which in five-cent words means that the heart reacts favorably to exercise.

A pilot must react promptly to many other stimuli, too. The reflexes are tested by the familiar striking of the knee to see if the patellar reflex causes the leg to jump. Equilibrium is tested by having each applicant balance on either foot with his eyes closed, or by putting him in a revolving chair. This is an interesting experiment to conduct at home with the aid of an interested friend. If no such equipment as a piano stool is available, bend over and turn around to the right, making ten complete turns in twenty seconds. The assistant should then force you into a chair and order you to sit up straight.

The fact is that normal persons cannot sit up straight, nor are their eyes focused on a particular object! A normal person will lean to the right, gradually assuming a normal position as his eyes cease to oscillate. Normalcy should be gained in not less than sixteen seconds and not more than thirty-six seconds; anything else is abnormal, and hence not desired in a pilot.

Pilots must not be nervous, especially of the type indicated by tremors. You can readily ascertain the state of the fingers, eyes, and tongue by observing them yourself: visible quivering of eyelids, tongue, or fingers is called tremors, and excessive quivering is cause for rejection.

Good balance, good reflexes, and good hearing are three items peculiarly bound together. Diseases of the ear have been known to affect stability, and poor hearing often indicates a disease of the middle ear. The whispered voice, watch ticks, or coin clinks from twenty feet are often given as tests—two quarters from twenty feet make an audible sound readily distinguished by good ears.

Lack of hearing is sometimes traced to diseases of the throat or an infection that is involving the Eustacian tubes. The locus of the infection may be in the mouth, either in teeth or tonsils. Although a doctor should be consulted if there is any serious doubt, you can inspect your own throat by means of a flashlight. Gums should be firm, pink, and evenly pointed between the teeth. Any recession, redness, or angry-looking appearance is a sign of an unhealthy mouth. Dark, decayed portions of the teeth called dental caries may easily lead to an abscessed tooth, which can spread infection.

The teeth must be present to the extent of eight molars, or grinders. Locate them by counting from the center to the back of the mouth: there are two incisors or biting teeth, a cuspid or "eye" tooth, two bicuspids, and three molars. The third molar (or wisdom tooth) is not always present, but present regulations call for a *total* of four molars and four incisors in a pilot's mouth.

It is also expected that pilots be within certain weight and height standards. The minimum is 132 pounds, five feet six inches tall. The maximum is 200 pounds, six feet four inches tall. Within these limits there must be adequate proportions; that is, a six-foot man must weigh more than the minimum of 132 pounds. Generally, the correct weight is computed as 110 pounds for five feet, with five pounds added for each additional inch of height.

Thus, most of the flight physical can be given in one's home. Even the mysterious urine analysis is not so hard, and can be made for the expenditure of a few cents. Get some "Benedict's Solution" from your druggist and put four or five c.c. (a little less than a teaspoonful) over a flame. Add a drop of urine and heat until it reaches a low boiling point. There should be no discoloration of the blue fluid; if a light green or heavy orange color appears, the presence of sugar is indicated, and a doctor should be consulted.

A second test may be conducted with "Robert's Reagent" by putting a small teaspoonful in a test tube and overlaying it with the same amount of urine. After standing a few seconds, no change should be noticed; if a white ring forms between the layers, either albumin or an infection is present—and, of course, a doctor should be visited. Either sugar or albumin is disqualifying.

Now summarize the test, just as the flight surgeon might do. Although you have not used a stethoscope or a sphymomanometer or a complicated eye machine, your results will show in a general way how you stack up with pilots. If you saw the letters clearly, followed the pencil on the ruler, recognized the colored yarns, worked the depth-perception pencils properly, your eyes should be good enough to land a plane in any airport. If your balance is normal, you should know a spin from a power dive, and if your heart score added up to seven or more, high-altitude hops needn't necessarily be a hazard. If ears, throat, and teeth are in good shape and there are eight molars present, you ought to hang on for some time to come and put away three square meals a day with the best of them!

EVERYONE'S TALKING ABOUT The PHANTOM P.30

$9.75

$10.50

● In the air...on the highway...or on the water...the PHANTOM P.30 is the latest sensation of the model world. Phantom engineers have spent years, sparing no expense, to bring you the finest Class B motor in history. In price it is amazingly low – possible only because Phantom sells direct from the factory to you. Join the multitude of expert model fans who today are powering their contest-winning planes with the P.30. Fill out the coupon below and you, too, will thrill to the amazing super-performance of the PHANTOM P.30!

P.30 Engine Features

Entirely new design. New long stroke, small bore motor. New principle of by-passing gives approx. 20% more power. Square valve increases power 10%. Every motor power-block tested in our factory and sold to you under a bonded factory guarantee. Sold complete with coil, tank and condenser.

P.30 Specifications

1/5 h. p.; 2 port 2 cycle; .710 bore; .750 stroke; .295 cu. in. displacement; bare weight 5¼ oz. Vacuum feed downdraft carburetion, will not siphon tank dry. ¼" crankpin; bronze bearings. Turned steel cylinder; lapped alloy steel piston; new patented principle of by-passing, eliminates piston deflector. Cylinder and by-pass one integral part; full ⅜" crankshaft; square rotary valve port; over-size anti-friction bronze bearings; lucite plastic gas tank; champion V-2 spark plug; metal enclosed con lensers; die cast connecting rod. Smith coil. Timing cam integral part of crankshaft. Hollow steel alloy crankshaft. Visible gas capacity. Motor built to be used upright or inverted. Gas tank can be mounted on either side of fire-wall. Newly designed connecting rod. Large ground steel piston pin. Needle valve conveniently mounted, clearing prop.

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☐ Money-order enclosed ☐ Send C.O.D.

☐ New Phantom "P.30" complete with coil, tank, condenser and prop spinner $9.75

☐ Phantom "P.30" flywheel $1.25

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☐ Special 11 inch hardwood propeller . . 49¢

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Add 3% if delivery point is in California.

Prices Slightly Higher in Foreign Countries.

A-24

Lone Star fan, Frank Wright, Texas, did a swell job on a Bombshell and a So-Long from plans in Air Trails.

Shades of 1918 haunt model flying fields when Ray Fagan turns loose his Fokker D-8.

For Scotty Murray, ex-Skyscraper member, models proved stepping-stone to wings in R. A. F.

Model matters

Gordon Light's Dope Can. Moon's On The Field.

THE DOPE CAN. (By Gordon Light.) Gene Larson, in a recent issue of the Fresno (Calif.) Gas Model Association *News*, recounted the highlights of his Chicago trip. It's a saga of rainstorms, detours, an unhitching trailer, and bruised-and-battered models. The trip back was roughest. Two miles out of Indianapolis the trailer overtook them when the hitch broke, hit a shoulder of the road going sixty, and looped when the tongue dug in. Gene's only flyable model was buried under a tool box and a couple of gallon cans of dope. The trailer behaved from then on until reaching the Arizona desert, when it ran out of a tire. So they piled all equipment possible in the car and abandoned the trailer in the middle of the desert.

Inexperienced builders invariably have a rough time reading plans not drawn full-size. Air Trails' large-page size is a help, but the real answer is full-size plans to spread out over your work table. Keep in mind the new set of full-size plans available monthly for only ten cents (reduced from a quarter a short while ago). One or more sets of each should be in a club's file for member reference. Better still, buy them for yourself as soon as they are announced, as only a limited number are available. Back-issue requests indicate that some builders are several months deciding whether or not to build a model. You won't have to mutilate your magazine if you use these plans. Construction will be easier and more accurate. You just can't ignore the quantity of paper and the complete information you get for only ten cents.

Knowing about our interest in fishing, H. A. Thomas *(Turn to page 57)*

Eddie Price, Aurora, Illinois, combined a Bunch Tiger Aero engine with a slick design for pleasant flying. Weighs 36 oz.

Long Island Luftwaffe. A recent Skyscraper contest near Hicksville brought out this striking line-up of wartime Fokkers.

$52 built this trailer for Davenport, Iowa, boys. L to R—Andrews, Grundy, Pepen, Frederick, Moss. The Cram Airport is their flying field.

Out-of-sight squawkers look over these spoilers on wing of W. A. Manes Apache. Worked by timer, they kill lift, boost drag, to bring down ship.

Ronald Shepard hangs on as 'chute snaps open. Flight timer cuts ignition, which releases the 'chute.

QUAKER CITY TRICKS

Putting on the most popular contest in the East, the Quaker City club's stunt events bring out a raft of experimenters, much to the delight of the many spectators.

Paper holds down pilot 'chute. Free, paper blows back, releasing small 'chute, which pulls out large one.

One way to make a three-point landing. This parachute model was one of several.

Hitch-hiker. Tricky pickaback by Van Leys Vincent featured rubber-powered model that went aloft on New Ruler, then flew on its own.

Not to be outdone by Vincent's pickaback, Bill Oberbeck and Tom Green teamed up two gas jobs. Timer on small ship is set for longer motor run than bottom model.

This might be a modified Cavalier; on the other hand, it might be an original design. But who cares? Pretty gals grace all Philadelphia meets. Meet Bunny Gutekunst.

Not a real plane that dropped in at the contest, but a huge 8½-foot Ryan scale model by Kerson-Bologh. Motor is an Ohlsson 60. One trainer the army missed.

We'd hate to have to watch all these models at the same time. Timer pulls pin to release two gliders at once. Mother ship carries total of six. Jim Wood deserves a hand.

Even radio-control models were entered in stunt event. This job by Norman Bean. Photo shows control wires from up forward running to elevators, rudder.

A good time was had by all—even the judges. Left to right, Cliff Rogers, Paul Maiwurm, Paul Snyder, Irwin Polk, Walter Eggert, Sr. Add stunt events to your contest!

KITTYHAWK

British version of the Curtiss P-40D is faster, more powerful than the bat-

r in mass production, it features an increase of 25% in fire power. Liquid-cooled, suped-up Allison engine.

STRATO-STREAK

BY LOUIS GARAMI

You don't know climb until you've built one of these flying bullets. Good soarer, too.

You'll smile, too, when you see how your Strato-Streak can climb.

Why rules need changing. Nothing can touch a job like this one.

Wing fins prevent spiral dives. Motor unit detaches. Atom motor.

THE Strato-Streak was created to prove beyond all doubt that the vest-pocket gas model can compete almost on an equal basis with larger-sized contest gas models. In creating the design, full consideration was given to all existing proven features of successful gas models. The acceptable features were embodied in addition to a number of new ideas.

This ship was designed for performance without any particular stress on appearance. Only the features vital to high-grade performance were incorporated. The gas-model competition rules being what they are, a fast climb is of primary importance. The model was made directionally stable so that it could point its nose to the sky and keep climbing on its tail until the motor cut. It was streamlined to the *n*th degree, all resistance being cut down to a minimum, so that a fast climb would be possible. To assist in this, a thin airfoil was used. When the motor cuts, the proportionately large wingspan, coupled with a short moment arm, permits tight gliding circles which are vital for taking advantage of rising currents.

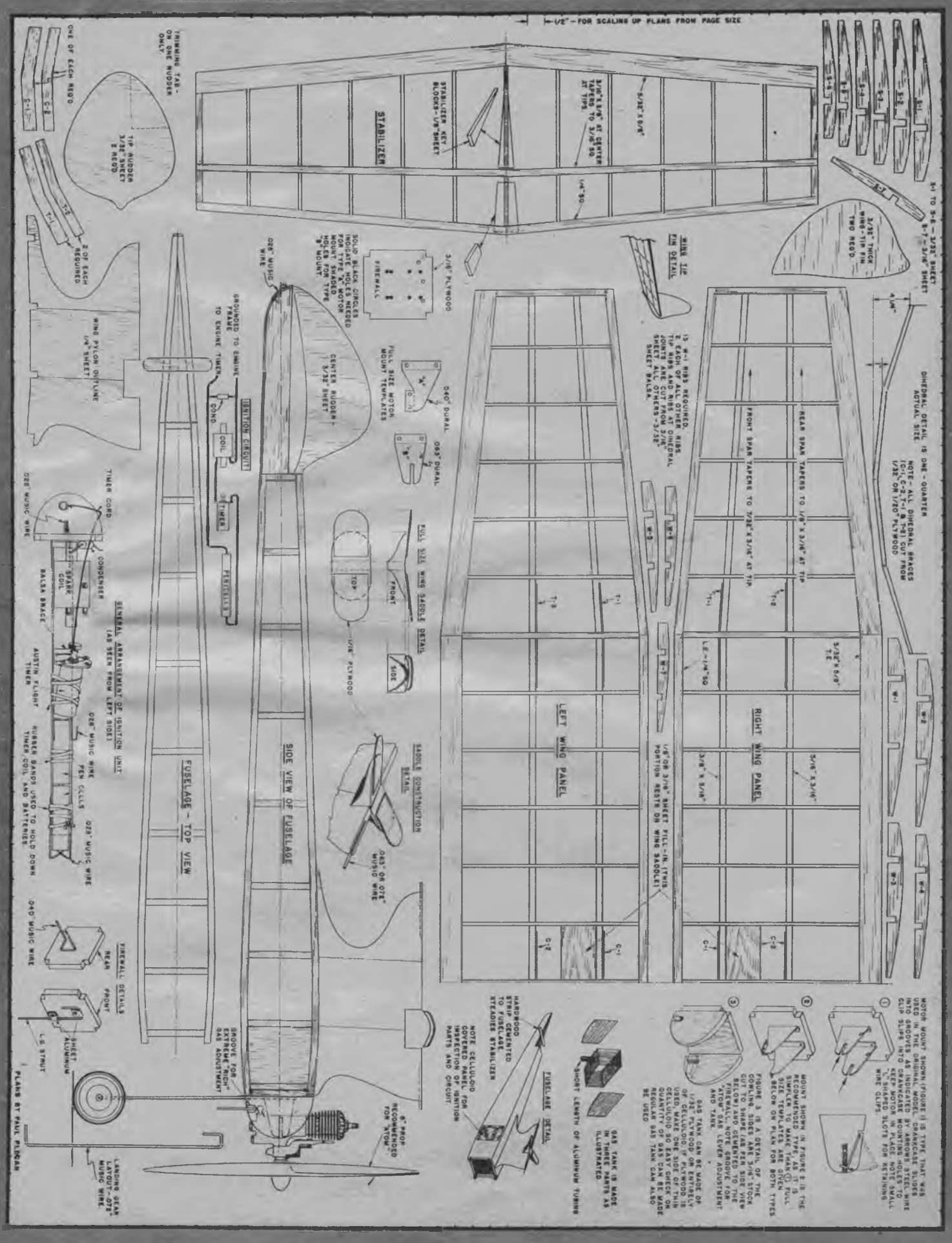
Construction is simplicity itself. The fuselage, composed of four longerons, is square. The wings have a straight taper, eliminating the possibility of warp. The tail is the same. The wing fins and rudder are sheet balsa, which makes for the easiest construction. The ignition unit, the source of greatest trouble with small models, is so simply arranged, that it presents no problems, even for beginners.

