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AIR TRAILS

OCTOBER, 1941

VOLUME XVII NO. 1

15 CENTS PER COPY

\$1.50 PER YEAR

A STREET & SMITH PUBLICATION

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FULL-COLOR COVER PHOTO OF ENGLISH SPITFIRE
BY BRITISH-COMBINE

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AT-10

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WHAT'S YOUR QUESTION

QUESTION: Could you let me have the addresses of manufacturers who build the following planes: Porterfield Collegiate, Funk, Jensen Sport-Plane, and the Brown L-5? O. L. G., Jr., Avon, Mass.

Answer: The Porterfield Collegiate is made by the Porterfield Aircraft Corp., 2809 E. 14th St., Kansas City, Mo.; the Funk by Akron Aircraft, Inc., 1280 Triplett Blvd., Akron, Ohio; neither the Jensen nor the Brown L-5 is manufactured any longer.

Question: I am inclosing a clipping from a magazine presumably showing the picture of a German Messerschmitt. Can you tell me what is the purpose of the small wooden propeller rigged on the undercarriage fairing? Can its purpose be to generate electricity? L. G., Utica, N. Y.

Answer: The clipping shows a Junkers Ju-87 dive bomber, otherwise known as the Stuka. Undoubtedly you are right. The wooden propeller actuates an electric generator which either charges the storage batteries or produces current for the radio.

Question: Please send me the price, name and address of the manu-

facturer of the Baby Albatross sailplane. I would especially like to know the price of the kit, as I would like to build it at home. C. R., Shawneetown, Ill.

Answer: This sailplane is manufactured by Bowlus Sailplanes, Inc., 13785 Paxton St., San Fernando, Calif. The price of the kit is in the neighborhood of \$400.

Question: Are torpedoes released from a torpedo plane in a dive? If not, can it be done in the dive? D. G., Shaker Heights, Ohio.

Answer: The plane releases its torpedo in a level flight at very low altitude. A torpedo cannot be launched in a dive, as it will go to the bottom; it must hit water as near to level position as possible.

Question: Could you please send me or tell me where I can obtain plans or layouts of Chet Decker's sailplane, the Minimoa? Were they ever published in Air Trails? J. A., Inglewood, Calif.

Answer: Sorry, but plans for the Minimoa have never been published in the magazine, and we doubt that any could be obtained in the U. S. The ship was built in Germany, and the Germans were very reluctant to let the plans out.

Question: In your August issue of Air Trails the Reviewing Stand mentions the book "Preliminary Airplane Design." Would you please give me the address of the Pitman Publishing Corp. which prints this book? S. E., Ben Avon, Pa.

Answer: The Pitman Publishing Corp. is located at 2 West 45th St., New York City.

Question: I would like to know if any plane in Europe has the engine behind the pilot as in the Bell P-39? C. K., Denver, Colo.

Answer: Yes, several European military ships were built with engines behind the pilot. They are the Koolhoven F.K.55, a midwing fighter monoplane built in Holland, and the Westland f7/30, a British single-seat fighter biplane.

Question: Can you tell me what engines the following planes used: World War I Halberstadt, Fokker triplane, deHaviland 5 and the Pfalz? Also, where can I get plans of the less familiar planes of the First World War? R. B., Maywood, Ill.

Answer: The Halberstadt was powered by a water-cooled Mercedes, 180 h. p. engine; the Fokker triplane by an air-cooled rotary Oberursel engine of 80 h. p.; the Pfalz by a 160 h. p. water-cooled Mercedes, and the deHaviland 5 had a 110 h. p. air-cooled Le Rhone rotary. Write to some of the model manufacturers who advertise in Air Trails regarding plans for less familiar World War planes. They may have them.

Question: Could you tell me if the Curtiss A-18 is still a standard ship with the attack division of the army air corps? What are the standard pursuit ships with the army? J. A., Hamilton, Ont., Canada.

Answer: There have not been many A-18 ships built; however, they are still in service. The standard pursuits of the army air corps are the Curtiss P-40, Bell P-39, Lockheed P-38 and the Republic P-43.

Question: Does the landing gear of the Brewster navy fighter retract? What is the horsepower of the Brewster and the Grumman fighters? L. S., San Angelo, Texas.

Answer: Yes, the landing gear of the Brewster navy fighter retracts into the belly of the fuselage. The ship is powered by a Wright-Cyclone engine developing 1100 h. p. for take-off, 800 h. p. in normal flight. The midwing Grumman fighter is powered by a Wright-Cyclone engine of 1,200 h. p.

Question: Would you please give the address of the Garden City Publishing Co.? Where can I buy a copy of the book, "All American Aircraft"? D. G., Fresno, Calif.

Answer: The address of the Garden City Publishing Co. is 14 West 49th St., New York City. You can obtain "All American Aircraft" from Thomas Y. Crowell Co., 432 Fourth Ave., New York City.

Question: Where can I get army plane insignia? What is the address

of the model maker whose picture appears on pages 46-47 of your August issue? J. C., Greensboro, N. C.

Answer: For army plane insignia try writing to Public Relations Dept., Army Air Corps, Washington, D. C. If you want to get in touch with Joe Battaglia, whose picture appeared in our August issue, write to him in care of this magazine.

Question: Where can I obtain the "Book of Modern Airplanes," by Harold H. Booth, and how much does it cost? J. A. McG., Shannon, N. C.

Answer: This book can be purchased from the Garden City Publishing Co., Inc., 14 West 49th St., New York City. The price is \$1.

Question: Could you please give me some information of the following planes: Norway's Marinens M.F. 11, Holland's Koolhoven F.K.58, and the Belgian Renard R.36? J. G., New Iberia, La.

Answer: The M.F.11 is a three-seat reconnaissance biplane with a wing span 50 ft. 6 in., length 38 ft. 1 in. It weighs, empty, 4070 lbs.; fully loaded, 6490 lbs. The top speed is 140 m. p. h., ceiling 16,400 ft. It is powered by a 600 h. p. Siddely Panther engine. The F.K.58 is a single-seat full-cantilever midwing all-metal monoplane fighter with a span of 36 ft., length 28 ft. 6½ in. It weighs, empty, 3,960 lbs.; fully loaded, 5,610 lbs.; has top speed of 310 m. p. h., cruising speed of 280 m. p. h.; ceiling of 34,100 feet. It is powered by an Hispano-Suiza radial air-cooled engine of 1,080 h. p. The R-36 is a low-wing single-seater all-metal fighter having a span of 38 ft. 2 in., length 28 ft. 10 in.; weight, empty, 3,894 lbs.; fully loaded, 5,634 lbs. It has a maximum speed of 313 m. p. h., and is powered by a twelve-cylinder liquid-cooled Hispano-Suiza Cannon-Motor of 910 h. p.

Question: Would you please tell me the designation of the Northrop plane pictured on the inclosed drawing? C. E., Windsor, Conn.

Answer: Your drawing is not very clear. The ship looks like the Northrop 2-E observation plane.

Question: Could you give me the wing area, wing loading, empty gross weights, and type of power plants of the following planes: Consolidated B-24, Lockheed P-38, Grumman Skyrocket, and the Vought Sikorsky XF-4U-1? D. F., Cincinnati, Ohio.

Answer: Most of the information requested by you is restricted. Specifications of the Grumman Skyrocket are not available. The Consolidated B-24 is powered by four Pratt & Whitney twin-row Wasp engines developing 1,200 h. p. each, it has a gross weight of 40,000 lbs., and a range of approximately 3,000 miles. The Lockheed P-38 has a gross weight of 13,500 lbs., carries 360 gallons of gasoline and is powered by two liquid-cooled V-12 Allison engines of 1,150 h. p. each. The XF4U-1 has a gross weight of around 9,000 lbs. and is powered by a Pratt & Whitney double Wasp developing 1,850 h. p.

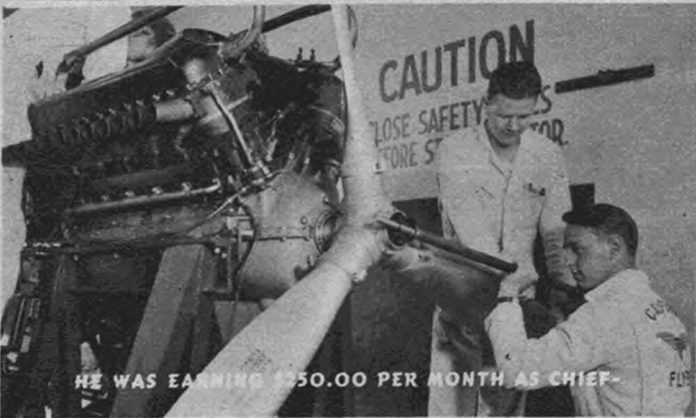
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We scan the aeronauti-
 cal horizon and report
 our personal findings.

APPARENTLY the light plane is surprising army officials all over the country. For years the advocates of light planes have tried to obtain the ears of army men regarding the usefulness of the standard light plane for messenger, spotting, and observation work in co-operation with the armed forces.

During recent maneuvers in Tennessee and Louisiana, a group of standard light planes consisting of ten Piper Cub trainers, two Aeronca trainers and two Taylorcraft trainers, donated by the manufacturers, pilots included, functioned even better than expected.



All sorts of difficult terrain was encountered, as well as bad weather, overloading with equipment, radios and whatnot, but the Grasshopper Squadron carried on perfectly, making impossible landings and take-offs from hastily prepared strips, roadways, back yards and fields. All these ships were standard models without special equipment, with the exception of two-way radios and army gadgets added for the missions involved.

Upon completion of the first phase of the maneuvers, General Innis P. Swift, in charge, enthusiastically approved them as standard equipment, commenting that they were the best type of message-carrying equipment the army ever had. In one instance the general radioed for one of them and it arrived in twenty minutes; thirty minutes later he received a radio message from headquarters stating that the plane was on its way to him. These planes are not to be part of the regular air corps, but a part of the regular artillery corps or whatever branch they co-operate with, manned by members of that particular unit skilled in its particular duties and problems.

The light-plane manufacturers and their pilots responsible for this splendid showing are to be congratulated.

★ ★ ★

Soaring pilots are very much like fishermen. On rainy days, when no flying was possible, the administration building on Harris Hill during the National Soaring Contest was always a good place to pick up some interesting yarns. Our soaring editor dropped in there on one such day just in time to hear Johnny Nowak of Michigan tell of an incident which happened to fifteen-year-old Dallas Wise, Jr.

It seems that Junior took off in his father's Franklin glider from Plymouth, Michigan, Gliderport one afternoon. The weather being favorable for soaring, he soon connected with a thermal and was off on a cross-country flight. After he had covered approximately ten miles the thermals petered out and Junior was obliged to seek a landing place. Right below him stretched a sizable airport, young Wise dived for it, and landed on its far end. Stepping out of the cockpit he walked toward the administration building, passing on



the way a number of camouflaged bombers. As soon as he neared the administration building, a guard grabbed him and demanded to know how come he was roaming around the Ford Airport where important defense work and the arming of British bombers was going on. Imagine the surprise of the guard when Junior calmly told him that he landed on the port in a glider. By that time the officials heard of the incident, and demanded that the glider be shown to them. The young pilot led them to the edge of the field and proudly displayed his Franklin. Dallas, Sr., had to be called in order to identify his son and the ship, and some red tape had to be cut before father and son were permitted to load the glider on the trailer and leave for home. Glider invasions can happen even in the United States!

★ ★ ★

Just had a letter from our old friend Bink, canine mascot and tail-wheel chaser at Cub-Haven Airport, Lock Haven, Pennsylvania, where the Cubs are made. Seems he's kicking about the cold quarters he had to put up with last winter. Might be a good idea for you airport chaps to give a thought to your mascots. After all, even *airdales* develop tail flutter on cold days with no warm place to sleep. Bink, by the way, is the mascot of Cub Fliers and a mighty good member in good four-legged standing.

★ ★ ★

Speaking of Lock Haven, while down there the other week we finally soloed—on roller skates. Yup, we were escorted to Hecla Park, fitted out with a seat-pack parachute and sent solo. The straight and level part was fine, but had trouble with banking on the turns. Thanks to plenty of stabilizers consisting of vertical posts about the hall, finally made a 360° of the hall and came in for a one-point landing with the throttle wide open. What we want to know is who had been tampering with the trimming tab on that left skate.

tab on that left skate.

★ ★ ★



The air corps tells this one:

A flying cadet at Randolph Field, Texas, was slated for special "skull drill" recently after giving flight instruction officers of Class 41-H some bad moments during navigation training flights to nearby Texas cities.

Major H. L. Mace, commander of flight operation, was directing the plane movements by radio when the cadet broadcast that his fuel tanks were empty. Amazed that a student airplane could have been sent out without adequate gasoline supply, Major Mace radioed the cadet to recheck, and was told the tanks were "practically empty."

Adopting a fatherly tone to keep the cadet from becoming confused, Major Mace said, "Look around and see if you can find a good field to land in."

The cadet did not reply, and Major Mace radioed back for a position report. "Oh, I'm on the ramp in front of Hangar C, here at Randolph Field," was the reply.

THE PROOF

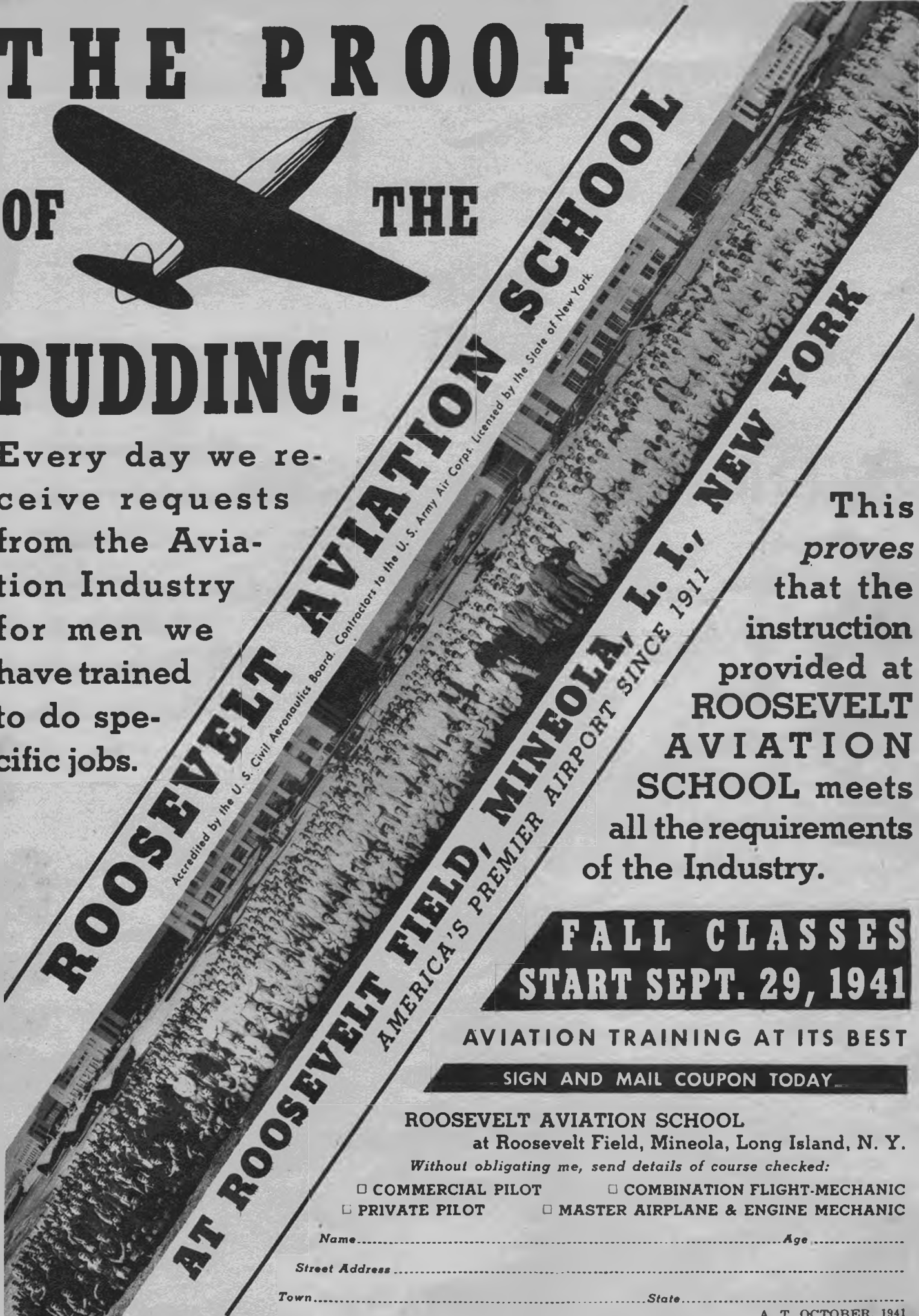
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A. T. OCTOBER, 1941



Adventure starts for the employee. After acceptance, new employees must be fingerprinted, photoed, investigated and prove citizenship.



The day begins. The thousands of employees stream through the various checking gates into the particular building where they work.

AROUND THE CLOCK



AT LOCKHEED

SPEED is the keynote at Lockheed. Speed of production and speed of their products. Lockheed's P-38 interceptor for the army air corps and for Great Britain breaks 400 m. p. h. with its two Allison engines. The famed Hudson, of which more than 1,000 have been built for Great Britain, has distinguished itself for ruggedness under fire. Its high speed and all-around performance make it popular with the British. The civil counterpart of the Hudson, the "14," and the similar-looking but newer Lodestar transport are the fastest ships of their type in the world. Based on the Lodestar is the new Ventura bomber for the English.

Lockheed and Vega, the airplane company, its subsidiary, expect to work 50,000 people around the clock for peak production.

Lockheed's streamlined Vega monoplane set new standards for speed and efficiency during the '20s and '30s. Looking forward to the tremendous growth of civil aeronautics after the war, and the immediate stepped-up production of fighting airplanes, Lockheed recently purchased the Burbank Union Air Terminal, one of the nation's largest civil ports. Foreshadowing future civil production are T. W. A. and Pan American orders for forty of the giant four-engined Constellations apiece.

These will be 64-passenger, four-engined planes, with a top of 350 m.p.h., range of 4,000 miles, and a 30,000-foot ceiling. Engines will be 2,500 h.p. Wrights not yet in production. Both cabin and engines will be supercharged. Useful load is sixteen tons. At the moment the priorities situation permits of plans for only three Constellations.

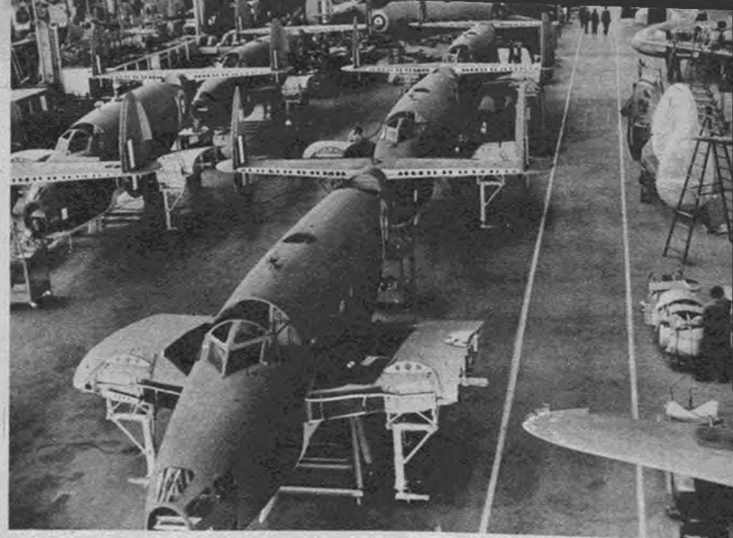
For the moment, the Lockheed motto is "First things first, and the first thing is the P-38."

Above, the P-38 (Lightning to English). Below, crowded factory space moves the Hudsons outdoors under floodlights for final assembly work by a night shift.





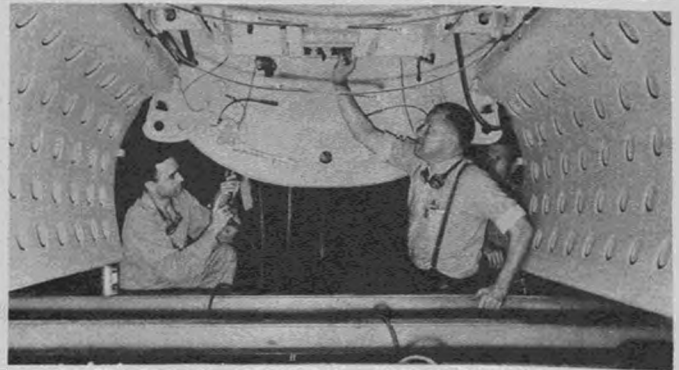
Miracle makers. Here in the drafting rooms of Lockheed originate the plans and specifications for the metal bullets both military and civil that fly under Lockheed trade-mark



Down the line they come. Lockheed Hudsons in the center and left and Lodestars on the right vie for preference in the race for completion.



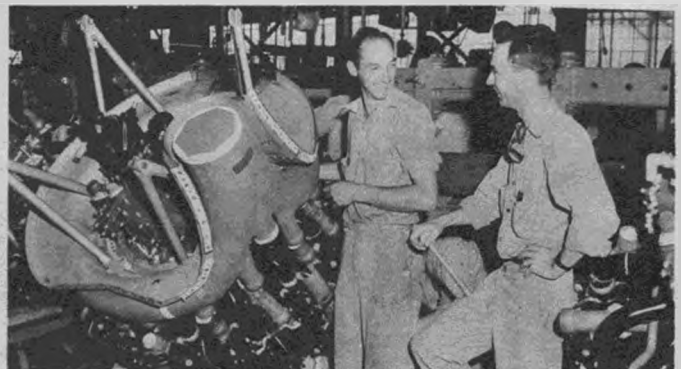
On castered dollies these wing-center sections progress down their individual assembly line. Here a riveting crew fills in its part of the job.



Open Sesame. These experts check the operation and production of the bomb bay doors of Lockheed bomber before ship moves along the line.

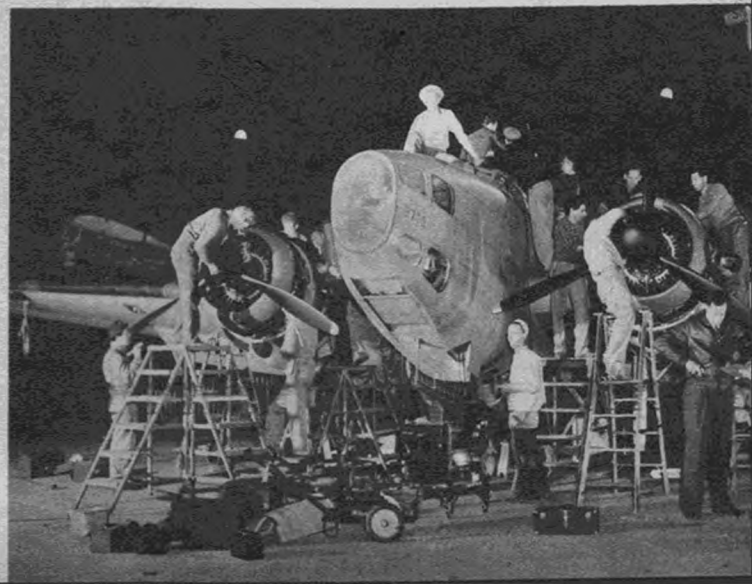
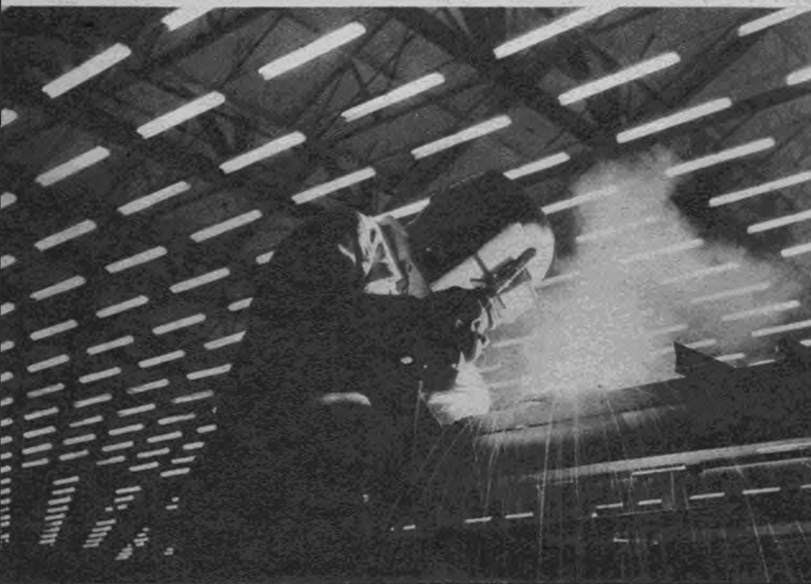


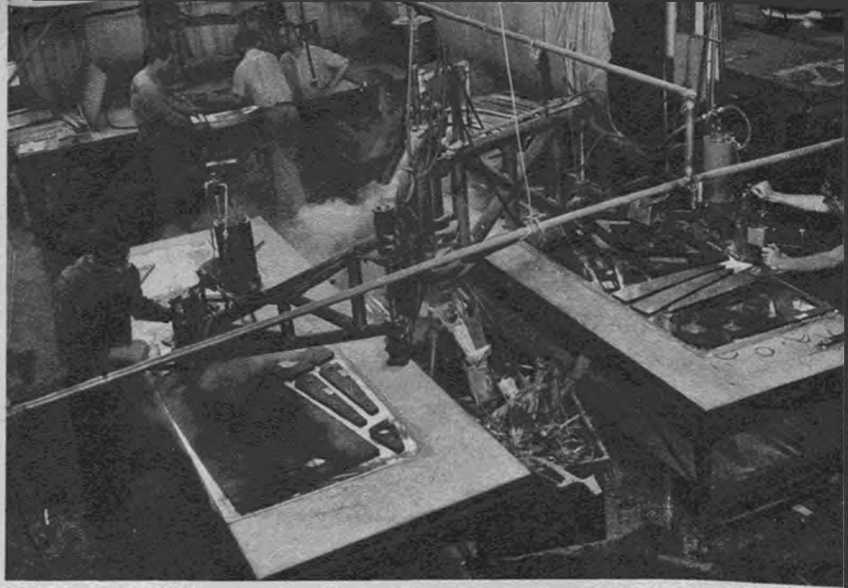
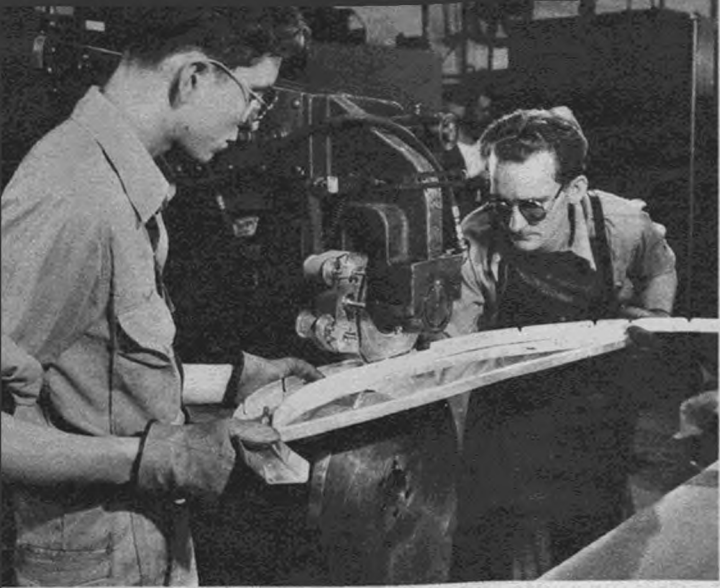
California's weather co-operates with defense and allows huge molds and dies to be worked upon and stored outdoors. Note electric crane.



Engine and mount become a unit in this section where the exhaust manifold, mount and engine are all assembled ready for installation on ship.

Modern smithy. This aircraft worker is using electric arc welder in building jig. Bomber gang of the night shift give the final touches to a Lockheed Hudson by arc lig



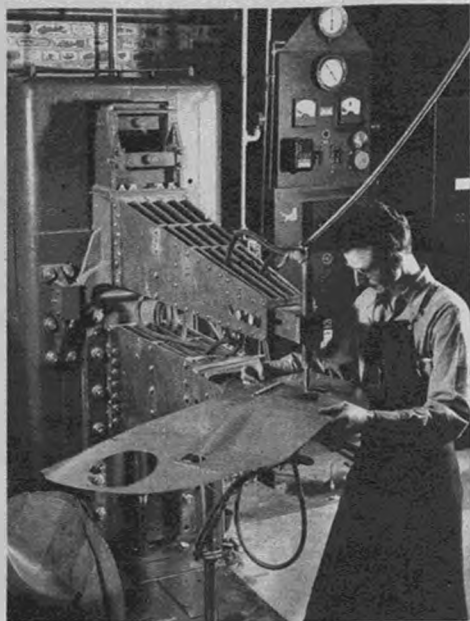


In this special roll spot-welding machine curver members are welded between rolling electrodes. This is for long straight welding runs.

This machine cuts several sheets of duralumin at once. They are bolted to a steel pattern to prevent possible shifting and then are cut by this high-speed electric router.

AROUND THE CLOCK AT LOCKHEED

(Continued from preceding page)



This new resistance welder makes possible more perfect electric spot welding in hard-to-reach places.



Covering the subject. These sheet-metal workers apply sheet duralumin cover to the metal framework.



Engine assembly line. Here the wiring and exhaust units of the power plants are attached and checked.

FAMILY LIFE AT THE DEFENSE FRONT



Open-air eatery. Lunch hour furnishes chance for workers to chew and chin.



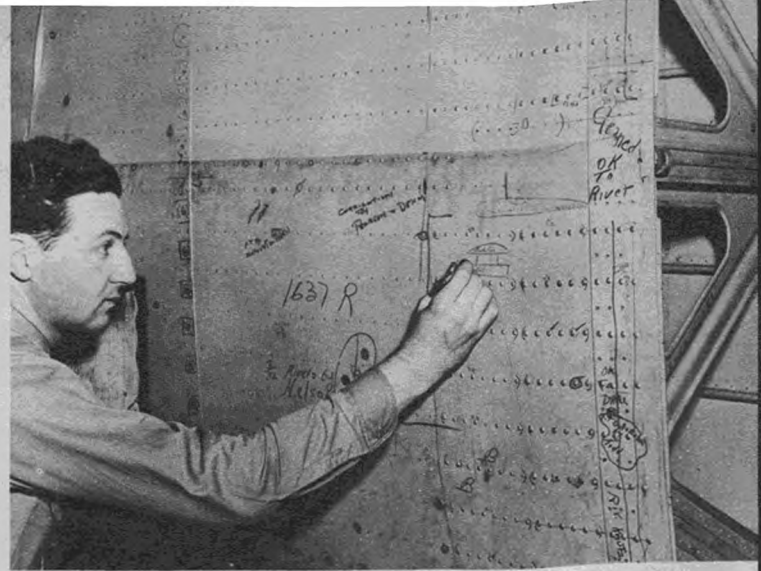
Shift's end. Work over, Joe Employee removes the traces of Lockheed real estate and prepares for leaving the plant.



