

AIR TRAILS

Pictorial

A STREET & SMITH PUBLICATION

MARCH

1943

20c

25 CENTS IN CANADA



THE JAP AIR FORCE

FULL COLOR SPREAD DOUGLAS A-20A
CONTROL-LINE CURTISS WARHAWK



BELL AIRACOBRA

**YOUNG MEN
16 and 17
YEARS
OF AGE ★★**

**The War Need Not
Prevent Your
Enjoying a Great
Lifetime Career
★★★**



After high school . . . what? Does continued education for a future career seem impossible? Listen . . . one of the greatest opportunities for a real lifetime career in one of the most important industries the world has ever known awaits young men of 16 and 17 years of age who act now!

Will Victory Catch You Unprepared?—America is going to win this war . . . and America is going to be the world leader in the gigantic aviation industry that is sure to follow the war. Men who have had specialized training in any of the various branches of aviation can be prepared to step into the important positions in this great commercial aviation industry ahead. On the ground and in the air, with the nation's many airlines and manufacturers, most unusual opportunities will be available for those who are ready. In the meantime you will be training to become a skilled aviation technician that can rate a definite advantage when and if you are called to military service.

SPARTAN School offers you the opportunity now to continue your education for a lifetime career that can be both colorful and prosperous. Recognized as the outstanding civil aviation training school in America, SPARTAN provides superior specialized training in any branch of aviation you choose. You're just the right age to get a head start on the world of tomorrow. But you should act at once! Mail the coupon for catalog. Next semester starts March 15th.

Special Announcement—Spartan Government Approved Aircraft or Engine Mechanic Course is now given in 20 weeks, and Airline Service Mechanic (A&E) Course is now 40 weeks, in line with revised wartime regulations of the Civil Aeronautics Authority to supply a greater number of licensed mechanics to the aviation industry. Write for details.

The "UNIVERSITY OF AVIATION" Awaits You

SPARTAN is a genuine "University of Aviation", where the highest ideals of educational training are maintained. 29 modern buildings located on 50 acres—completely equipped laboratories and shops—a fleet of training planes valued at \$200,000—seven flying fields—Government Approved and top-rated in the industry. The Spartan catalog will tell and show you ALL the interesting facts.

SPARTAN

SCHOOL OF AERONAUTICS
DIVISION OF SPARTAN AIRCRAFT COMPANY



SPARTAN SCHOOL OF AERONAUTICS—Captain Maxwell W. Balfour, Director. Address Dept. AT-33, Tulsa, Oklahoma

Send me your new Catalog, describing in detail the SPARTAN courses I have checked, also stating tuition and living expenses.

NAME AGE

ADDRESS

CITY STATE

PREVIOUS EDUCATION

CHECK COURSES YOU PREFER

- Commercial Pilot
- Airline Pilot
- Commercial Flight Instructor
- Aeronautical Engineering
- Airline Maintenance Engineering
- Aircraft or Engine Mechanic
- Aircraft Sheet Metal
- Aircraft Assembly Mechanic
- Airline Service (A&E) Mechanic
- Airline Communications
- Private Pilot Course
- Weather Forecasting
- Instrument Technician
- Women's Instrument Technician

Should You Enter Parks Air College

NOW?



Shown on this page are Parks graduates in representative fields of aviation. More than one-tenth of all graduates are flying officers in the Army and Navy.



Yes, Parks Air College is continuing its specialized aviation training for a capacity enrollment of civilian students.

Because graduates have proven themselves to be of superior value in every department of aviation, it can be expected that nothing will interrupt this important contribution to the war effort.

Your immediate question is: *Should you enter upon this training now?* Here are two other questions that will serve as sign posts for you in answering the first.

Do you have a genuine and lasting interest in aviation as a career field?

Is it your purpose to make yourself of the greatest possible value in wartime aviation?

If you can answer "Yes" to both of these questions, you can well consider taking up your training as soon as you fulfill entrance requirements and can be accepted by the College.

You have been told by the Commander-in-Chief of all our armed forces that *it is your "patriotic duty" to secure all possible training so that you will be prepared "for greatest usefulness to your country,"* and you can be assured that nowhere are men with comprehensive training more urgently needed than in aviation.

If you are a high school graduate, if you rank in the upper two-thirds of your class, if you have an interest in and love for aviation that will enable you to maintain an unusually heavy training schedule, and if your goal is to make, in time, really valuable contributions to the development of aviation, you are invited to investigate further the training that Parks offers you.