The simplicity of this high-performance model proves conclusively the practicability of vest-pocket gas models, which can be rapidly constructed and which will give performance equal to, if not better than, models of twice or three times its size—and the larger ships require many days of tedious labor and are costly to repair when damaged. This entire model can be built for less than a dollar. If it is properly constructed without warp, we urge extreme caution in flying it with motor runs over ten seconds. The model will consistently fly out of sight when a full twenty-second motor run is allowed.

CONSTRUCTION

Make the two fuselage sides one on top of the other. Note that the longerons go past the first cross brace to act as allocating stubs for the firewall. Assemble the square body. Fill in the two sides and bottom between the first and second cross brace with $^3/_{32}$" sheet balsa and cover the next side station with celluloid on whichever side is more practical for you. Through this *(Turn to page 52)*

10c **FULL-SIZE PLANS** of this model may be obtained by sending ten cents to **AIR TRAILS FULL-SIZE PLANS, 79 Seventh Avenue, New York, N. Y.**



DON'T CHANGE THE RULES!

BY CARL GOLDBERG

THE old question of rules is back with us again. So, of course, here I go sounding off again, although I am, as usual, on the opposite side of the steam roller. For years the rule committees have been changing gas model rules hither and yon, and each year the model builders grumble their very evident dissatisfaction. The instability of the rules was always a very sore spot with everyone until the Academy voted that all rules should be allowed to last at least one year. Finally, two years ago, the rules were stabilized to the point where there were fewer grumblers and the whole situation simmered down to everyone improving his design. As per usual, the model game has continued to progress, until today everyone is more or less alarmed over the ease with which any well-adjusted modern model flies away. Practically all leaders see the great danger to the game in this ease.

As you may know, I have fought wing loadings and power loadings until the cows came home because I'm against such rules as a matter of principle; that is, from the scientific angle. The freedom allowed indoor designers is my idea of a good set of rules. There you only have one restriction, the wing area. Everything else is left up to the individual and, consequently, the model designs quite naturally progress to the most efficient possible. However, it has become increasingly clear to me that something must be done to keep so many ships from flying away and becoming lost. My personal alarm grew so great that, at the Academy meeting the day after the Nationals, I went against my own personal feeling as stated above regarding wing loading, power loading, et cetera, and said that I thought it would be a wise move for the Academy to double both the wing and power loading for Classes B and C and raise them about 50 percent for Class A, and that furthermore it should be compulsory for every model entered in a contest to be equipped with an automatic spoiler or drag flap of some kind to go into operation after a length of time to be determined by the individual builder. The idea was that such stringent requirements would lend a certain amount of stability to the rules so that there would be no major changes required for at least two years. However, about a month ago, I had a chance to watch Dick Korda's demonstration of a dethermalizer at the Junior Aviators' Nationals in Cleveland, and, boy, it was plenty convincing. I'm certain now that it is not necessary to do anything about wing and power loading, but rather stress the drag-flap or spoiler idea because this is absolutely the only thing that will keep models from flying away. It alone will do far more than wing and power loadings combined. Korda's gadget simply hinges on the side of the rudder and operates after a period of six minutes, eight minutes, ten minutes, et cetera, all depending on how long Dick feels the timer will be able to see the model before it goes out of sight. Upon the occasion on which I saw this gadget work, I was helping to judge the original design contest and so Dick adjusted for operation to take place within our sight. Exactly on the second which Dick's helper told us that the dethermalizer would go into operation, the model started to bank and this became steeper and steeper and the model dove into the ground in a thermal-defying spiral. Of course, this model is a rubber-powered job and I don't know that a spiral dive is a very safe thing to do with a gas model. However, it is certainly better than losing a ship and I do think there are ways of employing this idea without taking such a severe risk of damage. In fact, I know that this principle can be employed without any risk of damage at all. At any rate, to cut the story a little shorter, I've had a number of discussions with various model builders and the upshot of each one has been that if all models were equipped with dethermalizers or drag-flaps of some kind, it would be unnecessary to make any change in the rules to stop models from flying away. In other words, we are all quite well satisfied with the rules except for the fact that our models are continually getting lost.

Regarding the compulsion of using a spoiler or drag-flap on all models, if this is objectionable, then perhaps we should have a tremendous educational campaign in all the model magazines showing different styles and methods of producing the desired dethermalizing qualities.

One of the arguments that has been brought up is that the fellows would start gambling their planes by setting the timer for the dethermalizer longer if the contest got close. However, a model that gets lost in a thermal can usually be seen by the fellow chasing it anywhere from five minutes to half an hour longer than the timer at the field. Consequently, there really would be no gambling. You simply figure out about how long the timer could see it and then add on an extra five minutes and set your dethermalizer timer accordingly. Just think of the value this would have to the great majority of those fellows who don't want to trade a fifty-dollar plane and motor for the chance that they might win a seventy-five-cent medal or a two-dollar cup.

As far as the wing and power loading increases are concerned, they wouldn't be so bad for the experts and all the big shots who have "hot" motors, but how about the average builder, the bulk of model builders, who can scarcely be expected to get really good flights if they're handicapped any more than they are now? As the rules are now, these fellows get along. All you really need is something to keep planes from being lost.

The whole history of model aviation has shown every single time without fail that the model designs and the model builders themselves progress far faster toward the goal of efficiency than the rules tend to keep models from flying away. Year after year after year in any popular class of model you care to name, there have been more and more and more models flying away to be lost for good. No amount of rule changes has ever halted this trend and the reason is very simple. It is because no one was ever able to figure out something which would leave a model airplane efficient enough to fly and yet not efficient enough to fly away; and that is exactly where the dethermalizer comes in.

Remember the time Gordon Light won the Wakefield contest by proxy over in England? It was with a 7-minute out-of-sight flight. As I remember, the rules at that time were for the ship to weigh at least four ounces. The British prided themselves on the Wakefield contest being a scientific event and thought they could prevent any future out-of-sight flight in that contest by going to the extreme of doubling the weight rule; and that is what they did. Well, at the Wakefield contest held two years later, the winner made an out-of-sight flight of 11 minutes. Then Jimmy Cahill won with a 33-minute out-of-sight flight and finally Korda made his 43-minute riser flight.

Getting back to gas modeling, let's say that the 10-ounce wing loading and 100-ounce power loading are adopted in the hope of reducing the number of lost models, or even a 12-ounce wing loading and a 120-ounce power loading. Will either of these changes actually accomplish that purpose, and if so, how long will it be before a further increase is necessary? At the present rate of model progress, with folding props coming in, more and more retractable gears and generally cleaner ships using some form of cowling and otherwise cutting down the skin friction, to say nothing of more powerful motors and more efficient propellers and the present study being given everywhere to more efficient wing sections—it is safe to say that by next summer the number of lost models would at least equal if not actually surpass the number of models that were lost this year. Considering all these improvements, anyone can see that the only thing that would hold down the number of losses in Classes B and C next year would be at least a 16-ounce wing loading and 160-ounce power loading, and then by the following year, the number of losses would again jump to its present level. Then again, you keep running into the difficulty of the average fellow just getting into the game who cannot afford to buy a real contest motor and yet who would like to be able to compete in the events. For him, the greatly increased loading would make it almost impossible to get any kind of a flight at all. As long as you leave the rules lenient enough so that the ordinary fellow can get his models to fly a little bit, the expert and the advanced builder will continue to lose their models. This is simply because there is such a wide gap in ability at both building, selection of motor and accessories, and adjustment, between your average builder and your advanced and expert builder.

One of the greater satisfactions in gas model building and flying is listening to the motor roar as it pulls the plane ever higher and higher. Yet, because of our steadily increasing efficiencies, we have had to steadily decrease the amount of the motor run. In the real old days, Maxwell Bassett used to get a 14 or 15-minute motor run. Even as short a time ago as 1937 we were able to get 4, 5 and 6-minute motor runs and it was plenty thrilling. Then suddenly came the 30-second motor run which led to the development of our present fast-climbing jobs. This development came so rapidly that a 20-second motor run was quickly resorted to in order to keep models from flying away. Now it is proposed that we should use a 15-second motor run. All this is apparently leading to the not-so-distant time when models will go z-i-p way up into the sky in just a couple of seconds, then the motor will shut off and the model will begin to glide. Where will the fun be in such a flight? There's plenty of thrill, yes, in watching the ship go up like that, but where is that part of the thrill which comes from listening to your motor? I maintain that this has a lot to do with the enjoyment of gas modeling. We absolutely don't need to go to a motor run shorter than 20 seconds; in fact, we can lengthen it if the dethermalizer idea is adopted.

Now, one more point about increased loading. Contest directors have a plenty hard enough time as it is to get runways big enough for the ships of the present day to get off. With increased wing and power loading, it will be just about impossible for 30 percent of the contest directors to hold R. O. G. events.

In conclusion, I would like to point out that the dethermalizer is practically 100 percent insurance against losing a model by a thermal, whereas no practical increase in wing and power loading can ever hope to keep a normal portion of models from getting lost this way.

★ NATIONAL RECORDS ★

UP-TO-THE-MINUTE LISTING OF NEW FLIGHT RECORDS APPROVED BY THE ACADEMY OF MODEL AERONAUTICS

INDOORS (Longest Flight)

TYPE	RECORD HOLDER	TIME
Stick Model H. L. Class B	Junior: Martin Friedland, Philadelphia, Pa.	18:55.5
	Senior: Alvin Rohrbaugh, New Haven, Ind.	21:38.0
	Open: Merrick Andrews, Philadelphia, Pa.	19:10.1
Stick Model H. L. Class C	Junior: R. Jagiello (deceased), Chicago, Ill.	19:17.3
	Senior: Milton Huguelet, Chicago, Ill.	23:49.0
	Open: Merrick Andrews, Philadelphia, Pa.	26:39.0
Stick Model H. L. Class D	Junior: P. MacCready, Jr., N. Haven, Conn.	6:14.0
	Senior: None established	
	Open: None established	
Stick Model R. O. G. Class A	Junior: Arthur Saltzman, Philadelphia, Pa.	10:09.0
	Senior: Milton Huguelet, Chicago, Ill.	12:23.5
	Open: Hyman Oslick, Philadelphia, Pa.	15:32.0
Stick Model R. O. G. Class B	Junior: Martin Friedland, Philadelphia, Pa.	17:00.0
	Senior: Martin Friedland, Philadelphia, Pa.	19:56.5
	Open: Frank Haynes, New York City	12:37.3
Stick Model R. O. W. Class A	Junior: P. MacCready, Jr., N. Haven, Conn.	1:04.0
	Senior: Ted Gonzoph, Philadelphia, Pa.	10:51.0
	Open: Merrick Andrews, Philadelphia, Pa.	8:04.4
Stick Model R. O. W. Class B	Junior: Arthur Saltzman, Philadelphia, Pa.	14:10.2
	Senior: David Call, Philadelphia, Pa.	15:49.0
	Open: None established	
Glider H. L. Class A	Junior: Otto Curth, Chicago, Ill.	:44.7
	Senior: Dushan Deshich, Chicago, Ill.	:46.2
	Open: Leo Vartanian, Chicago, Ill.	:54.3
Glider H. L. Class B	Junior: Otto Curth, Chicago, Ill.	:44.7
	Senior: Armando Sinibaldi, Chicago, Ill.	:46.9
	Open: Joseph P. Matulis, Chicago, Ill.	:39.7
Fuselage R. O. G. Class B	Junior: H. Kaczynski, Detroit, Mich.	12:42.3
	Senior: David Call, Philadelphia, Pa.	15:09.3
	Open: Walter Erbach, Sheboygan, Wis.	15:35.0
Fuselage R. O. G. Class C	Junior: R. Jagiello (deceased), Chicago, Ill.	11:32.3
	Senior: Gordon Cain, Boston, Mass.	15:53.0
	Open: James Cahill, Connersville, Ind.	17:21.9
Fuselage R. O. W. Class B	Junior: None established	
	Senior: William Hawkes, Philadelphia, Pa.	3:26.0
	Open: None established	
Autogiro	Junior: P. MacCready, Jr., N. Haven, Conn.	1:51.5
	Senior: Ralph Brown, Boston, Mass.	2:51.2
	Open: Joseph P. Matulis, Chicago, Ill.	1:03.0
Ornithopter	Junior: R. Quermann, Clarksburg, W. Va.	:17.3
	Senior: Robert Gibbs, St. Louis, Mo.	3:07.9
	Open: Carl Goldberg, Chicago, Ill.	4:05.4
Helicopter	Junior: R. Quermann, Clarksburg, W. Va.	3:54.6
	Senior: Harry Lerman, Boston, Mass.	5:13.8
	Open: Joseph P. Matulis, Jr., Chicago, Ill.	2:12.4