Well, mom, what happened at home today? Joe's family is one of hundreds living in trailer camps to be near work.



After assembly every part is carefully checked for perfection and compliance with the specifications. Here the tension of a control cable is being very carefully checked.



Every inspector signs right on the job his approval of every operation. Here an inspector is seen in act of initialing approved wing rivets.



Peace and war. Two production lines in the 600-foot final assembly hangar show on the left the Lodestar transports and on the right the Hudson bombers. These

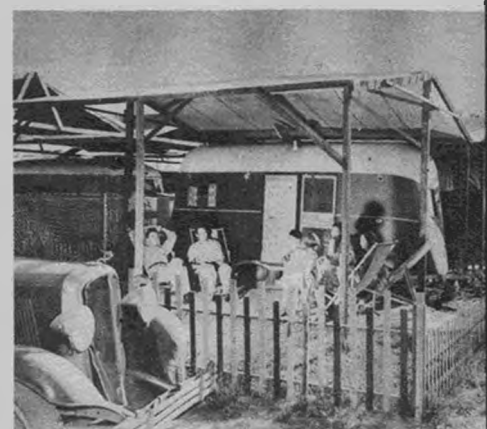
two lines and their respective lesser assembly lines for parts keep more than ten thousand employees working on continuous round-the-clock schedule.



What's cooking? Plenty, from the look on Joe's face. There's nothing like good eats after a big day at the plant.



Homework for all. Mom does embroidery, the youngsters catch up on stuff, and Joe learns more about his job.



Back-fence gossip as neighbors drop in just after supper. S'long, Joel



BLIMPS ON GUARD

BY Lieut. Comm. R. F. TYLER, U. S. N.

The commander of the K-2 takes you on a practice flight out over the Atlantic, demonstrating just how blimps would be valuable to us in case of war.

Note: The opinions or assertions contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the navy department or the naval service at large.

ALMOST two hours had passed since the rise of the sun, but still you couldn't see it. The clouds were heavy gray masses that filled the sky from horizon to horizon, racked and tumbled by a biting breeze born among the icebergs. The Atlantic, a hundred miles offshore, was a waste of sullen green swells and dirty white scud, and as lonesome as the moan of a whistling buoy in the night.

The freighter was on course for Philadelphia, her blunt bows shouldering stubbornly through the unfriendly combers, her rusty plates streaming spume after every lunge. She was heavy with cargo, low in the water, and couldn't have been logging more than ten knots; if she sighted land by nightfall she'd be doing well.

Both of the figures on the bridge were in oilskins, but the mate wore an old cap with a visor and had a pair of binoculars slung around his neck on a thong. These last he was using to scan the murky horizon with concentrated intentness, holding them steady over the forepeak for a minute at a time, and doubtless cursing the limited visibility. Suddenly he stiffened,



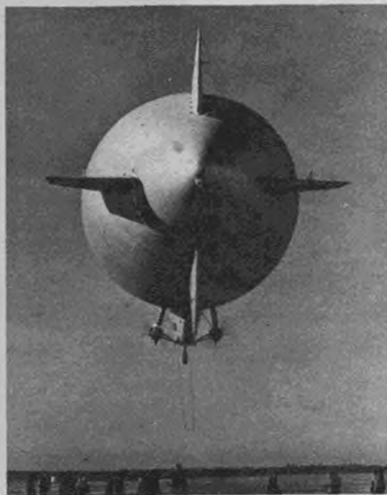
Navy blimp patrol. Three blimps prepare to go their separate ways on all-day patrol as far as 75 miles offshore. In war they would spot mines and submarines.

The author and the good ship K-2, a nonrigid of 400,000-cubic-foot helium capacity. The blimp's duration, ability to hover, and 8-man crew make it effective for coast patrol.





The crew awaits the take-off signal. Engines are warmed up as the blimp strains at the portable mooring mast.



Anchors aweigh! Navy blimp takes off at Lakehurst. Trailing lines held by ground crew.



On patrol. Blimps spotted many submarines in last war, were effective convoy escorts.

bracing himself as the ship rolled out of a trough. The glasses swung hastily from one side to the other; then they dropped from his hand to stop with a jerk at the end of the strap. He lifted an arm to point, and his mouth opened wide with surprise.

He needed no binoculars to see what he was now pointing at, though it had not drawn his attention before. He had noticed first the faint hum of throttled motors; now, looming abruptly out of the scudding clouds, he saw a shape like a huge silver sausage. The nose was bluntly conical, and where the tail tapered were four flat fins symmetrically arranged; underneath was something like a streamlined blister with a row of windows all around.

But all that is how things must have seemed on board the freighter, the way we looked to them as we floated out of the clouds. Aboard the blimp, I slid open one of the windows and picked up a megaphone. From a height of a hundred feet my voice carried easily. "Ahoy!" I yelled. "What ship is that?"

At first I couldn't understand the mate's reply. I thought for a minute he was using a strange tongue, and asked the ensign at my side if he had the foreign-language vocabularies handy. But then the mate ducked into the wheelhouse and reappeared with a megaphone of his own. His shout came loud and clear, with a marked Scandinavian accent. First the name of the ship, the registry; then, "Out of Recife, bound for Philly!"

I asked several more questions, noting his replies on a special log sheet and checking them against a naval information chart. Then I waved the megaphone at him. "Respects of the navy—and the best of luck!"

A second figure in a peaked cap, hastily buttoning his oilskins about him, came up a ladder to the tramp's bridge; that would be the captain. I could see the mate pointing in my direction, reporting the unexpected hail. The captain seized the megaphone. "Are we at war?" he bawled at the top of his lungs.

I grinned as I shouted back: "No! Routine practice flight!"

The two Pratt & Whitney engines mounted outside on either side of the gondola, which had been turning up just enough to hover the K-2 into the wind over the freighter's position, now revved up under opened throttle. Our nose lifted, and the blimp rose in a gentle curve toward its previous course until the bulk of the envelope was nearly hidden in the cloud layer, only the observation ports remaining down in the clear.

Looking back down at the bridge of the lumbering steamer, I could see the two officers staring after us. The mate was gesturing; I could almost guess what he was saying.

"A fine chance we'd have of getting anywhere near an American harbor if we were an enemy mine planter, huh!" And the captain's response; I'd almost bet on that, too: "I thought they'd chucked all them things in the dust bin since the last one burned up—what is it, the *Hindenburg*?"

There are doubtless many others who suffer from that same misapprehension; that the series of airship disas-

(Turn to page 28)



Ship's navigator carefully plots each ocean patrol flight to cover maximum area. Blimps can carry depth charges to drop on submarines.



Forty winks are snatched by one crew member as blimp continues its slow patrol over the ocean. Blimps have heated cabin and electric stove.

SECRET AGENTS OF THE AIR CORPS

BY JOHN R. HOYT

Get vital information, transmit it to proper places, keep mum—that's the job of G-2 men.

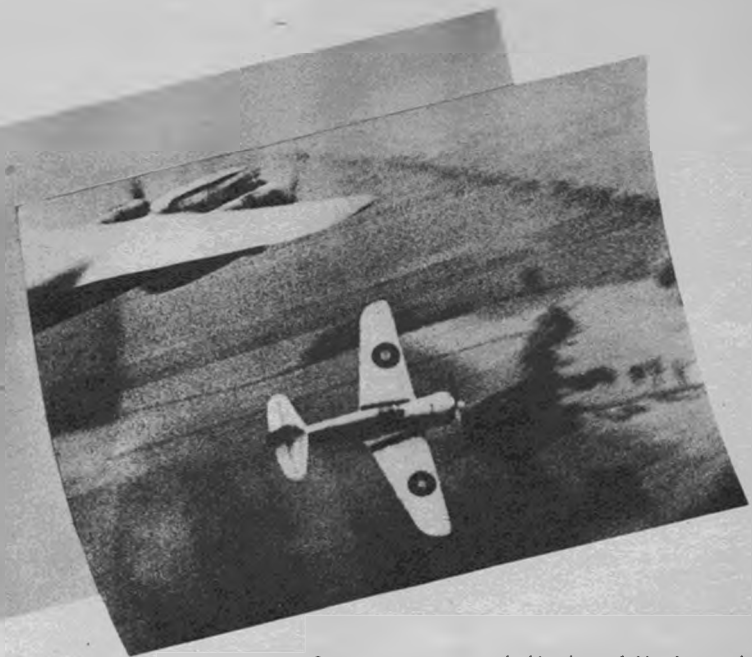
MAJOR X of the army air corps, and a member of G-2, was being interviewed. A veteran of both aviation and the army's rapidly expanding Intelligence Service, Major X spoke at great length—and said nothing.

"But," the reporter complained, "you haven't told me anything yet. How about spies? Where does your information come from? What are the Nazis doing?"

"Son," replied the major, "if your eyes were half as good as your curiosity you would have the key to G-2 in your hands. G-2 is the second section of the general staff—Intelligence. It is a unit that functions as well as it does because its members (like myself) don't tell everything they know. That is the key to it, and an excellent example of how G-2 works. We see a lot, find out all we can, and tell nothing!"

The major tried to give the impression that working for G-2 was as unvaried, uninteresting and lacking in melodrama as driving a mule team. But according to the best-sellers, anyone in the Intelligence Service, and especially aviation, has his hands full nowadays. And after a while it came out; the reporter merely kept quiet and let the major weave the background for a story.

To begin with there are more persons employed in G-2 of the general staff today than there were in the whole office of the chief of air corps five years ago! And today G-2, as the Intelligence



German censor passed this shot of Hawk attacking Dorniers. U. S. observers report performance.

division is called, is expanding so rapidly that officers in the war department itself cannot keep up with the picture. Expansion is going on, new men are taken in, vital information is uncovered. And there the work begins; just getting the information isn't so hard—it's keeping it and disseminating it that is difficult.

For example, G-2 wants to know all it can about foreign pilots, their planes, and how they accomplish their missions. During the week of April 25th, fourteen combat pilots of the United States air force landed in Britain as observers. Those pilots were expert in handling the P-40 pursuit, and ostensibly were going to demonstrate the craft to the British. But in the main they were observing foreign planes, pilots, and tactics—how the Nazis conducted themselves in the air, what their methods were and how they flew.

Of course, G-2 wants its information firsthand, and wants it authentic. But the idea of sending United States pilots abroad to tangle with a Nazi plane, as they were certain to do if they flew over spots where they could observe accurately, was fraught with danger. Sooner or later several pilots would be shot down, the news would reach the papers, and a tense international situation might immediately develop.

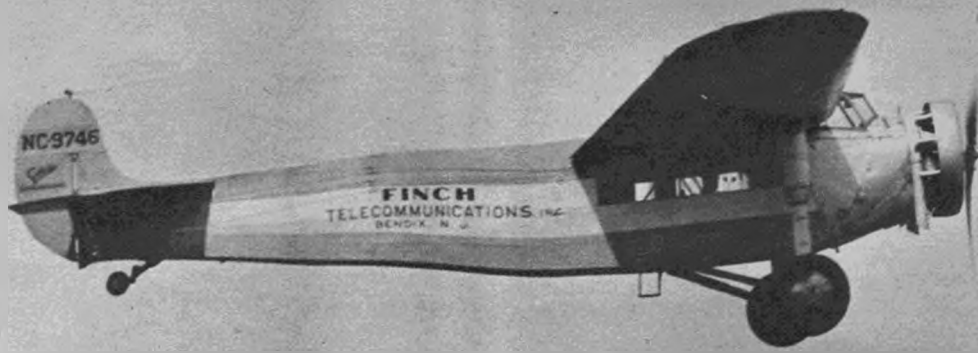
This question was brought up during the interview with Major X. The major didn't reply for a moment, and (*Turn to page 29*)



American "secret agent" pilots test and use American equipment in England to find out shortcomings and get essential information back home.



Ships like this Vultee Vanguard for the British must be evaluated for speed, maneuverability, armament and armor, all in our own interests.



Off for a test. Pilot and Chief Engineer Frank R. Brick take up the especially equipped Fokker monoplane.



Over enemy terrain the observer draws location of troop placements, guns, depots, in black on map of section outlined in red. Red does not transmit, so enemy cannot know meaning of marks.

RADIOED MAPS IN CODE

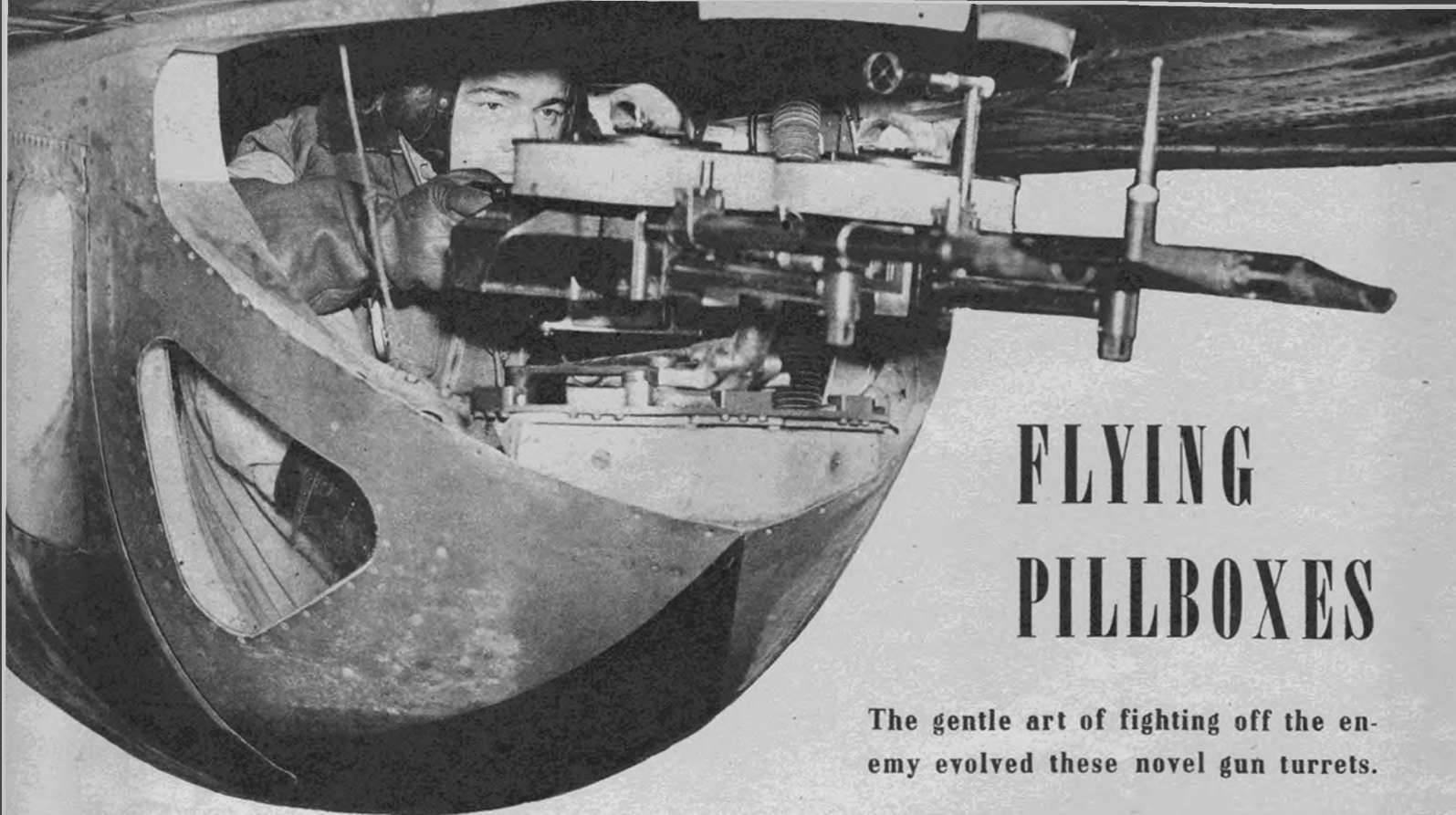
Equipped with this radio facsimile unit, planes can now transmit secret drawings of enemy territory, moves, etc.

Red-outlined map with marks is placed in transmitter and sent on a special wave length to headquarters.

At headquarters the officer takes coded information from machine. Other officer has red map outline on celluloid.

Solution. Weird markings placed under map outline complete the information picture.





FLYING PILLBOXES

The gentle art of fighting off the enemy evolved these novel gun turrets.

"Dustbin" beneath Handley-Page Hampden houses a two-gun sentinel, firing under tail.



Ready for all comers. Rear gunners on Consolidated PBY-5s (Catalina in England) man two sets of these swivel-mounted machine guns. Huge blisters designed on basis of war findings.

Famous multigun power-operated turret on Defiant night fighter can train its guns up or to the side at right angles against strongest slipstream. This crew has thirteen victories.



Aimed by remote control, machine gun in tricky turret on Beaufort torpedo-bomber gives increased protection.

Daniel Boone, twentieth century. Even machine guns need servicing. This gunner cleans tail guns on Whitley bomber.



○ Army, Navy, or Marine Corps Field
(for civil aircraft use only in emergency)

⊕ Seaplane Base
(with complete facilities)

⊙ Rotating Beacon
(with course lights)

⊙ Commercial or Municipal Airport

⊙ Forest Ranger Station

⊙ Oil Well Derricks
(general location)

⊙ Mooring Mast

⊙ Swamp

⊙ Mine



YOU CAN'T MISS IT!

BY IDELL DURRETT HAYS

—at least you shouldn't, with the complete and detailed air charts available today. This is their story.

WHEN George Jackson, proud possessor of commercial license No. 95475, decides to fly from Kansas City to Cheyenne, the first thing he needs is an airplane.

But the second thing is a map.

Without a map, he cannot follow a true course—cannot even chart one.

Uncle Jim, starting out on his vacation, drives his car into the most convenient filling station, gets a highway map and, with the added aid of mileposts, winds his way easily across the continent to his favorite fishing haunt, checking his route as he goes. Travel to him is bounded only by space. When his gasoline supply gives out, he stops.

But when George's gasoline gauge registers empty, he spins. His travel is bounded by both space and time. To conserve gasoline and minutes, he must map a flight course before leaving the ground, calculating the shortest distance between Kansas City and Cheyenne with regard to topography, wind, deviation, et cetera. There are no signposts along the air lanes, so detailed maps showing landmarks and approved landing fields are the more important.

Upon the accuracy of his charts, and the skill with which he utilizes them in course mapping, keeping "located" while in flight and gauging safe altitudes for flying, may depend George's life, as he balances time and fuel against distance and weather.

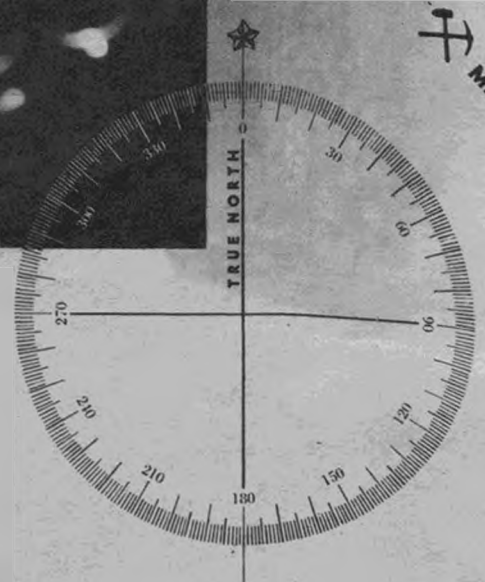
The job of turning out these highly specialized, flight-checked aeronautical charts has, since their first appearance, been delegated, by the Air Commerce Act of 1926, to the United States Coast and Geodetic Survey, a scientific service bureau of the department of commerce.

For more than one hundred years, the survey has handled capably the printing of similar nautical charts for sea use. When the new need arose, the government turned to them once more.

In the fifteen years since their institution, the charts have had to keep up with—and therefore reflect the progress of—one of the world's fastest-advancing industries. They have done so, the sale of them going up steadily—and now exceeding that of nautical charts.

Of course, it is possible for a flier to follow an ordinary automobile map, or even, as in the case of Downwind, friend of Smilin' Jack in the funny paper, a geography atlas. Back in early days of mail carrying, when pilots became lost, they descended to low altitudes, found a herd of cattle and flew over them. If the cattle stampeded, the fliers knew they were off the air lane; if the cattle were "conditioned" to the motors, the pilots were on course.

Army fliers tell stories about hedge-hopping, "flying the telephone poles," dropping low to read the town's name on the water tank, or using the "iron compass"— (Turn to page 26)



I GET MY PRIVATE

The old story of learning to fly that's always new—told by a traveling salesman.

BY WALTER E. EDWARDS



Don't worry, it's strong enough to hold you even if you are big. Bill, left, assures Walter that the rugged training plane can really take it.



Down-the-hose directions. Instructor Bill Turso, left, uses combination hand and voice signals in flight. Here he and Walter test Gosport tube.



Bill gave me plenty of tips on air maps on how NOT to get lost on my first cross-country solo.

Mine! The signed log book making me a Private Pilot is handed over by Inspector Copeland.



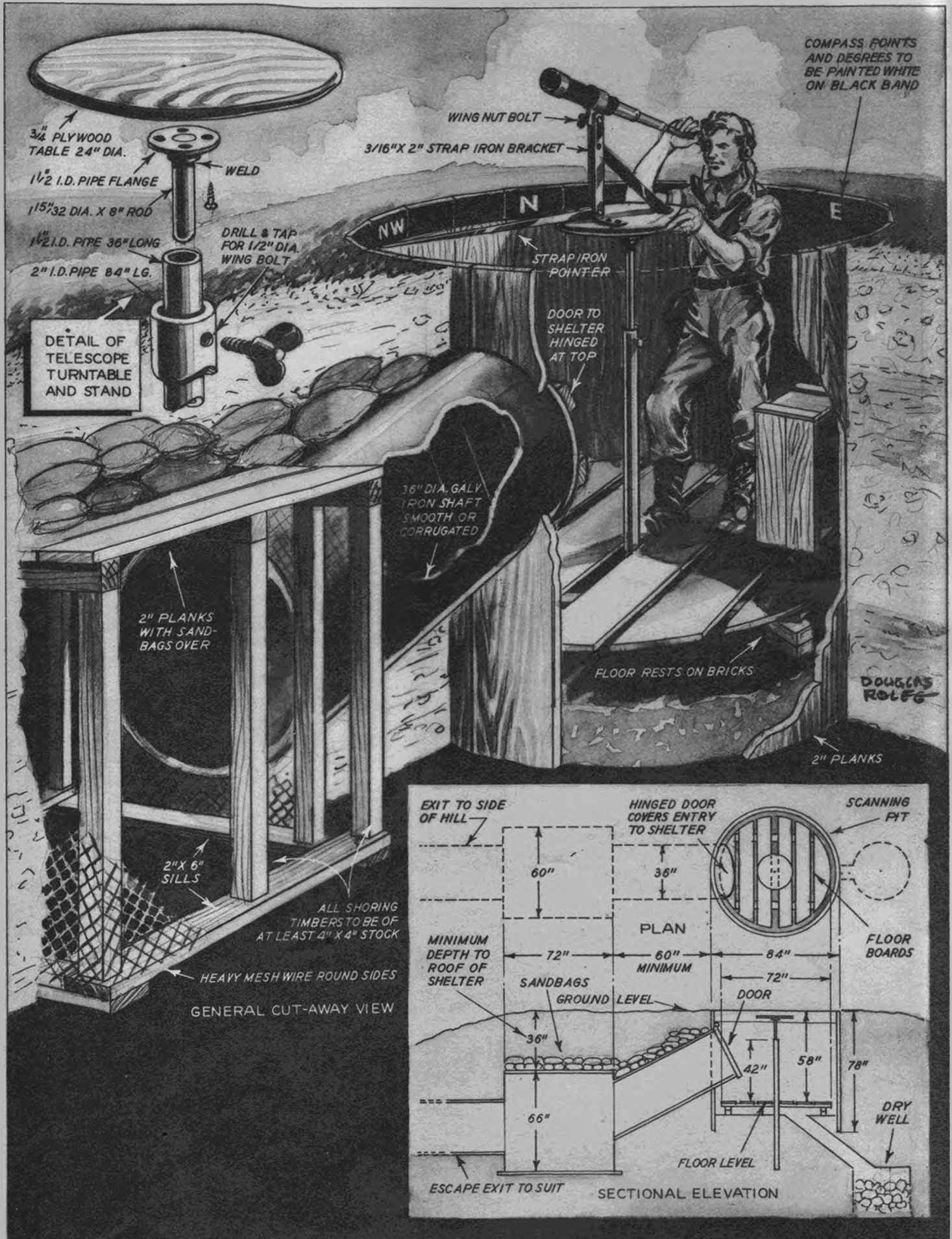
YOU have never heard *this* one about a traveling salesman! Selling steel for a big company has its ups and downs. But even if you are on the "up," in Bridgeport, Stamford, Hartford or New York, you can always look up and see those lucky devils flying in planes go still higher. So, living in Garden City, I decided one week end to step over to Roosevelt Field and have a look-see. . . .

Well, there I was, a registered student, a contract in my jeans, waiting for the first dual hop. Had never been up before. It wasn't bad. (That fellow Bill Turso sure can fly—he's got five thousand hours.) Sure, the first hop wasn't bad—but that's because I finally got down. Gentle reader, remember, if you are interested, I went into this business as cold as a nude Eskimo. From the gunning of the throttle on the take-off to the three-point (thank Heaven) landing, I was scared. Being fundamentally a little reckless by nature, I have since been glad of this original fright as I think it has made me a more careful pilot. That too-true observation of Horace Greeley, "Your hindsight is better than your foresight by a damn sight," can never be applied to a pilot. If your foresight isn't good, you'll never be around to figure out your hindsight.

My knowledge of aviation was nil. Thus my decision to attend a Grade A school. Roosevelt Aviation School, I knew, offered a first-class ground school as well as proper equipment for flying. The curriculum I obtained, the equipment I saw, and the men I met, sold me on my first visit. In the ground school I learned that a pilot's problems are not all with his ship. Meteorology, navigation and civil air regulations must be as integral a part of a pilot's make-up as his co-ordination of stick and rudder. Mr. Cappe, fondly known as Cap, has a way of presenting adiabatic rate, radius of action, and why you can't take a number (Turn to page 31)

AIR DEFENSE NOTE BOOK

No. 1—Home-made spotter's post for civilian aircraft warning service.



Set six feet in ground, this post can be made from easily obtainable materials. Dry well for drainage on right; safety shelter with escape exit on left.

ELMIRA MEET

BY ALEXIS DAWYDOFF



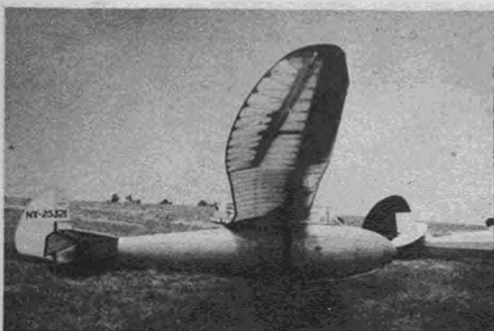
Famous field. This shows the beautiful rolling hills and valleys about Harris Hill.

"Military" was the word at this year's Twelfth National Soaring Contest. Here's what happened.

TWO narrow-winged sailplanes soared silently in tight formation over the sun-baked top of Harris Hill. Both landed simultaneously, holding their positions, and rolled up to grandstands crowded with people. One of these motorless craft bore the insignia of the army air corps with the lettering AAC-TG-2 (Army Air Corps Training Glider 2) painted on the fuselage below the pilot's cockpit. Flown by Major Frederic Dent, Jr., the first army Silver "C" soaring pilot, this ship set the tenor of the Twelfth National Soaring Contest held in Elmira, N. Y., from June 28th to July 13th.



Maj. Gen. Arnold, Evans Trophy, and donor, Edward Evans.



Canadian Kite. The McGill University's Kirby Kite came down from Toronto to participate in contest.



Fancy Flier. Lawrence Institute of Technology's high-performance Yankee Doodle did aerobatics well.



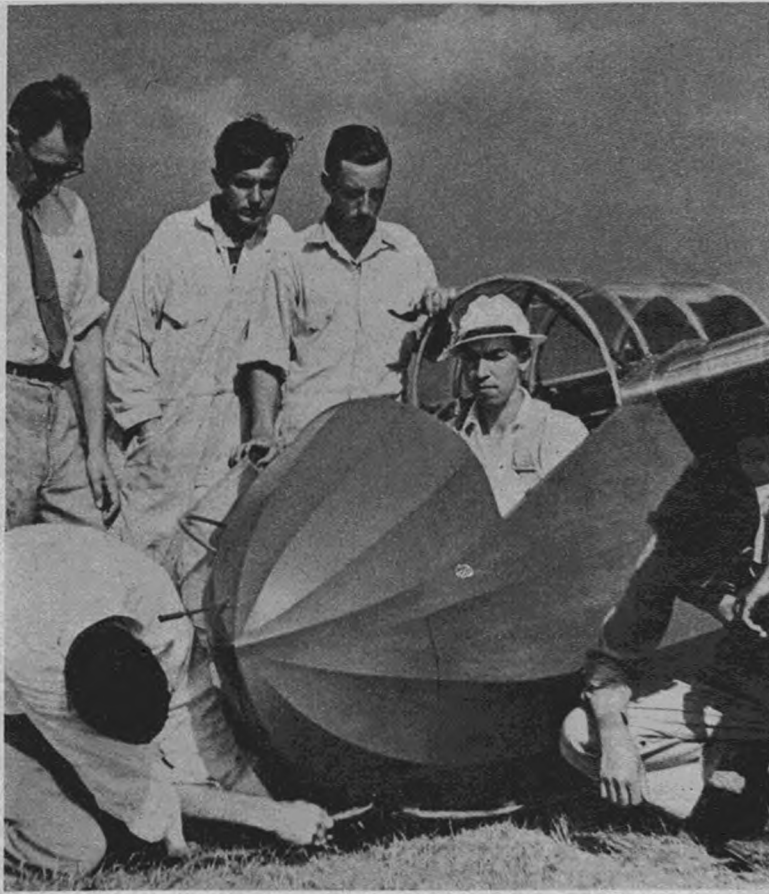
Polish participant. The Orlik sailplane drew plenty of attention from both pilots and spectators.