The catalog outlining in detail each of the four courses, and providing much other useful information, will be mailed you on request. It is free. Write or use the coupon.

PARKS AIR COLLEGE

East St. Louis, Illinois

PARKS AIR COLLEGE was founded August 1, 1927. Has enjoyed full Federal approval longer than any other aviation school.

Is accredited in its Aeronautical Engineering School by the Illinois Superintendent of Public Instruction.

Included since 1938 in The Directory of Colleges and Universities, issued by the United States Office of Education.

Has a capacity enrollment of 300 commercial aviation students, also detach-

ments of U. S. A. Air Forces Aviation Cadets and Mechanics.

Has its own airport with a school plant of 25 buildings devoted to school purposes entirely, also a group of fields for military flight training.

Has a faculty of 104, each especially qualified for his particular field of instruction.

Open to high school graduates with a ranking in the upper two-thirds of their classes.

PARKS AIR COLLEGE
East St. Louis, Illinois

Section AT-3

Please send me details of four major courses in commercial aviation training.

Name..... Age.....

Address.....

City..... State.....

LIGHTHOUSE OF THE FUTURE

AIR TRAILS

Pictorial

A STREET & SMITH PUBLICATION



POLLY SMITH PHOTOGRAPH

Aviation is the career which young men can follow with confidence. It is the lighthouse of the future . . . the beacon which will guide the world safely toward security after the war.

DALLAS AVIATION SCHOOL

LOVE FIELD

DALLAS, TEXAS

MAJOR W. F. LONG
DALLAS AVIATION SCHOOL
LOVE FIELD, DALLAS, TEXAS

PLEASE SEND ME A COPY OF YOUR FREE CATALOG.

NAME AGE

ADDRESS

CITY STATE

Air Trails 3-43

MARCH, 1943 VOLUME XIX NO. 6
20 CENTS PER COPY \$2.00 PER YEAR

CONTENTS

WHY THE MOSQUITO?	By James L. H. Peck	6
GUNS UP TO NOW		14
THE JAP AIR FORCE	By William Winter	15
MACHINIST'S MATE	By Lieut. Robert C. Du Soe, USNR	18
EVERYONE CAN HELP		19
TALENT TESTS	By Alice Rogers Hager	20
CONDOR CADETS		22
TRANSPORTS OR BOMBERS?		24
YOUTH IN AVIATION		
High School Flight Training		25
Consider the Beginner	By Harry C. Copeland	26
Tippy Tutor	By Bruce Keith	27
Air Manual, Lesson No. 7—Flight Maneuvers		28
THE WARHAWK	By Claude McCullough	29
CO-AXIAL PROPS		34
SPINDIZZY SPITFIRE		34
DETHERMALIZER SURVEY	By H. A. Thomas	35
DOUGLAS A-20A IN COLOR		36
PIONEER	By Caldwell Johnson	38
KEEP 'EM PURRING	By Larry Eisinger	40
AIR TRAILS PLANBOOK NO. 1		42
THE SKYRANGER	By Gregory Kohn	43
THE DOPE CAN	By Gordon S. Light	64
BALSA BUTCH		68
FULL-COLOR COVER PHOTO OF BELL AIRACOBRA BY RUDY ARNOLD		

C. B. COLBY EDITOR
WILLIAM WINTER MANAGING EDITOR
W. F. TYLER ASSISTANT EDITOR
ROEL I. WOLFSON ASSISTANT EDITOR
ALEXIS DAWYDOFF ASSISTANT EDITOR
GORDON S. LIGHT CONTRIBUTING EDITOR
ALEX D. SNIFFEN ART EDITOR
ALEXANDER CAÑEDO ASSOC. ART EDITOR

Monthly publication issued by Street & Smith Publications, Incorporated, 79 Seventh Avenue, New York City. Allen L. Grammer, President; Henry W. Halston, Vice President; Gerald H. Smith, Secretary and Treasurer. Copyright, 1943, in U. S. A. and Great Britain by Street & Smith Publications, Inc. Reentered as Second-class Matter, June 27, 1912, at the Post Office at New York, N. Y., under Act of Congress of March 3, 1879. Subscriptions to Canada, \$2.50; not sent elsewhere.