OUTDOORS (Three-Flight Average)

TYPE	RECORD HOLDER	TIME
Stick Model H. L. Class C	Junior: Ed Vargo, Chicago, Ill.	5:18.0
	Senior: Roy Messinger, Linden, N. J.	11:15.0
	Open: Chester D. Lanzo, Cleveland, Ohio	14:49.2
Stick Model H. L. Class D	Junior: Paul Oskawski, Aliquippa, Pa.	7:23.0
	Senior: Robert Davis, Clarksburg, W. Va.	8:04.3
	Open: Toful Petraitus, Akron, Ohio	7:02.6
Stick Model R. O. W. Class C	Junior: Bill Seegmiller, Lakeland, Fla.	1:04.0
	Senior: Gordon Peterson, Oakland, Calif.	:48.0
	Open: John Schneider, Scotia, N. Y.	:22.3
Stick Model R. O. W. Class D	Junior: Bill Seegmiller, Lakeland, Fla.	1:22.2
	Senior: None established	
	Open: John Schneider, Scotia, N. Y.	:42.4
Gliders H. L. Class B	Junior: Austin Rinaldi, Jersey City, N. J.	2:05.0
	Senior: Chas. Richbourg, St. Augustine, Fla.	2:49.5
	Open: Howard Beitchman, Hampton, Va.	5:41.0
Gliders H. L. Class C	Junior: Bob Codde, Oakland, Calif.	:26.3
	Senior: Stewart Bennett, Oakland, Calif.	1:07.0
	Open: John Schneider, Scotia, N. Y.	1:12.1
Gliders H. L. Class D	Junior: Bob Codde, Oakland, Calif.	:21.3
	Senior: Clifford Doyle, Jacksonville, Fla.	:34.6
	Open: Henry Thomas, Akron, Ohio	:46.4
Gliders T. L. Class C	Junior: Robert Hine, Gloversville, N. Y.	:53.8
	Senior: Ray Frodey, Pittsburgh, Pa.	1:34.4
	Open: Mike Morel, Cleveland, Ohio	1:24.0
Gliders T. L. Class D	Junior: Austin Rinaldi, Jersey City, N. J.	2:51.0
	Senior: Owen Niehaus, Rochester, Pa.	5:42.0
	Open: Richard Korda, Cleveland, Ohio	3:30.4
Gliders T. L. Class E	Junior: Austin Rinaldi, Jersey City, N. J.	:51.5
	Senior: Harold Geres, Flushing, N. Y.	5:52.0
	Open: George Brown, Jersey City, N. J.	1:47.7
Autogiro	Junior: P. MacCready, Jr., N. Haven, Conn.	:12.8
	Senior: Bob Meuser, Oakland, Calif.	:11.3
	Open: None established	
Helicopter	Junior: Bill Yahnke, Cleveland, Ohio	:20.0
	Senior: James Ryan, Cleveland, Ohio	:42.0
	Open: Elmer Shapiro, Cleveland, Ohio	:25.0
Ornithopter	Junior: None established	
	Senior: None established	
	Open: None established	
Fuselage R. O. G. Class C	Junior: Harry Robbins, Topeka, Kans.	4:22.9
	Senior: Walter Seegmiller, Lakeland, Fla.	6:35.4
	Open: Joseph Vermoch, Chicago, Ill.	4:24.2
Fuselage R. O. G. Class D	Junior: Samuel Scuro, Pittsburgh, Pa.	5:36.2
	Senior: Justus Merkel, Monaco, Pa.	7:36.3
	Open: Robert Korn, Wheeling, W. Va.	13:41.9
Fuselage R. O. G. Class E	Junior: None established	
	Senior: James Ryan, Cleveland, Ohio	2:16.0
	Open: Chester D. Lanzo, Cleveland, Ohio	3:07.2
Fuselage R. O. W. Class C	Junior: None established	
	Senior: Manuel Andrade, Oakland, Calif.	1:22.2
	Open: John Schneider, Scotia, N. Y.	:48.6
Fuselage R. O. W. Class D	Junior: Robert J. Bates, Clarksburg, W. Va.	2:33.0
	Senior: Robert Davis, Clarksburg, W. Va.	3:11.0
	Open: James E. Long, Clarksburg, W. Va.	2:30.0
Gas R. O. G. Class A	Junior: William Repenning, Oak Park, Ill.	4:33.0
	Senior: Joseph Bashar, Paterson, N. J.	16:39.0
	Open: W. A. Gibson, Hamilton, Ohio	15:50.7
Gas R. O. G. Class B	Junior: Bobby Davis, Atlanta, Ga.	21:33.8
	Senior: B. Redeker, Cincinnati, Ohio	9:20.3
	Open: Don Lampson, Lakeport, Calif.	14:13.6
Gas R. O. G. Class C	Junior: R. Pittenger, San Francisco, Calif.	10:10.6
	Senior: Robert Sweger, St. Paul, Minn.	15:44.0
	Open: Donald K. Foote, Sacramento, Calif.	24:37.8
Gas R. O. W. Class A	Junior: None established	
	Senior: Coley Doane, Batavia, N. Y.	:58.6
	Open: Peter Bowers, Alameda, Calif.	:38.0
Gas R. O. W. Class B	Junior: Glen Cady, Auburn, N. Y.	:20.3
	Senior: Fred Gross, Cranford, N. J.	:36.5
	Open: Frank Young, Buffalo, N. Y.	1:05.3
Gas R. O. W. Class C	Junior: None established	
	Senior: Gordon Peterson, Oakland, Calif.	1:54.8
	Open: Donald K. Foote, Oakland, Calif.	2:48.4

Abbreviation Key: H. L.—hand launched. R. O. G.—rise off ground. R. O. W.—rise off water. T. L.—time limit

Tops in adaptability for a flying model is this neat army observation plane. Good proportions make it sensational flier. Good design simplifies construction.

Framework is just about as simple and rugged as a veteran designer could make it.

SCALE THE CURTISS O-52

Realism and high performance are combined to an amazing degree in this stable air corps flying model.

ONE of the latest and most talked-about U. S. army war birds is the new Curtiss Observation—the O-52. Designed especially for "pecking" duty, the O-52 is one of the most efficient in its class. And although few realize it, aircraft of the observation type are just as important, if not more so, than those 400-m.p.h. fighters!

This O-52 will make as beautiful and consistent a flying model as the real ship is efficient—and that's something! Having a wing area of 129 square inches and a total flying weight of 4 ounces, our O-52 is just up to weight rule—a characteristic of extreme importance in flying-scale competitions.

The construction is rather simple and no difficulty should be encountered if the directions are carefully and accurately carried out. As with most flying scale models, the fuselage is by far the most difficult unit to construct—so, before that enthusiasm is lost and you start to cool, let's get on with the construction.

CONSTRUCTION

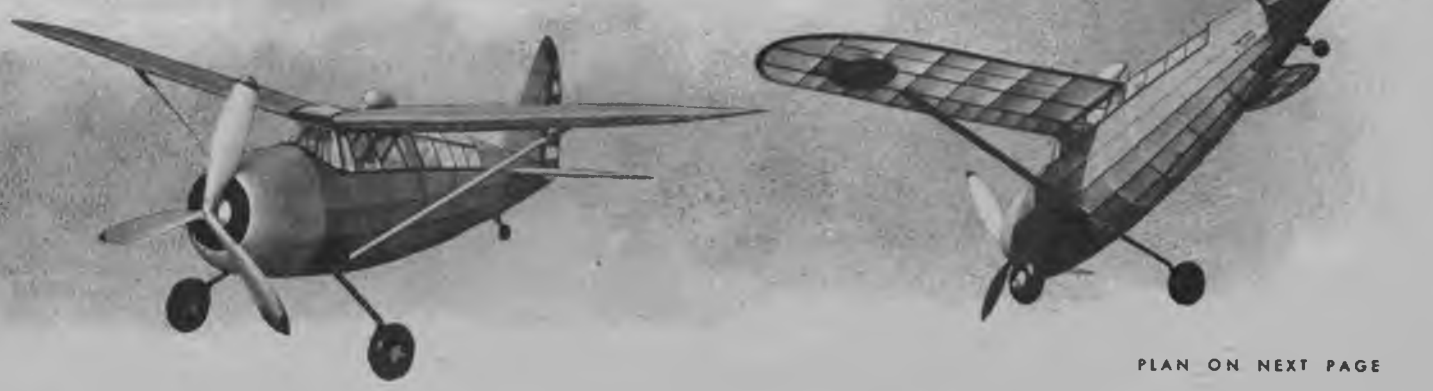
With the assumption that you have already enlarged the plans to read full size or else eliminated "model builder's torture" by sending your thin dime to Air Trails for the full-size drawings, start the construction by cutting out the bulkhead halves from $^1/_{16}$" stiff medium sheet balsa. After the bulkhead halves are carefully sandpapered and labeled, cut from $^3/_{32}$" medium sheet balsa the fuselage "keel" and pin directly over the drawings. Then cement each bulkhead half in place, care being taken to make certain that all are perpendicular to the plan surface. After the cement has sufficiently dried to permit handling without the fear of bending the bulkheads from their perpendicular position, the $^3/_{32}$" square "line-up" stringer should be cemented in place. You will note that when cementing stringers in place, all are cut down from Bulkhead B to C to make way for the $^1/_{16}$" sheet nose balsa covering which is later cemented into place. After a check-up to make certain the line-up stringer did not pull the bulkheads out of position, the fuselage half may be removed from the plan and the other bulkhead halves cemented into position. The right-side line-up stringer should then be added and the entire structure allowed to dry.

After the cement is dry, cement the $^3/_{32}$" square stringers in position, adding one to one side and then one to the other to insure a true fuselage.

Next we plank the nose with flexible $^1/_{16}$" sheet balsa. You will note that because the stringers were shaved between Bulkheads B and C, the sheet covering is flush with the stringers—all of which makes way for a smooth covering job. After the planking is completed the solid nose section should be made. First cut two "rings" from soft ½" sheet balsa. Cut out the center of each ring so a ¼" wall remains, and then cement both rings in place.

Next add the front ⅜" thick solid section of sheet balsa, and proceed to carve the nose until it fits in with the fuselage contour. Cut ⅛" into the front layer to give the effect of a cowl, and drill a ⅜" diameter hole for the hardwood nose block. Apply a few coats of clear dope to the balsa surface to fill the pores, and then proceed with the cementing of the landing gear in place.