Frank Schellhorn of the Airhoppers about to give his famous blue toque a spin in the sleek blue Kirby Kite.

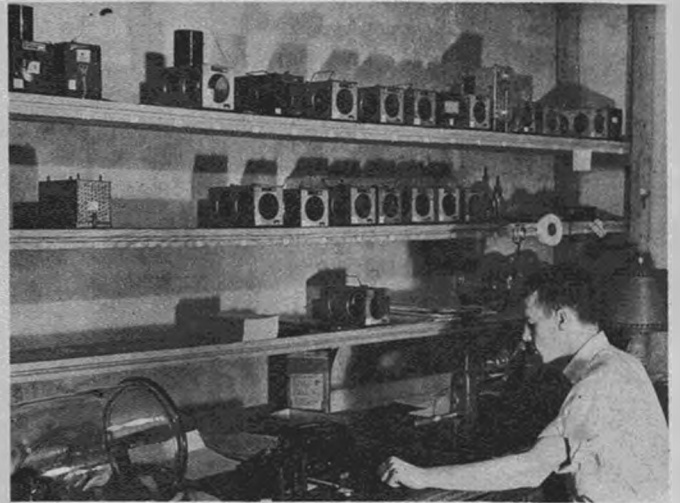
Mr. and Mrs. co-operate. Walter White in cockpit of the Aero I. T. I. is assisted by his wife as crew chief.

The army IS interested. First army sailplane to be purchased for training is Schweizer two-place.





Stanley Smith, winner of the Air Trails Jardur Aviation Chronograph award.



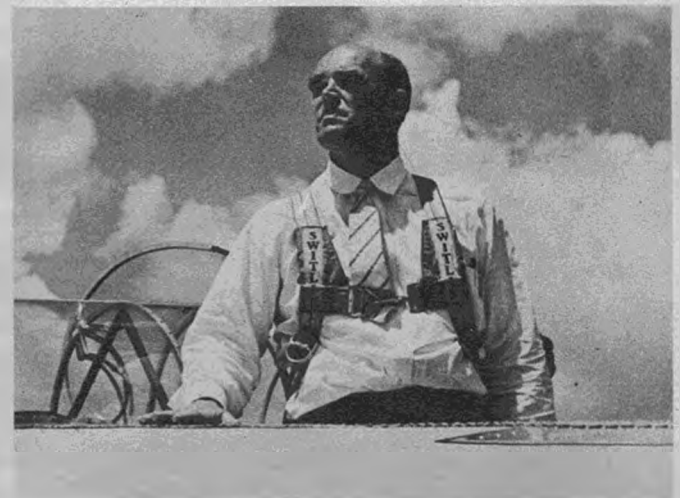
Constant checking of barographs assured pilots of accurate flight recordings



Frederic Dent, Jr., air corps major, heads the army training group.

This year the crowds on Harris Hill saw for the first time a military sailplane, forerunner of a number of similar craft now on order by the air corps, and were aware of the presence of a large number of representatives of the military services, all there in the official capacity of observers. Army men included Maj. Gen. H. H. Arnold; Maj. W. S. Lee, representing Maj. Gen. Geo. H. Brett, chief of the army air corps; Maj. J. Beebe, aide to Gen. Arnold; Col. N. N. Grant, surgeon of the army air corps; Lieut. John Watkins, and Maj. Thomas Phillips, veteran soaring pilot. The navy was represented by Lieut. Com. Donald F. Smith and Commander Albert Rice of the Naval Reserve Base, Floyd Bennett Field, and Ensign Robert Buell. Observer for the marine corps was Lieut. Mallory. All these officers were given rides by either Major Dent, flying the army glider, or by Parker Leonard in the Elmira Area Soaring Corp. two-place Schweizer.

C. A. A. guests and observers included Gen. Donald H. Connolly, administrator of civil aeronautics, Washington, D. C.; Earl R. Southee, chief of standards division, Civil Pilots Training Program; Milton Girton, Nelson Shapter and Robert Auburn of the C. A. A. Wan- (Turn to page 32)



New prexy of Soaring Society of America is veteran pilot Parker Leonard.

The Screaming Wiener won Aviation magazine award for the best new design at the contest.

Staten Island ferry. Dick Johnson, 18, flew this Schweizer 182 miles to Staten Island with a passenger.

Another newcomer. The Univ. of Notre Dame's glider performed well. Note corrugated ailerons, rudder.



That's a SILLY RULE

BY PRIVATE
PILOT



"A lot of the C.A.A. requirements for a private license are pure boloney and I can prove it!"

FOR several years pilots have encountered more and more restrictions in private flying. Airports have five-dollar landing fees, tower operators think they own the air, and the least offside movement is a penitentiary offense. With the advent of war there is a possibility of private flying being done away with altogether, but after the war it will be back bigger and better than ever.

At that time there will be a huge aviation industry, a few hundred thousand pilots and a dire need for sensible, adequate legislation. Before this event occurs it might be well to point out a few facts that do not seem worth retaining when that time comes. A lot of the present CAA requirements for a private license are pure boloney, and I can prove it!

To begin with, private flying must be encouraged by sound rules. There is the case of Pilot A, a man of sixty who purchased a light plane in order to commute from Boston to New York. After buying the plane he found that there were no instructors available because they were all busy teaching CPTP students to fly—at the government's expense. At that time, a set of dual controls could not be left in his plane unless they were demonstrating the plane, and it began to appear as though he would never learn to fly.

After he soloed, the CAA changed the rules to the effect that solo pilots could not go more than fifty miles from their airport. Accordingly he took the necessary steps to secure a license; he logged the hours, obtained more flight instruction in order to pass the flight test and tried to study the regulations. On the day scheduled by the CAA inspector he appeared, took the written examination, and failed it.

One of the reasons for his failure was the fact that many questions on the examination were irrelevant. The exam consisted of a hundred questions, half on regulations and half on navigation and meteorology, some of which didn't seem to even remotely concern a private pilot. For example, one question read as follows: "Which of the following instruments is used to find altitude: (1) barometer; (2) barograph; (3) tachometer; (4) anemometer; (5) hygrometer?"

The answer, obviously, is "altimeter," but it was not possible to select that word. In order to have known the answer it would have been necessary to be fairly familiar with at least four of the instruments listed, not one of which is necessary for a private pilot's flying, especially the type of flying that most pilots indulge in—short cross-country hops.

The average private pilot does not know these things and

does not need to know them. The standard of flying may be higher if he does, but then again it may not. If it is the development of private flying that is desired, the average citizen should be encouraged to fly, and such irrelevant questions be deleted from the examination.

The first of the exam—on regulations—also stressed many questions such as "Can a pilot having a Class 2S rating fly a Class 4M plane?" This question seems a bit far-fetched because no private pilot is going to fly a DC-3, and if the examiners want to know if the applicant is aware that he can fly any ship solo, but can carry passengers in only such weights as he is rated in, they should devise the questions accordingly.

The second half of the examination—on meteorology and navigation—is partly essential and partly nonessential. It is well to know some weather, some clouds, and how to read a teletype weather sequence—especially if cross-country work is the type of flying one has in mind. But some of the navigation is hard and of no practical value because it simply cannot be used by the average flier.

As the average pilot will testify, cross-country work is done with an automobile map. The pilot draws a line from his airport to the next one, and gets a good idea of the angle. The mileage is measured off, and the time of arrival computed; he knows that his plane will stay aloft only so long, and tries to reach an airport within that time. The wind is not too essential, because it is not very effective under 15 m. p. h., and in anything stronger than 25 m. p. h. he will not venture to take a Class 1 plane, and probably not a heavier ship. So the wind will make only a slight difference in his calculations.

It is true that a 15 m. p. h. wind would put him fifteen miles off his course at the end of an hour—that is, fifteen miles right, left, short or beyond the estimated point. But because a Class 1 plane flies so slowly it is possible to keep track of roads and towns at all times and make adjustments accordingly. By watching the section lines and flying with them any dub can get from one airport to another.

Of course it is nice to know the compass and to feel competent to use it. But not one pilot in fifty can do that and do it well. Those who think they can may try this problem: Pretend the ceiling is lowering, night coming on, rain is falling, and the gas is running low. Seated in the cockpit of a cabin job you wonder what course you are flying true. The compass reads 137°, the deviation is 5°W and the variation for the locality is 17°E. What is the true course? Time yourself, trying to remember that you have to fly, keep cool, and figure it all out correctly. If it takes fifteen seconds you're a whiz—the average time will be more like a minute or even two minutes. And the correct answer can be found at the end of this article.

The lesson is that navigation on paper and navigation as done by the private pilot are two very different things. The average pilot cannot fly his plane, watch his map, and maintain a compass course within 20°. It is all he can do to keep it within 15°—and if this is the case any precomputation of course is useless. At the end of fifteen minutes most pilots have to correct their course 25° in order to pass over their check point, and from then on it's hit or miss.

Perhaps the worst point of the whole mess is that fact that an average pilot cannot understand the regulations even if he has a copy in his hands. If this is doubted, pick up a page or two, especially Chapter 60, and start in. The easier an idea can be stated, the harder it is made to read. Some statements are set forth in sentences having four "ands," a "wherefore," a "whereas," and a couple of "provideds." A perfectly enraging feature is the reference, whereby the qualifications are given in paragraph 60.000, and from then on to the end of the chapter any additional qualifications will read "as provided in Paragraph 60.003," and after turning to 60.003 it will refer the reader to 60.002, which will infer that the meaning is in 60.001, but by that time the doctors arrive with a strait jacket—because the light suddenly dawns it was in 60.000 all the time.

A final bit of maladjustment is the flight test. This constitutes the last part of the examination, and is given following the written test if the inspector prefers. Interest in aviation is not encouraged by the knowledge that in order (*Turn to page 29*)



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You Can't Miss It

(Continued from page 19)

following the railroad tracks. The latter plan led them astray frequently when they took the wrong fork at the switch. None of the other systems is either safe or sure.

One young lieutenant, stationed at the army air corps' post at Selfridge Field, Michigan, learned his map lesson the hard way. Taking off from his base without a map in the cockpit, he went up for a scrappy dog-fight with another young officer. Becoming separated from his companion, he flew around aimlessly, enjoying the stunting and upside-down scenery. This was all familiar country—or so he thought.

But when his gasoline supply became skittishly low and the army field didn't appear, he settled the P-8 in a cornfield. "Which way is Detroit from here?" he inquired, a little sheepishly, of the farmer who walked across the field to the "rescue."

"Right off that way, son," the man replied, nodding south. "About eighty miles."

The lieutenant went into a mental spin. "Eighty miles! Say, what part of Michigan is this?"

The farmer smiled. Then he said, "Canada."

The navy has a story to match that one, dealing with the cocky fellow who, starting off from Kansas City for St. Louis sans chart, was turned around just 180 degrees. When, after fifteen minutes, he looked down and saw the Missouri River flowing west instead of in the right direction, he had to do an about-face!

True sectional air navigation charts omit many details which appear on regulation topographic maps, adding often exaggerated items of greater importance to the flier.

Purpose of the sectional chart is "to aid the pilot in following his course by reference to visible objects; to enable him to re-orient himself after a period of flying by dead reckoning; to serve as a guide when flying by radio navigation; and to furnish a plotting sheet for scaling courses and distances and plotting bearings."

Since the visible element is the important one in contact flying, perusal of an air navigation chart shows such identifying markings as "church spire," "highway intersection," "observation tower," "railroad bridge," "racetrack," "reservoir," "military post," "dam," "oil derricks," "coke ovens," "mill," "penitentiary." The maps record both natural and man-made topography.

The chart also contains specific data: times of weather broadcasts in particular regions; danger sections, as for example the "local magnetic attraction" near Colorado Springs due to ore deposits in Pike's Peak; power and frequency of radio ranges; location of radio beacons; and complete aeronautical data furnished by the Civil Aeronautics Administration—accurate locations of airports, auxiliary landing fields, beacon lights, civil airways, and other aids or obstructions to air navigation.

The survey lithographs its charts

in colors—sometimes seventeen to one map—since quick, easy reading is essential if the maps are to be valuable to the pilot who, especially in an open cockpit, does his map following under difficult circumstances. Often he has to compete with darkness, rain or wind, as witness the army pilot who confesses to that old story of the delayed landing because of "wind in the wrong direction." In an open-cockpit plane, on a cross-country, the wind whipped the map out of his hands, ripping it along a jagged course—which route he had to fly, over the strange terrain, using an unnecessary amount of time, fuel and nervous energy!

There are eighty-seven sectional charts, already issued, needed to cover the States (at a scale of 1:500,000—approximately eight miles to the inch). Mounted like a jig-saw puzzle, they map the complete country. On January 1, 1941, they included 30,488 miles of lighted airways, almost 2,500 airports, 3,014 intermediate landing fields, and 2,261 light beacons.

America's maps are conceded by many to be the best. Lieut. G. B. Manly, of the army air service reserve, writes in "Aviation from the Ground Up": "The C. A. A maps are Lambert Conformal projections. They are so accurate that a course from coast to coast—2,450 miles—may be laid out and not be more than a mile off. . . . These charts . . . are so clearly printed and well organized that the fledgling flier can follow them perfectly with very little practice." Lieut. Manly says he "recently purchased maps all over Europe and bought many different kinds of maps covering most of the area of the world but found none to compare with our own."

At least in one point they have no superiors: to no other series of charts published in this or any other country is the comprehensive field check, used on the sectional charts, accorded. A trained observer, traversing the charted area by air, compares actual terrain features with those represented on his proof copy, deleting unessential landmarks, emphasizing prominent ones, substituting new for old data.

Because of changing man-made topography, such checks are made periodically, so that charts are as up-to-date as is humanly possible. An average flight check requires from fifty to eighty hours in the air, and some fifty thousand square miles are inspected.

Next in importance are the regional charts (at a scale of 1:1,000,000), for use in radio navigation. They were made necessary by higher speed planes with greater range and altitude capabilities and by instrument flying. Since much terrain detail is omitted here, a smaller number of charts is necessary for a single flight, according to Mr. Casper Durgin, hydrographic and geodetic engineer of the survey. They are most suitable for plotting lines of position; seventeen are available now.

Two other type charts are pub-

lished by the survey: the aeronautical charts for radio direction finding at a scale of 1:2,000,000, in series of six, covering the States, for determining course, distance, magnetic variation, location of fields, air-navigation aids, dangers, elevations, and location of plane during flight; and the aeronautical planning charts, at a scale of 1:5,000,000, for planning routes between distant points. (This last named is a chart showing main cities and airports, with contours and gradient tints of elevation and an index of the sectional charts for use in determining necessary maps for any particular flight.)

The subject of aviation maps, however, is bigger than just a consideration of the best flying maps. It encompasses weather maps as well. Weather changes are the only real "signposts of the sky," hence the value of the shifting picture of weather in the clouds. By authority of the Air Commerce Act of 1926, and the Civil Aeronautics Act of 1938, the weather bureau has the responsibility of furnishing meteorological service for aviation "to promote the safety and efficiency of air navigation in the United States and above the high seas."

There are about 550 stations along the civil airways in the States, Alaska and Hawaii, and over 250 stations off the airways, for reporting weather. At approximately 150 airway terminals, qualified meteorologists are on duty twenty-four hours a day. In constant communication by radio and telegraph, their reports are sent out by the Washington, D. C., center, almost up to the minute. These meteorological divisions turn out complete maps every few hours for the guidance of aviators, with the barometric readings, wind velocities, temperatures, and movements of pressure areas at different locations across the United States, clearly marked.

These maps are especially valuable to the long cross-country flier. He can, with little effort, make use of helpful winds and conditions, miss streaks of bad flying weather.

An air-line captain, as he makes the flight plan before the take-off, checks the weather maps with his copilot, allowing for wind deviations, tailwinds, et cetera, learning ahead of time whether he can expect lowering ceilings at Kansas City, rain at Wichita, and whether he must fly at 5,000 or 7,000 feet between Albuquerque and Amarillo.

The map field is still inadequately covered, none the less. Needs of the moment are charts of metropolitan areas such as New York and San Francisco. (At a scale of 1:250,000, including area within 50 miles). Mr. Durgin visions another map dream for the future: charts of principal airports corresponding to marine navigational harbor charts. (At a scale of 1:125,000, including area within eight or ten miles of the airport.) Such charts would be of untold value either to a pilot not familiar with the landing field or a

(Turn to page 28)

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You Can't Miss It

(Continued from page 26)

pilot made unfamiliar by bad weather or lowered visibility.

The automatic direction finder of radio, the terrain clearance indicator, ultra-high-frequency beacons, instrument-landing systems, and frequency-modulation equipment all are new trails to be blazed by the map makers.

Yet in a country not yet half mapped and with 3,000,000 square miles within its bounds, the completeness and accuracy of aeronautical maps available to the pilot today is surprising.

Erwin Raisz ("General Cartogra-

phy") points out a new use for maps in the aviation world: for passenger convenience and enjoyment. Long ago, railroads and bus companies realized the added interest a map gives, taking their cue from the avid highway map readers. Soon they issued booklets on "Spots of Interest Along Your Way." Air lines, according to Mr. Raisz, are even more aware of the interest-stimulating, educational opportunities of travel, for which planes offer exceptional facilities. Patterns of geology, vegetation and types of farming show up well from the air.

Blimps On Guard

(Continued from page 15)

ters culminating at Lakehurst in 1937 has completely washed out all lighter-than-air progress. With respect to hydrogen-filled rigid dirigibles of the Zeppelin type it is no doubt true. But blimps are something else again, especially when they are filled with noninflammable helium.

The navy does not discourage easily, and there has always been a small but fervent group of officers loyal to lighter-than-air. With certain lessons learned from the failures of the big rigid types, they set to work to develop the blimps, in which the shape of the bag is maintained by the internal pressure of the gas rather than by structural framework. And their work has produced results.

The first big step was the use of helium as the lifting force, thus eliminating the fire hazard. Envelopes were improved, gondolas were enclosed and streamlined, air-cooled motors replaced the old heavier water-cooled types, thus vastly increasing the useful-load capacity. A retractable taxi wheel was added to simplify take-offs and landings, and the use of the mooring mast was perfected, thus simplifying docking and undocking and making it unnecessary to berth the blimp in its hangar after every flight.

The blimp has certainly grown up. The K-2, now in service, is of 400,000 cubic feet volume; the next four of the K series, now under construction, will be closer to 416,000. They carry complete radio equipment, navigating gear, a crew of seven or eight men with an electrically operated galley that never misses a meal, and a comfortably furnished cabin that can be heated in winter from the exhaust manifolds. In addition to regular equipment and fuel, their load capacity is ample to take on machine guns and ammunition and still leave room for a number of depth bombs that can be aimed with deadly accuracy from a ship capable of regulating its speed to any desired figure from zero up to its maximum of seventy-five miles an hour.

But let's finish our routine patrol. All day long we cruised off the Atlantic coast, occasionally at full speed, but generally loafing along to save fuel and to get a good look at what was below us. Every craft sighted meant an entry in our log,

with positive identification, and we sighted plenty, as we covered more than five hundred miles.

Toward evening we approached the coast through clouds that now had dropped to form a solid layer of mist and drizzling rain. Visibility had fallen to barely a hundred yards, and it was getting dark. Were we worried? Not a bit. Several auxiliary mooring sites were available. Any of these could easily be reached via our radio check system. And at Lakehurst was our hangar.

The blimp's flexibility is ideal for the job of patrolling our well-nigh endless coast lines. Slow speed is a tremendous advantage when it comes to spotting mines, U-boat periscopes, and oil smears which would be difficult to see from a swift-moving plane carrying only one or two observers. At lower speeds the blimp's time in the air can be stretched to forty or fifty hours, and it can hover indefinitely over one spot if necessary.

Even in the World War the records show that the blimps did a real job. They spotted forty-nine submarines and 134 mines in the course of over nine thousand patrols, and can boast that no convoy was ever molested by a submarine while being escorted by a blimp. Those U-boat commanders had a healthy respect for blimps, and they still have.

Why, then, you may ask, aren't the British using them today? For one reason, helium is strictly a U. S. monopoly which no other country in the world has had a chance to experiment with. If they asked us, I suppose we might give, under the provisions of the lend-lease act. But they aren't asking right now, for the second reason, which is that the blimp, for all its virtues, is vulnerable to attack from a hostile airplane. The British have no use for blimps as long as their coastal waters are habitually infested with Heinkels and Messerschmitts.

Our defense problem here, however, is slightly different, and can be expected to remain so. It is conceivable that in case of war enemy planes might approach our shores, but it is almost inconceivable that such planes would be any except the heaviest type of long-range bombers with a mission to carry out and no wish to waste time chasing fugitive blimps around the sky. Pursuit or

Yes, the chart maker's art has always been a hard and busy one. Because aviation has grown so rapidly itself, it has been difficult for the map maker to stay a jump ahead. But since the first international conference of aeronautical charts was held in 1911 at Brussels, he has been working—sketching, designing, drawing, pantographing, lithographing, printing, studying colors and numbers and distances. And now, in a day when flight-checked maps are commonplace necessities to every air-minded person, he must even have wings himself!

attack planes are the ones the blimp must fear, and they have not the range to approach us except from the decks of a carrier. Even assuming such a contingency, the cloud might have a silver lining. One incendiary bullet can destroy a hydrogen-filled dirigible in an instant, but a bag full of helium is a tougher proposition. The blimp might be crippled, forced down to the surface; the crew driven into their rubber lifeboat. But from the first moment its radio would have been warning of the attack, and the loss of one blimp would be a small price to pay for the warning of the presence of those hostile aircraft.

At least that's the way the lighter-than-air officers feel about it. They think that blimps have a specialized but very important role to fill in the protection of our coasts. The proof of this attitude is that the Lakehurst station is being enlarged, other bases are planned for Boston, Norfolk, and San Francisco, and a total of forty-eight nonrigid airships was authorized for eventual construction to complete the L. T. A. nonrigid airship program.

"What the devil are those fellows doing?"

At some distance, the visibility now being improved, I saw another blimp, close down on the water over one of our destroyers, which was lying at anchor. As we passed that way I heard some shouting going on, then a rope was dropped from the gondola. After a minute it came up again with a small object dangling. My first officer gave a snort.

"Looks like a pot of coffee!" he commented sarcastically.

"Coffee?" I exclaimed. Then I understood. That was the G-1, one of the smallest and oldest of the training blimps in the navy service. We feel very, very sorry for the poor lads on the G-1, and often tell them so. Theirs is one of the few ships not equipped with an electric galley. When they want a hot cup of coffee they have to ask a destroyer for it!

But who knows, perhaps our gentle scorn is misplaced. It may turn out that in the aforementioned contingency it will be the G-1 that sights the enemy first, broadcasts the all-important warning. In that case I'll be wishing I had been assigned to the G-1!

That's A Silly Rule!

(Continued from page 24)

to gain a cross-country permit (or a private pilot's certificate) one must spin a plane to the right and left.

Take for example the case of an elderly woman who commenced to fly and who found that flying was the one thing she wanted to do. During the time when solo students were permitted to fly unlimited cross-country flights, she took her plane from the North to the South several times, being in Miami for the air races and having a good time going from airport to airport where the boys were astounded to see a sixty-one-year-old grandmother step out of her airplane.

Then the rules changed. In order to continue her flying—and all she wanted to do was fly across country (because stunts, practicing eights, or becoming a commercial flier never entered her mind)—she found she must have a private pilot's license. Being vigorous and determined, she set out to get the thing.

The written examination was passed by careful boning. The regulations were learned verbatim, and meteorology was easy. Navigation didn't mean much except on paper, but even that was hurdled. But then came the flight test. The first thing required was spins: a spin to the right not less than one turn, and a spin to the left the same way.

The elderly woman detested spins and hated to do them. Nevertheless she went up, spun her plane to the right and let it go three turns before recovering. The left spin was a spiral and so didn't count, and the inspector failed her in the flight test. That meant she had to purchase a few hours of dual instruction before coming back for a flight test.

But back she came, this time letter perfect in spins. However, the inspector asked for steep turns, which according to the CAA must be 70° banks, although it can be proved very easily by any dub that a light plane lacks the horsepower to do a 70° bank. Besides, a turn that steep exerts a load factor of 3G's on both plane and pilot, which is dangerous

in bumpy air and is too much to put on the veins of a person over sixty.

That meant little or nothing to the inspector. He asked for the turns, although the lady protested she never banked that steeply and probably never would. And because she lost over 200 feet in two complete revolutions, he "busted" her on the check.

The maneuver she could really perform—and the only maneuver that came anywhere close to being a test of her ability to fly across country (and, after all, cross-country work was the part she *should* have been tested on, and which is not tested at all by the CAA!) was the spot landing test. In this she was letter perfect, being able to set the plane down within the 300-foot square with ease. She had had half a dozen forced landings and never bent an axle, which was a record of some kind. She had a good sense of speed and altitude, which is the main thing in spot landings; the part she thought was hokey was the fact that one must fly *over* the spot, then cut downwind at a 45° angle and absolutely turn one's back on the spot. This is contrary to all good sense and smart forced-landing procedure—but that is what the inspector wanted and that is what he got. But it took three flight tests to get the private license.

These are just a part of the conditions that should be modified before private flying gets going again if the war puts a stop to it. Private flying is in for a good-sized boom, with the CPT's 100,000 government-trained pilots, the army and navy hordes, and the other poor dubs who are buying their own time when and if the operators will sell it to them, and providing there is a rerated instructor who will teach the maneuvers, senseless though they may seem. At that time there will be a need for good, sensible regulation and stern enforcement of rules. But let's have rules that make some sense and regulations that will encourage John Q. Public to buy a plane—and keep it.

Correct answer to problem: 149° true.

Secret Agents Of The Air Corps

(Continued from page 16)

when he did, his eyes were far away. "To date," he said slowly, "our casualties have been few. There were some as a result of an automobile accident and one, as I remember, from a fall. The pilot fell down a flight of stairs."

Let it be cleared up once and for all: There are no international situations created by the men selected to serve in G-2! Each operative has been chosen because of his ability to perform a certain task or mission. Pilots who observe abroad do not tell what they have seen, nor do they divulge for whom they are working. (In fact, no one knows just who is an agent of G-2—but more of that in a moment.) Only after returning to this country are the reports made, and then they are made in person to Colonel Candee of G-2.

If it is not yet clear what G-2 is, examine this statement by an officer in the public relations division of G-2, who attempted to clear up any doubt on that subject. He said, "This organization has one main purpose: to obtain, evaluate, and disseminate information. To this end we obtain the right kind of men and send them to various places. We are responsible for getting the information, then seeing that it is used in the manner which will achieve the results we want."

"In other words," he was asked, "if the information is not wanted in the newspapers, it doesn't get there?"

The speaker merely smiled a G-2 smile. "Perhaps," he said.

"Isn't that censorship?"

"Certainly not. We merely refuse to divulge information that is re-

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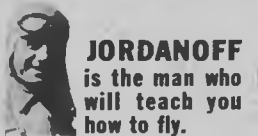
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garded as essential to national welfare. We are organized to protect the country by getting information. G-2 of the army air corps is responsible for the following functions:

"1. The performance of the functions of the second section of the general staff—intelligence of the enemy.

"2. Public relations—maintaining morale by the release of pertinent information and the withholding of other information.

"3. Evaluation of war information—a very important task.

"4. Maintaining a liaison with Intelligence divisions of the general staff.

"5. Maintaining the same contact with naval Intelligence.

"6. Providing news letters and information to the general public.

"7. Other assignments. This covers a multitude of things, better left undiscussed.

"You can see yourself that it is a broad field, requiring a huge staff. We have operatives everywhere—"

"As foreign spies?"

The officer paused irritably. "We don't talk about that," he said.

Perhaps that is why G-2 men declare that there is no glamour connected with their work. They have a job to do—a thankless job, with no recognition for a task well done. Major X said, "Write about the public-relations angle—steer clear of the spy stuff, the Mata Hari feature." There is nothing romantic about G-2. So secret must be the assignment of an officer to a mission that his family never knows what he is doing. Men who must tell their wives about everything they do, or who must brag about themselves, seldom are selected for work or for a mission in the Intelligence service. If they happen to be assigned to a task, it may be to serve as a pawn to throw the enemy off guard—a disseminator of misinformation.

One reason why Major X disclaimed a romantic background in G-2 is that each man must hide his light under the proverbial bushel. Each man must curb or disguise that desire within every human's breast to pose as a big shot, a secret agent. Obviously, if everyone knows that Captain Smith is a secret agent, he immediately becomes an agent—but not a secret one! The most crowning success in intrigue and spying is never revealed; it is like running interference for the quarterback, doing all the work and getting none of the glory.

The agents of G-2 abroad are there to perform delicate missions. G-2 must find out how many planes, how many pilots, and what kind of performance the enemy is capable of. They must know the limits and quality of the fuel, the possibility of winning this war on the lack of lubricants and high-octane fuels. We must know the pace and quality of pilot training. Such information can be obtained only by having excellent men placed in key positions abroad, where there is danger every moment—and where there is, as a consequence, romance and glamour never described in the best thriller ever written.

The pilots of G-2, testing the P-40s in England and flying the British planes in combat are examples of heroism without reward. In May there were almost six hundred P-40s in Britain, but only a couple dozen were in use. It was the duty of our pilots to test and use those planes, attempting to find out what points were shortcomings and to get that essential information back home. Such items as speed, armament, armor and maneuverability must be evaluated in order to make American planes superior to those abroad.

That these men make the supreme sacrifice goes without saying. As this is written, a news item one inch long appears in a local newspaper: "Lt. B. . . . killed in the crash of an RAF plane in England." How the papers received this information no one knows; it is evidently a slip on the part of G-2 in letting it out, as ordinarily such an incident would have been attributed to an automobile accident or a bad fall.

In such a colossal organization there are bound to be slips, but they are the exception, not the rule. Officers who talk are quickly detected, especially those who talk under the influence of liquor. "We want men who talk freely when they are drunk," Major X declared. And then added, "About many subjects—none of them being aviation!" Men are chosen only after careful scrutiny and study of the man himself and his record. The selection of an officer for a confidential mission is made only after deliberation and study. He must be able to hold his liquor—in fact, he must be able to talk when he drinks, and talk well. If he can disseminate incorrect information, so much the better.

Of course, for purposes of increasing morale and building up the public-relations angle, only accurate information is given out. But it is the right kind of information, and to this end G-2 wants its officers to inspire enthusiastic articles, to give talks, and to remain forever in the background, getting information, evaluating it, and keeping their mouths shut.