All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or artwork. Any material submitted must include return postage. Printed in the U. S. A.

TRAINING

is the key to *SUCCESS* in

WAR PRODUCTION U. S. AIR FORCES FUTURE of AVIATION

Never has it been more difficult to plan your future, but the one great lesson taught us by the war is that thorough technical training is the key to success. Whether you seek an important supervisory position in aircraft production or a high technician rating in the U. S. Air Forces, you can only obtain it through long-range training that prepares you for the more responsible positions . . . and **ONLY** such training can fit you for a career in the tremendous expansion of civil aviation after the war.

The executives who have made aviation **THEIR** career know that the value of each man is governed by two factors: his intelligent sincerity in selecting aviation as his life work, and **THE ABILITY AND EXPERIENCE OF THOSE WHO TRAIN HIM FOR THAT CAREER.** They know that Curtiss-Wright Technical Institute graduates are—and for many years have been—thoroughly qualified to fill the industry's exacting requirements.

Located in the very center and a very important part of Southern California's great aircraft industry, with its more than two billion dollars in unfilled orders, Curtiss-Wright Tec has come to be recognized as the nation's leading institution for the training of Aeronautical Engineers and Master Mechanics. Mr. Donald Douglas, President of the great Douglas Aircraft Company, chose this school for his own son's training, which pointedly indicates the high standing Curtiss-Wright Tec has attained in the aircraft industry since its establishment in 1929.

It is imperative that before you invest in a course of career training you determine what the returns will be on your investment . . . for your training will determine how much money you will make all the rest of your life.

Curtiss-Wright Tec's career training is carefully designed to do just **one thing**—**TO MAKE MONEY FOR YOU**, so that upon graduation you can be independent and self-supporting for life. Our thousands of successful graduates have proven that Curtiss-Wright Tec training gets results and always pays, since it trained them in advance for the highest position they could ever expect to occupy. It can do the same for you.

This school has never guaranteed positions for its graduates, but practically every graduate has obtained immediate employment and is advancing rapidly. The demand for our graduates far exceeds the supply, and we honestly believe that every student who enrolls here will be able to obtain, with our assistance, immediate employment upon graduation.

WARNING!—"Don't miss the boat." The greatest opportunity in your lifetime exists today! There never was such an opportunity in aviation for you; there may never be another. A position awaits you. Insure for yourself a steady income and independence for life. **DON'T FOLLOW LEAD!** Send in your enrollment before you "miss the boat."

Offering specialized and proven training in **AERONAUTICAL ENGINEERING & MASTER MECHANICS**

NO FLYING INVOLVED



THIS TOWER OVERLOOKS AVIATION'S MOST DISTINGUISHED SCHOOL OF AERONAUTICS

CURTISS WRIGHT
TECHNICAL INSTITUTE

GRAND CENTRAL AIR TERMINAL 1228 AIRWAY GLENDALE (LOS ANGELES) CALIF.
UNDER PERSONAL SUPERVISION OF MALCOLM C. C. MOSELEY, OWNER, SINCE ITS ESTABLISHMENT IN 1929

Contractor to the U. S. Army Air Corps

BE WISE—PROTECT YOUR FUTURE

MAIL TODAY • DON'T DELAY

MARKED DATE OF EXPIRATION SHOWS ON FULL INFORMATION AND DETAILS ON THE CHECK CHECKED BELOW

AERONAUTICAL ENGINEERING COURSE

MASTER AVIATION MECHANIC COURSE

SPECIALIZED ENGINE COURSE

SPECIALIZED AIRPLANE COURSE

SPECIALIZED AIRCRAFT WELDING COURSE

POST GRADUATE AERONAUTICAL ENGINEERING COURSE

SPECIALIZED AIRCRAFT SHEET METAL COURSE

AERONAUTICAL DRAFTING COURSE, HOME STUDY

AIRCRAFT BLUE PRINT READING COURSE, HOME STUDY

NAME _____

ADDRESS _____

CITY _____ STATE _____ **AT-3**



WHY THE MOSQUITO?

CONSIDERED THE FINEST LOW-FLYING BOMBER
AND RECONNAISSANCE MACHINE, THE MOS-
QUITO MARK-IV HAS FIGHTER PERFORMANCE.

Mosquito in flight; it has exceptional maneuverability. Span is 54 feet 2 inches. Ship was evolved from the deHavilland Comet shown below in which Scott and Campbell-Black won England-to-Australia race.