The landing gear is bent from .035 steel wire to the shape indicated, and cemented in place to the face of Bulkhead C^1-C^1. Cut the $^3/_{16}$" diameter fairing struts from flexible balsa and *(Turn to page 49)*



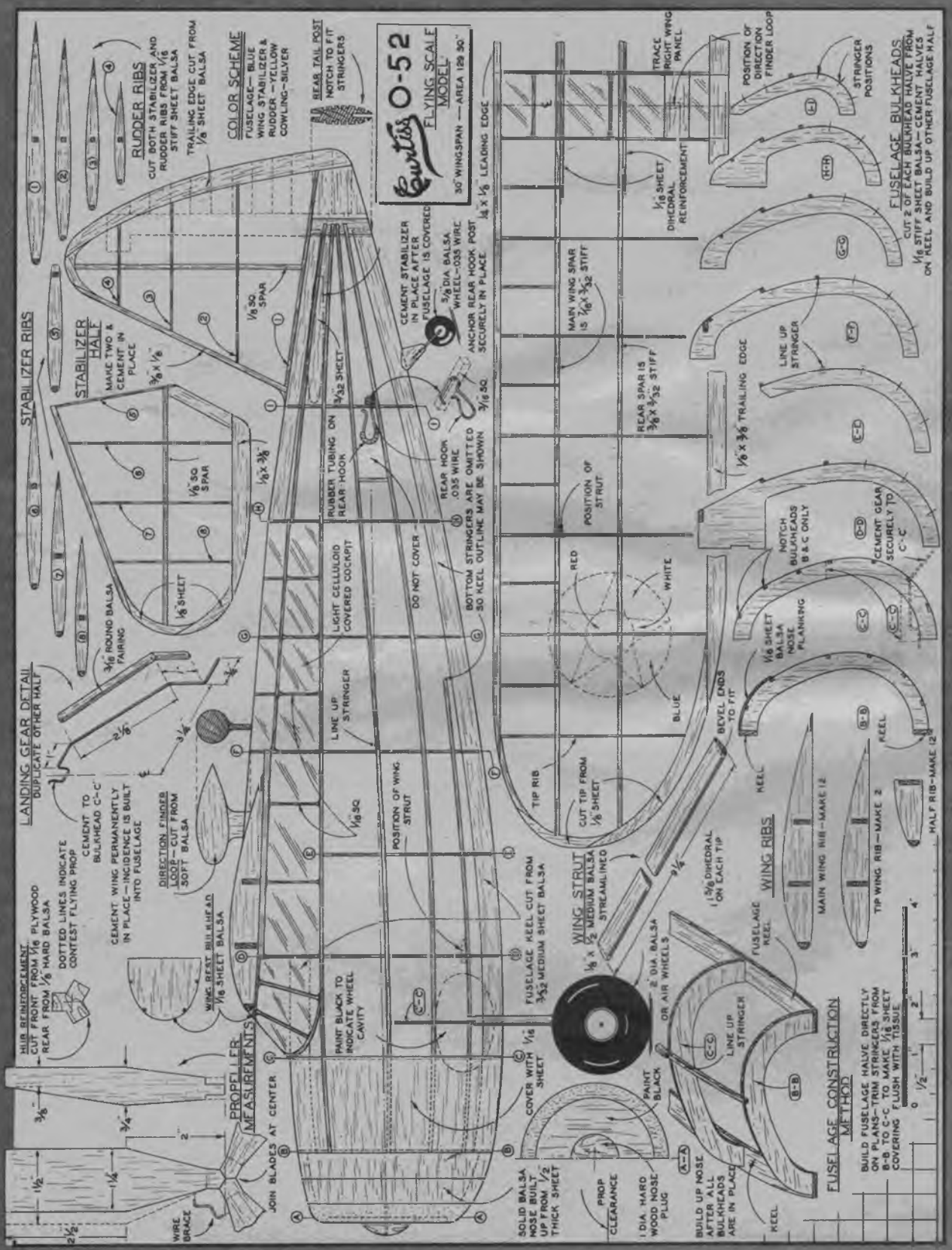
BY RONNIE ALBERT

PLAN ON NEXT PAGE

CURTISS O-52

Continued from Preceding Page

10c **FULL-SIZE PLANS** of this model may be obtained by sending ten cents to **AIR TRAILS FULL-SIZE PLANS, 79 Seventh Avenue, New York, N. Y.**



Louis at the Nationals with one of his all-balsa-fuselage gas models. The sheet wood is bent to shape by the simple trick of doping it on one side.

MODEL CAREER MEN

LOUIS GARAMI BUILT HIS FIRST MODEL WELL OVER THIRTY YEARS AGO IN BUDAPEST.

WHEN in 1908 Louis Garami flew his first model airplane in Budapest, Hungary, his school chums thought him crazy. In those days even the real planes rarely flew. In Budapest you could always go out to the airport where fragile wood-and-linen flying machines skipped around, cutting grass.

It was on one of these airport pilgrimages that Louis was bitten with the proverbial model bug. Actually, though, it was Big Brother Joe who was the model builder and who dragged Louis along to see the airplanes. Joe built just one model. When it didn't fly, he gave up. "His career was finished," says Louis, "so I took over." And for thirty-three years Louis has been grinding them out.

Today Louis Garami is noted for his varied small gas-model designs. His yen for simple fittings and fixtures has earned him the reputation of "Gadgeteer." Louis has a trick for everything, as the analytical builder will discover on looking over any Garami design—the Strato-Streak, for instance.

Garami specialized in custom-built models, perhaps half a dozen gas jobs a year. There was the time he and Henry Struck banded together for a mass-production blitz of all-balsa fuselage models. These were sold to Macy's in New York City and other department stores. Finally the boys became so adept that Struck alone manufactured seventy-five fuselages in one day. But when Ideal brought out their molded fuselage construction, the jig was up for Struck and Garami.

Louis has made over a thousand models—not counting commercial production. Old-timers will bend your ear at the drop of a hat about their early endeavors with kite sticks, glue, paper napkins, shellac and sliced old inner tubes for motive power. Garami really can crow. Long before most of us were even born, he was nailing and gluing fuselage side frames together on the family window sill in Budapest. His props were made out of T-square heads (he doesn't say where he got them from); the models were copies of Bleriots and other dashing "flying machines" of the era. And they all flew.

We should thank Big Brother Joe for having Louis with us today. Prior to the last war, Joe came to America and soon had a flourishing radio-repair business. In 1923 Louis decided to join Joe in this country—he had probably heard of our gigantic thermals—and worked for him about eight years. But once a model builder, always a model builder; Louis was up to his old tricks by 1931. "I had to start all over again," he claims. Actually, he had at least twenty years' head start.

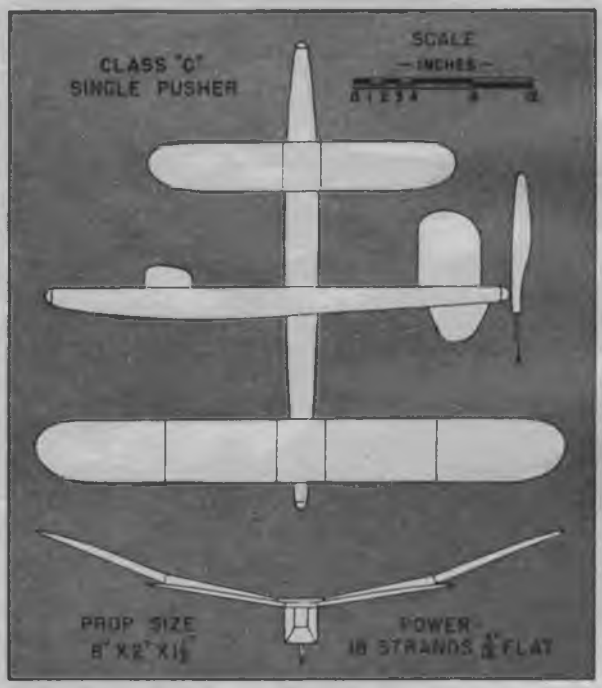
What Louis thinks about contests would fill a book. Winning contests is ninety percent luck, according to him. (No one but a contest winner would seriously disagree.) Some contests are just about as square as a wrestling match, in his opinion. He points out that a couple of high-pressure henchmen who know the tricks can talk a watery-eyed timer into seeing an out-of-sight flight for gosh knows how many more minutes. The classic example in Garami's book is the time a scaled-up Strato-Streak made high time for the day but was nosed out by an enterprising gent who entered two models, theoretically for two people, but flew both himself. He was able to glean three flights out of the total six to win out by a minute. What the officials were doing in the meanwhile, Louis doesn't know. By the time the protest was aired, the said villain had gone home with the bacon. So Louis flies for the fun of it. Two ounces of dope for a prize isn't sufficient inducement for losing a model. Louis says he loses 'em anyway.

(Turn to page 57)

WHY NOT PUSHERS?

The author's consistent contest victories prove that pushers have plenty on the ball.

How a twin-pusher is launched. Forte is great longitudinal stability.



The author and his latest successful pusher. It won four out of eight contests, placing high in two others. Longest flight was 11:40.2.

BY GEORGE DE LA MATER

"YI, he launched it backward!"

"Boy, what a head wind! Oh—it's a pusher."

"One of *those* things. Didn't you know that pushers are obsolete?"

And so it goes. Anyone who builds pushers nowadays is regarded as a die-hard, a throwback or just a plain nut. Is all this ridicule deserved, or should we give the pusher another chance?

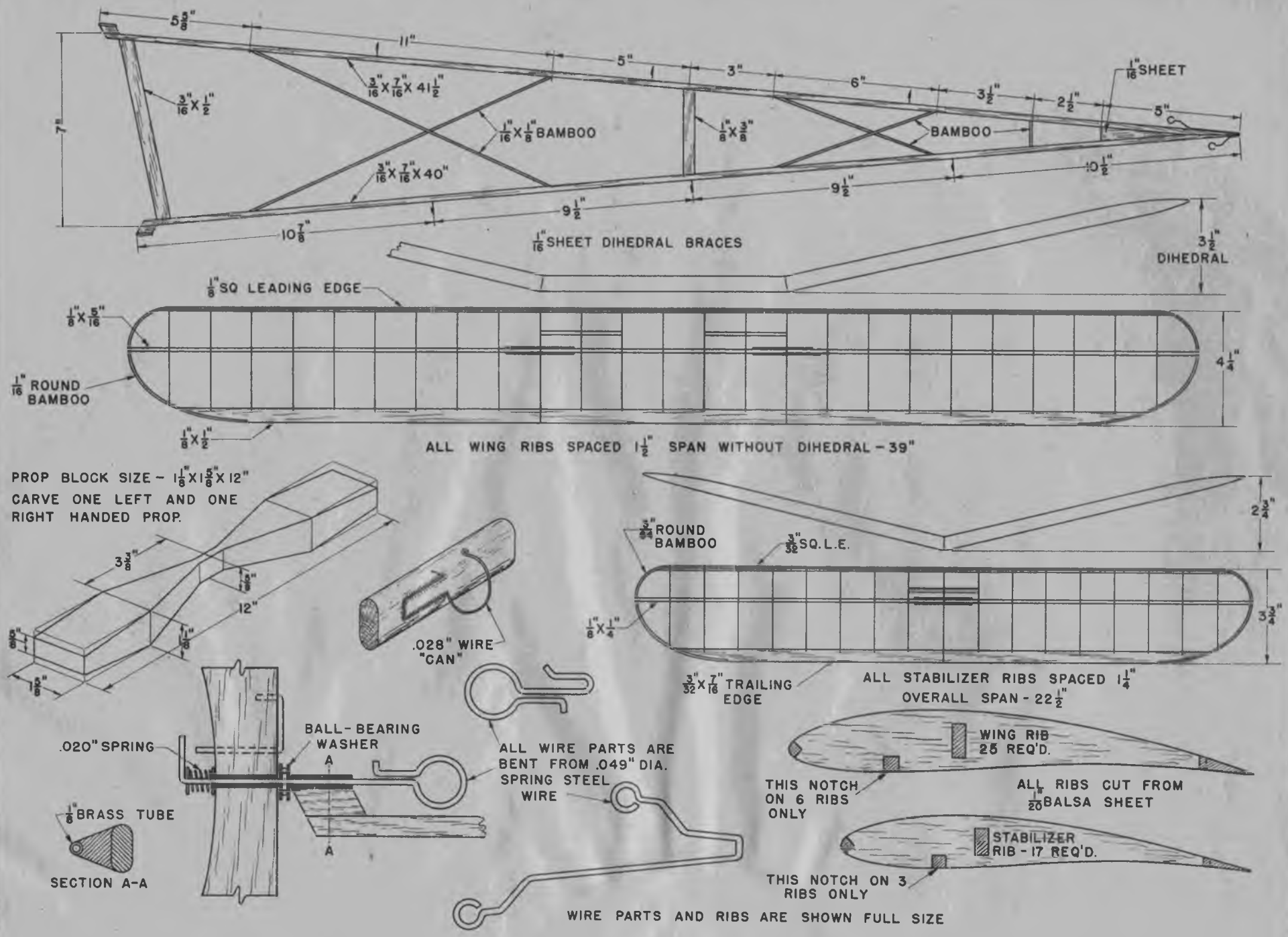
Prior to 1933 the only type of outdoor stick model seriously considered as being capable of winning contests was the twin-pusher. Tractors were unstable and too hard to adjust. Then in 1933 through the use of larger stabilizers and the discovery of the principle of the offset thrust line, a tractor won first place in the Nationals. Immediately modelers began to build tractors, arguing that here was a ship that was easier to build, was lighter, glided better, and finally, looked more like a real airplane. By 1936 the pusher had practically vanished.

The author, realizing that the pusher has good qualities not found in tractors, has been experimenting with such models for the last few years. Presented here are the results of his experiments, in the hope that other builders will find them helpful and will renew the competition between the pusher and the tractor.