How secretive G-2 is and how quiet its operatives are is illustrated in the following story that Major X related to the inquiring reporter. It seems that a Captain Z was detailed to a squadron for duty, and also to observe for G-2. It was essential that certain information on planes and performance be obtained and sent directly to the Intelligence division instead of being relayed via an intermediary.

Accordingly, Captain Z took his place in the squadron. No one knew or suspected his connection with G-2, not even the commanding officer. Flights were made when enemy planes appeared, and finally a considerable amount of data was obtained. At that time a certain colonel arrived who was also connected with G-2, and who ordered the captain to turn over his data.

Captain Z excused himself from duty and was gone ten days, being with the colonel the meanwhile. At the end of that time, his secret work with G-2 having been concluded, Captain Z returned to his squadron

to find a highly incensed commanding officer.

The C. O. called the captain in to account for his being A. W. O. L.

"What's the idea of A. W. O. L.?" he wanted to know.

The captain apologized. "I'm sorry, sir, but I cannot answer that question. I shall have to take the liberty of referring you to Colonel—"

The commanding officer made a sarcastically disparaging remark about his friend, the colonel, and sent Captain Z to his quarters. Thereafter he regarded Captain Z with deep suspicion, wrote up the incident in the captain's fitness report, and years later had not forgotten the matter. To this day he believes that Captain Z was "snooping," for the purpose of making a report on the capabilities of the C. O. (Needless to say, the colonel caught the fitness

reports and made the proper notations of Captain Z's connections with G-2 thereon.)

According to the public-relations officer in the office of the air corps' G-2, the unit is doing an excellent job and will continue to improve. Already our pilots are learning from observations abroad what one man can and cannot do in modern combat. The marvelous new electric sight is replacing the cumbersome and impossible telescope sight used so long by the navy. The value of maneuverability, higher horsepower, air-versus-liquid cooling, and heavy pilot armor, is pointed out in those secret reports to G-2 of the air corps.

And if you want a job as an undercover agent of G-2, Major X's words hold the key to it all: "Find out all there is to know—and say nothing about it to anyone!"

I Get My Private

(Continued from page 20)

man's hat off flying over Sing Sing, that is guaranteed to keep you awake. Easy stuff like advection fogs, temperature inversions and warm fronts, are taught only after a half hour of practice on spins.

In the meantime, those first thirty minutes were growing. Bill was going through the process of what he likes to call "dishing it out—can you take it?" Dishing it out easylike for that first solo. After that he promised to lay it on heavy. (Perhaps he was mindful of Mr. Hugh Copeland, the director of Roosevelt School, known to all and sundry, surreptitiously, as "Cope." Cope is the fellow whose flight examination and John Hancock finally give you the little piece of paper making you a certificated pilot.)

Dual practice continued at the average of an hour and a half a day. The time drew close for my solo. One beautiful afternoon we were practicing landing and take-offs. After one particularly bad landing, Bill in disgust said, "You're terrible!" "What'll I do?" I crooned meekly. "Fly the blankety-blankety thing yourself," said Bill, climbing out. I must have sat there staring at him for five minutes with my jaws agape. Finally he grinned, and I remembered a story he had told me, and I grinned back and shot her the gun with all the confidence in the world.

This story of Bill's is worth repeating. It concerns an instructor who, in checking out a student, insisted on landing after landing. Each landing was perfect. Yet the instructor would insist on another try. Finally, the student's judgment failed. He came down wheels first and bounced high in the air. After this landing, the instructor left the student, confident he was ready to solo! Upon being questioned, the instructor explained his actions in the matter. He had not known if each perfect landing was a matter of luck or good judgment on the student's part. Even if it were the latter, that judgment might fail, as it actually did. The instructor wanted that failure to occur while he was with the student. Then, if the student's

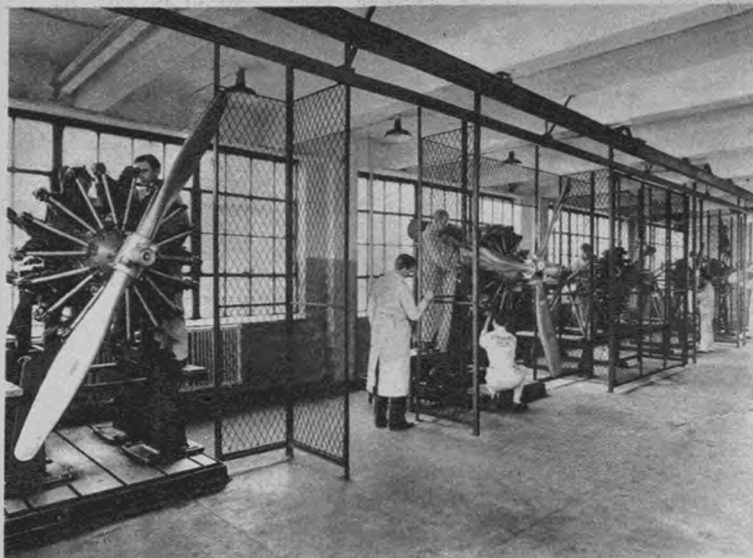
recovery was good, the instructor would be certain of his ability.

My recovery from that particularly bad landing had been excellent!

That first solo was a thrill. But so is every solo. It is not all play. The austere features of Mr. Copeland loom before one's eyes as soon as there is a tendency to play instead of practice. The school curriculum is designed in such a way that when it is followed, it has two distinct advantages. Each maneuver, practiced and perfected, leads to the following maneuver. Also, if a definite formula is followed, time and therefore money are saved.

Come with me on a typical half hour of practice. Climb in and good old Ron, our starter and timekeeper, will give us a twist. Off and closed, Ron. Contact! The Kinner purs. Ron turns around and we taxi to the downwind end of the field, take a good look around, and we're off. We make our boundary turns and climb to two thousand feet over an open field. Here we make 720° power turns at a 70° bank in each direction. Feel that bump—that was our slipstream we hit. Boy, I'm hot today, for a change. Next from 2,100 feet we spiral twice and make a 360° approach to a simulated forced landing. (I hear that's one Cope loves to catch you on.) Don't forget to clear the engine after each turn. Now that we are downstairs, we practice 8's on and 8's around pylons. We've got five minutes to get back. We'll practice co-ordination along the way and end up with a 180° approach spot landing. Here we are. Ron timed us thirty minutes on the nose.

The day of doom arrived. I finally had my thirty-five hours of solo and Hugh Copeland was to give me my flight examination one afternoon. Bill had checked me that morning and he said I was ready. I'd taken my written exam and passed. There was no escape. The sweet and benevolent features of Cope were twisted by my imagination into an ogre resembling all three Fates. My knees beat a tattoo. I argued with Bill that



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I was not ready. Bill got mad for the first time. "Listen," he said, "when you lose confidence in me we are through. Either you take that test or we'll never fly together again. I say you're ready."

You say, unbelieving reader, that you know an exam is bad, but you think it can't be that bad. Pause a moment and reflect. Suppose—and this is a natural assumption—suppose you should fail. Your pride is debased. Your confidence in your ability as a pilot is ruined. And last, but not least, your pocketbook is squeezed, for you must wait thirty days for a re-examination and spend hours of practice. That pride, however, is the cause of your imagination running riot. You've been bragging at home and abroad of your ability as an ace. Fellow students have listened to stories of your prowess in the air. Failure now? Unthinkable!

Mr. Copeland called and postponed our date until five o'clock. I picked up courage, for cumulus clouds were building up in the north and appeared to be growing into cumulo-nimbus. However, five o'clock arrived, and so did Cope. Furthermore, the weather still appeared to be safe. Here we go!

I get my instructions to go up and do spins right and left and then return to the field and do three 180° approach spot landings. Cope and Bill will stand apart on the ground making an imaginary line representing my spot. The spins are easy, but coming in for my first 180° spot, I notice that the cumulo-nimbus clouds are practically on top of me.

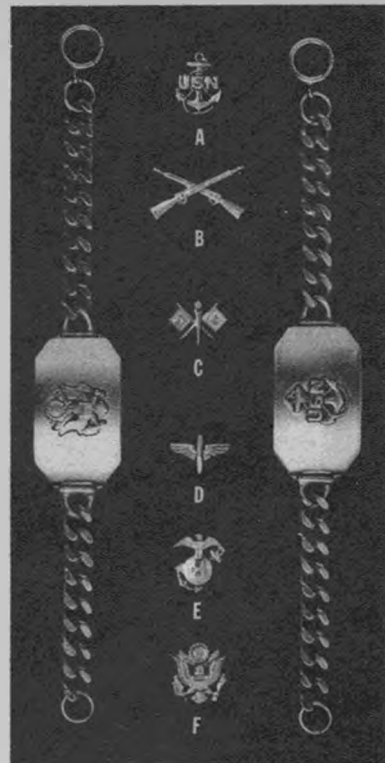
In my hurry to get in, I overshoot, am forced to slip, and practically decapitate Cope. They rush out and grab my wings just as the line squall hits and the wind shifts. Well, I figure, that washes me up. But what did you say, Cope? I showed good judgment in coming in fast?

We wait the squall out and Cope and I go up for the rest of the test in beautiful weather.

Have you ever been in an argument with a woman? Then you know that regardless of how mad you get, she always has the last word. That's a bad situation—but can you imagine not having any word at all? That's exactly what happens when you use the Gosport system. The instructor or examiner with the mouthpiece does all the talking and you must take it. It seems the motor, the wind and even the gods are against you. The one consolation—you can cuss and be washed clean by the slipstream.

Cope tells me to do this and that. I do this right and sing, that wrong and cuss. In the middle of every maneuver Cope cuts the throttle for forced landings. Finally, "O. K., let's go home," says Cope. I can detect neither pleasure nor displeasure in his voice. We taxi to the line and climb out. I take a peek at Cope's face. That guy ought to make a swell poker player.

"How'd he do?" queries Bill. "Got a pen, and where's your log book?" retorts Cope. He writes. I tremble. What is it? No! I did! The traveling salesman made it.



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Elmira Meet

(Continued from page 23)

dering over Harris Hill, we also saw Lester Gardner, executive vice president of the Institute of Aeronautical Sciences; State Senator Chauncey B. Hammond, Col. Edward S. Evans, donor of the Evans National Soaring Championship Trophy; Godfrey L. Cabot; Col. J. Carrol Cone, assistant vice president of Pan American Airways; Bernarr MacFadden and many others.

Some of the highlights of the meet were Decker's flight from Elmira to Wapping, Conn., 225 miles—the first time in the history of the national contest that anyone has landed in New England. Stanley Smith, winner of the Air Trails prize, established a new American goal flight record for two-place sailplanes when he and Passenger Robert Kluge flew 73 miles to Scranton, Pa. Lyle Maxey, of Michigan, flying a Midwest sailplane, rose inside a thunderhead to the highest altitude reached during the meet. His altimeter registered over 18,000 feet, but unfortunately the barograph he carried was calibrated for only 14,000 feet. The juvenile entrants proved that tender years are no handicap in flying. Seventeen-year-old Dick Johnson of California flew 182 miles with passenger in his Schweizer two-place from Elmira to Miller Field, Staten Island, N. Y., and Dallas Wise, Jr., who reached his fifteenth birthday last may, gained two legs on his Sil-

ver "C." (Bad weather did not permit young Dallas to make his last flight of 32 miles in order to emerge a full-fledged Silver "C" pilot.)

A total of thirty gliders and seventy-three pilots were entered in this year's contest. As in previous meets, they came from near and far. Canada was represented by the McGill University Glider Club of Toronto, flying a Kirby Kite sailplane. Clubs and organizations included the Harvard Glider Club, Boston, Mass.; M. I. T. Glider Club, Cambridge, Mass.; University of Michigan Glider Club, Ann Arbor, Mich.; Cornell University Glider Club, Ithaca, N. Y.; University of Notre Dame Glider Club, Indiana; Airhoppers Glider Club, New York City; Aero Club Albatross of New Jersey; Elmira Glider Club, Elmira, N. Y.; Hudson Valley Glider Club, Wurtsboro, N. Y.; Detroit Glider Council; Soaring Society of Southern California, and the Eastern States Soaring Association. The total mileage of official distance flights was 3,218 miles; 788 take-offs were made from Harris Hill, 322 from the airport, of which 90 launchings were by airplane tow.

The contest officials were Jay Buxton, director of operations; Leonard Parker, assistant director; Bernard L. Wiggin, meteorologist; Prof. C. W. Terry, barograph chief; R. E. Franklin, Gustave Scheurer and John No-

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CONTEST FLIGHT LOG

June 28th. Contest opened in the afternoon with usual ceremonies, during which a number of prominent visitors welcomed the contestants and stressed the importance of gliding in connection with national defense. No official flights were made, although a number of pilots took off for short hops.

June 29th. Chester Decker flew his Minimoa sailplane 41 miles to Warren Center, Pa.; John Robinson, in the Zanonia, 38 miles to Windham Center, Pa.; Dick Johnson in the two-place Schweizer, 7 miles to Appalachian, N. Y.; Lyle Maxey in the Midwest, 27 miles to Ulster, Pa.

June 30th. Chester Decker, 49 miles and 3,660 feet altitude to Whitney Point, N. Y.; William Putnam in the Orlik, 38 miles to Newark Valley, N. Y.; John Robinson, 3,820 feet altitude over Harris Hill.

July 1st. John Robinson, 152 miles and 14,260 feet altitude to Cementon, Pa.; Lyle Maxey, 69 miles and 14,400 feet to Lanesboro, Pa.; John Simpson of Canada in a Kirby Kite, 50 miles to Binghamton, N. Y.; Chester Decker, 49 miles and 6,145 feet altitude to Binghamton, N. Y.; Earl Boggs of California in the Screaming Wiener sailplane, 32 miles to Owego, N. Y.; Wm. Putnam, 51 miles to south of Binghamton, N. Y.

July 2nd. This was Earl Southee Day, celebrated in his honor as a mark of esteem for Earl's untiring efforts in behalf of recognition for the American gliding movement. Gen. Donald H. Connolly, administrator of civil aeronautics, State Senator Hammond, and other officials paid tribute to Mr. Southee's faith and vision in the future of motorless flight.

Chester Decker was the star of the day with his flight of 225 miles to Wapping, Conn., near Hartford, his best altitude being 9,110 feet. John Robinson, Lyman Ward in the XYZ Wolf, and William Putnam in the Orlik all landed at the Tri-City Airport near Binghamton, N. Y., 42 miles from Elmira. Dick Johnson flew 21 miles to Waverly, N. Y., reaching 4,520 feet.

July 3rd. Stanley Smith in his Schweizer two-place, 42 miles to Tri-City Airport. William Putnam of Detroit, 50 miles to Genesee, Pa. E. Lain in the Midwest, 21 miles to Rathbone, N. Y.

July 4th. Soaring conditions unfavorable. Short flights were made by Johnson, Decker, Maj. Dent, Robinson, Stanley and Leche. William Putnam put on a stunting exhibition in the Orlik.

July 5th. John Robinson, 170 miles to Troy, N. Y., altitude 7,230 feet; William Putnam, 129 miles to Dolgeville, N. Y., altitude 7,200 feet; Chester Decker, 160 miles to Schenectady, N. Y., altitude 8,140 feet; Stanley Smith, 58 miles to Trout Run, N. Y., altitude 6,450 feet; Dick Johnson, 51 miles to Geneva, N. Y., altitude 5,970 feet; E. Lain, 38 miles to Penn Yan, N. Y., altitude 7,570 feet; Walter White in the Aero I. T. I., 28 miles and 5,420 feet altitude to Perry City, N. Y.; Stanley Corcoran flying his two-place Cinema II reached an altitude of 7,120 feet; Randy Chapman set his goal to Cortland and return, but missed Harris Hill by five miles, landing at Horseheads, N. Y., making a flight of 95 miles. Chapman flew the very fast Lawrence Tech sailplane Yankee Doodle.

July 6th. Poor weather conditions. No official flights made. In the morning a directors' meeting of the Soaring Society of America was held during which the following officers were elected: Parker Leonard, president; Don Hamilton and Jay Euxton, vice presidents; Arthur Schultz, treasurer. The directorate of the S. S. A. consists of all the officers plus Lewin Barringer, Commander Eugene F. McDonald, Helen Montgomery, Chester J. Decker and Dr. W. Klemperer. Robert Stanley and Stan Corcoran were named to the executive committee, and Floyd Sweet, former secretary of the Soaring Society, was elected contest director.

July 7th. No contest flights due to poor weather conditions.

July 8th. John Robinson, 97 miles and 12,150 feet altitude to Leonardsville, N. Y.; Lyman Ward, 53 miles to Chenango Bridge, N. Y.; William Putnam in the Yankee Doodle, 41 miles to Tri-City Airport; Lyle Maxey, 4,400 feet altitude over Harris Hill.

July 9th. Dick Johnson with Passenger Marion White, 122 miles and 5,550 feet altitude to Miller Field, Staten Island, N. Y.; John Robinson, 114 miles and 4,970 feet altitude to south of Suedberg, N. Y.; William Putnam, 79 miles to Montdale Corners, N. Y., altitude 5,700 feet; Lyle Maxey, 79 miles, 5,400 feet altitude to Wilkes-Barre, Pa.; Lyman Ward, 53 miles to Auburn Center, Pa.; Stanley Smith and Passenger R. Kluge, goal flight of 73 miles and 5,020 feet altitude to Scranton, Pa. H. Abrams in ABC sailplane, 43 miles to LeRaysville, Pa.; Walter Lob in M. E. T. Franklin, 41 miles to Rumerfield, Pa.; R. Glider in Harvard Baby Bowls, 34 miles to Rome, Pa.; A. Ames in Harvard's Schweizer Boomerang utility, 29 miles to Ulster, Pa.; Maurice Waters in the Elmira Club's two-

place Schweizer, 21 miles to Waverly, N. Y.; Dallas Wise, Jr., in his Franklin, stayed up for 6 hours 14 minutes, gaining the first leg on his Silver "C."

July 10th. Robinson, 108 miles to Pulaskee, N. Y.; Putnam, 99 miles to Vienna, N. Y.; Stanley Smith, 89 miles and 6,480 feet to Canastota, N. Y.; Alcide Santilli in the Wolf, 30 miles to Ithaca, N. Y.; Dallas Wise, Jr. completed his altitude requirements for Silver "C" with 4,450 feet over American Airline Airport.

July 11th. Only contest flight made by Stanley Smith, who gained 3,280 feet altitude over Harris Hill.

July 12th. No contest flights, due to unfavorable soaring conditions.

July 13th. Robinson, 40 miles to Liberty, Pa.; Stanley Smith took off for Middletown, Pa., missed it by 3 miles, flying a distance of 122 miles. Gen. Arnold, Maj. Lee, Col. Edward S. Evans, Bernarr MacFadden and other notables arrived to participate in the closing ceremony. The contest officially ended at 4 p. m.

BANQUET AND AWARDS

The closing banquet was held at the Mark Twain Hotel. William McGrath of the Eclipse Machine Co. presided as chairman. Principal speakers were Maj. Gen. H. H. Arnold, Bernarr MacFadden, Godfrey L. Cabot, Col. Carrol Cone, Col. Edward S. Evans. Earl R. Southee awarded most of the trophies. Col. Edward S. Evans presented the National Soaring Championship trophy to John Robinson, who became the soaring champion for the second consecutive time. William Putnam of Detroit took second place and Chester Decker of Glen Rock, N. J., third. Decker led the contest until July 7th, but unfortunately was forced out because of his induction under the Selective Service Act. In plain words, the draft got him.

The Warren E. Eaton Memorial Trophy for the most outstanding contribution to the art, sport or science of motorless flight was awarded to Floyd J. Sweet.

Bendix Aviation Corp. distance awards were presented to the following pilots: first, gold trophy and \$500 to Chester Decker; second, silver trophy to Richard Johnson; third, bronze trophy to John Robinson.

Aviation magazine design award for most outstanding American sailplane design at contest to the "Screaming Wiener," designed by the Crown City Glider Club of Pasadena, Calif.

Air Trails magazine flight award, a Jardur Chronograph, to Stanley Smith, engineer of the Bell Aircraft Co., Buffalo, N. Y., for his goal flight with passenger to Scranton, Pa., establishing a new American record.

The Zack Mosley "Smilin' Jack" award, \$25, for landing nearest to Washington, to John Robinson.

The Evans barograph award for greatest altitude made by a Group II pilot, to R. Stevens of the University of Michigan; for greatest distance made by a Group II pilot, to J. Simpson of Canada.

Samuel Willard Silver "C" award: \$25 for the first "C" pilot to complete five hours' duration, to R. Eikembery, Notre Dame; \$15 for the second, Dallas Wise, Jr., Detroit, Mich.

Columbia Rope award: six special coils of rope to utilities making at least one contest flight, to Harvard Glider Club, Notre Dame Glider Club, M. I. T. Glider Club, University of Michigan Glider Club; Dallas Wise, Jr., and L. Edgar.

Switlik Parachute and Equipment award: \$10 for greatest altitude dur-

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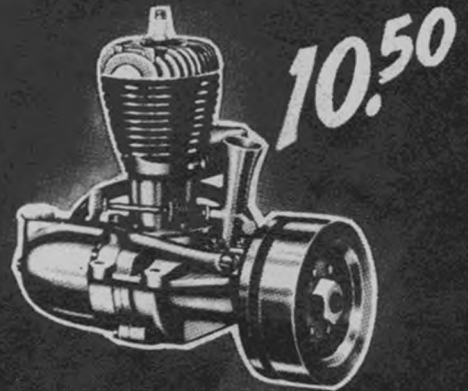


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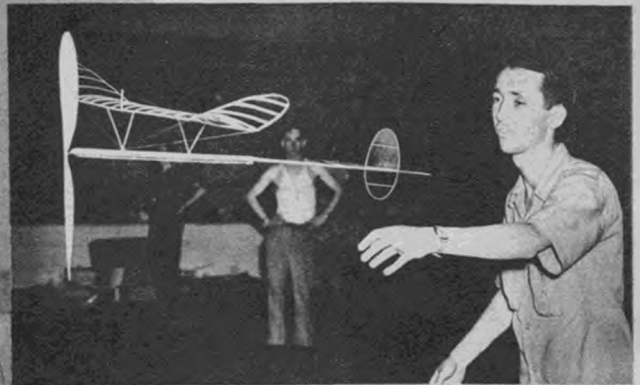
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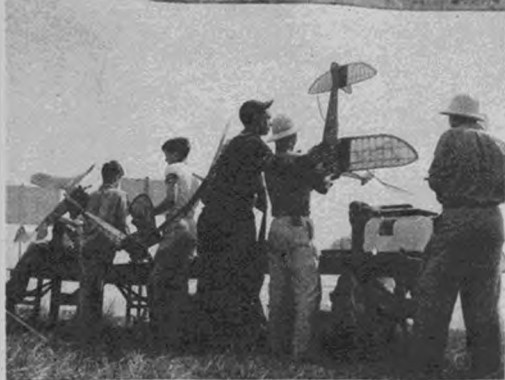
Off to a flying start! Rubber-powered fuselage model jumps off.



Indoor models like this stick were flown in Chicago Amphitheater.

1941 NATIONAL CHAMPIONSHIPS

Is your visit to the Chicago jamboree still a dizzy blur? Cheer up—here's what you saw and heard!



Line forms to the right. Usual queues of sunburned contestants waited at a dozen tables for processing models.

ABOUT 1300 model builders turned up in Chicago the first week in July for the 14th Annual National Model Airplane Contest. Army and navy service and defense work kept many others away. Currency regulation kept practically all the Canadians at home. Several model builders came up from Mexico. One of them took a second in the best-finish event. New Zealand entered several models in the Moffett Trophy event. These were entered originally in the 1940 contest. Prior to the contest this

Henry Cole of Tacoma, Washington, packs in the turns in his streamlined cabin model. Note retracted wheel.

Jim Walker's crew prepares his first-place-winning Get your props here! Army of gas radio-controlled model. One radio model did a loop. contestants were well supplied.





Jerry Brofman, Brooklyn, winner of the Air Trails Trophy in gas.



Henry Struck receiving congratulations from Roscoe Turner on being the National Champ.



Ex-Moffett and Wakefield winner, Jim Cahill, was there as usual. Not a bad model, either.



Watch the birdie! Leon Schulman and h. Zombie. Retracting wheel, folding prop.

NATIONAL CHAMPIONSHIPS - 1941

year, the Chicago proxy fliers whipped them into flyable condition, but they were not up to standard.

Chicago seems to be within traveling range of most model builders. There were large delegations from distant cities such as Boston, New Orleans, St. Petersburg and Portland.

All contestants are conscientious the first few days. They register, get their official entry cards, greet a few of the other boys and then retire to do last-minute work on their models.

There was an industrious crowd whittling away at the work—won the Stout Perpetual Trophy. He also won the senior divi-

provided a steady flow of balsa and other material for the boys. The workshop was posted with a few pertinent rules. The printer might as well have saved time and effort on the one that read: "Don't run motors after 10:00 p. m." As usual, there were some who worked day and night to have a model to fly—having arrived in Chicago with only a strong mind and some material.

Wednesday (July 2nd) was the first day of flying. Indoor builders were let loose in the International Amphitheater. Gordon Cain of Boston won the Bloomingdale Trophy for the second year straight. Pete Andrews of Philadelphia added more evidence to the already-long list that he's one of the best indoor men. Stanley Stanwick did 1127.0 seconds with an indoor stick and total time of 1082 seconds. The Moffett International Trophy



Among those present, left to right—Gordon Light, Harold Kulick, Al Lewis, Bill Winter.

Looks as if H. A. Thomas is a jitterbug in addition to his drawing and model building.



Sal Taibi crashed through at last, taking first in Class C Open with his popular Pacer. The Pacer is a Bay Ridge kit.

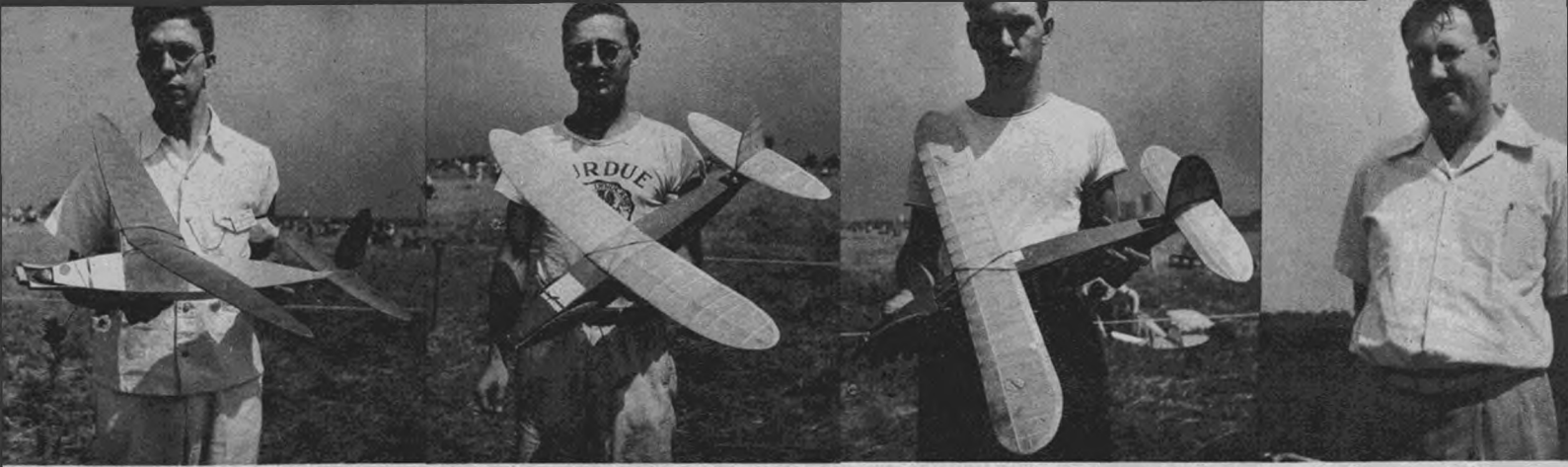
The old maestro himself, Carl Goldberg, with his latest Interceptor. Carl is famous for his Clipper, Zipper, Sailplane.



Dick Korda was the man to beat. Took first in Class C Open in rubber. 300 sq. in. job had timer dethermalizer.

Perennial contestant, Wally Simmers, Midwest, with his new Dyna-Moe, high-climbing rubber-powered cabin.





Ed Lidgard, proxy flier for Alfred Leong, New Zealand. Model a Moffett entry.

Richard Obarski, Moffett-event proxy for W. Alexander, Auckland, New Zealand.

Bob DeBatty flew as proxy flier for N. Ricketts, of Auckland, New Zealand, in Moffett.

Meet Clinton B. DeSoto, well-known radio-control writer.

sion of the indoor cabin event—only twenty seconds back of Cain. Stanwick is an aërographer at the U. S. Naval Air Station at Pensacola, Florida. He was sent to the contest by the navy. He's a crackjack builder and did good work with the Boston group before enlisting about a year ago, and an even better job of carrying the navy's colors at this meet. He finished in a tie for second in individual points scored.

Ray Beaumont was the outstanding rubber-powered model flier of the contest. Flying in the outdoor cabin event on Thursday, he piled up a three-flight total of 1133.5 seconds for first place. This put him in the finals for the Moffett Trophy on Saturday, when he had two O. O. S. flights of 8 and 10 minutes and a benches in the Hotel Sherman. Model-shop exhibition booths

spends a year in Philadelphia in the custody of one of the country's best young modelers. Unfortunately, there were no Canadians entered in this event.

Ray Beaumont was tied with Stanley Stanwick for second place in the individual high-point scores. But Henry Struck topped their 150 points. His 175 won him the Grand Championship. Struck's list of contest victories is a mile long. He's tops in all departments of flying. He won the flying scale event (open division) with an Interstate Cadet that did over 4 minutes, got second in the indoor cabin, tenth in the indoor stick, and eleventh in the outdoor cabin.

Another New Yorker, Sal Taibi, made Saturday a great day for Brooklyn. He flew his Pacer (Class C, open (Turn to page 54)-



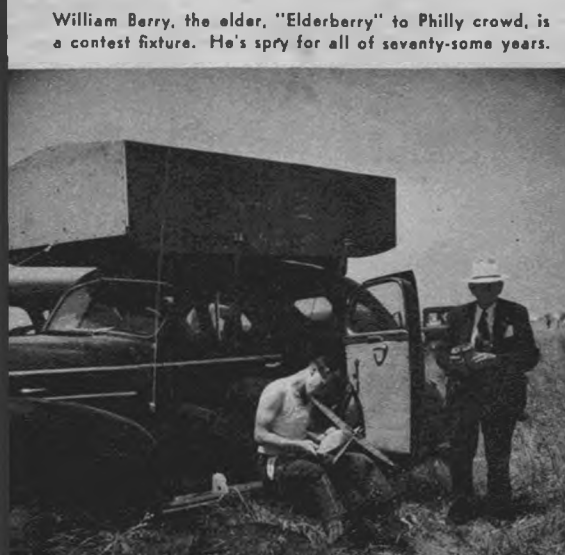
The Mexican air force invaded Chicago. Team captain Capt. Salas L. Jose, Mexico City, captured a second.