By James L. H. Peck

ONE day in mid-December, a trim twin-engined monoplane circled Bolling Field, Washington, D. C., and proceeded to land. The manner in which the ship was set down amazed the group of army and navy officers and observers because the landing was accomplished over an obstacle and within an exceedingly short distance for a 54-foot plane whose lines suggested high speed and wing loading. But more surprises were in store for the group. The ship took off sometime later with



Built for the R. C. A. F. in Canada this Mosquito is powered by two Packard-built Rolls-Royce Merlins. First ship has recently been test-flown here.

a very short run, climbed speedily, and then went through a breath-taking aerobatic routine of the sort associated only with fighter airplanes—and good fighters at that. The demonstration was climaxed when the pilot approached the field, switched off the port engine, feathered the propeller, and tipped the mid-wing monoplane over into a beautiful slow roll while only 100 feet over the field!

The fact that the pilot happened to be young Geoffrey deHavilland, one of the finest aerobatic fliers alive, enhanced the performance, but not even Geoffrey could have made a plane of lesser ability do what the Mosquito did over Bolling Field. The aircraft was the first Canadian-built Mosquito bomber. Powered by two American-made Rolls-Royce engines and Curtiss electric propellers, it was appropriately equipped for its first American performance.

The Nazis, too, were amazed at the Mosquito, but not in such a pleasant way. Just when the craft made its European debut has not been disclosed officially, but first word came via the German radio to the effect that a secret British plane called the Mosquito had been shot down. For a time people outside the services believed the monoplane to be a fighter, but finally the British Air Ministry revealed the existence of a Mosquito reconnaissance bomber in connection with the big daylight raid on Oslo, Norway. Since then, the Mosquito has ranged far and wide over Greater Germany and occupied territory in both low-altitude and high-level bombing missions. During its service, the plane has undergone three minor modifications and is now flying as the Mosquito IV.

The new deHavilland ship is almost in a class by itself, having a counterpart only in the Martin B-26C Martian of the AAF, which is a medium bomber and, as such, a much larger and heavier plane. According to British re- (Turn to page 62)

THEY'RE GRASSHOPPERS—B'GAWD!



Abel Grasshopper . . . reporting for duty, sir! Able to climb quickly and easily from restricted space—able to land anywhere—ready and willing to do any tough chore the Army may assign.



War or Peace . . . when anything new takes place in lightplane progress, expect it to start with Aeronca . . . that's why Grasshoppers were born!

☆☆☆ Just a short time before America's official entry into the war, the Army decided to experiment with light planes under actual combat conditions . . . take-offs from small, bumpy fields . . . landings in congested areas . . . sometimes a country road . . . often just a common cow pasture . . . all kinds of weather . . . and constant alerts both day and night. ☆☆☆ And the easily handled Aeroncas came through all gruelling tests with such a record for dependability, that today, satisfied Air Corps personnel

allocate them for pre-glider training, liaison work with troops afield, artillery operations, and various other assignments for which their maneuverability and control qualify them.

☆☆☆ Officially designated as the Army's L-3-C . . . a keen-minded brass hat, after seeing them perform, promptly dubbed them "Grasshoppers" . . . We emphasize with modest pride this apt appreciation of Aeronca "First and Finest." Aeronca Aircraft Corporation, Middletown, O.

A full-color book to delight the young in heart . . . Walt Disney's "Mr. Grasshopper Wins His Wings". Send 10¢ in stamps to Dept. T, Aeronca Aircraft Corp., Middletown, Ohio.



AERONCA

FIRST *Grasshopper* FINEST



"WELL GROUNDED" PILOTS FLY BEST



AMERICANS are the most mechanically minded people on earth! Coordinate this native mechanical ability with thorough flight training and the world's best pilots result. That's the calibre of airmen being turned out for our Army Air Forces at Ryan Schools in California and Arizona. Because true airmanship combines a mastery of basic mechanics with flying technique, ample emphasis is given ground instruction for all Army cadets. If you want to join this selected group of U. S. Army Air Force pilots, who know planes as well as fly them, visit your nearest recruiting office today.

RYAN

RYAN SCHOOL OF AERONAUTICS
Headquarters, San Diego, California

RYAN SCHOOL OF AERONAUTICS, Hemet, Calif. • RYAN SCHOOL OF AERONAUTICS of Arizona, Tucson, Ariz.