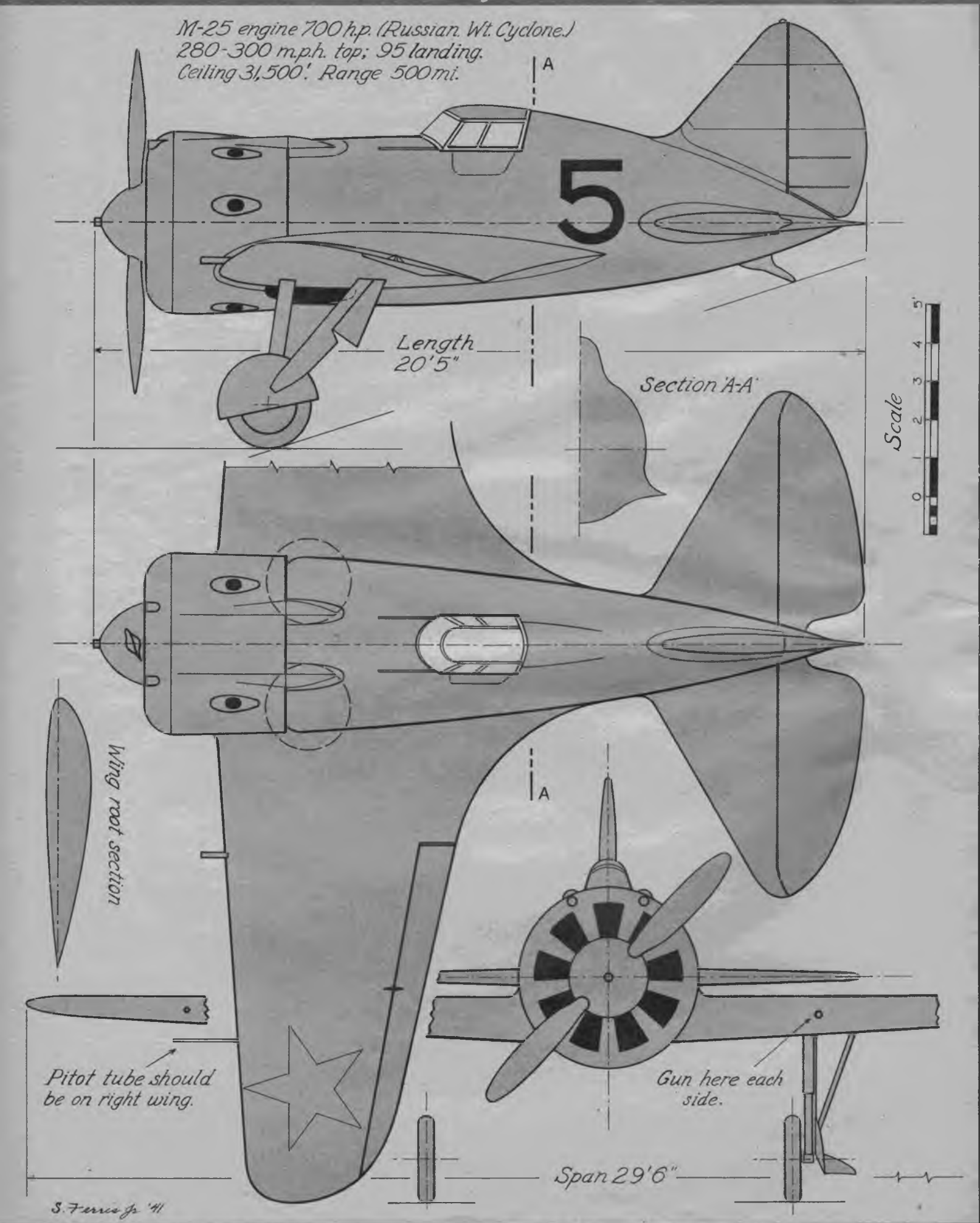
Longitudinal Stability. Perhaps the most outstanding characteristic of the pusher is its great longitudinal stability. In a tractor we obtain longitudinal stability by using a large lifting stabilizer, the idea being that as the angle of attack of the model begins to increase, the tail lifts the rear end of the ship, keeping the nose down and preventing a stall. In the pusher we have the same set-up except that what was formerly the tail is now the main supporting surface, and can exert a much greater stabilizing force.

It may be noted that having the larger surface at the rear produces another very interesting effect whenever the model is stalled by a gust of wind. A properly adjusted model, either pusher or tractor, always has its front surface stall first, thereby causing the nose to drop and the model to dive in order to regain flying speed. The forward surface of a tractor represents about 75 percent of the total lifting surface, and when this ceases to function the model drops rapidly until speed is regained. The forward surface of a pusher, on the other hand, is only 33 percent of the total lifting surface, and the loss of this part of the lift for a second or so will not greatly increase the sinking speed of the model. This explains why a poorly adjusted pusher is often seen to soar out of sight.

(Turn to page 55)


5⅜"
11"
5"
3"
6"
3½"
2½"
5"
1/16" SHEET
7"
3/16" X 1/2"
3/16" X 7/16" X 41½"
1/16" X 1/8" BAMBOO
1/8" X 3/8"
BAMBOO
3/16" X 7/16" X 40"
10½"
9½"
10 7/8"
9½"
1/16" SHEET DIHEDRAL BRACES
3½" DIHEDRAL
1/8" SQ LEADING EDGE
1/8" X 5/16"
1/16" ROUND BAMBOO
1/8" X 1/2"
4¼"
ALL WING RIBS SPACED 1½" SPAN WITHOUT DIHEDRAL - 39"
PROP BLOCK SIZE - 1⅛" X 1⅝" X 12"
CARVE ONE LEFT AND ONE RIGHT HANDED PROP.
3⅜"
12"
.028" WIRE "CAN"
2¾"
3/64" ROUND BAMBOO
3/32" SQ. L.E.
1/8" X 1/4"
3¾"
3/32" X 7/16" TRAILING EDGE
ALL STABILIZER RIBS SPACED 1¼"
OVERALL SPAN - 22½"
.020" SPRING
BALL-BEARING WASHER
A
A
1/8" BRASS TUBE
SECTION A-A
ALL WIRE PARTS ARE BENT FROM .049" DIA. SPRING STEEL WIRE
WING RIB 25 REQ'D.
THIS NOTCH ON 6 RIBS ONLY
ALL RIBS CUT FROM 1/20 BALSA SHEET
STABILIZER RIB - 17 REQ'D.
THIS NOTCH ON 3 RIBS ONLY
WIRE PARTS AND RIBS ARE SHOWN FULL SIZE

MOSCA-Russian 1-16 fighter BY STOCKTON FERRIS



DOWN THE RUNWAY

Official news compiled by the Academy of Model Aeronautics, governing body of model aviation in America.

CONDUCTED BY AL LEWIS • EXECUTIVE DIRECTOR

WE love to get fan mail—it's all doggone interesting. You'll see as we go through our mail bag this month. But we certainly have a time with those fellows who insist on addressing their envelopes simply "A. M. A., Washington, D. C." After such letters go the rounds of the American Municipal Association, the American Medical Association, et al, we manage to receive them. As a matter of fact, any letter that reads, "Here's a buck, send me a gas-model license," is forwarded now to A. M. A. headquarters by all government agencies. At long last—recognition for the modeler and his Academy.

The mail we receive these days carries plenty of comment on the rules. Everybody wants to lose fewer models. Yet the main idea of a model plane is to build in plenty of *flyability*. How to get the two together is the Academy's—and the modeler's—problem. Some suggestions run to ten ounces per square foot of wing area, 100 ounces per cubic inch of piston displacement (both minimums), and a fifteen-second engine run. Quite a few groups favor that sort of regulation. Others are for simplifying contest procedures and the processing of models by abolishing the cross-sectional fuselage requirement for gas models (remember that "L" squared over 100?), and in all events giving everybody five attempts—with each duration recorded as official and no delayed flights. Sounds good to us. What's your idea, and, more importantly, what are the suggestions of your club on 1942 regulations?

From England comes regular news of the Society of Model Aeronautical Engineers. The "S. M. A. E. *Journal*" is nobly carrying on under some difficulties, and from it we learned that last year's S. M. A. E. budget was about $2,500, as compared with the A. M. A.'s $11,000. This was because war conditions have resulted in the curtailment of many S. M. A. E. activities which, in ordinary times, would raise the financial figures of the society. Headquarters hears also from Eire (or Ireland, if you will). From the honorable secretary of the Model Aeronautics Council of Eire, Chris F. Bruton of *(Turn to page 54)*

★ ★

CANINE CHASER

MEET RICKY, DOG FOR PUNISHMENT.

"Come on, pal, flip it over." Ricky, the only gas-job retriever in captivity, chases his master's (Phil Abrams) models.

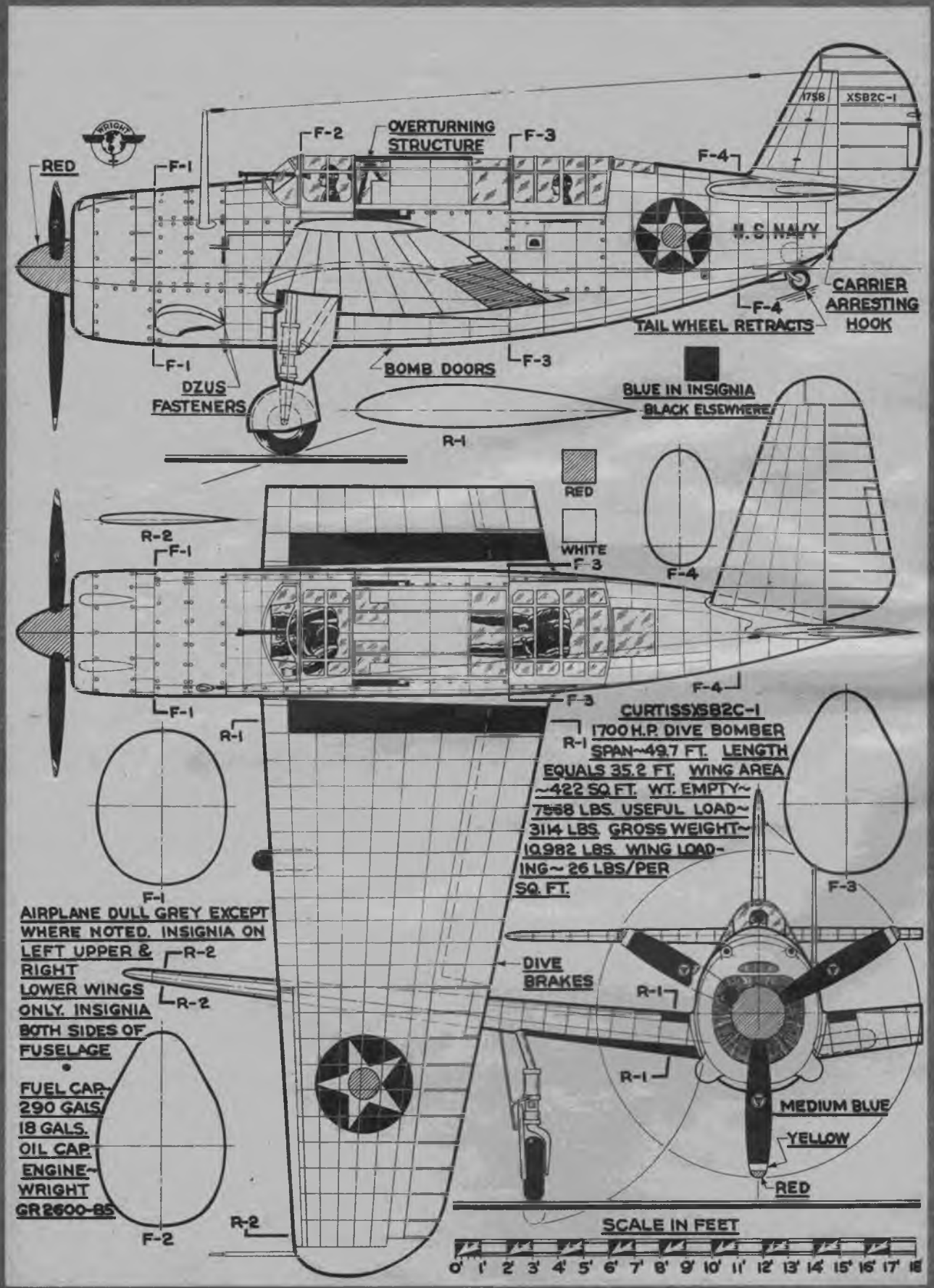
"That's the stuff." The chase is on. Trouble with Ricky is that he chases all models.

"How's zat?" Ricky suggests solution to problem of gents in the "green coupe" who pick up models and race away.

"Ho-hum. Oops, there's another guy over there ready to fly. Wait a second, buddy!"

DIVE BOMBER-Curtiss SB2C-1

BY ROBERT LLOYD BROWN



Scale The Curtiss O-52

(Continued from page 41)

cement in place. To obtain a neat job, it is best to groove the fairing to fit the wire and then cover the entire strut with tissue paper. Next cement the rear hook and tail wheel in place; add the cockpit braces along with the wing rest bulkhead, and then sandpaper the entire structure with No. 0 sandpaper to make certain no nicks and bumps result.

In making the stabilizer, first cut from $^1/_{16}$" medium sheet balsa the ribs, and cement in place along the $^1/_8$" square spar. Add the leading and trailing edges, and then sandpaper the structure with No. ½ sandpaper. Because each stabilizer half is symmetrical it is not necessary to make one right and one left, and consequently the stabilizer is made in two identical halves and then joined individually to the fuselage.

The construction of the rudder is our next task and, since this is very similar to the stabilizer construction, little need be said. A word of warning, however. When making the rudder, be certain that the ribs bevel to fit the trailing edge, else small wrinkles will result at the point where the rib and trailing edge meet.

Now that we have the framework of our tail surfaces completed, our next job is making the wing. Because of the fact that the wing is of the nontapered type, wing construction is very simple. Cut the ribs from stiff $^1/_{16}$" sheet balsa and cement in place along the spars. Both front and rear spar are cut from a sheet of $^3/_{32}$" stiff sheet; the front or main spar measures $^7/_{16}$x$^3/_{32}$", while the rear spar is $^3/_8$" deep. Add the $^1/_8$x$^3/_8$" trailing edge and then cement the $^1/_4$x$^1/_8$" leading edge in place. Trim off both leading and trailing edges to work in with the contour of the airfoil and then sandpaper the joints carefully.