The winning smile. Jim Walker, American Junior, captured first in radio with three-wheel ship using R. C. H. equipment.



Mr. and Mrs. Bill Good haunted radio event. Good brothers did not compete this year.



William Barry, the elder, "Elderberry" to Philly crowd, is a contest fixture. He's spry for all of seventy-some years.



Price Roark, one of the Arkansas travelers, with another of those Little Rock low-wings. It was a good flier, too.



Man with the magic touch, Bill Gibson, who won A and B Open in gas; A Open in '40.



Why, we don't know, but this gas model built by Rodney Chase had this flat fuselage.



One of the nicest stick jobs we've seen. Tubular stick from $1/32$ -inch sheet balsa, high-aspect wing. By Caldwell Johnson.



Although its fuselage profile looks like a fish out of water, design was carefully worked out by George Gallanis.

FROM THESE DESIGNS—

BY HENRY STRUCK

1941's National Champ analyzes and forecasts as per ships seen at Chicago.

THE Nationals are rapidly becoming a competition—in the full sense of the word—losing some of the “fair” atmosphere they used to have, when each fellow wondered what his neighbor had dreamed up. For, with the contest rules unchanged for two years (minor miracle), the general design of the contest ship has become quite stabilized. Experience demonstrated the soundness of the set-up of parasol, polydihedral wing and long tail moment arm with large stabilizer for obtaining the stability required to handle great power. Most design changes therefore ran toward the refinement of individual parts such as airfoils, pod and boom fuselages, retractable landing gears, folding props, et cetera. However, never let it be said that modelers have become stagnated in design, but only that the record number of competitors concealed what may prove to be next season's tried-and-true fliers.

The Chicago Times and the Chicago Park Department combined to make this meet the smoothest ever run. The absence of the usual long lines, with timers and runways always available, was enough to warm the heart of any long-suffering contest goer. Only the weatherman failed to co-operate fully. Before he could lock up the breezes for which the Windy City is famed, the first three days of the meet had passed, and with them the chance for wholesale record smashing. There was plenty of good flying, though, accompanied by much strenuous legwork through the deep grass. That same grass, however, saved many a ship to fly again in spite of a test crack-up.

GAS-POWERED MODELS

Class A used to be distinguished by obvious attempts at extreme lightness to make the weight rule, Class B by harboring most of the efforts at “super-duper” design, and Class C by being the most realistic. These conditions have passed. Contest ships now seem somewhat like those tricky advertisements wherein a gentleman lounging in an easy-chair contemplates an advertisement of an identical man who in turn is doing the same thing, and so *ad infinitum*. The only real difference is size.

The new engines around .34 cubic inches have given Class C jobs fresh impetus, especially for those who have no means to transport or build six-footers. These motors also make it possi-



Robert Hildebrand likes gull wings, dihedral tail tips.



We don't know builder, but his gas-powered scale Consolidated trainer was nifty.

More gull wings. Proud owner is Stirling Harper.

Over-size wing ribs form end plates on wing. One-wheel pylon jobs seem to be stand-by.

Spars by the dozen in both wing and tail featured this efficient-looking job by F. Cisco.

Tried and true are the diamond-shaped rubber jobs. This is James Noonan's





Shades of World War I, a Fokker D-8 by John Ecker. Powered by gas, it looked and performed realistically.



Old friend Bill Gough who specializes in flying scale models, entered this beautiful Ryan trainer in flying scale event.



Ray Beaumont, Moffett winner. Featured Top-per-type wing and tail ribs, folding wheel.

ble to design an "all-events" ship. It's either a very large A, or a regular B, or a small C—call it whatever your motor size may be. Bill Gibson, Hamilton, Ohio, was the leading exponent, with wins in Classes A and B, and a place in C! His ship was a parasol with an area of 400-450 square inches, and similar to his winning model of last year which was detailed in Air Trails.

With most designs settled on the parasol type, there were many variations of fuselage profile, ranging from "billboard" to "pipe." The reduced drag possible through boom and pod design (less "wetted" area) brought out numerous ships of this type which performed well. In order to further increase the climb, extra-thin airfoils such as the N. A. C. A. 6406 are being more widely used. To obtain sufficient strength in these thin wings, hard wide sheet-balsa leading-edge covering must be used. Gas props are also coming to the folding stage. This seems like an excellent idea, especially with retractable wheel jobs. The modeler can take care and carve a fine propeller without feeling that the first poor landing will destroy his work. Add to this the un-

doubted improvement of the glide and a "folder" is a good investment.

In construction, the average contest job still features a fuselage built up of longerons and uprights, usually with some sort of stringer fairing. Many wings used sheet-balsa leading-edge covering to obtain maximum strength and efficiency with lightness.

RADIO-CONTROL MODELS

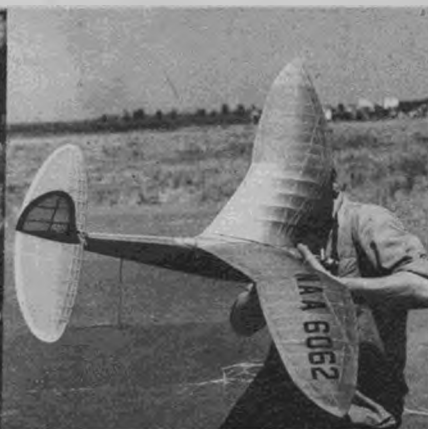
Jim Walker, developer of the U-Control racers, won this event with a compact six-foot job. The motor speed was controlled by using double spark timers—one for retard and the other for advance—while the ship was maneuvered by a rudder tab. Walker could taxi his ship onto the runway with the spark retarded, and when in position, switch to advance and take-off. Third place was won by C. H. Seigfried, who demonstrated the effectiveness of his elevator control by looping his giant twelve-foot ship. That the radio-control event has become practical is almost entirely due to the tireless efforts of a small group of (Turn to page 55)



"Clean lining" is the word for it. Planked fore fuselage, longerons aft. Schoenfeld.



Pusher canard, by Jack Leredahl, was soundly designed, well worked out. Note wing fins.



Whoops, my dear! Hoopengartner still goes in for super gull wings. Lot of work, we'd say.



Leo Bailey mounted stab on fin to relieve monotony.

Despite queer looks, trend is toward this. Excellent construction, too. By Bob Becker.

Not a big rubber job, but a practical C gas model by Jim Ryan. At processing table.

Ed Manning worked out this tailless over past few years. Climbed well, stable, fair glide.

Can't beat this for streamlining. John Clemmons, Texas.

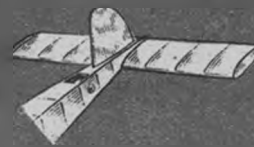




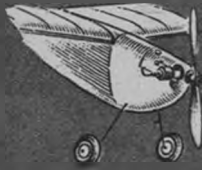
Pusher, or canard, by Jack Laradahl, flew successfully.



Extreme cathedral and small rudder area worked out well.



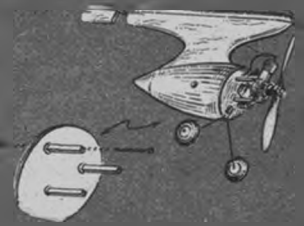
Joe Vermoch used end plates on stab, sheet balsa rudder.



Most unique motor installation was horizontal Brown.



Robert Hildebrande used tip dihedral, skids, for tail.



J. Kleinburg used threaded dural bars on motor mount.

THE DOPE CAN

BY GORDON S. LIGHT

The Dope Can spends a hot week at Chicago. Including Carroll Moon's "On the Field."

TECHNICAL and scientific aspects of a national meet are capably reported by the experts. But people are just as interesting as the models they build. Unless you were at the Chicago meet, you probably didn't know that Bruno Marchi of the AMA headquarters in Washington was earmarked for army service beginning shortly after the contest. The other AMA Washington powerhouse, Al Lewis, is getting married. . . . Bob Toft of Minneapolis is working in a test house at the Allison engine plant during summer vacation from the University of Minnesota. . . . Bill Good was married since we saw him in '40. Mrs. G. has the same friendly manner that always made meeting the Good brothers a treat.

Chet Lanzo of Cleveland made the trip in a house car complete with refrigerator, gas stove, and all other comforts of home. He kept his rubber motor in the icebox to prevent heating up before flying time. . . . Jimmy Metchicas and four other boys made the trip from South Carolina in an old Model A Ford. . . . Newspaperman Art Rice is a pusher with good ideas about model building. Model Manglers of Toledo are his

special interest. . . . Kresge Aero Club rallied around their director, "9G" Schulman, to win second in club scores. . . . A woman living five miles from the flying field reported that her neighbor had picked up five models and was keeping them in his house. Officers in a patrol car convinced the collector that his hobby was a trifle irregular and that the models should be returned to the boys. . . . Bob Sommers, director of Stix, Baer, and Fuller Club (St. Louis) was delayed at home by a baby who arrived just in time for the Nationals. . . . It was hard to tell if there were more kids-with-their-parents than there were parents-with-their-kids.

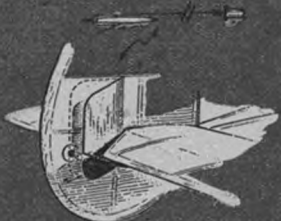
Wally Simmers (Chicago) and Charles Hollinger (Tacoma, Wash.) consoled each other about the troubles model shop operators have getting ready for a contest. To lock up the shop, pull down the shades, and try to do some building is useless—the phone rings, someone tries the back door, there's always a model builder who needs material for his own contest models waiting to interrupt you.

Commenting on the human element involved in timing a model, Bill Berry, Sr., of Philadelphia, told about a timer at a Trenton meet still timing the model after the youngster had brought it back—he had his eye on a buzzard soaring in the distance.

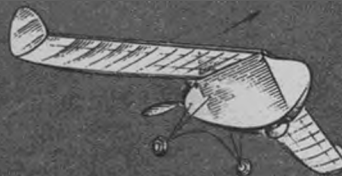
The entire first page of the July 20th Philadelphia *Inquirer* was full-color shots of models and builders. Photos by Staff Photographer Larry P. Keighley were striking.

W. A. Gibson of Hamilton, Ohio, lost his model in Kentucky during a contest this year. The hillbillies wanted five dollars. When he finally paid the ransom, parts of the model were brought out of three different homes. This year Gibson won two firsts—Class A and B Open.

PAGE 42



Austin timer released tab after motor run. Dick Korda.



Successful flying wing gas model entered by Manning.



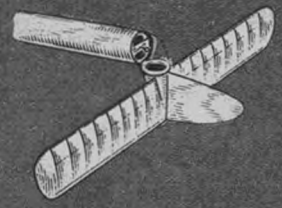
Large flanged bushings and tube for rubber. By Vermoch.



Flattened diamond fuselage cross section by R. Chase.



Cabin and bowlegged landing gear. Model by H. Jordan.



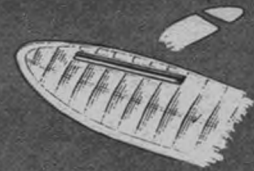
Caldwell Johnson hinged tail group to facilitate winding.



Simplified turned-up wing tip construction by Vermoch.



High aspect, high-wing mount, retractable wheel. Beckler.



Leading edge wing slots. Tried by H. W. Benson.



Light multispar wing by Jack Gerloff. Sheet between spars.



"Eyebrow" wing tip slots used by P. MacCreedy. Practical.



Clemmons had string to keep wheel down and timer open.

Alan Preston, Ned Rice and George Karpovich came from Springfield, Mass., to enter the radio-control event. They were the youngest. Karpovich is a graduate of high school, the other two are seniors. They took sixth place. Members of the faculty of the Technical High School and other local people helped them with the radio equipment and gave them a financial boost. The boys piled in their Cavalier-type model the first day, but managed a repair job in time to make several good control flights before the contest closed.

Clinton B. DeSoto of the American Radio Relay League was on hand for the R. C. event. He helped out several of the boys who weren't licensed amateurs. Clint has a complete knowledge of the radio side and has done enough model work to make him familiar with all aspects of the R. C. subject. We cornered him and he promised articles on the subject. He just finished a book "Calling CQ," a collection of adventure yarns turned in by "ham" radio operators.

We had a letter from an Australian builder who was particularly enthusiastic about the low-wing models of Kingfish Sadler. The letter was unsigned, so in the May issue we printed part of it and included an S O S for the writer's name. He supplied it promptly after reading the May issue—all of which was a fortunate set of circumstances since he'd been having trouble getting copies of A. T. He is H. E. E. Brock, geologist at the university, Adelaide. He says failure to sign his name to the first letter is further proof that all university people are absent-minded. Model building in Australia moves right along despite shortages of wood, rubber and motors. A Brown motor costs from forty to fifty dollars.

L. Wright of New South Wales, Australia, flew his gas job

19:47 officially O. O. S. on 12 seconds' power. He followed it on foot for three-quarters of an hour. A month later it was found about five miles away. The wing had started to mildew, the balsa was rotting in places, and when he cleaned out the engine he found ants in the cylinder! O. O. S. flights are too common and the rules have been revised. Eight ounces per square foot has been boosted to 12; power loading has been increased from 80 to 120 ounces per cubic-inch piston displacement; engine run has been increased to 30 seconds. Contest attendance in Australia has been cut by enlistments and conscription. Nevertheless the flight times go up and up.

In the Linden, N. J., *Gazette*, Ed Gerhardt writes his thanks to the boys who brought their girl friends to the last contest. Said it gave the noncombatants something to do while the boys were busy making flights. The wolf! The club held a twilight meet last June that would have been perfect in all respects but for the notorious Jersey mosquitoes that mobilize for their night maneuvers just about the same time.

F. A. Ledward of the Blue Mound Model Club of Milwaukee sent instructions for making a rubber "lube." Listen carefully, boys and girls. Mix two parts castor oil, one and one-half parts soap chips, and two parts glycerin. Heat over a low flame until the mixture is smooth and thoroughly dissolved. When cooled the lube is ready for use and resembles a heavy cold cream. Take a little on your fingertips and draw it over the rubber and rub vigorously so the friction melts the lube and forces it into the pores of the rubber. Do this for the entire length of your motor. Shake off the loose particles of lube and the motor is ready for use. Thanks, F. A.; builders are always asking for a good rubber lube.

(Turn to page 62)



Deep-gulled wings achieved pylon effect. Hoopengartner.



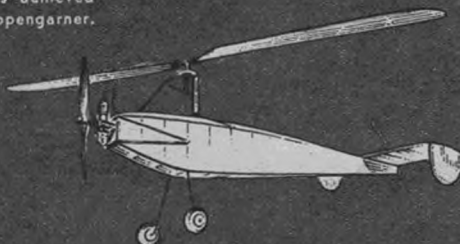
Folding gas prop by Tom Meiklejohn was one type.



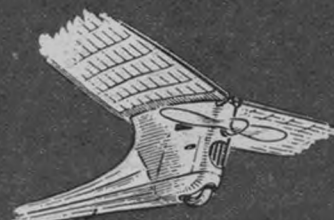
Modified Sailplane, by Ellis; planked, and faired wheel.



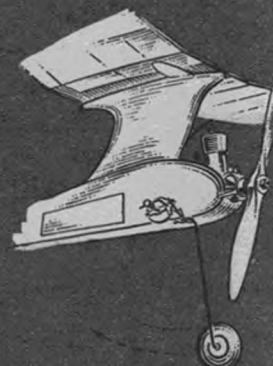
Lefebre's folding prop hinger. Used by Irving.



Works from autogyro kite tried by Burling on Atom.



F. Cisco used high thrust, one wheel, multispar wing.



Goldberg's Interceptor h timed retracting whe



LIGHTNING

Speed events, dive bombing and aerobic meets, smoke screens, hedge-hopping are a few of the things you can do with control-line flying.

A remarkable action shot catches a Tiger Shark just before "busting" a captive balloon.

Editor's Note—This article and the following article and plan were worked out with the special permission and co-operation of American Junior Aircraft and Victor Stanzel & Co. Both "G-Line" and "U-Control" flying are made possible by special patented apparatus available in the construction kits. The plan that follows is presented for the use of individual builders.

DID you ever see a gas job fly in circles of about one hundred feet in diameter, diving, zooming, looping and virtually darting all over the sky—just like one of Uncle Sam's pursuit jobs in a dogfight? Oh, no we're not referring to contest models on their first test flight; we're talking about gas jobs flying on the end of a length of wire, or line, climbing up and diving down with you



Jim Walker, foreground, assists Louis Garami to start a controlled flight with a Fireball. Walker is the developer of "U-Control."

Wide open! Tiger Shark is being flown by "G-Line" method, one line from ship to pole in hand.



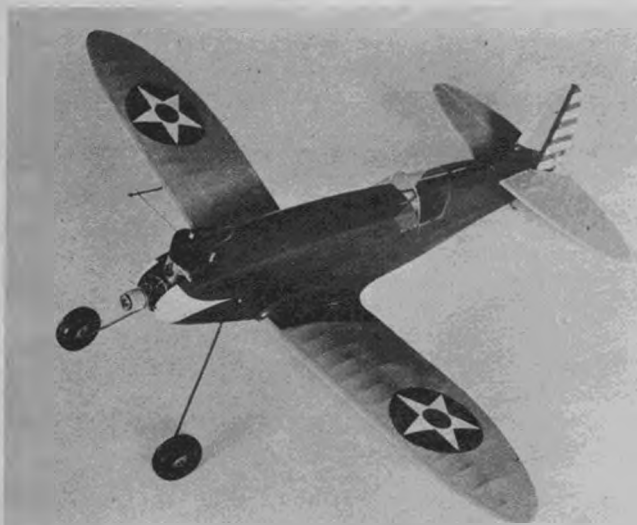
ON A LEASH

BY FRANK REINHOLD

controlling every maneuver! Although still in its state of infancy, "control-line flying" is destined to become the greatest phase of gas model flying! We model builders are getting rather downhearted (and financially down, too) by having our latest creation fly out of sight—and with that new engine, too! What should we do? Well, here's the answer—attach a wire or line to your job and fly it in circles ten or fifteen minutes at a time!

Not only is control-line flying the answer to the out-of-sight problem, but it is the solution to the space problem which confronts eighty percent of all gas-model fliers. You don't need a mile-square airport—just a one or two-hundred-foot square—a playground, baseball or football field. Another outstanding feature control-line flying offers the model builder is the fact that *you* are the pilot. With a simple twist of the wrist *you* can make your job take off, climb, loop, dive and even fly upside down!

Controlled flying offers infinite possibilities for new wrinkles in model flying. Balloon busting, hedge-hopping, stunts, smoke screens, racing, and dive bombing are just a few of the ideas already tried.



This P-60 typifies kind of model made possible by control-line flying. Flying-scale models of real fighting ships can now be flown without crashes.

The Lakewood Model Airplane Race Association, California, holds special controlled-flying contests. Competition is held in five classes, depending on qualifying speeds, 40 to 50 m. p. h., 50 to 60, 60 to 70, 70 to 80, and over 80. Qualifying laps are held over a quarter-mile distance, the real thing over a mile.

But the best one we've heard of was a fifteen-foot controlled gas model for a circus. It carried a monkey.

Aside from the flying advantages control-line models possess,



You can fly your pet gas buggies without losing them in thermals. With "U-Control" pilot works elevators; with "G-Line," dips or raises pole.

they are opening up a new field in gas-model building and flying—*prototype* gas jobs! Vultee Vanguards, Ryan S. T.'s, Curtiss P-40s, Bell P-39s—in fact, almost every army or navy fighter, to say nothing of the many speedy sport planes, lend themselves perfectly to this type of flying. You can't very well build a gas-powered replica of a speedy army or navy fighter and expect it to fly more than once in free flight, but you can equip that very same model for control-line flying and fly it to your heart's content without the slightest chance of having a major crack-up! And what's more, you have an airplane that looks like an airplane.

The actual working mechanism which makes it possible to control the flight path of our control-line model, a Vultee Vanguard, described in the article following, consists of hinged elevators, the movement of which is controlled by two lengths of piano wire. The two wires are attached to a simple mechanism located directly at the center of gravity of the model and, by pulling one wire the elevators move downward, causing the model to dive. By pulling the second wire the elevators move upward, causing the model to climb and eventually loop. The end of each wire line is attached to a handle which the pilot (that's you) holds. By bending the wrist toward or away from you slightly, pressure is exerted on each line, which in turn moves the elevators either up or down. The use of two control lines minimizes danger of injury to spectators due to line breakage. In the event one line breaks, the other will either dive the plane into the ground or throw it into a series of loops, either of which prevents its flying off into space.

The mechanism inclosed within the fuselage of the model to convert the "pull" of the two control lines into up-and-down elevator movements is merely a combination of two levers. (See Diagram A in following article, "Pilot this Vanguard!") By pulling the front wire the control plate is moved, causing the elevator-control rod to move forward, thereby moving the elevators down. Pressure on the rear line causes the control rod to move backward, moving the elevators up. The control rod is attached to the elevator horn which, for our specific example, is located on the bottom of the stabilizer. To limit the movement of the control plate, which in turn regulates the angle of movement of the elevator, a slide rail is anchored securely in the position shown in Diagram A. By inserting pins in various positions along the slide rail, the angle of elevator movement may be easily controlled.

This particular system is called "U-Control," and was developed by Jim Walker of American Junior Aircraft, Portland, Oregon. American Junior kits also provide for a throttle control.

(Turn to page 63)

PILOT THIS

BY FRANK REINHOLD



Flying scale models like the author's Vanguard can be made to dive, zoom, and even loop, all in response to the pilot's manipulation of the elevator wires.



Roaring overhead at 50 m. p. h., our model Vanguard reveals control wires that run from operator's hand grip to the ship's control mechanism.



The control method is adapted from the patented "U-Control." Tipping the top of stick forward causes ship to dive; pulled back, model climbs.



A homemade wooden hand reel is needed for winding the control wires when not in use. Unless such a reel is used music-wire lines may snarl.

THE Vultee Vanguard presented this month, adapted for "control-line flying," is a one-inch-to-the-foot scale replica of the type now doing yeoman duty across the puddle. The original model had the total weight of twelve ounces, and was powered with the new Super Atom engine, but any Class A or B engine may be satisfactorily used. Oddly enough, the engine displacement for control-line flying does not alter the flying qualities of the model to any great degree, the only noticeable effect being an increase in speed.

CONSTRUCTION

The fuselage of our Vultee Vanguard is carved from soft solid balsa because this type of construction not only results in an extremely strong, durable, and easily repairable unit, but requires much less time than the bulkhead-type construction. First obtain two blocks of very soft balsa each measuring 25" long, 6" deep and 2 1/4" wide. Trace the side view on each block and cut out with a coping saw. Cement both halves lightly together and shape the outside with the aid of the cross-section fuselage contours. After the outline is fully shaped and sandpapered, cut away the glue joints and hollow out each half with a gouge or similar instrument. After hollowing out each section to correspond with the



This baby Vanguard is built one-inch-to-the-foot. A Super Atom engine is used, but any Class A or B motor will do. Size of engine affects speed accordingly.

VANGUARD!



You can fly this scaled-down British fighter by direct elevator control. Speed dashes, power dives, and zooms!

wall thickness shown in the fuselage cross sections both halves should be permanently cemented together and allowed to dry.

To install the motor mounts and make possible installation of the wiring and control systems, the upper portion of the fuselage is cut away as shown on the drawings. After this section is cut away, cementing of the motor mounts to suit your particular engine is greatly simplified.

The stabilizer is made in one section and cemented to the fuselage at zero degrees incidence. Cut from $\frac{1}{8}$ " sheet balsa the main spar, which tapers from $\frac{1}{4}$ " at the center to $\frac{1}{8}$ " at the tip, and cement rectangular sections of $\frac{1}{16}$ " sheet balsa to represent the ribs. Each rectangular section rib tapers to fit the spar. The center rib is $\frac{3}{8}$ " deep while the extreme end rib is $\frac{3}{16}$ " deep. After the $\frac{1}{8} \times \frac{3}{16}$ " leading edge is cemented to the center of each rectangular rib section, the corners are trimmed and sanded until the desired symmetrical section results.

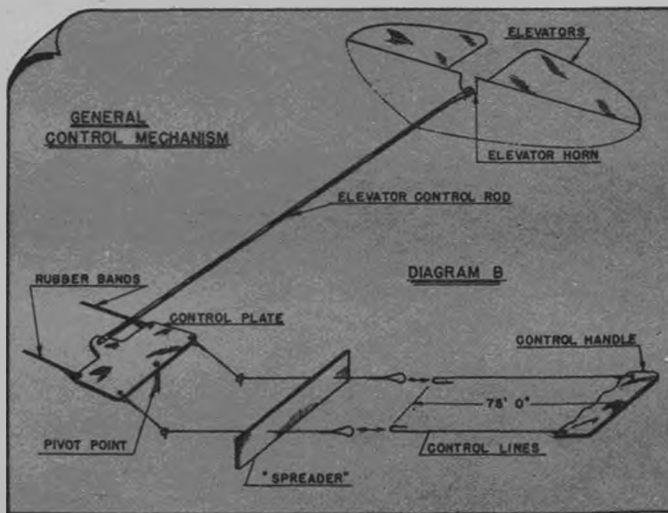
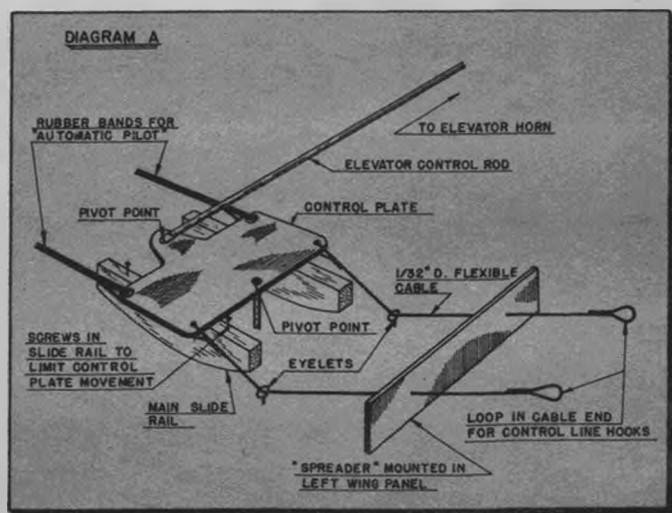
The elevators should next be carved from $\frac{3}{16}$ " sheet balsa and carefully mounted in place. The tip elevator hinge of each half consists of a section of .035 wire fitting into a $\frac{3}{8}$ " length of $\frac{1}{16}$ " O. D. aluminum tubing which is embedded into the stabilizer tip. For the center stabilizer hinge effect we employ a single section of .035 piano wire bent in such a form that it also acts as the

control horn as shown in the drawing. For a bearing, drill and cement a small piece of .035 sheet aluminum tubing to the inside of both center ribs as shown. To mount the stabilizer, the rear portion of the fuselage is cut away where indicated.

The rudder is extremely simple because it is carved from a stiff sheet of $\frac{3}{16}$ " sheet, tapering to $\frac{1}{16}$ " at the tip and having a symmetrical airfoil. The trimming tab is built into place and has a hinge consisting of a section of .035 sheet aluminum. The rudder is cemented in place after the stabilizer and control mechanism are installed.

In making the wing, first cut all the ribs from $\frac{1}{16}$ " stiff sheet balsa and cement in place along the spars, which are cut from $\frac{1}{8}$ " sheet to fit the rib notches. Add the $\frac{3}{16}$ " sheet leading and trailing edges and cement both wing halves together, care being taken so each tip has the required 3" dihedral. Reinforce the center section by cementing sheets of hard $\frac{1}{8}$ " sheet to the sides of each spar.

Before the wing is cemented to the fuselage, the landing gear, which is bent from $\frac{1}{16}$ " steel wire, is securely cemented into place along the front wing spar. After the gear is in place, cover the bottom of the wing where indicated with $\frac{1}{16}$ " sheet balsa and cement the wing to the fuselage. To insure a (Turn to page 64)



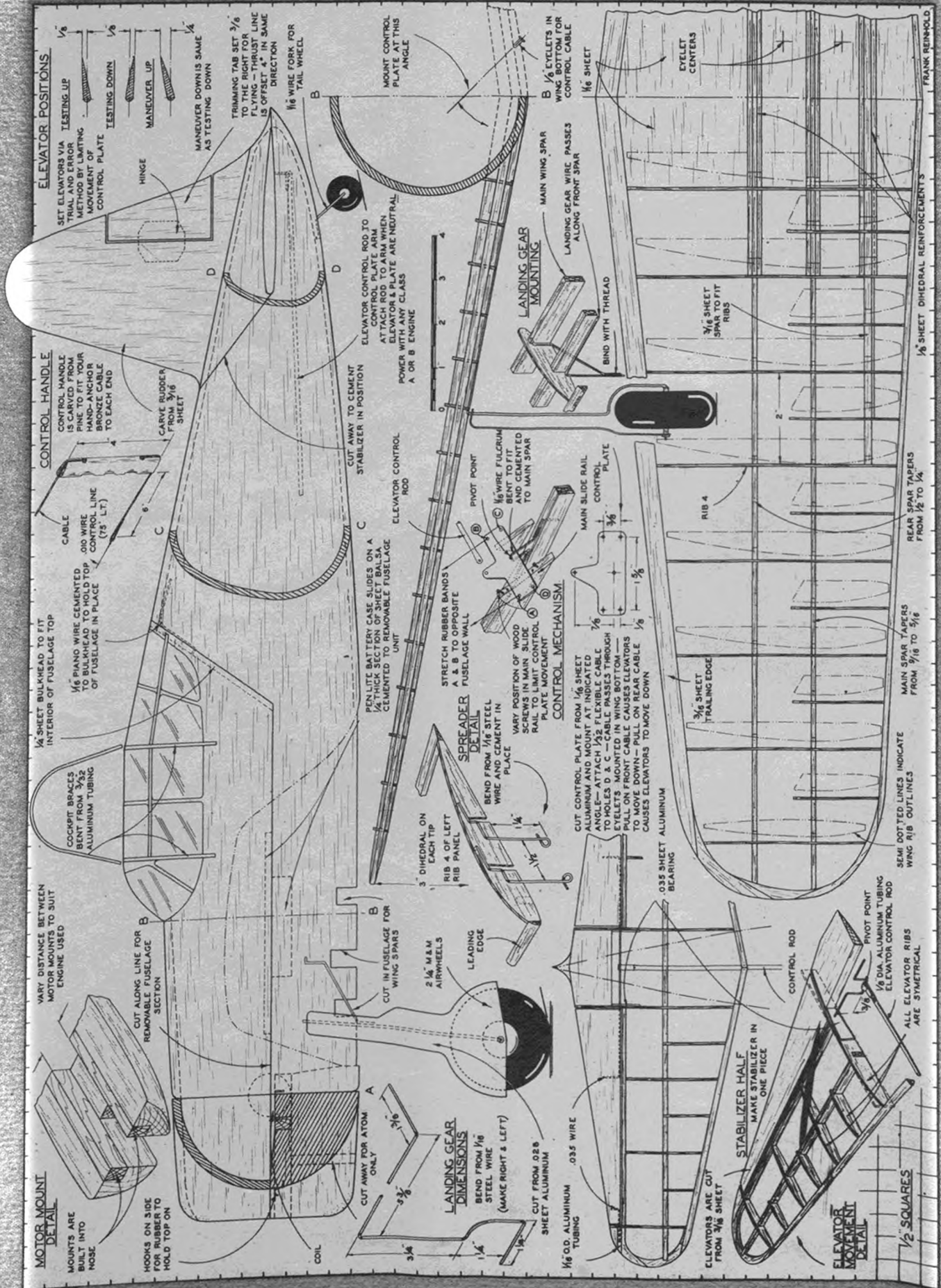
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AIR TRAILS FULL-SIZE PLANS, 79 Seventh Avenue, New York, N. Y.