You will note that the wing is made in two sections—one left and one right. $1^5/_8$" dihedral in each tip is cemented in place when the wing panels are joined together. Reinforce the joint by cementing $^1/_{16}$" sheet to the rear of each spar at the point where they join at the center.

Although many of the current flying-scale models use the conventional two-bladed propeller, we are inclined to believe that the three-blader is a bit more effective, and consequently equipped our O-52 with such an airscrew. (Anyway, the real ship has a three-blader.)

A three-bladed propeller may seem rather difficult to build up, but actually it isn't. In fact, it will be much simpler to make than a two-bladed prop of equal diameter. You will note that the drawings contain two prop block outlines. For those of you who worry about appearance a bit more than flying ability, we suggest you use the outline as indicated by the dotted line. As for you other

(Turn to page 51)

Small Fry

World War No. I is past history for most people, but to Allan F. Kritchell, Jr., of New York, the story of its fighting planes lives on in miniatures like this Pfaltz.

And typical of dozens of beautifully wrought gnat-size warplanes of another day is this Handley-Page bomber. Coloring is authentic, insignia properly located.

"DON'T QUOTE ME!"

Talk of the trade as overheard in factory, field, store.

BY THE TRAVELING SALESMAN

OF utmost importance was the joint Academy of Model Aeronautics and Model Industry Association meeting held in Pittsburgh September 27th and 28th. It is hoped that as a result of this "forum" due recognition will be given model aviation as an educational activity. While European nations subsidize model aircraft building and flying, and Canada forms the Air Cadets to air-condition their youth, our government has not as yet even given proper recognition to our activity. This, it is hoped, will be remedied as a result of the Pittsburgh get-together. Modelers and leaders can do their part by pointing out the importance of model aviation as a basis for a career in aeronautics to their political, government and military friends.

For more than a year, quiet discussions have been going on between Air Youth of America and the Academy of Model Aeronautics with a view toward a closer affiliation between the two. It looks now as though something bordering on a merger may come about in the near future. This will be a boon for all model aviation, and may hasten government recognition and perhaps financial aid for model aeronautic activity.

While Air Youth, the Academy of Model Aeronautics and other model groups are planning long-range promotional activities, the model industry is getting farther and farther behind the eight ball due to serious shortages of raw materials. There is no point in developing a program when there will be no "tools" (model materials). By getting recognition for the activity, priorities and preference ratings may be possible.

Burkard Engineering Co. is in the process of moving to larger quarters in keeping with the rapid expansion of its half-inch scale model line. . . . Though up to the neck in defense work, Herkimer Tool & Die, manufacturers of O. K. engines, are planning a long-range program which should make gasoleers happy when things loosen up a bit. Their increased advertising campaign will do much to make O. K. a byword. . . . Both Comet and Megow are consolidating their lines, eliminating the less popular numbers and concentrating their production on the fast sellers. Many dealers thought some of the lines were becoming a little too unwieldy and cluttered up with old numbers. A little weeding here and there will streamline the lines and make handling models easier for the merchants.

Silkspan will be available only in white both in GM and OO, reason being that coloring is the bottleneck, which it is hoped will be eliminated around the first of the year. As it is, shipments of Silkspan will go to old customers only, and in quantities that will make hoarding impossible. Production of Silkspan is limited, due largely to the fact that the machinery used in its processing is also engaged in the production of papers essential to national defense.

Bill (Berkeley) Effinger, Jr.'s, observation that the flying of midget gas buggies encourages a thirst for beer has come to the attention of a big advertising agency, which will use Bill and "A" American Ace in a forthcoming billboard campaign. Such is fame (hic)!

Proof of distress in the model industry is one manufacturer's announcement of a line of fifty-cent kits which was promptly recalled after only a smattering of small initial shipments. . . . We hear that these same models will hit the market at ninety-five cents. Is it distress or profiteering? Model builders are smart judges of values, perhaps because their budgets are limited. Let us hope that some manufacturers, in taking advantage of the present situation, don't kill the goose that laid the golden egg. Ten, fifteen and even twenty-five percent increases are not too unreasonable—but 100% is too much!

Priorities are the mother of invention—perhaps they will hasten new developments in the model field. Note Joe Ott's paper bulkheads, et cetera, which have been acclaimed by builders.

We think this is one of the prize stories of the year. When we asked Jack Marlin, of Capitol Aircraft Supply Co., why his company is changing its name, he really let down his hair. It seems the aviation industry somehow has the idea that Capitol is a bona fide manufacturer of large-scale equipment. It's a rare day when someone doesn't call up asking for a conversion of a Liberty engine or, perhaps, a slightly used Stinson tail wheel. The killer-diller came the day the Wichita Aeronautical Chamber of Commerce invited poor Jack to locate his plant in that city, citing the government's recommendations to move vital industries inland. So now it's to be Capitol *Model* Aircraft Supply Co.

We noticed that Mercury Model Airplane Co.'s ad in the November issue featured the Ohlsson 60 Special. Mercury said they'd pay the postage special delivery, *(Turn to page 62)*

Scale The Curtiss O-52

(Continued from page 49)

modelers, you know what to do, so we won't bother putting it on paper.

First obtain three individual blocks —all equal in size and weight—and then cut the outline with a coping saw. After the outline is completed, proceed with the actual carving on one blade, starting with the underside. After the underside is completed to the degree where about $^3/_{32}$" undercamber exists, the upper side should be carefully carved. Each blade tapers from about $^3/_{16}$" at the extreme hub to $^1/_{16}$" at the tip. Round off the tips so they are of an elliptical outline and then bevel the hub so when all three blades are joined together 120° exist between the center lines of each blade. Use the same process in making the remaining two blades, and then, after all three are carefully sandpapered and matched, join together. To reinforce the propeller hub, a section of $^1/_{16}$" plywood is cemented to the front of the prop. A $^1/_8$" hard balsa hub reinforcement is anchored securely to the rear. As an extra reinforcement measure, three .035 wire braces bent to the shape shown on the plan are cemented between the propeller hubs. The propeller is then fitted for freewheeling and doped three times with thick clear dope. After this is done, cover the entire surface with tissue paper and paint silver.

The prop shaft should be bent from .048 steel wire and the loop covered with rubber tubing to prevent the rubber motor from being cut. As for power, power your model with eight to twelve strands of $^1/_8$" flat brown rubber having about 4"-6" slack.

COVERING AND ASSEMBLY

Before covering the fuselage with blue Silkspan tissue, the cockpit should be covered with a light-grade celluloid; that is, celluloid that bends easily. Do not cover the portion near the wing trailing edge with celluloid until after the wing is attached to the fuselage. After the celluloid is in place, the fuselage may be covered and then sprayed with a light coat of water. When the covering is dry and taut, dope the surface a few times with thin clear dope. Next cover the stabilizer and rudder with yellow paper—the covering material in all cases being Silkspan tissue—and cement the stab and rudder accurately in place.

The wing is next covered with yellow tissue and given the same water and dope treatment as the fuselage and tail surfaces. The wing is cemented in place and, after the cement is dry, the $^1/_8$x$^1/_2$" streamlined wing struts are added. The celluloid center section is then carefully installed and the direction loop finder, which is carved from soft balsa, cemented where shown.

To bring out that American touch, the Stars and Stripes are added to both wing and rudder, respectively, and the 2"-high U. S. army letters cemented to the underside of the wing. The aileron elevator hinges

and flaps are indicated by strips of 1/16" wide black tissue, applied with fairly thin dope. To give the appearance of the space where the retracted wheel fits in, the portion indicated on the plan is painted black, as is the landing-gear strut and the entire nose plate.

FLYING

Knowing model builders, we realize these flying directions will only be glanced at—because everyone has his pet way of testing a job. At any rate, for your model's sake choose a nice calm day for that "first," with the surrounding area consisting of high grass—the higher the better. Balance your O-52 at a point between both wing spars and glide the model to notice the turning tendencies. Warp the rudder so the gliding tendency is toward the left, and put a 1/32" sliver of bamboo in the nose block to slant the thrust line to the *right*. Thus your model will climb to the right and glide to the *left*. And when that winder is put into play the climb will be right and the glide—gee, that'll be right too!

Strato-Streak

(Continued from page 36)

window you can watch the timer and thereby vary the motor run to your liking. Cut the plywood bulkhead carefully so that the four longeron stubs fit snugly. Give it a coat of glue. Screw on the motor mounts temporarily and then locate the landing-gear wire. If you use the built-in gas tank, put it on the side which is handier for you. Make the V-shaped ignition channel and glue it in the back of the firewall. In its correct position it is lying on one side on the bottom of the body. Wire up the ignition unit and try it. Open the ports of the engine and press the breaker points together for a split second. If the ignition is healthy, a loud click is heard in the cylinder. In case this click is heard only once in a while, the cause may be worn or dirty points, weak batteries, or fouled plugs, providing the wiring is O. K. and the coil and condenser are in good shape. Do not proceed with the rest of the plane unless your motor is running smoothly. Decide just this once that the ignition is not the last thing in the model—but the first.

Make the wing in four sections. Cover with light Silkspan. On the tip sections, cover with the grain running parallel to the ribs. This reduces the possibility of warp and makes a smoother airfoil. The elevator is made the same way. Cover all the rudders with Silkspan.

FLYING

If the wing is not warped, the model should hand-glide beautifully. Correct the incidence on the elevator in case it is necessary. Use a six-second motor run on the first flight, with the spark advanced halfway. (About ten-o'clock position on the Atom.) The model should go to the right under power and glide to the left. The final adjustment on my models boils down to 1/16" right thrust under the firewall and ¼" left on the tip of the rudder tab. Adjusted properly and with a hot motor, the Strato-Streak will reach an unbelievable altitude in twenty seconds and will glide with the best of them.

Keep 'em streaking!

BILL OF MATERIALS

6 36 x 3/16" sq. hard
4 sheets 3/32 x 3 x 36" soft quarter-grained
1 sheet 5/32 x 2 x 36" medium
1 sheet 3/16 x 2 x 36" medium
1 sheet ¼ x 2 x 18" medium
1 block 2½ x ¾ x 1¼"
2 36 x ¼ x ¼" hard
1 3/16 plywood 2¼ x 2¼"
1 1/32 plywood 2 x 9"
1 piano wire .072 10" long, also a length of .040 and .028 wire, wheel, bolts, nuts, hook-up wire, et cetera.

MIGHTY HIGH FLYERS

★ CIRCATOMIC

★ SUB-PISTON

★ ATOMATIC

★ HUBSHAFT

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More and more, every day model builders are turning to the PRACTICAL midget size gas model airplane. Inexpensive to build, taking the minimum of time and space, convenient to construct, transport and fly, midget gas buggies are the answer to a modeller's dream. Note the actual size illustration of the Super Atom and visualize for yourself the unlimited experimental possibilities. See it at your dealer's or order direct! Complete with DYNA-FLASH COIL and Condenser. **$15.50**

MICRODYNE ENGINES

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General Post Office, N. Y.

Down The Runway

(Continued from page 47)

Dublin, it is learned that the M. A. C. E. is the "controlling body for model aeronautics" in that country now.

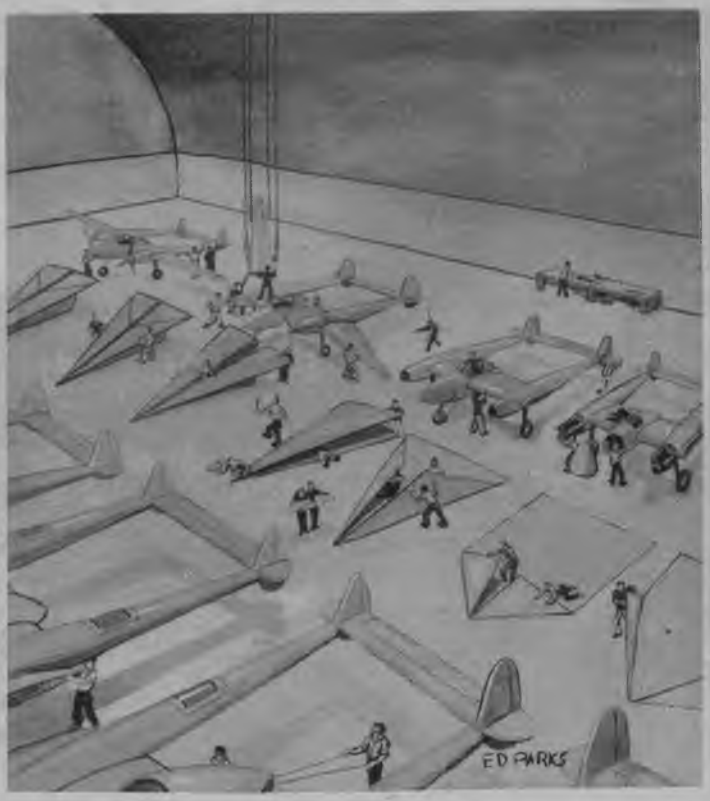
The Eire group is soon to celebrate its third anniversary and was ready to affiliate with the Federation Aeronautique Internationale just before the outbreak of hostilities, but because of the war has been unable so far to secure international recognition, like the Academy and the S. M. A. E. A rather delicate issue was brought up when the Eire representatives first approached the F. A. I. leaders. The Paris officials of the federation thought the Irish lads should work under the English franchise (S. M. A. E.) but the boys of Britain understood better the feelings of their island neighbors and aided in their preparing a strong case for separate recognition, which appeared "in the bag" when war popped out of the bag.

Another international communication arrives from Vernon B. (Moffett marvel) Gray of Auckland, New Zealand, who reports plenty of model activity "Down Under," but quotes Class C engines as selling from $35 to $40. Ouch! Many of the better-known builders, especially those who have sent Moffett entries which were flown by proxy in American national meets, are serving with the R. A. F., and at the time of writing, Bill Mackley, to cite an example, had made more than thirty bombing flights into Germany.

Clinton B. DeSoto of the American Radio Relay League, and a member of the A. M. A. radio-control committee, had us all pepped up when he revealed that the A. R. R. L. was pushing for simpler regulations for a "ham" radio operator's license. Looked for a while as though even the Academy headquarters' office boys could get a license and operate a radio-control gas model. Alas and alack—national-defense activity resulted in thumbs down when several Federal agencies decided that too many new operators might give a spy or two an opportunity to get in some dirty work. Consequently, it's as difficult as ever to secure a license, and your Washington representatives are still confined to paper gliders.

In the brand-new listing of national model aircraft duration records released by the Academy's contest board, the great Commonwealth of Pennsylvania leads all the other States with more than seventeen percent of the high times. Illinois is runner-up with fifteen percent, and Ohio and California tie for show money with twelve records apiece, representing eleven percent of the total 103 official records accepted. Only a few categories now remain without official marks, and every indication points to those being filled in as more record trials are scheduled during the coming months among the Southern A. M. A. chapters.

High time for indoor flying is held by Merrick S. (Pete) Andrews of Philadelphia, who flew a Class C hand-launched stick model for 26 minutes 39.0 seconds, thus besting a 25-minute mark which indoor fliers have tried for years to do. The three-flight outdoor average top time (as we toddle off to press) is held by Don Foote of Oakland, Calif., whose Class C gas model established a record time of 24 minutes 37.8 seconds.



The entrance of California into the national record picture is of special interest inasmuch as up to about two years ago the Californians gave the Academy and its work mighty slim recognition, except in a few notable cases. Plenty of hard work by A. M. A. contest directors on the West coast has succeeded in putting over the A. M. A. and its policies.

Ring the gongs and beat the tomtoms! Here's another boost for our hobby sport. During a broadcast over Station WRNL at the National Exchange Club convention model meet held in Richmond, Va., Edward Sharp, construction administrator for the National Advisory Committee for Aeronautics quoth: "We have about two hundred of . . . model makers at Langley Field. These young fellows, who have never been employed before, who have come directly out of school—usually out of high school—come to work down there as skilled men. That's because of the experience they have already gotten in the pursuit of this hobby. They take civil service examinations. We have been fortunate enough to get the civil service commission to recognize their skill and their special aptitude for this work, and we have put them on at Langley Field over the past two or three years, and we are doing marvelous work down there with them. In this day of shortage of skilled mechanics—trained, experienced, old mechanics—and especially in these days of national defense when mechanics are needed and when there's a great shortage of them, it has been very fortunate for us that we can call on this group of model makers."

Now you can see why Mr. Sharp was elected an honorary fellow of the Academy!

Why Not Pushers?

(Continued from page 44)

Spiral Stability. Pushers are just as stable spirally as are tractors. The method of obtaining spiral stability is the same in either case, namely, to locate the center of lateral area a little to the rear of the center of gravity. If a newly designed pusher flies with the rear end swinging from side to side, the C. L. A. is ahead of the C. G. The cure for this is to decrease the dihedral of the elevator or increase that of the wing. A model which tends to dive spirally into the ground probably has the C. L. A. too far to the rear, although insufficient angular difference between the wing and elevator may be the cause.

Since the twin-pusher has two propellers rotating in opposite directions, the torque effect is entirely eliminated. A properly aligned twin-pusher will show no spiral problems, even when fully wound.

Propellers, Motors. Each propeller of a twin-pusher should have a diameter of about 70 percent of that of a single-propellered model of the same size. This gives considerably more blade area than a single-propellered model of the same size would have, resulting in a longer motor run and yet a rapid climb. Each motor should have about half as many

strands as would be used in a single-propeller model of the same size. This enables a very large number of turns to be stored in each motor, and consequently the motor run is very long.

The twin-pusher described in the drawing is a time-tested contest design. Out of eight contests entered, it has won four firsts, one second, one third and two fourths. The longest flight to date with this model is 11:40.2, out of sight. The wing area is 160 sq. in., and that of the elevator is fifty percent that of the wing or 80 sq. in. The required weight is 4.80 oz. Be sure to use firm balsa for the fuselage and to coat all joints several times with cement. If the fuselage is properly built the propellers will clear each other and the fuselage with room to spare. The rest of the model is of conventional construction.

Flying. Fasten the wing and elevator to the fuselage with rubber loops and put two motors of ten strands of $^3/_{16}$" rubber, each 40 in. long, in place, closing the propeller and S hooks with small rubber bands. Place a piece of $^1/_8$" sq. under the leading edge of the elevator and glide the model, moving either the wing or elevator backward if it stalls, or forward if it dives. When the model glides smoothly, wind each motor about 250 turns and release the model. It should fly smoothly both in climb and glide. A smooth climb and stalling glide indicate that the angular difference between the wing and elevator is too low. Increase the incidence of the elevator. A stalling climb and smooth glide indicate too much incidence in the elevator. The model will probably fly in large circles either to the left or right. If it does not, set the elevator askew on the fuselage. The end which is farther forward will be on the outside of the circle. The model may also be made to turn by washing out the end of the wing which is to be on the inside of the circle. Continue to fly the model, gradually increasing the power until you are storing about 1,200 turns in each motor. If any "bugs" appear, straighten them out before going to higher power.

Single-pusher. The design of a single-pusher presents much the same case as the twin-pusher, except that here we have torque problems. The model will glide somewhat better than the twin, but the motor run and climb are cut down to those of a tractor. The model in the drawing presents no difficulties. It flew best in left circles, both in the climb and glide. The adjusting procedure is the same as that for the twin, except that a little side thrust may be necessary in order to control the torque.

Further Improvements. A twin-pusher with inclosed motors should be quite easy to construct. Folding propellers were not used on these models as they would act as rudders extending behind the model and steer it into the ground. A successful pusher folder should fold forward against the fuselage. This would necessitate some sort of a spring to pull the blade forward.

Model Career Men

(Continued from page 43)

Between nine and five on any weekday you can find Louis at Polk's Modelcraft Hobbies in New York City, where he does everything from designing kits to overhauling old engines. Louis likes it. It's a job in his own line, model building. What hobbyist would not like to be paid for making models? On the side, Garami boosts his income by selling construction features and model designs to the magazines. You've seen many of them in Air Trails. On Sundays he can't stay away from the contests. Fortunately, Mrs. Garami is a loyal contest follower.

Louis dumfounded the Nationals one year in Detroit. Detroit was in the throes of a heat spell, the second hottest city in the nation during the contest week. Out from New York in an air-conditioned train came Garami. After one hour on the field he disappeared, and by the time the boys checked up he was back on the train bound for New York. That was the time he made his famous remark that tickled Nationals followers: "This isn't a model contest, it's a contest of physical endurance."

Maybe that's why they say the only place Louis likes hot air is near the clouds.

Model Matters

(Continued from page 31)

of Little Rock diverged from model talk long enough to tell us his brother catches huge "alligator gars" in the White River in eastern Arkansas. The largest was 185 pounds and over seven and a half feet long. H. A. says it's a sight to see him drag in a beast of that size. Right smart-sized bait fish! But back to models, H. A. reports the fourth annual club contest last August was a success in spite of two inches of rain that fell in forty-five minutes during early afternoon. The cloudburst was accompanied by a gale that blew down and tore up concession tents, washed away sandwiches, demolished many models, and thoroughly drenched contestants and spectators.

The *Beam*—a mimeographed model monthly—has the platform of "Guiding Alabama to Better Modeling." Jacques Houser, a student at Auburn University, is the editor. He asks for help in giving the *Beam* a State-wide coverage.. If you have nothing to offer, at least send your name and address to him for a free copy. Address is BK House, Auburn, Alabama.

Rumbling and grumbling about rules comes from all parts of the country. In the November issue, Leon (9-G) Shulman, chairman of the AMA Gas Model Committee, suggested raising the wing loading to 11, 10 and 9 ounces per square foot for Classes C, B and A, and power loading to 100 ounces per cubic inch displacement. The O. O. S. menace must be licked. Flying them out of sight is aerodynamically exhilarating but financially depressing.

Our objection is that the model

spends too much time as a speck in the sky and not enough time at close range where the flight can be appreciated. The take-off is a roar and swish, and in a few seconds it's visible only to the farsighted. Compare this to the unassisted take-off of a heavy gas model. Barely moves at first, then slowly the tail comes up, and there are a few bounces before it's really in the air. The climb and flying speed are slow. This kind of flying with a semiscale job complete with fancy-pants trimmings and gadgets is the real thing. The bulk of the gas modelers like ships that resemble large airplanes. It's high time the rules paid off on craftsmanship and all-around flying qualities.

It's time events other than pure duration were added. Weight carrying, for example. A couple of pounds of dead weight will sober up any model. Landing gears would have to be designed instead of merely adding them as a necessary formality to comply with the rules.

Bill Gibson of Hamilton, Ohio, wants rules made up early in fall as soon as the results of the summer contests are digested. This would give modelers and manufacturers three extra months to work on new designs. At present, rules are announced the beginning of the year.

When you buy material advertised in Air Trails, would you please mention it to the dealer? It'll be a boost for us.

H. M. Volentine is a hotel night clerk in Clarksville, Arkansas. Model building accounts for many of his spare hours off duty. Photos he sent us indicate he does a particularly good job with flying scales. This phase of modeling seems popular in Clarksville. At a recent contest for boys aged twelve to seventeen, there were fifty-five models entered. The photo of the first five place winners indicated high-class workmanship.

Pittsburg (Kansas) has a club of three modelers who hold regular contests as enthusiastically as any large club. They've turned in some excellent flights with Wakefield types. Don Gray, Jr., did 21:50 with a Naudzius-designed Moffett Trophy Winner. Builders in southwestern Kansas are asked to contact Gray at 706 West Euclid.

Bridgeport (Conn.) Aeronauts have two perpetual club trophies—one for gas and one rubber. Each trophy is contested for twice a year. Contests are staggered so that every three months there is a major contest to keep the 'Nuts on their toes. Ed Whitten says the club-sponsored First Annual Connecticut Yankee Championships last August were a success and will be a high spot in the club's contest program in '42.

Gas models were hand-launched at the meet of the Ypsilanti (Mich.) Hornet Gas Model Club last August. And that is what robbed Gerald Holly of a new national record in Class C senior (which was 15:44 average as of August 30th) when he racked up 64 minutes total for three flights. His longest was 47 minutes. His model is an original design made especially for a Bunch Tiger. He's been building three years, graduated from Ypsilanti Central High School last June, intends to study at the University of Michigan. Donald Gridley, sponsor of the Y. H. G. M. C., is happy about Gerald's work and we're grateful to him for supplying this information.

There is a shortage of balsa wood in England. The supply released to the model industry after the government is supplied goes into scale-model kits of military airplanes for use in aircraft identification work. Wakefield-type modelers will have to use hardwoods. It will be interesting to see how a spruce or bass Wakefield job will compare in weight and performance.

Crating airplanes for shipment to England is much the same, whether it's a model for the Wakefield contest or a bomber. Size of cases is somewhat different, but the packing technique calls for the same precautions against breaking and moisture. Space is at a premium. And in both instances, size of packing cases determines the location of splices in the wing and fuselage that will give a breakdown to fit the limiting dimensions of the crate.

Chicago and Philadelphia each has thirteen national records, based

on the list released by the AMA August 30th. Cleveland has eight. New York City takes a single, solitary first. As the biggest city in the country, New Yorkers' ears should be long and fuzzy. But this poor showing can be blamed to some extent on the lack of suitable flying areas within reasonable distance of the city.

Ross Houck of Ocean Beach won the Southwestern Championships at San Diego this spring. His model is a Sailplane powered with a Super-Cyclone. He's won five of the monthly contests held by the San Diego Aeroneers with this model. . . . Jim Cahill has been promoting the idea of holding AMA-sanctioned indoor record trials at the St. Louis Arena this fall and winter. . . . Ed Lidgard has written an article on model building in the army, which will appear in these columns at a future date. Ed has just finished his mechanic's course in the air corps and expects a transfer to Texas from Chanute Field in Illinois. . . . Winter has come to New England, and the Junior Aviation League has started its thirteenth indoor season. Boston is one of indoor flying's last strongholds. The technique the Boston boys developed went a long way to build up points and give them the club championship at Chicago. . . . Model clubs on the West coast seem perfectly willing to stick by the AMA if the rules are changed to reduce fly-away flights and if the AMA gives the boys a little more attention. They're somewhat touchy on this point.

Editors and manufacturers alike would have less gray hair if there was some way to determine what models the scale builders are making. They're never quite sure what models will click. There's little use in asking for a list of favorites unless the models have actually been built. There are too many interesting airplanes that aren't particularly good scale models. Your letters about the models you build, your success with them, and your tastes in all phases of the hobby are carefully compiled and used as an index when selecting articles. Keep writing. We want to hear from you.