DOWN THE RUNWAY



So you would like to run a contest. Well, before you do, take our advice and follow these valuable tips.

CONDUCTED BY AL LEWIS • EXECUTIVE DIRECTOR

RECENTLY we had the opportunity to present a few suggestions in these columns on how to start a model airplane club and keep it functioning. Since the main objective of any club is to run contests, we are going to outline a few suggestions on how to plan and conduct a model airplane competition.

Model airplane meets should be fun—fun for the contestants, for the spectators and for the officials. The only way you can really get enjoyment out of an aeromodeling competition is to have it well planned in advance and smartly executed. When your club decides to put on an invitation contest, the first thing you should do is to call in all the experienced contestants and leaders in your vicinity and have a “bull session,” so that you can get their ideas on how best to run your meet. In these days of thousands of contests being held every season, we must not forget that any airplane meet, regardless of size, is a big undertaking, and not lightly to be entered upon.

The best way to insure a successful competition is to provide

plenty of officials, for, regardless of how imposing an array of prizes you can promote, unless each entrant can get in all his official flights without delay and without quibbling, your meet will not reflect credit on your club.

Do you have plenty of stop watches? Can you secure the services of technically minded adults who can quickly “process” the models? Is it clearly understood where the limits of flying will be established at your field? Has someone arranged for spectator control, policing of the field and attendants to direct the parking of automobiles?

In making all arrangements for your competition, think things through from both the contestants’ and spectators’ angle. In other words, if the contestant parks at such a spot, how far will he have to walk to set up his models? Is the spectator parking located convenient to the refreshment stand and toilet facilities? Has a lane been left open for the contestants to pursue their far-flying models by automobile?

There is no need for us to go further. These (*Turn to page 57*)



“DON’T QUOTE ME!”

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



CARL GOLDBERG (Comet’s fair-haired boy) and his wife came East vacationing. It turned out a busman’s holiday, since Carl spent all his time visiting hobby shops, model personalities and contests.

Harry Rice flew to the Nationals in his Waco while Irwin Ohlsson “flew” out in his Cadillac and got there first! . . . Comet lavishly entertained its distributors and representatives who attended the meet. . . . The Rogers 29 and 35 got a big hand through the Nationals grapevine when the Virginia contingent tested them and found them super. When they get into production we’ll see!

While only accessories and B & D Browns roll out of Jr. Motors Corp. plant, lights burn late into the night and it won’t be long now! . . .

Clyde Austin, with Mrs. Austin and his star salesman attended the Nationals and toured the country to the East coast, visiting his customers. Austin is credited with brightening the manufacturers’ meeting with his remark, “All you fellows owe me money,” to which Presiding Chairman Louis Kapp of Comet retorted, “We can’t very well pass a resolution to pay you!” . . . During his trip East, Irwin Ohlsson demonstrated his Sixty Special for the signal corps in—30° temperature.

N. E. (Jim) Walker, manufacturer of American Junior ready-to-fly model airplanes and the U-Control Fireball, builds and flies radio-control gas models as a hobby. This year he won that event at the Nationals. To our mind, his model was one of the most practical there. It controlled perfectly (Jim would “gun” her on the banks), had about a six-foot span and a stock Brown Jr. engine with two timers. Can this be the beginning of radio control for the advanced gas modelers?

Congratulations to Mike Trost of Trost’s Model Shops, Chicago, upon his marriage September 6th.

The Model Industry Association has allotted a certain sum for the use of the Academy of Model Aeronautics in awarding prizes at the leading model meets. Contest directors soliciting prizes from manufacturers will be referred back to the AMA. . . . The Academy will soon launch a nationwide competition using one specific type of rubber model to revive, stimulate and promote interest in rubber-powered model airplane building.

International Models of New York have hit the market with plastic prop spinners for gas models (to be available for Class A, B and C) in (*Turn to page 59*)

WAKEFIELD

DESIGN

BY AL CASANO

FULL-SIZE PLANS

one sheet 38 inches x 50 inches

No more need to enlarge plans or to make your own working drawings. Now you can get full-size plans identical in detail to the scaled-down drawing on the opposite page. This is just one of a series. Be sure to tell your friends and fellow club members. Only a limited number of these full-size plans will be printed, so order immediately. Send ten cents per plan to

AIR TRAILS FULL-SIZE PLANS
79 Seventh Avenue, New York, N. Y.



Not a "box," yet easily built, this rugged competitor features consistent flights and long contest life.

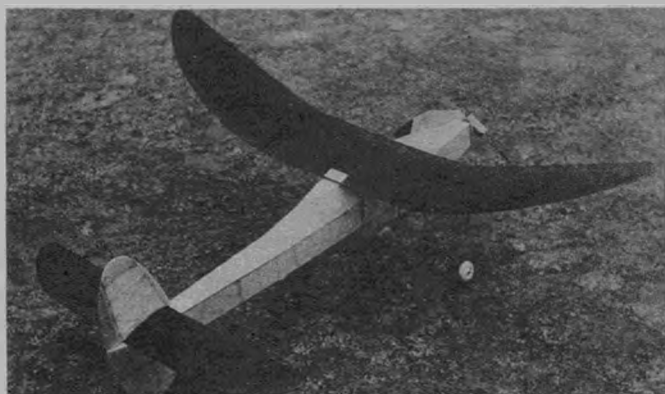
THIS ship, built to Wakefield specifications, has been named Glamour Girl, because of the many curves in the right places. Tested in a number of contests, Glamour Girl has left little to be desired as far as performance is concerned. The ship has a very fast spiral climb, and a slow, lazy glide. Both climb and glide are to the right. Well, since talking about it will not get it built, let's get started.

CONSTRUCTION

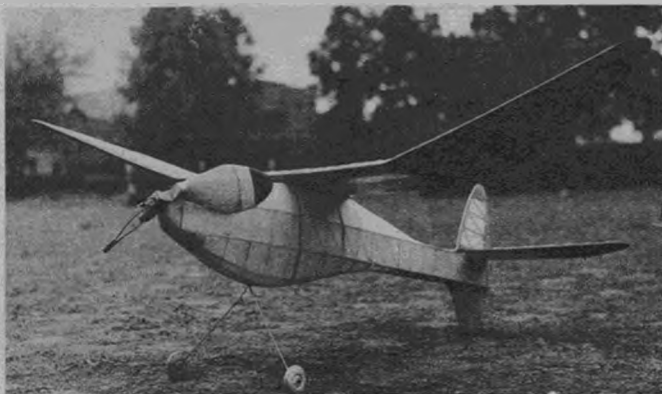
The fuselage is built up of the two main sides, with $\frac{1}{8}$ " square longerons and cross braces, and $\frac{1}{16}$ x $\frac{1}{8}$ " diagonals. The diagonals add little weight but give perfect bracing against the twisting strains encountered in high-powered rubber jobs. The diagonals also take up the strain when a longeron snaps in the heat of competition. Choose your material carefully, using hard stock throughout the entire fuselage, as this is where most of the hard knocks will be absorbed. After making the two sides, join together as per plan view of the fuselage. Be sure to use accuracy in scaling up the plans, and follow the dimensions given. After the two sides are joined and dry, sand this part of the fuselage thoroughly, first (Turn to page 60)



The author demonstrates "unassisted" take-off under Wakefield rules.



Casano's models are noted for carefully built wings for high efficiency.



Fuselage is made of primary frame, faired top and bottom with formers.

CUT THAT SKIN FRICTION!

BY MAURICE
SCHOENBRUN

The designer of the Rocketeer, Gladiator and Tomahawk suggests a few ways of stepping up aerodynamic efficiency of your gas model. His comments are worth listening to.

TO many builders the reduction of skin friction may seem a very minute factor, but experiments have proven that thirty percent of all resistance in the entire ship is caused by the faults of covering.

Stop a moment and think what makes a streamlined model "streamlined." We find that streamlining consists in clean fairings for the tail surfaces and the wing, for the most part. By that we mean that all incidences should be faired so that they afford a minimum of drag. Too, the landing gear should be as short as possible. This may seem another very incidental matter, but again research has found that a one-wheel landing gear, or one that may be fully retracted, will add greatly to a ship's performance.

Those are fundamentals in streamlining. In looking over innumerable articles on so-called streamlined ships, it was found that a majority of the ships described had clean fairings of all surfaces and that ninety percent of them had elliptical or oval cross sections. They were, for the most part, either planked or of former-stringer construction, and without doubt their construction took many hours of work in plotting bulkheads, planking and sanding, to say nothing of using dope, wood filler, et cetera. When the models were completed they looked very beautiful, but close study revealed that sag between the bulkheads and irregularities in planking had ruined the entire effect and had, actually, built up rather than eliminated drag.

There are a dozen and one ways of cutting down skin friction on a fuselage. Take an ordinary box fuselage and place stringers around it. Selah! A lot of drag has been eliminated and the ship looks better. The stringers keep the covering from sagging between the uprights, and aside from the fact that fellow modelers will remark on the improvement, the ship will be noticeably more efficient.

Although most gas modelers avoid diamond fuselages, they present an even better approach to streamlining. A diamond fuselage, plus stringers placed on all four sides, gives an octagon effect, which particular form is well known to rubber builders. The form is efficient and remarkably easy to build.

After we had built many of the above-described models, we discovered that they were structurally strong enough for a light impact, but under the rigors of a real "splatterish" crack-up, as the result of a loop or spiral, they couldn't take it. Of course, the streamlined diamonds made a fine-looking crack-up, but we decided to improve on the design and make a fuselage that would really stand up. The actual working time on such a fuselage con-

sumed from seven to ten hours, and we decided that there must be a faster method of turning out a fuselage with a higher strength factor.

Above all, in our designing, we kept to our idea of reducing skin friction to a minimum. The ultimate result was the ship illustrated herewith. Note the strength of the fuselage, at the same time the efficient low-loss design.

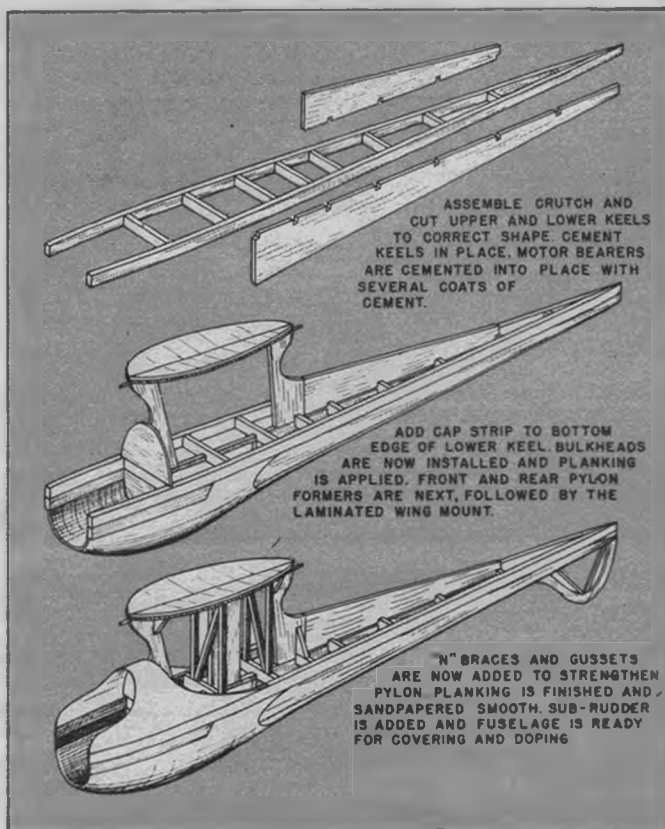
The fuselage of this ship is constructed around a "crutch," as was the Rocketeer (Air Trails, Nov., 1939). This system of construction has proven to be very popular with Eastern builders and entails a minimum of work with a maximum of strength. In this particular instance the crutch was built of $\frac{3}{4} \times \frac{3}{16}$ " medium balsa, and aside from this construction the fuselage has no cross members whatsoever, thereby establishing an almost unheard-of precedent in modeling.

Our original premise of eliminating (or reducing) drag hinges on the "smoothing" of the air passage over the body. Without cross members, there are no barriers to the flow of air, and thus a very efficient section is evolved.

In a Class C model, such as this, the upper and lower keels of the ship are constructed of $\frac{1}{4}$ " sheet balsa and are cemented to the cross pieces of the crutch. Notches further secure these keels in their proper places as shown in the drawings. In this particular model, a further innovation is the simplicity of the pylon design. The pylon leading and trailing edges are of $\frac{1}{4}$ " sheet balsa notched into the crutch. The wing platform, which is of $\frac{1}{8}$ " laminated balsa, is placed

above the leading and trailing edges and cemented in place. Additional strength is provided by $\frac{1}{4}$ " square spars which are cemented at proper intervals (one third and two thirds of the distance along the wing platform) to give greater bracing. These are cemented in place and run from the wing platform again to the crutch cross piece. These do not intersect the crutch, but must be at least a half inch in from the crutch on the cross pieces to give a better sag effect to the silk covering.

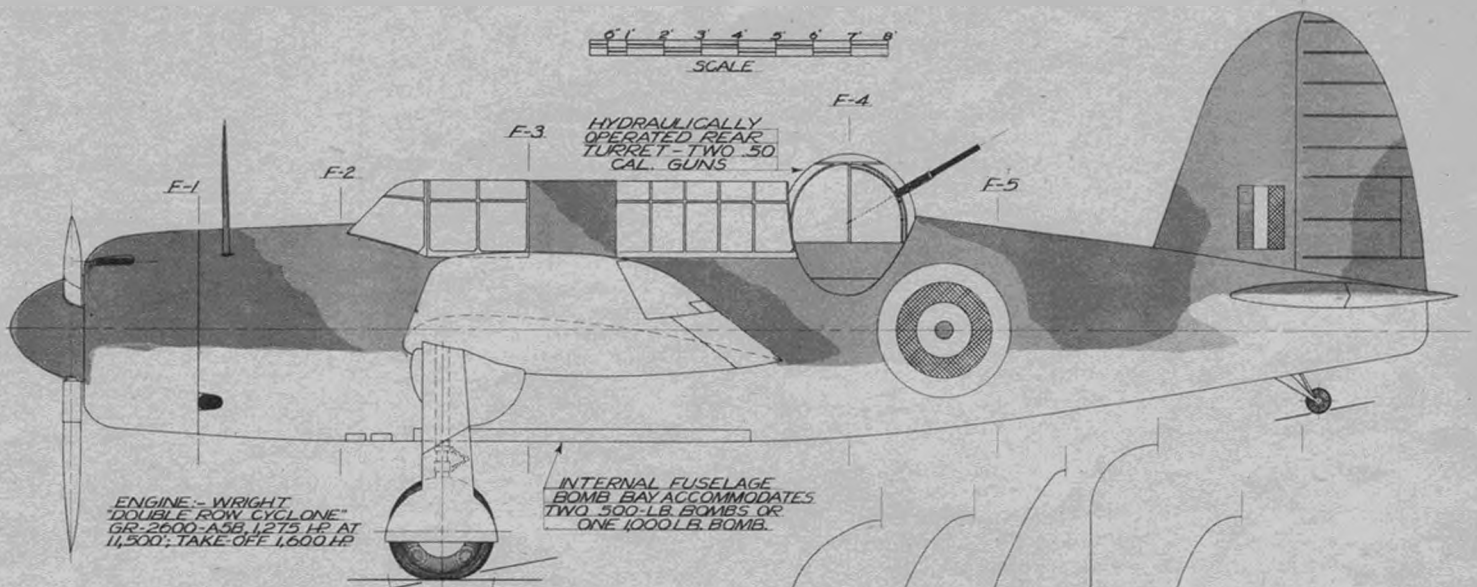
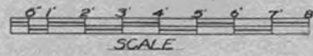
One of the most important features of the ship (which has been named the Theoradical) is the firewall and nose-block construction. To maintain the low-drag idea, the nose is rounded into a semibulb shape by the cowling. From the firewall to a point about four inches toward the rear, the fuselage is covered with $\frac{1}{16}$ " sheet balsa. Note the special hatch which houses the batteries and the Austin timer. This bulb effect, you may note by study, merely emphasizes the streamlining, and (Turn to page 64)



BREWSTER BERMUDA - British Dive-Bomber

BY J. B. RUST

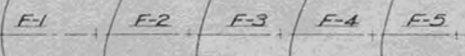
F-6



ENGINE - WRIGHT "DOUBLE ROW CYCLONE" 61R - 2600 - 155, 1275 HP AT 11,500; TAKE-OFF 1,600 HP

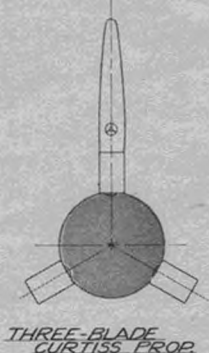
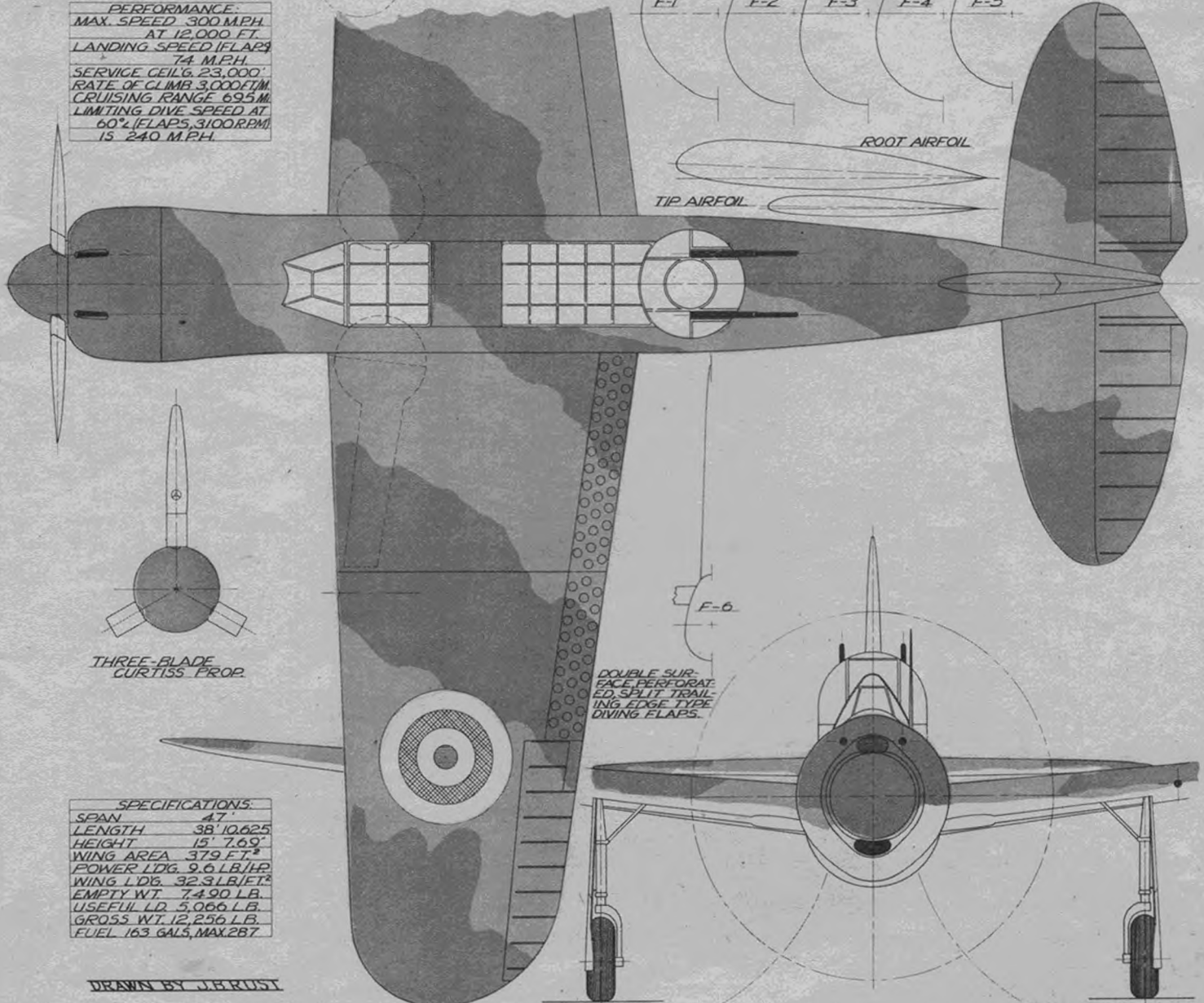
INTERNAL FUSELAGE BOMB BAY ACCOMMODATES TWO 500-LB. BOMBS OR ONE 1,000-LB. BOMB.

PERFORMANCE:
 MAX. SPEED 300 M.P.H.
 AT 12,000 FT.
 LANDING SPEED (FLAPS)
 74 M.P.H.
 SERVICE CEIL'G. 23,000'
 RATE OF CLIMB 3,000 FT/M.
 CRUISING RANGE 695 M.
 LIMITING DIVE SPEED AT
 60% (FLAPS 3,100 R.P.M.)
 IS 240 M.P.H.



ROOT AIRFOIL

TIP AIRFOIL



DOUBLE SURFACE PERFORATED, SPLIT TRAILING-EDGE TYPE DIVING FLAPS.

SPECIFICATIONS:
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 LENGTH 38' 10.625"
 HEIGHT 15' 7.69"
 WING AREA 379 FT.²
 POWER LDG. 9.6 LB/HP
 WING LDG. 32.3 LB/FT.²
 EMPTY WT. 7,490 LB.
 USEFUL LD. 5,066 LB.
 GROSS WT. 12,256 LB.
 FUEL 163 GAL. MAX. 287

DRAWN BY J. RUST

MODEL-CRAFT'S NEW SCALE-TYPE GAS MODEL THAT WILL FLY AGAINST PEDESTAL-TYPE SHIPS!

The trend is to real DESIGN in gas models... away from mere contest "freaks". For years some "experts" have been saying that you couldn't get high performance in a cabin-type airplane. However, Modelcraft designers have been more interested in finding out what COULD BE DONE. After exhaustive test-flights, we announce the new "Westwind", a true "aviator's model", with scientifically slotted wings and performance that challenges any pedestal model on the field.

So perfectly balanced that you have to carry the BEST BATTERY on the market to bring the weight up to 8 oz. per sq. ft. a Westwind (for Class B or any small Class C engine) is nevertheless as STRONG as any gas model ever built. Like all Modelcraft models it is easy to build from complete, well-made kit. Order from your dealer or the West's \$3.85 Largest Model Supply House. Price.

MODEL-CRAFT 7308 S. VERMONT AVE. • LOS ANGELES, CALIF.

1941 National Championships

(Continued from page 39)

division) for two flights and a Schulman-designed Zombie for one flight for a total of 1482.7, which was high for all three divisions of Class C. Second place went to Ray Acord of Hollywood with 1481.6. Sal must have perspired freely until the official results were announced.

Veteran contest builders didn't lose their grip on the winning spots—actually they seemed to tighten their hold. One of the 1940 gas champs; W. A. Gibson of Hamilton, Ohio, took two firsts—Class A and B gas, open division. He totaled 1297.2 for A and 900.3 for B. Another old champ, Dick Korda, won the outdoor cabin open division with 1082.7, fourth in the Moffett, and several other high places. Previous winners who were right up there again this year were Jim Cahill, Pete Andrews, Gordon Cain, Hank Thomas, Carl Goldberg, Chester Lanzo, Dick Everett, C. C. Johnson, and others.

Director Gunnar Munnick had a team of eleven boys from the Junior Aviation League of Boston. For several years he's been banging away at the Megow Team Championship Trophy. Last year Boston was runner-up. This year the trophy went back with the Boston crowd. Their 150 points were well out in front. Kresge Aero Club of Newark, N. J., was second with 112. The Skyrockets from New Haven, Conn., racked up 47 points to win fourth with only three members entered.

The army and navy have claimed many older model builders. Many have enlisted, others have been conscripted. Bob Roberts of Gary, Indiana, is having a tough time keeping club work moving since practically all the older and experienced builders are in the air corps. A few Chicago boys managed to get home for some of the contest. Their complaint about army life was that cramped living quarters gave them little space to build models. Improving an army cot into a sort of workbench seems rather inadequate. But there were encouraging signs that the army and navy are thinking seriously of model building as a recreational feature of camp life.

Jim Walker of Portland, Oregon, had things pretty well under control. He gave demonstrations with his U-Controlled Fireball. Flying on the end of fifty-foot control wires, the Fireball is a fast-moving, maneuverable airplane. It can be zoomed, dived, and looped. Walker's other model was radio-controlled. It was a 5½-foot tricycle-gear job with several controls including throttle which he used in making unassisted take-offs from a standstill. During Friday's flying he had a nasty crack-up that called for some fast work to prepare for the next day. The boys from California pitched in, and at two a. m. they were still going strong. When a photographer let go a flash bulb, Walker looked up with a worried frown. Said he thought it was sunrise and they wouldn't have time to finish the repair job. But they did it well enough to bag a first in the R. C. event in a field of thirteen

entries that gets tougher every year.

Defense has claimed much of the brain power and mechanical ability that in ordinary times would be tackling the interesting problem of radio control. There are still many features to be licked. For example, shock-mounting the receiver unit in the model. Vibration must be damped at all engine speeds—a point which has caused more than one apparently tuned receiver to go dead when the engine was revved up for the take-off.

Bill and Walt Good didn't fly their radio-control job this year. It was in shape, all set to fly, but the boys were too busy. Bill has finished college and is working in Pittsburgh. Walt is just winding up his college work at Iowa City and getting ready to move to a new job in Washington, D. C. Both of them managed to get to Chicago as spectators.

Weather was good for the three days of outdoor flying (Thursday, Friday, and Saturday) As usual, the boys flew their ships into all parts of Cook County. Dick Everett of Hampton, Va., followed his gas job thirty-nine miles before losing it out of sight. Dick Korda of Cleveland has the answer to this problem. He equipped his 300-square-inch rubber-powered cabin fuselage with a dethermalizer. After fifteen minutes or any other desired length of time a mechanical timer works a little tab on the rudder which kicks the model into a tight spiral and brings it down out of the thermal.

Seems as though dethermalizers or new rules will soon be necessary. Short-wave patrol cars, diligent chasing, and honest citizens returned many of the roving models. But even so, many of them were lost. Modelers are getting tired of losing models. But how the rules could be changed is something few agree on.

Allen Vopal of Cleveland won the best-finish event with a beautiful solid-scale Waco. This was one of the several models flown to Chicago from Cleveland, along with their builders, by Arlene Davis, the only woman holding a pilot's rating for the heaviest type transport airplane. Telling about her trip, she said they flew at different altitudes from time to time hunting the smoothest air to prevent damage to the models. In fact, they seemed more concerned about the models than themselves. When the results of the judging were announced late Thursday night, Vopal said the first thing he'd do would be to wire Miss Davis in Cleveland that the model they'd worried about had justified their attention.

The Model Industry Association banquet Thursday night was one of the high spots of contest social life. The Terrace Room of the Morrison Hotel was well filled, food was good, speeches short, and vaudeville entertainment amusing. MIA is a thriving outfit, and the good it's doing for the hobby carries into lasting and worth-while channels—in addition to promoting pleasant banquets.

Airplane model builders were not

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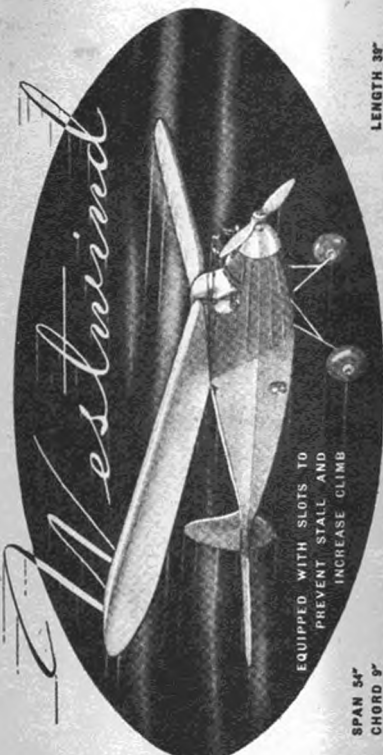
No more need to enlarge your own plans or to make working drawings. Now you can get full-size plans of the models shown above. Each plan is on one large sheet of paper.

BE SURE TO TELL YOUR FRIENDS AND FELLOW CLUB MEMBERS ABOUT THEM.

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alone in Chicago—the race car and model railroad boys were holding their meetings and contests the same week. Their headquarters were at the Morrison—just a few blocks from the Hotel Sherman. But the airplane boys dominated the show even at the exhibition of the model companies in the Morrison.

Contestant banquets always wind up the meet. Builders relax after a strenuous week and discard their inhibitions and repressions. They really whooped it up. Each year there are more people at the banquet, and each year the banquets become more hectic. Saturday evening the Grand Ballroom of the Sherman was taken over by the model builders. Exploding firecrackers and squadrons of paper airplanes ruled out any dull moments. Roscoe Turner was master of ceremonies. (Col. Turner started the trip to Chicago in an automobile

but it threw a wheel, so he carried on in a safer way—by Taylorcraft.)