ON THE FIELD. (By Carroll Moon.) Boy, what names these modelers conjure. Our latest find is the Steel City Model Manglers of Birmingham, Ala. Anyway, these guys held their second annual Miniature Air Carnival on August 24th in Birmingham. Officiating at the contest were Sid VanScheck, AMA State contest director, Robert M. Morgan, John Morgan, G. T. Walden and Lewis Watson. Best flight of the meet was turned in by Art Grey, who flew a Zipper powered by a Torpedo, taking first in Class A-B gas. Art turned in 9:37 for his average time. Winners were as follows: In Class C gas, Billy Roden, original design, Ohlsson 60, took first. In Class A-B gas, first was Art Grey with his Torpedo-powered Zipper. Ed Wright won the Class D rubber event with a Flying Cloud. In Class C rubber, R. Lavender was first with a Baby Duration. D. McClusky captured the flying-

(Turn to page 61)

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CHORD—6 INCHES
LENGTH—25½ INCHES
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CONFORMS WITH ALL A. M. A. CONTEST REQUIREMENTS.

Kit will come complete, less wheels, as we believe that 99% of the modelers who build this model will want air wheels.

THE Buzzard Bombshell is known all over America as one of the greatest Class C gas-model planes in the world. It holds so many records that it's impossible to list them all—but just to give you an idea—it set a Class C national record with a flight of 49 minutes and 40 seconds!

This is the great model noted for its simplicity in building—its easy sheet-balsa fuselage construction—its wonderful stability in flight. It has a spectacular climb and a soaring glide. IT HAS NEVER BEFORE BEEN OFFERED AS A PREMIUM.

But NOW—and only if you act quickly—you can get this sensational Buzzard Bombshell model FREE with a year's subscription to AIR TRAILS, leading aviation magazine. The model we are giving away is a reduced size—Class A—but it's the genuine Buzzard Bombshell! It's a once-in-a-lifetime chance. Fill out the coupon now.

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Model Matters

(Continued from page 59)

scale event with a remarkably well done Stinson O-49. McClusky also won the sailplane event. In the U-Control event, McClusky again scored, with an A. J. Fireball powered by a Brown. Lew Watson was field reporter and Bob Morgan was press reporter.

On August 25th the AMA chapter of Nebraska held its annual Nebraska Model Airplane Contest at Muny Airport, and officials reported that it was an outstanding success. High winner among the many entrants was H. O. Parmenter of Lincoln, while his son, Bill Parmenter, also cleaned up. Oscar Olson of Omaha took Class A gas; Bob Hart, Class B gas, and Bill Ruzika, Class C. Entries from Omaha, Fremont, Hastings, Auburn, Fairbury, Wilber, Unadilla, Columbus and Hamburg were reported. Seventy contestants competed. Longest flight of the day was recorded by Max Coover, whose rubber-powered ship turned in a 9:18 flight.

Philadelphia always turns out some swell contests, and the Gas Model meet held September 7th was no exception. Leon Shulman was the high-point winner, and we personally never expect to hear the end of it. Despite a high wind, Leon had plenty of competition, and won out despite his Zombie designs. He captured the Megow trophy for high points, also winning a sizable bale of cash and much hardware. Walt Eggert, Sr., was director of the meet.

Harry Vogler manages to keep a real red-hot interest among fliers in the Pittsburgh, Pa., area, and we hear that his locale will be the site of the Scripps-Howard Junior Nationals in 1942. On September 14th the clubs of Vogler's area held a big-time meet at the Pittsburgh-Butler Airport. Five events punctuated the meet schedule with gas, of course, one of the main attractions. Aaron Latkin took the Class A-B event with a total of 644.2 seconds. Ken DeLannie was first in Class C gas with 635 seconds. Justus Merkel took the rubber fuselage event with 263. Emerich was first in the stick event with a 416.7 total. Norbert Van Tuil won the glider (tow-line event) with 154.5.

They had a big crowd (8,000) at the Ninth Annual Mississippi Valley Model Airplane Meet, held at Parks Auxiliary Airport at Belleve, Ill., August 17th, and many of the top performers in the country participated in the numerous events. Jim Cahill won the indoor cabin event with 17:21.9. Milt Hugulet was tops in the indoor stick event with 23:49, and Carl Goldberg won the indoor ornithopter event with 3:36.6. Outdoors, R. E. Podolsky (Doc to youse guys) was first in Class A with 15:34.7. Alf Latta took the Class B senior gas event with 8:02.5, while K. G. Pfeiffer won the Class B open gas with 9:32. Bob Wright was tops in Class C open with 15:01, while E. S. Beckman took the open Class C with 15:01. Buddy Cope won the outdoor cabin open with 10:36.1. Joe Limosani won the outdoor stick (senior) event with 10:36, while Joe Vermach was tops (what, again?) in the open stick class with 10:36. George Lambroe won the towline glider event.

"This is as high as I can push her—what've those kids got that we ain't got?"

"Don't Quote Me!"

(Continued from page 50)

but they didn't say what the price was! Well, Mercury, how much are those Ohlssons? $18.50, you say? Right! Incidentally, Mercury is going to concentrate on its plane line and wishes to dispose of the line of boat kits. Going, going—

Dale G. Kilburn of Casper, Wyoming, thinks manufacturers should supply dealers with better booklets illustrating the company's line of models. According to Kilburn, descriptive sheets supplied by Comet, Megow, et cetera, do not fill the bill. His argument is that a good booklet would speed up sales, save the clerk's time, and keep the customers satisfied. Sounds logical.

There's a rumor floating around that Barney Snyder (Modelcraft) is going to dump on the market some hardwood rubber-model propellers to take the place of the Japanese variety, now no longer available. Price will be approximately the same. Barney knows his merchandising. He is also introducing a scale B-19 (1/11" =1') packed in a beautiful two-color box with a picture of the real ship on the cover. Dealers, that means turn-over! Despite such standout features as roughly shaped wings and fuselage, and die-cast propellers, price will be only one buck. The North American Mustang will gallop soon from Barney's plant in the form of two twenty-five-cent kits, one a flying version, the other a solid.

Jackson's Models & Supplies is entering the gas-model field in the near future with a new Class A and B gas model. This model has been extensively tested and has very fine flight characteristics.

This year for the first time Philip J. Corr, of Corr's Sport Supply, 812 Ninth St., N. W., Washington, D. C., offered a very fine trophy in the 14th National Model Airplane Meet, which was then put up for competition in the outdoor rubber-powered events. However, following the competition, the various listings of winners which appeared gave credit to Mr. Corr with several pseudonyms—such as "Gorr," "Gort," "Cort," et cetera. Mr. Corr wishes to announce that the family name, which has been associated with the model and cycle business of Washington for forty years or more, is still spelled C-O-R-R.

Boat in a Bag

Daily R. A. F. planes fly over the Channel, the North Sea, the Mediterranean. This Blenheim crew practices forced water landing. Bag contains inflatable dinghy.

Four men in a boat. Man on left is holding a signal flare. High-pressure flask, containing carbon dioxide, inflates raft in matter of seconds. Food rations are carried.

R. A. F. Slanguage

EVERY event, industry or activity the world has ever known has put new words into the dictionary. The last great war gave us such classics as *Big Bertha, Archie, Jenny* and other expressions which have, in time, become part of the language.

The glib-tongued laddies in the R. A. F. have created a flock of new phrases and expressions, some of which are destined to become part of the language, some of which have already begun to perish.

From English publications, from conversations with R. A. F. men here on duty for convoy, ferry and instruction and from Americans who have heard the expressions and brought them home, this small list of terms has been gathered.

Ack-ack. Originally the rapid-firing light antiaircraft guns; now applied to antiaircraft of all calibers.

Angle upward. Zoom; climb at an exaggerated angle. Also *angel upward.*

Ash can. Retractable or ejectable gun position. Also *dust bin.*

Balbo. An enemy squadron leader.

Bandits. Germans. The term *Jerry,* left over from the last war, is still widely used, particularly by the older officers.

Beat it up. Dive-bomb the antiaircraft. Also "make whoopee" in town.

Black. A glaring error.

Blotto. Gone berserk, savage, usually from excitement of "overtankage."

Boobed it. Missed it, muddled it.

Bomphlets. Dropping propaganda onto enemy or occupied territory.

Bompfleteer. The fellow who drops propaganda.

Brassed off. Bored with inactivity.

Browned off. Depressed; fed up, bored.

Bumps. Landings.

Chatterbox. A machine gun.

Chit. A message or dispatch. Also order.

Confetti. Ammunition for the machine guns.

(Turn to page 64)

Photo Credit List

The following list shows the sources from which credited photos were obtained. Abbreviations: bot., bottom; T., top; U.L., upper left; U.R., upper right; L.C., left center; R.C., right center; L.L., lower left; L.R., lower right; Cen., center; T.C., top center; B.C., bottom center.

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Page 43—Al Daraghy.

Page 47—Harold Kulick.

Page 49—Rudy Arnold.

Page 62—British-Combine.

Page 64—Three Lions.

Deck. The concrete base for a balloon platform.

Doing a Wilkie. Making too hasty a check-up.

Flak. Antiaircraft bursts; from the German: *Flieger Avwekn Kanone.*

Flap. Making a fuss, usually about something trivial. Also an air fight.

Flat spin. Harassed.

Flip. A short trial flight.

George. The automatic pilot.

Get cracking. Get going.

Go to the movies. Go into action.

Gone crackers. Shell shock or flight fatigue.

Gone for a Burton. Killed in action. From the name of one of the first R. A. F. pilots killed in this war.

Greenhouse. The cover, glass or plastic, for the pilot's cockpit.

Hangars. Sausage or barrage balloons.

Ham fist. A clumsy pilot or mechanic.

Hip flask. A service revolver.

Jinks. Make a quick bank.

Jump out the window. Bail out.

Kites. Airplanes. (A mechanic's term.)

Mae West. A breast life preserver.

Met blokes. Meteorologists.

Mouse traps. Submarines.

Mud. Flak spraying on the plane.

Nobes. Nobody's business.

Ops. Operations.

Picking a pinpoint. Locating an airplane on the ground.

Pulpit. The transparent nose or rotatable tail turret on a bomber.

Roller skate. A tank.

Rumf. Red tape; forms to be filled out.

Salvo. Dropping a number of bombs at the same time.

Scramble. Take-off.

Scrambled eggs. The gold oak leaves on an air commodore's hat.

Shoot a line. Brag.

Stick. Bombs released at intervals.

Tail-end Charlie. The rear gunner. Also the last airplane in a formation, assigned to shift position constantly in order to ward off unexpected rear attacks.

Tally-ho. "We are in contact with the enemy."

Target. An enemy airplane.

Taped. Solved a problem.

Tiffy. Engine-room worker.

Tore a strip off me. Received a reprimand.

Wailing Winnie. Air-raid siren.

Written off. Killed or crashed in action.

Modelers Have Private Airport

Baltimore Aero-Craftsmen have Modelhaven Airport, complete to anemometer, sleeve, vane.

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Air Trails Advertisers December 1941

SCHOOLS

MODEL AIRPLANE KITS, MOTORS AND SUPPLIES

MISCELLANEOUS

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 index.

What's Your Question?

(Continued from page 8)

Question: In your May, 1941, issue of Air Trails, in the article "Water Preferred," by Howard Hasbrook, it stated that a seaplane can land on land with safety. I would like to know how it is done. L. D. R., Jr., Royersford, Pa.

Answer: The keel of a seaplane float is built very strong, so it can stand impact with the ground without damaging the pontoon. The seaplane is landed on the ground very much the same way as a landplane, the only difference being that it is not dropped but rather flown in for a landing.

Question: What type of planes were used in the movie "Flight Command"? How many Lockheed P-38s are there in service at present? R. B., Lenoir City, Tenn.

Answer: The airplanes used in the movie "Flight Command" were Grumman F3F-2 fighters. Sorry, we do not know how many Lockheed P-38s are in service at the present time.

Question: Could you tell me where I could obtain "Book of Modern Airplanes" and "All American Aircraft"? W. W., New York City.

Answer: "Book of Modern Airplanes" can be obtained from the Garden City Publishing Co., 14 West 49th St., New York City; "All American Aircraft" from Thomas Y. Crowell Co., 432 Fourth Ave., New York City.

Question: Can you please tell me the name and address of the Culver Aircraft Corp, makers of the Culver Cadet? G. T., Buffalo, N. Y.

Answer: The Culver Aircraft Corp. is located at 600 East 35th St., Wichita, Kans.

Question: In your September issue your answer to a question contained the expression "powered with a geared 75 h.p. Lycoming engine." What did you mean by a geared engine? H. H., Lynwood, Calif.

Answer: A geared engine is one in which the propeller shaft is driven through a series of gears rather than direct. This enables the engine to revolve at a high speed, thereby increasing the horsepower while the propeller turns at a slower speed, which in some cases is desirable for efficiency.

Question: In reading about lighter-than-air craft I often see the expression "gas cell" used. Just what are gas cells and how are they used in such craft? M. B., New York City.

Answer: In lighter-than-air craft the gas is not contained in one huge bag or cell, but in several small units or cells. This is for safety in case of leakage or repair. One of these cells may be deflated without harming seriously the buoyancy of a dirigible. In large rigid-frame dirigibles there are many of these small cells, each fastened to the internal framework. Small free balloons are in themselves single gas cells.


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