The Chicago Park District and the Chicago Times did a good job again this year. They kept 1300 model builders happy with ample timers, officials, and judges. Flying conditions were good. At the beginning of the meet Maurice Roddy looked as though he had gone without sleep for a week. As the contest moved along, the reason for this became clearer. Roddy and his crew had done a thorough job of planning beforehand. Every feature of the meet seemed to unfold in its place without confusion or delay. It was a smooth-running Nationals, and shows that experience and enthusiasm are an unbeatable combination. Maurice Roddy and the Chicago bunch have both. If they extend an invitation to the Nationals again in '42, there will be more than 1300 takers.

From These Designs

(Continued from page 41)

enthusiasts. It's necessary for the entrant to devote his time exclusively to his radio job, as witnessed by the fact that three days were set aside for this event.

OUTDOOR RUBBER MODELS

The old standby of light, simple construction was again the keynote of successful rubber model design. In this way the ship can be brought up to weight with valuable rubber motor, permitting plenty of slack and plenty of strands, a combination which will give a powerful climb for at least fifty seconds. Folding propellers were universal, with free-wheelers nowhere to be seen. Stick and cabin models were identical in design and construction. Consequently a number of practical souls built "sticabins"—models whose fuselage cross section was under $L^2/200$ to qualify as a stick, but upon the addition of a "cabin" could be made to meet the cabin requirement of over $L^2/100$.

In order to reduce the chances of losing their ships on their first flights, the Cleveland fellows (Korda, Lanzos, Reich) developed "thermal busters." These consisted of Austin air timers rigged to pull a wire pin, permitting a spring-loaded tab to swing over, forcing the ship down in a tight spiral after the lapse of a predetermined time.

The flying scale event was run off beautifully, thanks to a group of sleep-scorning judges. These men began the grading of the ships 6 p. m. Friday and continued without interruption until 5 a. m. Saturday. In this way the ships had only to be weighed at the field, and they could be flown with no more delay than any other contest model. Duration of the flying scale has been increasing steadily since this event was introduced at the 1937 Nationals, chiefly because modelers are using more discretion in their choice of designs by applying their knowledge of the setups that offer stability and avoiding mere pretty appearance.

INDOOR MODELS

The indoor events are sort of looked down upon by the majority of the "action" men—but their very deliberation and certainty of a long flight builds up that old stage suspense, leaving most of the entrants limp at the end of the day. Every flight seems to be up for a record, and all you can do is try to count the prop revs per minute and wonder how many turns the heroic winder dared pack in his single loop of $3\frac{2}{3}$ " rubber, and so guess at the final time. Then, again, the whole meet is going on in a comparatively small area and under similar conditions. Everyone can keep track of the best times and know exactly where he stands.

As both events were held on the same day this year, the stick jobs were spared the pain of strange growths in an effort suddenly to meet the cabin requirements. The arena was rather drafty, and once again it was the sturdier ship that could stand buffeting the rafters and lights under the arch of the International Amphitheater (down in the center of the stockyards, but a fine place to fly).

A SUGGESTION

The National Meet already has plenty of events, but the addition of a seaplane category would be of great value and interest. Little is available at present to guide the increasing number of modelers who like to "take a hydro up to the lake" on their vacation. With the competition found at the Nationals, proper float and hull design would soon be accumulated. All that would be required would be a wood frame of ample size with a canvas lining to hold the water. If necessary, the ships might be limited to Class A and B to keep the take-off area at a minimum.

We-ell, maybe it wouldn't work, because with the heat usually found in July, the tank would probably be filled with splashing modelers, with no room to duck the models.

A REAL GASOLINE ENGINE \$5.95



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The only nationally advertised \$5.95 kit that includes a coil, condenser and wires.
Identical Engine, Less Coil and Condenser \$4.95

Here is your opportunity to buy a kit of the famous G.H.Q. Gasoline Motor. ABSOLUTELY COMPLETE — ALL MACHINING DONE — READY TO ASSEMBLE. All you need is a screwdriver. No mechanical knowledge required.

Everything in the kit including Champion spark plug, COIL, CONDENSER, tank and cap, ignition wire, cylinder, piston, connecting rod, timer, crankshaft, all screws, nuts, bolts, simple illustrated instructions, etc. Every part is fully machined and finished. A SCREWDRIVER IS THE ONLY TOOL YOU NEED.
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Indeed an engineering triumph—accomplished by outstanding G.H.Q. designers and engineers, who have constructed into the G.H.Q. motor everything that years of exhaustive scientific aerodynamic research could produce—geared to the highest possible degree of perfection. But more than that, the acid test . . . an overwhelming response. Thousands of users in all parts of the country are praising, recommending, and endorsing this scientific achievement. It seems as if everyone in America wants one. The most hair-raising thrill you've ever experienced will be yours with the G.H.Q. motor—actually one of the most powerful motors ever constructed. Has broken records for amazing performance.

ALL PARTS GUARANTEED

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4 Port 2 Stroke Cycle— $\frac{3}{4}$ " Stroke—15/16" Bore—200-7,000 R.P.M.—Bearing Surface, $1\frac{1}{4}$ " Long—Crankshaft, 5/16" Diam.—Invertible—Rotation, Either Direction—Height, $4\frac{1}{2}$ "—Width, $2\frac{1}{2}$ "—H.P. Approx. 1/5th. Class "C" under N.A.A. Rules.

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Is Your Guarantee of a Good Investment!!!

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30 MINUTES TO ASSEMBLE • ALL PARTS WARRANTED

Imagine operating your own G.H.Q. 1/5 Horse Power gasoline engine—small enough to fit in the palm of your hand—yet turning up over 7,000 revolutions per minute and powerful enough to fly model airplanes of from 4 to 10 foot wingspan, and propel model boats from one to six feet in length and midjet cars that travel over fifty miles an hour! There are also hundreds of other ways you can enjoy using this miniature yet powerful power plant—for small pumps, generators, compressors, blowers, fans, grinders and countless other experimental purposes.

Your G.H.Q. gasoline engine will be far more than just a toy for your spare moments. It is a scientifically constructed mechanical marvel that will thrill you with thousands of hours of pleasure. You will get a real kick out of controlling with your finger tip the surge of power your engine develops.

This engine has been tested and proven over the last eight years. Over fifty thousand of these powerful little G.H.Q. engines are now in actual daily use. Why not join the ranks of these hobbyists?

ENGINE IS COMPLETE AND READY TO ASSEMBLE!

Your engine comes to you with every part completely finished. Our factory-trained skilled mechanics, using the latest automatic precision machinery, have finished each and every part to the last detail. You merely assemble the parts in accordance with the few simple instructions given, using only an ordinary screw driver, and inside of thirty minutes, your engine is ready to operate.

Not only will you and your friends have the thrill of seeing an engine ASSEMBLED BY YOURSELF operating, but you will gain a knowledge of gasoline engine theory and practice that will be of real practical value to you.

FACTORY ASSEMBLED **READY TO RUN** **\$6.95**
— complete with coil and condenser —

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J. B. Providence, R. I.—"A few weeks ago I received the G.H.Q. motor kit and it is running perfectly. I hope to write you soon and tell you about some excellent flights."

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A. K., Hillside, N. J.—"I still can't understand

how you can put such a dependable and rugged engine on the market at such a low price."

E. T., Sayville, N. Y.—"Received my G.H.Q. Kit today and am more than delighted with same. You've got 'em all beat for price and performance."

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CLASS "C"



Have you seen it? .60 cubic inches of pure power.

Modelers who are interested in Class C are invited to examine this latest Ohlsson & Rice engine—companion motor to the deluxe Ohlsson 60 Custom—at all dealers now.

Containing a host of features unsurpassed by any motor at any price—for example, the completely die cast aluminum-alloy crankcase, the individually micro-lapped piston and cylinder, and the one piece heat-treated, hardened, and ground crankshaft, the "60 Special" is engineered on the Proven Basic Design that has made Ohlssons NATIONAL CHAMPIONS for three years.

The efficiency of this basic design has been established beyond any question, and the "60 Special" has been proved by flight and wear tests to measure up in every respect to the name it bears.

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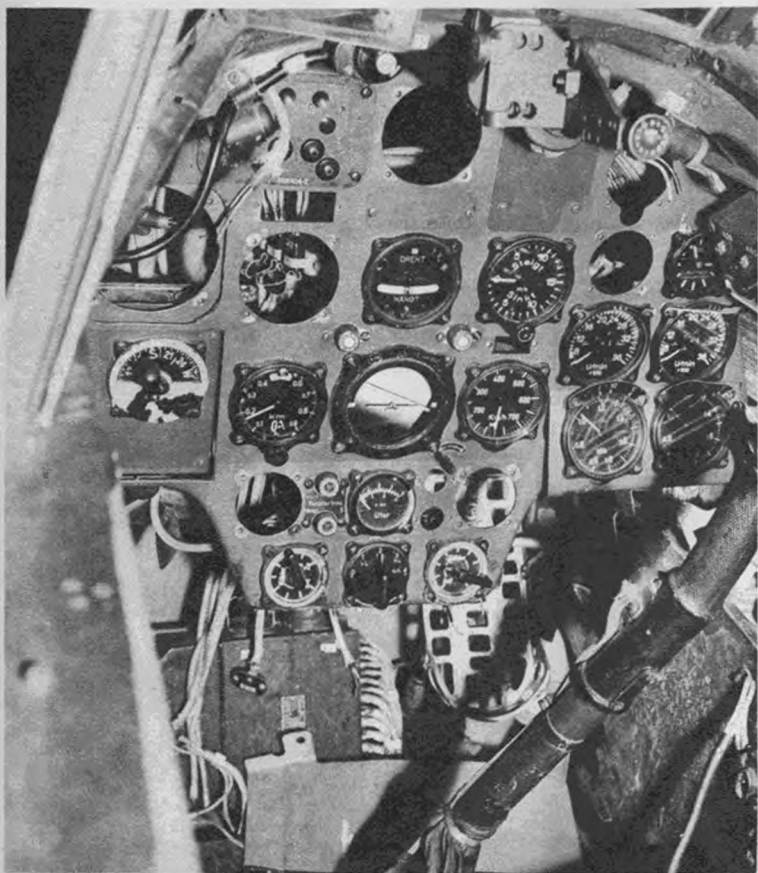
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WE STUDY NAZI VISITOR



Vultee worker examines fallen Messerschmitt 110 shipped here by British. Four guns shown are .30 cal. Hole in nose is for camera. Two 20-mm. cannons fit under nose.



Authorities agree German planes are well made, despite stories. Fault in 110 was lone swivel gun for rear protection. Holes indicate instruments removed for study.



CHOICE OF CHAMPIONS

Another champion, Sal Taibi, First Place Winner in Class "C", Open Division 1941 National Championship Meet, used FLO-TORQUE props on his winning flights.

Sal is a consistent user of FLO-TORQUE props and has this to say:

"I am writing this letter because I am sure you would like to know that I was using FLO-TORQUE props on my winning flights in Class 'C', Open at the 1941 Nationals.

I think FLO-TORQUE props are the best that can be obtained for flying gas models.

Aeronautically yours,

Sal Taibi"

FLO-TORQUE'S are available at three popular prices.

The INVADER at 15c and 25c

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On sale at all better model shops everywhere.

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SO

You Think You
Know It All?

Read

HINTS FROM
THE STICKS

in the

NOVEMBER
AIR TRAILS

Down The Runway

(Continued from page 49)

and hundreds of other questions will be apparent to anyone who mentally plans a contest in advance. Don't forget that your best bet is the contestant himself. Despite a lot of hard work on the part of hundreds of contest officials, there have been few, if any, perfect contests. We should capitalize on the efforts of others and learn by what has been done before. For instance, the usual "gripe" to be encountered is that it is difficult to get official flights in at all of the meets. If there have been enough processers, there may not have been enough timers. Or, if there have been enough timers, there were not enough recorders to keep the business of the meet flowing along smoothly.

After you have catered to the contestant's wants and provided ample facilities to insure his having a good time and competing in the first perfect contest of his career, give a little attention to your spectators. The reason most spectators crowd on the field of battle is to see what is going on—for how can you expect them to appreciate the activity if they are kept far behind some side lines?

Arrange special demonstrations for your eyewitnesses to keep them content. By means of a loud-speaker system have some of your contestants wind up a rubber model with accompanying rapid-fire sportslike description by the commentator. In the same manner, it is possible to put on a demonstration with a gas model. Show your visitors how a motor is fueled, how the timer is checked, the official and accepted method of launching the ship, and how the motor is tested. A raised platform is most excellent for this purpose and can serve as the announcer's stand as well. If you provide a lunch hour, take a tip from the Detroit clubs and stage mass flights with hand-launched gliders, or put on an "in the good old days" demonstration of twin-pusher flying.

In addition to novelty events which always lend sparkle and diversity to any meet program, you can also hold record trials for models not entered in your regular events. In this manner, it is possible to whip up contestant and spectator interest by announcing that Joe So-and-so will attempt a new national record with his outdoor helicopter—the only one of its type in captivity. Contestants, too, will appreciate the opportunity to try for new national records, providing you let them know about this plenty of time in advance, so they can make proper preparations for entering their unorthodox craft.

It would be highly improper if we did not seize this opportunity to stress the importance of having your competition sanctioned by the Contest Board of the Academy of Model Aeronautics. This will give national recognition to your competition and serve to demonstrate to prospective entrants that the meet is being conducted by reliable authorities under the official regulations which the

model builders themselves have assisted in writing. With so many hundreds of meets being held throughout the country, the designation as an official sanctioned affair will focus greater attention on the meet than if it were unsanctioned.

Besides, it sounds awfully good in your newspaper publicity to be able to say that the Academy of Model Aeronautics in Washington, D. C., the governing body for model aviation in America, has placed its stamp of approval on the contest and will recognize as official any new national duration records which may be set during the course of the competition.

Running a meet is like running a business, or better still, a horse race. The idea is to start out ahead of the contestant and spectator and to improve your position from there on. In this manner, you will finish ahead of these two characters to bring new laurels to your club and to yourself.

Before closing up shop for this month, we would like to say a word or two about prizes—those very attractive inducements which were originally designed to add zest to the fray and to denote the mark of championship. Today, however, the prizes have come to assume a position of paramount interest in the mind of every aeromodeler, and it is prizes that may prove your greatest stumbling block. What to give—merchandise, medals or money? To each and every contest director we have only this to say: The more you do the less people appreciate it. You can just build your prize list up to a point where it has no real significance to the average flier. And remember this, too. Cups, trophies, plaques and medals cannot be sold, swapped or flown out of sight like merchandise prizes.

We well recall a Louisville, Kentucky, meet which we attended this summer in which genial Bill Gibson of Hamilton, Ohio, the winner of the Class A and Class B open division gas model championships at the 1941 National Meet, placed fourth or fifth to receive a medal. Said Mr. G.: "In all my competition flying, this is the first time I ever won an honest-to-goodness medal and I value this just as much as I would a kit or inexpensive motor."

So you can see it is all very simple this running of meets. All you have to do is make your arrangements in advance, overlooking not a single detail, and then make sure everyone carries out his or her duties. Of course, on the day of the meet you will probably find that the chief timer left all the stop watches at home, or the chief recorder forgot to bring any pencils. But this is old stuff in the life of any experienced contest director—which you soon should be. Remember that the Academy was created to serve you, and if it can be of any help in your undertakings, just drop headquarters folks a line at the Willard Hotel in Washington, D. C. Timer!

CONTEST CALENDAR ADDITIONS
August 31st-September 1st. Atlanta, Ga. Class AAA Labor Day meet for

3 GREAT FLITES



Wings

SAL TAIBI'S Sensational TIME RUNS
Total 24 mins., 43 sec.
Individual flights: 1-22 (7 second motor run) 13-15 and 16-25.

FIRST

Pacer's

CHAMPION OF CHAMPIONS

60" WING SPAN

32 OZS. (With Engine)

4 SQ. FT. AREA

45" LENGTH



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Conquered

MORE THAN 1000

COMPETITORS IN THE Nationals

The cream of America's Modelers competed in this *** feature event of the Nationals—THE PACER 'C' Established itself as the Champion of Champions—carving out the most brilliant flight performance against all competition! PACER 'C' is a faithful adaptation (slightly larger) of the original, record-making PACER!

Field Proves 2000 Flights
With Over

This prize-winning achievement is no "flash-in-the-pan" performance! This aerodynamically perfected model demonstrated its consistency and stability when checked against more than 2000 field flights! It's a "bugproof" "foolproof"—a thrilling sky performance every time you send 'er up! For contest or sheer pleasure flying—you set the pace with PACER 'C'.

Strength in Every Line
Easy to Build and Transport

Complete kit contains detailed, full-size plans: Easy to follow and construct! Formed landing gear. Streamline wheels, printed sheets, Silkspan covering. Finest materials thruout! YOU MAY PAY MORE, BUT YOU CAN'T GET MORE!

Topper

FAMED GORDON MURRAY WINNER



A slightly re-designed adaptation of Murray's 1939 Nationals Winner! Climbs like a rocket!

Super deluxe kit with many extras. \$3.50

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The sleek, original Gordon Murray 58" wingspan plane which set new records after winning the '38 Nationals for any 'B' motor. Deluxe kit, wheels, etc. \$4.95

Bay Ridge Mike

1st Model Ship in Gas Model History!



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SENSATIONAL CLASS 'A'

Originally designed for Class B engines, then carefully revised for Class A. Plenty of THRUSTABILITY, easy to build! Fine contest type. 48" span. Complete kit, less sheets only \$1.49 pp

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Send complete, deluxe kit checked below. I enclose (Cash, Check, Money-Order). (Check which.) For COD kit reaches you.

PACER 'C' 1941 National Champ. \$4.85

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The A-C Timer is the first and only timer designed exclusively for gas models.

Works on airhydraulic principle with only one moving part. Impossible for unit to jam or be affected by motor vibration.

Duration may be adjusted from 0 to over 2 minutes. Duration not affected by motor vibration.

Easy to install. Has drilled holes for mounting timer to plane.

Midget size weighs only 1/2 oz. Regular size weighs only 3/4 oz.

Every timer checked for accuracy and fully guaranteed.

Midget Size \$1.25
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FREE 1941 Austin-Craft JUMBO CATALOGUE
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On orders under \$1 add 5¢ postage. Remit by money order, check or stamps. PRINT NAME AND ADDRESS.
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We have a large stock of GAS ENGINES on hand. Also a complete line of kits including Comet — Megow — Berkeley, etc. Send stamp for price list.
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A QUALITY ENGINE DELIVERING TOP PERFORMANCE IN CLASS "B", AT A PRICE YOU CAN AFFORD.
FEATURING commutator type timer... wide orifice exhaust port... micrometer needle valve... non-sooting air intake tube.
Easily assembled in a few minutes. All the moving and rotating parts are machined and carefully fitted at the factory. Guaranteed as to design, workmanship and material.
ORDER YOURS TODAY FROM YOUR DEALER OR DIRECT FROM MANUFACTURER
Bore 13/16"
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Displacement 28 cc.
Weight 4 1/2 oz.
Complete with spark plug but no coil or condenser.
Price \$4.95
IMMEDIATE DELIVERY
A Product of **WILLIAM L. BROWN, 3rd** 9636 No. TENTH ST. PHILADELPHIA, PA.



gas and rubber models sponsored by Atlanta Aero Engineers. Contact W. F. Roberts, 1115 Ponce de Leon Ave., N. E., Atlanta, for entry blanks. Prizes totaling \$200.

September 1st. Melbourne, Iowa. Class AA contest for gas models and rubber-powered entries sponsored by fire department of Melbourne. Merchandise awards totaling \$150. Wallace R. Blake, directing official, 321 N. 3rd St., Marshalltown, Iowa.

September 6th. Boston, Mass. Class A outdoor rubber-powered model meet of Junior Aviation League at Smith Playground, Allston (Boston). Club awards and points toward trips to Nationals. Gunnar Munnick, in charge. J. A. L., Jordan Marsh Co., Boston, Mass.

September 7th. Steubenville, Ohio. Class AA invitation meet for gas and rubber-powered models sponsored by Sky Hawks at model airport nine miles west of Steubenville on Highway 43. Motors and merchandise prizes. Frank Barilla, 422 Maxwell Ave., Steubenville, Ohio.

September 7th. New Haven, Conn. Class AA Northwestern States gas model meets at New Haven municipal airport, sponsored by Elm City Gas Hugs. Trophy and merchandise prizes. William Paulson, contest director, 529 Quinlup Ave., New Haven, Conn.

September 7th. Richmond, Va. Here's one you won't want to miss! Class AAA National Exchange Club Convention meet with more than \$200 in prizes. Technical end will be handled by modelers and leaders from N. A. C. A. Gas and rubber-powered events open to all and Virginia State Championship events for members of the Virginia Model Association. Richmond Exchange Club will assist under direction of R. A. Burton, Jr., 111 E. Broad St., Richmond, Va.

September 7th. Salt Lake City, Utah. Class AA Gas Model Meet at Gas-Hoppers Model Airport, sponsored by Douglas Models Co. For all classes of gas models. The gold Douglas Trophy and smaller cup together with merchandise awards will be offered in this Third Annual Douglas Trophy Contest. CD: Jack Douglas, 105 West 2nd St., S., Salt Lake City, Utah.

September 7th. Scranton, Pa. Class AA Northeastern Pa. Gas Modelers Ass'n. Fall Meet. At Scranton Airport for all classes of gas and stunt event. Trophies, motors, and merchandise valued at \$200. CD: William Devis, 1022 River St., Scranton, Pa.

September 7th. Philadelphia, Pa. Quaker City Class AAA Annual Invitation Model Airplane Contest for gas all classes and stunt event. Location to be announced. Sponsored by Quaker City Gas Model Airplane Ass'n. Approximately 250 entrants are expected to compete for trophies, merchandise and cash totaling about \$300. Joseph C. French, 2126 County Line Rd., Ardmore, Pa.

September 7th. Allentown, Pa. Class A Allentown Model Cadets Meet at Leh Farms (Lehigh Parkway) for rubber-powered models and gliders. Ernest Schaffhauser, 636 N. 10th St., Allentown, Pa.

September 7th. Albany, N. Y. Class A Capital District Aeronautic Ass'n. Invitation Meet for gas and rubber. At Albany Airport. Trophy and merchandise prizes. CD: Albert L. Hurd, 17 Locust St., Stop 29, Schenectady Road, Albany, N. Y.

September 7th. Akron, Ohio. Class A Edith Van Orman Chapter Outdoor Contest, at Municipal Airport. For gas: Class A, B and C; rubber; stick and fuselage. CD: H. M. Jeilison, vocational director, board of education, Akron, Ohio.

September 7th. Pittsburgh, Pa. Model Wings Class A Meet at Model Wings Field, for gas, rubber and T. L. gliders. Sponsored by Model Wings. Merchandise awards, 50 expected to compete. M. J. Thomas, 246 Morrison Dr., Pittsburgh, Pa.

September 14th. Pittsburgh, Pa. Sixth Allegheny Mountain Area Model Meet sponsored by Aero Club of Pittsburgh and Boys Club of Pittsburgh for gas, rubber, cabin and stick and gliders. There will be merchandise prizes. Harry G. Vogler, CD, 1633 Duffield St., Pittsburgh, Pa.

September 14th. Harrisburg, Pa. Class AA Capital City Cloud Chasers' Fall Contest. Dr. J. Clarence Bachman, 2121 Derry St., Harrisburg, Pa.

September 14th. Denver, Colo. Record Trials for the Exchange Gas Model Club of Denver. No prizes to be awarded. Harry W. Bennett, CD, 3405-07 East Colfax Ave., Denver, Colo.

September 14th. Silver Spring, Md. Silver Spring Aeronauts 2nd Annual Class AAA Meet, for gas all classes, rubber and gliders. Trophies and merchandise awards. Sponsored by Silver Spring Aeronauts Model Club. 200 contestants expected. Stewart Culp, 729 Silver Spring Ave., Silver Spring, Md.

September 14th. Philadelphia, Pa. Class AA Philadelphia Metropolitan A. M. A. Council Round Robin Gas Meet. Sponsored by one of the member clubs of the Metropolitan Council. CD: Joseph C. French, 2126 County Line Road, Ardmore, Pa.

September 14th. Holyoke, Mass. Class A Holyoke Gas Model Club Meet, sponsored by C. E. Walker & Co., Sport Shop, at Tobacco Fields near boundary of Holyoke and Westfield, just off Route No. 202. All classes of gas and events for rubber if enough interest shown. CD: Robert E. Ezold, 37 Lynnwood Ave., Holyoke, Mass.

September 20th. Atlanta, Ga. Class AA Atlanta Aero Engineers Night Flying Contest between the hours of 8:30 and 9:30 p. m. Prizes to be announced. Steak fry after contest. CD: W. F. Roberts, 1115 Ponce de Leon Ave., N. E., Atlanta, Ga.

September 20th. E. Hartford, Conn. Class AA Conn. Model Aircraft Meet at Rentschler Field for rubber, R. O. G. and stick; gliders and solid scale. Sponsored by United Aircraft Corp. and Y. M. C. A. (Hartford). Eighty to 100 entrants expected to compete for eight cups, medals and high point cups for both senior and junior events. Frank W. Schade, Room 510, City Hall, 27 W. Main St., New Britain, Conn.

September 20th. Boston, Mass. Class A Indoor Contest for Jordan Marsh-Boston Traveler Junior Aviation League members at South Armory, Irvington St. for stick hand-launched and stick R. O. G. models. Point system and club awards. CD: Gunnar Munnick, director, Junior Aviation League, Jordan Marsh Co., Boston, Mass.

September 21st. Pawtucket, R. I. Class AAA Second All Rhode Island Model Airplane Meet at Narragansett Race Track, Newport Ave., for gas, rubber and gliders. Trophies and merchandise. Sponsored by Pawtucket W. P. A. Recreation Center. Emile L. Dubuc, 681 Broadway, Pawtucket, R. I.

September 21st. Steubenville, Ohio. Class AA Sky Hawks Model Airplane Invitation Meet sponsored by Sky Hawks Model Airplane Club at Model Airport nine miles west of Steubenville on Highway 43. All classes of gas and rubber-powered stick and fuselage for motors and merchandise prizes. CD: Frank Barilla, 422 Maxwell Ave., Steubenville, Ohio.

September 21st. Pine Valley, N. J. Pine Valley Fall Gas Meet at Pine Valley Airport for gas all classes, plus a beauty and stunt event. Over \$400 in prizes will be awarded. Approximately 240 contestants expected, based on last year's attendance. E. N. Angus, CD, 24 Ormond St., Oaklyn, N. J.

September 21st. Springfield, Mass. Class A Springfield Monthly Model Meet at Westfield Model Field. Benjamin R. Bushey, 16 Carlisle St., Springfield, Mass.

September 21st. Allentown, Pa. Class A Allentown Model Cadets Meet at Leh Farms (Lehigh Parkway) for rubber-powered models and gliders. Ernest Schaffhauser, 636 N. 10th St., Allentown, Pa.

September 21st. Hampton, Va. Class A Hampton Roads Model Ass'n. monthly rubber model and glider meet at Morgan Field. CD: Dick Everett, R. F. D. No. 3, Box 111, Hampton, Va.

September 21st. Schenectady, N. Y. Record Trials. Capitol District Aeronautic Ass'n. Schenectady Aeronauts Division. For all classes rubber, gas and glider models. At Schenectady, N. Y. CD: Albert L. Hurd, 17 Locust St., Stop 29, Schenectady Road, Albany, N. Y.

September 21st. Yeading, Pa. Class A monthly meet of Mainliners Aero Club for rubber and gas models and merchandise awards. CD: William D. Coverdale, Jr., 85 Lincoln Ave., Yeading, Pa.

September 21st. Pittsburgh, Pa. Model Wings Class A Meet at Model Wings field for gas, rubber and T. L. gliders, sponsored by South Hill's Hobby Shop. Merchandise awards. Fifty to compete. M. J. Thomas, 246 Morrison Drive, Pittsburgh, Pa.

September 22nd. New York City. Academy Record Trials for all outdoor events except gas. Frank Zaic, 100 East 10th St., New York City.

September 28th. Akron, Ohio. Class A Edith Van Orman Chapter Outdoor Contest at Municipal Airport for gas: Class A, B and C; rubber; stick and fuselage. CD: H. M. Jeilison.

September 28th. Philadelphia, Pa. Class A Philadelphia Metropolitan A. M. A. Council Round Robin Gas Meet. Sponsored by one of the member clubs of the Metropolitan Council. CD: Joseph C. French, 2126 County Line Rd., Ardmore, Pa.

October 4th. Elkins, W. Va. Class AA Outdoor Contest at Smith Playground, Allston (Boston) for Jordan Marsh-Boston Traveler Junior Aviation League members. For rubber-powered models. Point system and club awards. CD: Gunnar Munnick, director, Junior Aviation League, Jordan Marsh Co., Boston, Mass.

October 4th. Elkins, W. V. Class AA Mountain State Forest Festival Championship Model Aviation Meet. At Municipal Airport. Sponsored by Mountain State Forest Festival for all classes gas and junior and senior rubber-powered stick and cabin models. Trophies and merchandise awards. CD: Carl Hopkins, 140 Thompson St., Clarksburg, W. Va.

October 5th. Pittsburgh, Pa. Allegheny Mountain Aero Model Championships, sponsored by Aero Club of Pittsburgh and Boys Club of Pittsburgh, for gas, rubber, cabin and stick and gliders. Merchandise awards. Harry G. Vogler, CD, 1633 Duffield St., Pittsburgh, Pa.

October 5th. Denver, Colo. Record Trials for the Exchange Gas Model Club of Denver. No prizes to be awarded. Harry W. Bennett, CD, 3405-07 East Colfax Ave., Denver, Colo.

October 5th. Atlanta Ga. Class A Atlanta Aero Engineers Club Contest.

W. F. Roberts, CD, 1115 Ponce de Leon Ave., N. E., Atlanta, Ga.

October 5th. Yeadon, Pa. Class A Monthly Meet of Mainliners Aero Club for rubber and gas models. Kits and merchandise awards. CD: William D. Coverdale, Jr., 85 Lincoln Ave., Yeadon, Pa.

October 12th. Philadelphia, Pa. Class AA Philadelphia Metropolitan A. M. A. Council Round Robin Gas Meet. Sponsored by one of the member clubs of the Metropolitan Council. CD: Joseph C. French, 2126 County Line Rd., Ardmore, Pa.

October 12th. Steubenville, Ohio. Class AA Sky Hawks Model Airplane Invitation Meet sponsored by Sky Hawks Model Airplane Club at Model Airport nine miles west of Steubenville on Highway 43. All classes of gas and rubber-powered stick and fuselage for motors and merchandise prizes. CD: Frank Barilla, 422 Maxwell Ave., Steubenville, Ohio.

October 12th. Pittsburgh, Pa. Class AA Tri-State Championship Meet at Model Wings Field, for gas, rubber and T. L. gliders, sponsored by So. Hills Hobby Shop. Merchandise awards. Fifty expected to enter. M. J. Thomas, 246 Morrison Drive, Pittsburgh, Pa.

October 18th. Boston, Mass. Class A Indoor Contest for Jordan Marsh-Boston Traveler Junior Aviation League members at South Armory, Irvington St., for flying scale models, hand-launched gliders, and Paul Gullow kit models. Point system and club awards. CD: Gunnar Munnick, director, Junior Aviation League, Jordan Marsh Co., Boston, Mass.

October 19th. Hampton, Va. Class A Hampton Roads Model Ass'n. monthly

rubber model and glider meet at Morgan Field. CD: Dick Everett, R. F. D. No. 3, Box 111, Hampton, Va.

October 25th. New York City. Academy Record Trials for all classes outdoors except gas. Frank Zaic, 100 East 10th St., New York City.

November 1st. Boston, Mass. Class A Indoor Contest for Jordan Marsh-Boston Traveler Junior Aviation League members at South Armory, Irvington St., for stick hand-launched and fuselage R. O. G. models. Point system and club awards. CD: Gunnar Munnick, director, Junior Aviation League, Jordan Marsh Co., Boston, Mass.

November 15th. Boston, Mass. Class A Indoor Contest for Jordan Marsh-Boston Traveler Junior Aviation League members at South Armory, Irvington St., for flying scale models, hand-launched gliders and Paul Gullow kit models. Point system and club awards. CD: Gunnar Munnick, director, Junior Aviation League, Jordan Marsh Co., Boston, Mass.

December 6th. Boston, Mass. Class A Indoor Contest for Jordan Marsh-Boston Traveler Junior Aviation League members at South Armory, Irvington St., for stick hand-launched and stick R. O. G. models. Point system and club awards. CD: Gunnar Munnick, director, Junior Aviation League, Jordan Marsh Co., Boston, Mass.

December 20th. Boston, Mass. Class A Indoor Contest for Jordan Marsh-Boston Traveler Junior Aviation League members at South Armory, Irvington St., for flying scale models, hand-launched gliders and Paul Gullow kit models. Point system and club awards. CD: Gunnar Munnick, director, Junior Aviation League, Jordan Marsh Co., Boston, Mass.

"Don't Quote Me!"

(Continued from page 49)

seven delicious flavors. Lewis Barnett calls them "Nuts in Technicolor." Now that the import business has gone with the wind, we can look for many interesting items from International.

Berkeley Models are whispering about a radically different type of construction for a new line of gas models. Plastics! (What else?)

Joe Ott's new line of models will positively be the easiest to build ever. At least seven patents cover the jig type of construction by means of which the models are assembled. The plan makes the jigs and bond paper substitutes for balsa in many structural parts. The whole set-up looks very good and is the first new development in model construction in years! Joe Ott knows how to merchandise. His boxes were always superb, and his plans so good we are surprised other manufacturers haven't followed suit long ago!

Flying scale fans will get a break about the time you read this when Cleveland brings out their two new three-quarter-inch scale models, a Curtiss P-40 at \$2.50 and a Lockheed "Lightning" Interceptor at \$3.50. Cleveland's redesigned gliders are in production. "Built-up" construction has been substituted for the solid pod on the Eaglet and the nose on the Condor. Cleveland is justly proud of its gliders. Even the Class A indoor Dart has been flown out of sight outdoors.

What's this about priorities hurting gas engine production? Phil Zechitella, sales manager for Junior Motors, tells us his firm is going ahead full steam on development and

production of a new Class B engine. Other production has been shut down while extensive tooling is being rushed. The new motor is a vast improvement over the old Brownie, which has been redesigned, with new dies and castings for all parts. A new type fuel feed control, new ignition timer, improved cylinder scavenging, increased port area, new type lapped piston, and new type connecting rod are some of the features. No delivery dates are available as yet, depending on deliveries of raw materials.

Barker Engineering Co., whose Spitfire engine received high praise from owners, reports that due to the present priorities system raw material shortages prevent immediate deliveries of orders. However, precision machinery used by model engine manufacturers is fitted for defense orders and Barker holds contracts for small aircraft parts.

Burkard Model Engineering Co. is expanding plant facilities to a modern two-story building where they will occupy the entire premises. A new line of giant metal-covered scale models is planned. A navy seaplane trainer (Ryan STM-2) will be added to the regular line. . . . H. & F. will introduce within a month a forty-two-inch wing span Grumman Skyrocket similar to the flying scale job by Sidney Struhl in a recent issue of Air Trails.

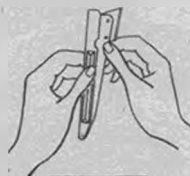
The C. Z. Model Airplane Co., Chicago, originators of metal-covered model airplanes, now have nine models in their line and will announce several new ones shortly. These come in kit form and retail from 50 cents up. This company started to manufacture metal-covered model kits about two years ago and has several times moved to larger quarters.

BOYS, YOU'VE NEVER USED A KNIFE LIKE THIS BEFORE!

- DOUBLE-EDGE
- ★ The blade can't slip
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New 3/4" War Models . . . now 6 in all!

LOCKHEED "LIGHTNING" P-38
World's fastest fighter. Span 38 1/2". Huge, powerful twin motor model. Complete Kit SF-85, only **\$3.50**

PLAYBOY SENIOR

Huge 80 inch span. Class C. A consistent winner everywhere. Kit GP-5017 (complete except power unit) only **\$3.95**

PLAYBOY JUNIOR

Big 54 inch span (360 sq. in.) Class B. The one they have to beat to win. Kit GP-5006 (c. e. p. u.) only **\$2.50**

BABY PLAYBOY

Class A. 35" span. Biggest dollar value on market. Kit GP-5005 (c. e. p. u.) only **\$1.00**

Other Popular Models

Cleveland Wakefield Gull. Span 45". Kit E-5013. . . . \$1.00
Cleveland Javelin. Span 39". Kit E-5011. . . . 25c
Cleveland Thermaller. Span 36". Kit E-5014. . . . 50c
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CURTISS P-40 "TOMAHAWK"

Very efficient fighter. Ordered in great numbers by British. Span 28". Complete Kit SF-77, only **\$2.50**

SPITFIRE Similar to above. Span 27 1/2". Complete Kit SF-73. **\$2.50**

AIRACOBRA Span 25 1/2". Complete Kit SF-76. **\$2.50**

ME-109 Span 24 1/2". Complete Kit SF-74. **\$2.50**

GRUMMAN "SKYROCKET"
Span 31 1/2". Complete Kit SF-75. **\$2.50**

BIG 7-FT SPAN
CLEVELAND CONDOR Soaring Glider. Span 84". Class D or E. Complete Kit E-5019. **\$1.00**
CLEVELAND EAGLET Soaring Glider. Span 48". Class C. Complete Kit E-5018. **.50**

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These are "top-value" kits.
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A SNAP TO START!
O. K. ENGINES

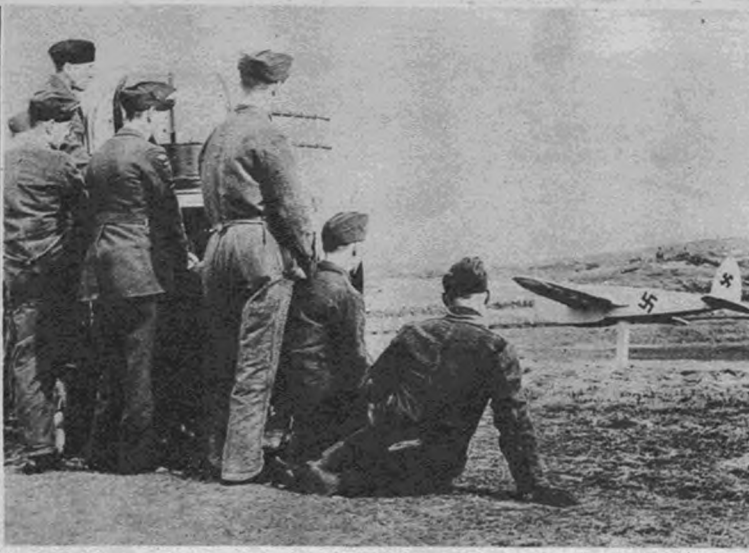
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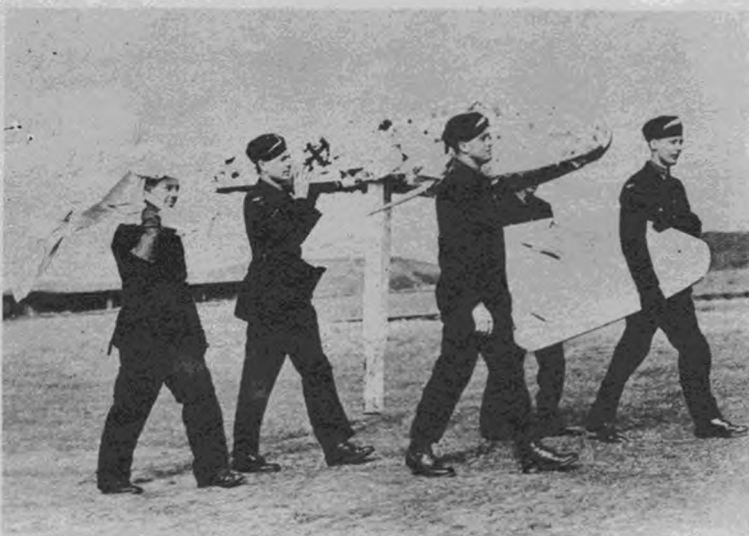
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British student gunners find their eye by potting dummy Nazi planes at novel shooting gallery.



Our erstwhile Heinkel bomber is peppered on the wing, quite literally. Note how guns tilt almost vertically. Power turrets turn guns against the strongest slipstream.



Take it away! Four turret guns fire at combined rate of close to 5,000 rounds a minute! Powered turrets of British are among sensational developments of the war.

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It's a Glider AND a Flyer!

*Class "B" *Wingspan—33½" *Length—21½"
For the longest, smoothest soaring flights you've ever experienced, fly this new, double-purpose glider. Easy to build, complete kit includes all necessary materials for building both the glider and the flyer—only **50¢**

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Big 30" Wingspan **95¢**
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CURTISS SB2C-1 U.S. Navy Dive Bomber
REPUBLIC P-47 U.S. Army "Thunderbolt" Pursuit

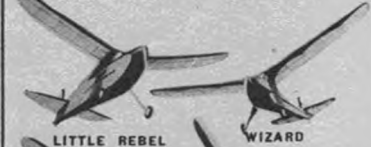


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Scientific's **25" WINGSPAN**
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MEGOW

Super Quaker
Gas Model \$4.50

(By mail, postage 20c extra)

The new SUPER-QUAKER attracts attention everywhere it appears. It is a REAL airplane . . . a thoroughbred in every line that makes winners of the fellows who build and fly it. With automatic Retractable Landing Gear and ultra-streamlining, this new Megow gas model climbs like a frightened hawk. It is brand-new—and already has won top prizes in contest flights. The new Megow SUPER-QUAKER has many of the features that made the Flying Quaker and the Quaker Flash so famous . . . but new ideas have been developed, and improvements added that surpass all previous designs. It has shown consistent performance of five-minute flights or more on twenty-second engine runs. The SUPER-QUAKER is a Class C, six-foot, four-inch wingspan model. The kit is complete except for liquids, wheel and power plant. Full size plans are included, and all materials carefully selected.



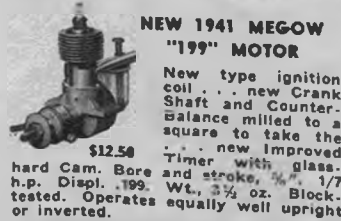
Ranger
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Primarily a Class B, the Ranger is a Class A when used with the "199" motor shown below. Span 46". Weight, ready to fly, 18 1/2 Oz. Comp. with motor, wheels, propeller, flight timer and kit, \$15.75. Kit only, \$1.50. By mail, 20c extra.



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95c

New type designed to take the "199" engine. Easy to build. Small, light, and sturdy for safe landings. Span 46". Kit E-21, less wheels and propeller, 95c. Complete with engine, wheels, propeller, kit and flight timer, \$14.95. By mail, 20c extra.



NEW 1941 MEGOW "199" MOTOR

New type ignition coil . . . new Crank Shaft and Counter-balance milled to a square to take the . . . new Improved Timer with glass. h.p. Displ. .199. Wt., 3 1/2 oz. Block-tested. Operates equally well upright or inverted.

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PHILADELPHIA, PENNSYLVANIA

With all the talk about increasing the weight rule for gas models, the remarks in the Fresno (Calif.) Gas Model Association *News* (June) are especially pertinent. Thermals on the West coast are both powerful and plentiful. At a recent Bakersfield contest the first five places were over 30 minutes. Many ships fly out of sight and are never found. Recently Vernon Oldershaw launched his job at Coalinga; it was found in Salinas, eighty-five miles away. Al Bissonett recovered his some forty miles from the take-off. The West coasters would like to see the AMA form a Western division to formulate suitable rules for holding the models under control. Suggestions are invited by the editor of the *News*, Route 2, Box 89, Fresno, Calif. Considering what has happened at Chicago and contests in the East, model builders in all parts of the country should be willing to go along with any rule changes that would eliminate the bulk of O. O. S. flights.

Milwaukee Gas Model Club has changed its name to the Milwaukee Model Aviation Club so the members who build rubber models wouldn't feel neglected. There's a corresponding change in policy encouraging rubber modeling with a hydro contest as one of the first projects. The Third Annual Wisconsin State Meet was a success despite the weatherman and a tough time finding a suitable field. Older builders should be happy about Henry Gebhard who is in his late forties but can still teach the youngsters a few tricks. He won the finish and workmanship award. James R. Custin is publicity man for the MMAC. He ends his letter about their activities this way: "Just as last year, this contest report comes in late because Custin has to monkey with radio control instead of tending to business." How can you get sore at a guy like that!

ON THE FIELD. (By Carroll Moon.)
Verdun, Canada. Aero enthusiasts, aside from those in the R. C. A. F., fly in the model airports of the North, according to our correspondent in this section. Lawrence Flood, proprietor of the Verdun Stamp and Hobby Shop, promoted the contest and acted as contest director at the meet held July 13th, and reports that several thousand witnessed the flying events. In Class A, rubber event, Marshall Green won with 2 minutes, 24 seconds. In the Moffett event, Green was first with 1:32, with his second ship taking second. Eric McIntyre took the Class E glider event with :40 3.5. Yvon Cerat took the gas model event with 1:41. Grand prize for the day was an O. K. motor. H. Pound was announcer while Charles Eastman, W. Main and W. Freshner were assisting officials.

Linden, N. J. We have received (via fast dog team) the June issue of the LMAG (Linden) *Gazette*, and it's a right smart mimeographed paper of several interesting pages. The Linden group is exceedingly active and members of the club are always among the

top winners in any Eastern contest. We congratulate the publishers, the club and Mary Walker. Oh, yes, they also fly airplanes.

Lincoln, Neb. July 22nd was the date of the Four-State Model Meet held at Fairburg, Neb., which was attended by some 150 of the top modelers in the area. Jack Moralez directed, and reported that a "swell time was had by all," despite a prevailing wind. Ed Manion, of Lincoln, took first in Class A with an average of 99.3. Parmenter took first in Class B with a three-flight average of 354.9. In Class C, Don Woods of Omaha took top honors with 261.3 average. In the Class C rubber event (junior), Jimmy Pierce of St. Joseph, Mo., was first with 234 seconds. In the senior event of this group, Gerhard Omen, Jr., of Gladstone, Neb., took first with 256.3. The tow-line glider event was won by Jack Spaulding, of Lincoln, with :39.3. In the HL glider event, Bob Fox was first. Don Woods, who won the Class C gas event, had the best single flight of the day, which was 13:04.2.

National City, Calif. The first annual meet of the San Diego Aëroceers, held June 1st at the club's field, proved such a success that the Model-Air's Rubber-powered Club (which we gather was the power behind the event) is now pointing to bigger and better things in the future. For one thing, the meet proved the widespread interest in rubber events, attracting entrants from San Bernardino, Los Angeles, El Centro and Santa Barbara and other California centers. Harold Strawn acted as contest director and cash awards totaling \$25 were offered as prizes as well as trophies and merchandise. Oh, yes, Bob Schniedling of Chula Vista reported the event. Congrats, Bob, and what this country needs is more rubber builders who know an airfoil from a prop and when to build in adjustments and when to call it just a plain warp of the wing.

Daytona Beach, Fla. Question: Did anyone see Bill Ramsey of Daytona Beach at the Nationals? Well, he was there traveling free on top honors won June 14th-15th at the Florida State Model Airplane Meet held in Daytona Beach. The meet was attended by seventy of Florida's best modelers, and Bill took the top prize of a \$150 trip to the Nationals. The event was sponsored by the Daytona Beach Exchange Club. W. T. Thomas, AMA contest director for Florida, was chief official and he was assisted by members of the city recreation department. Trophies posted by Eastern Airlines and a Class C cup donated by Eddie Rickenbacker were among the top prizes. Gene Chaille (a prominent Air Trails contributor) was up from Miami with a large delegation, and Gene finished second in the State competition. Because of wind, motor runs were cut to 15 seconds.

John Foley of Daytona Beach won the junior glider event with :56 sec-

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onds. Gene Chaille won the senior and open glider event with 1:38.5. Gene also won the fuselage (rubber) event with 2:14.6. In the stick event, Tony Sylvia of DeLand was first with 1:48.7. Ramsey won the fuselage event with 3:27.6. Ramsey also won the stick event with 4:10.1. In the Class A gas event, Charles Johnson of Jacksonville was first with 2:25.6. Ramsey was first in Class B gas with 2:27.4. W. D. Hoffman of Sanford took Class C gas with 6:07.4.

New York City. As predicted, the flight center for modeling in the New York area has moved eastward to Hicksville, L. I., approximately twenty-five miles from Times Square. There, on July 5th, the Sky-Chiefs held their first contest, and, although times were not high, it proved that

Lightning On A Leash

(Continued from page 45)

Another variation of controlled gas-model flying, developed by Victor Stanzel & Co., Schulenberg, Texas, is known as "G-Line" flying. Stanzel's system is simplicity itself. The model is flown on the end of a single silk or linen line (18 to 45 pounds test) attached to a rigid eight-foot pole, preferably a fishing pole. Elevators and rudder are adjustable for trim, but are not actually controllable. The pilot controls the model by dipping the stick to cause a dive, or raising it for climb. A regulation casting-rod tip through which the G-Line passes prevents entanglement of the line around the pole tip. Average length of the line is 35 to 50 feet, the shorter length being recommended in windy weather. The same flying precautions apply to both U-Control and G-Line flying.

Naturally, in order that the pilot have complete control of the model at all times, the control lines must be taut. To insure this, the model is adjusted to fly "against the circle." When flying in the usual counter-clockwise direction, the rudder should be set at least ten degrees to the right (looking at the model from rear to front) and the thrust line be offset about four to six degrees in the same direction. These adjustments along with the centrifugal force the model creates while flying will definitely keep the control lines taut at all times—when the wind velocity is low. However, when a fairly strong wind is blowing, the wind very often forces the model off its usual path of flight and consequently the control lines slacken. Slackening of the control lines is very dangerous and should be avoided by keeping the model low and in an even or slightly downward path of flight. In other words, never have the model climb into the wind, and always loop with the wind at your back.

Following is a list of safety suggestions outlined by Jim Walker, of American Junior, for Mr. I. V. Packard of the Nebraska Aeronautics Commission, for Fireball flying:

1. The boundaries of the circular flight should first be determined and all spectators kept at least twenty-five feet back of this area.

interest had not lagged in the metropolitan area—almost seventy-five enthusiasts participated in a little-advertised contest. Bernie Licquorman, of the Sky-Scrapers, with a scaled-up Diamond Demon, took first in Class C with an average of 2:36, narrowly nosing out Max Jurist who averaged 3 seconds less. Licquorman's plane used a Brown motor and achieved its time by its consistent flights. Jurist had a plane of his own design powered by a Comet 35. The ship was terrific, employing a retractable gear and achieving a terrific climb. Although the first two flights were not sensational, a flight of over 4 minutes O. O. S. proved the plane's worth on the third attempt. Cliff Travis, flying a Bantam-powered ship of his own design, took first in the combined A-B Class.

2. It is preferable that all spectators stand on the windward side of the pilot, since at this point centrifugal force is minimized and ground speed of plane is decreased.

3. Before making flight, the operator should make strength test by exerting at least a fifteen-pound pull on control lines.

4. Flying area should not be adjacent to take-off point of free-flying model craft.

5. Care should be taken that spectators do not enter flying circle while plane is in air. In the event of spectators entering the ring while plane is in the air, the landing spot can be selected by the pilot running away from the plane in a circle. This will keep it in the air until it is desired to bring it in.

6. During speed events, all diving starts should be made against the wind. Timer and timing point should be directly to windward of plot.

7. All loops and high maneuvers should take place downwind from pilot in order to prevent slackening of lines and the possibility of losing control.

Since the control lines slacken slightly now and then, just enough to cause the model to become erratic because of the flimsy elevators, we resort to a little trick which will automatically return the control plate to the neutral position. Our "automatic pilot" consists of two rubber bands attached to each end of the control plate. The tension of each should be slight but equal, so that when no pressure is exerted on any of the control lines, the control plate is pulled back to the neutral position. Thus, when the wind forces the lines to slacken, the rubber bands pull the control plate into the neutral position, thereby stabilizing the model until the lines become taut again.

To prevent the model from side-slipping to the right in case of too much rudder and right thrust-line adjustment, a "spreader" is attached to the center of the left wing half. The spreader should guide the control lines so they are perpendicular to the center vertical fuselage line. In general, the distance between the two spreader line guides should be about half the average wing chord.

When we come to adjusting the elevator movement for a slight climb or, as the case may be, loop, we are more or less stumped because the elevator setting varies with each particular model. For this reason the "trial and error" method of adjustment is the most widely practiced. Determining the correct elevator area is also a great problem because the

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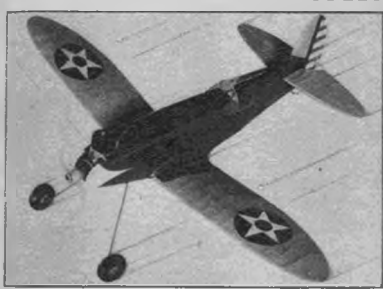
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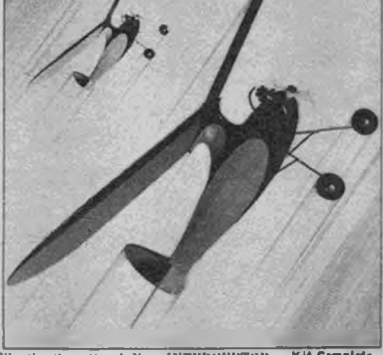
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greater the elevator area the more reactive the model. In general, it is safe to make the elevator area about one fifth the total stabilizer area, the aspect ratio of both being the same. To help prevent a major crack-up on the first test flight, the elevator movement should be not greater than two degrees in both up and down directions, all measurements being taken from the neutral position. After you have a half-hour of "time" with the elevators in the "training" position, you should adjust the control-plate movement so the upward elevator movement is twice that of the downward angle. This will permit you to start stunting without the fear of not having your job forget to pull out of a loop.

The choice and upkeep of control lines is a major factor in successful control-line flying, and only the best steel piano wire should be used. (Silk or linen line for "G-Line" flying.) For models having a weight up to 24 ounces and flying in a one-hundred-foot circle, .010-diameter steel wire is ideal. Models in the 24 to 30 ounce class should fly with .012-diameter piano wire lines, while any other job up to 4 pounds should fly on .018-diameter stock. The condition of the control line is just as im-

portant as the condition of the model, so be certain your control lines are free from rust and kinks. You never know when a sudden jerk will be exerted on the lines, and should they be weakened by rust or a kink—well, you fill in from there on.

Before and after flying, your "control lines" should be always kept on a spool because, as you probably know or else will find out, a roll of tangled, springy piano wire is better than the best jigsaw puzzle ever worked out!

The diameter of circle you wish to fly in varies anywhere from 100 to 600 feet. Of course, stunting with a 50-foot control line is apt to be dangerous, unless you are certain of the elevator setting and the maneuverability of the model in general. The diameter of circle for all-around flying is about 150 feet, which calls for a 75-foot line. But after a bit of experimentation, which will include some rough landings, you'll be able to handle your model as an army pilot handles his pursuit plane. And talk about getting dizzy as you twist with your model lap after lap—well, all we model builders are more or less inclined to be that way, anyway, so we shouldn't mind it too much!

Cut That Skin Friction

(Continued from page 52)

since it fairs directly into the pylon, it detracts not a bit from the symmetrical airflow, and in fact adds not only to appearance, but to performance.

An additional feature on the ship was a pants on the single wheel. Experts have figured that a single wheel may add as much as ten percent drag, but the pants reduces this by at least fifty percent. Strange as it may seem, this pants actually adds strength to the landing gear, for its rigidity helps hold the ship in an upright position during those hard landings.

The writer has designed many ships, both gas and rubber, in his years of modeling. Among these was

the Rocketeer, which last year took the California Championship. But no ship ever to emerge from his workshop showed the promise of the Theoradical, in any way. Thanks to the reduction of all drag forces, the ship has an astounding climb, very fast and almost vertical in angle. It has averaged better than five minutes in its first two days of tests, despite poor weather and lack of thermals. Hitherto the writer had considered it impossible to do better than two or three minutes without thermals, but the Theoradical proved the theory wrong. But it did prove one theory to be right—that reduced skin friction makes for flight efficiency.

Pilot This Vanguard!

(Continued from page 47)

smooth joint between the wing and fuselage, cut away the bottom of the fuselage to fit the wing spars, and, after the rib bottom blends into the fuselage bottom contour, cement the wing into place at zero degrees incidence.

The control mechanism we employ is very similar to that used by Jim Walker on his U-control Fireball model. The control plate is cut from 1/16" sheet aluminum and mounted on a 1/16" piano-wire pivot point which in turn is securely anchored to the main (center) wing spar. To smoothen the movement of the control plate, two "slide rails" on which the control plate rests are cut from hard 1/4" sheet balsa and cemented in position where shown. After the 1/8"-diameter elevator control rod is attached to the arm of the control

plate, loop a 2" length of 1/8" flat rubber from hole A to the opposite fuselage wall and a similar length from hole B to the fuselage wall opposite. The tension of both rubber bands should be rather slight but equal. This acts as an "automatic pilot" because it will automatically return the control plate to the neutral position should the control lines become slack.

To both holes labeled C and D we attach a 12" length of flexible cable 1/32" in diameter which passes through the 1/8" brass bushings cemented to the sheet-covered section of the wing bottom. The cable attached to both ends of the control plate passes through the bushings, through the piano-wire "spreader" located on wing rib 4 of the left panel, and then is hooked to the .010 piano-

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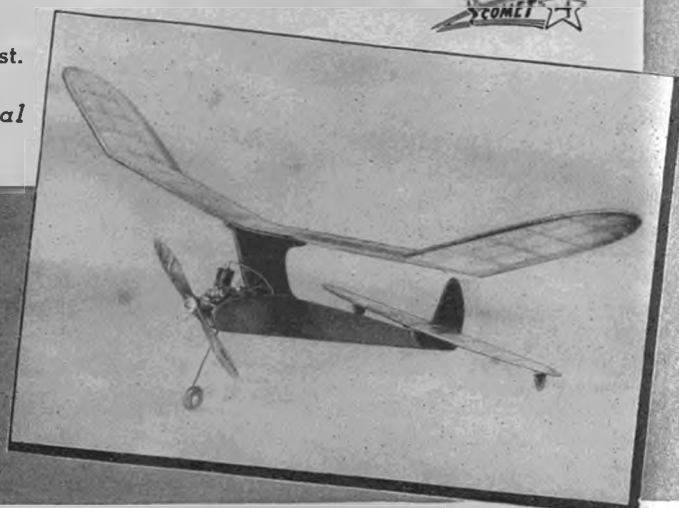
First Places	Class C—Junior	Jerry Brofman.....	Sailplane-
	Class B—Junior	Eddie Vargo.....	Zipper
	Class B—Senior	P. W. Klintworth.....	Zipper
	Class B—Open	W. A. Gibson.....	Zipper
	Class A—Open	W. A. Gibson.....	Zipper
Second Places	Class C—Junior	Charles Alsdorf.....	Zipper
	Class C—Senior	Bud DeBolt.....	Zipper
	Class C—Open	Ray Acord.....	Sailplane
	Class B—Open	Karl Girten Jr.....	Zipper & Interceptor
Third Places	Class C—Open	Herbert P. Andrews.....	Sailplane
	Class B—Senior	Bill Lutz.....	Interceptor
	Class B—Open	Herbert P. Andrews.....	Zipper

- Longest single flight any gas event: Ray Acord—Sailplane—19 minutes 53.6 seconds.
- Sailplane also placed in Radio Control Contest. Ship weighed 4 lbs. 14 oz. complete.
- Above information obtained from official contest records.

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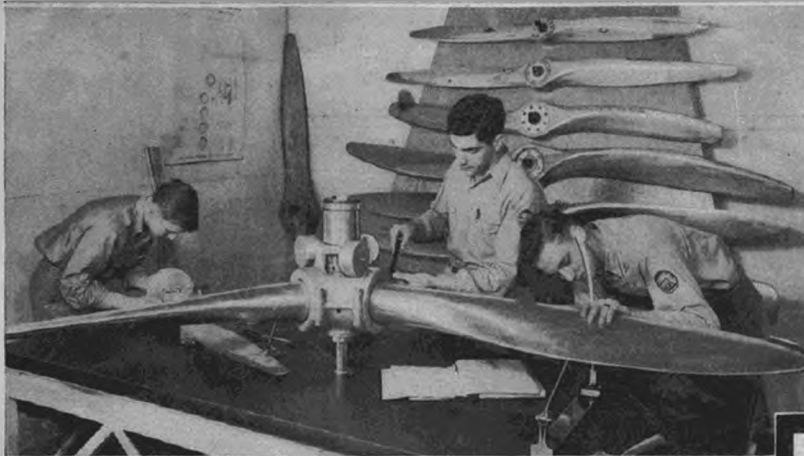
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