**"RYAN IS A GOOD
PLACE TO TRAIN
AND A GOOD PLACE
TO WORK"**

... says Harry Raine, technical instructor at Hemet. He was chosen by his fellow ground school instructors to express their determined attitude in their all-out war work at the Ryan School of Aeronautics.



DEDICATED FOR THE DURATION TO THE EXCLUSIVE TRAINING OF ARMY PILOTS

PERISCOPE



NOW a tank can see over a hill!
Dependable Lycoming-powered Stinson "Sentinel" ships are acting as periscopes for our mechanized units operating in the four corners of the earth. Through blistering heat and tropical storms Lycoming power never falters in the vital role of powering the periscopes of Uncle Sam's "land dreadnaughts."

LYCOMING AIRCRAFT ENGINES

*The Training Plane Engine of Today
... The Private Plane Engine of Tomorrow*

★

Lycoming Division, The Aviation Corporation
Williamsport, Penna., U. S. A.



474



a n *Impossible* Figure

Strictly speaking, as any modeler knows, there's no such figure as 700%. But that didn't deter Ohlsson and Rice craftsmen from setting out to do what was the *impossible* on this particular war order, and achieving another production record.

The machine shown above is a piece of special equipment recently designed and built by Ohlsson and Rice craftsmen. It drills two holes in a steel driving block at a 90 degree angle, simultaneously. With the exception of loading the blocks, operation is automatic. The movement of the drills is governed by lifting cams which provide positive feed and, incidentally, greatly lengthen the life of the drills.

The introduction of this machine not only increased output of the part seven times over previous production, but also released seven skilled workmen for other important duties.

Building special equipment to overcome production bottlenecks has grown to be second nature in the Ohlsson and Rice shop over a long period. *Practically every part* of a model airplane engine called for its own machine or machine tool. Today the knowledge and craftsmanship developed in pioneering the mass-production of precision-built miniatures is enabling the men and women of Ohlsson and Rice to beat the promise on war production, *putting better equipment faster in the hands of our fighting men.*

Everything the Ohlsson and Rice organization possesses in skill, resources, and energy is now devoted to the war effort. And if you're wondering about our morale under this pressure, it's 700%.

Illustrated folder on Ohlsson and Rice Miniature Motors and "precision control" production methods mailed on request.



OHLSSON AND RICE
MANUFACTURING COMPANY
 P. O. Box 2324, Terminal Annex • • • Los Angeles, California



If this were your

Roosevelt Aviation School



*Certificate of Graduation from the
Master Airplane and Engine Mechanic Course*
you would hold in your hand the key to a Career
in Aviation. You would be properly trained to
meet every requirement for Civilian Employ-
ment as a Maintenance Mechanic on Army
Airplanes or on Commercial Airplanes.

*A million mechanics are going to be needed
to keep 50,000 planes in the air. No other type of
expert is as much in demand as the Master
Airplane and Engine Mechanic. So, if you
want a training that will put you to work and
keep you at work—now and after the war—
sign and mail the coupon below and do it now.*

*1943 Classes Start Monday, January 4, and
every fourth Monday thereafter.*

We can accept only thirty students per month.

SIGN AND MAIL THIS COUPON AND DO IT NOW!

ROOSEVELT AVIATION SCHOOL, At Roosevelt Field, Mineola, L. I., New York

Gentlemen: Without obligating me, please send details regarding your highly specialized

MASTER AIRPLANE AND ENGINE MECHANIC COURSE

Name.....Age.....

Street Address.....

Town.....State.....

C26S—Shielded



CHAMPION SPARK PLUGS

are the

dependable source of full, flowing engine performance, so vital to a Navy pilot at that crucial moment when an enemy ship—the never-to-be-forgotten prize, looms large in his sights. Champions are on active duty on every front.



C26—Unshielded

Reports are continuously flowing into our offices citing service records of the outstanding performance, long life and extreme dependability of Champion Aircraft Spark Plugs, in engines of every type and size.

These case histories are gratifying to us and the results directly traceable to inherent qualities in materials and design which are the results of truly exhaustive research and engineering over a long period.

Champion manufactures spark plugs, and spark plugs only, and has always backed its products with exclusive facilities and personnel, without equal in the spark plug industry. We believe that is why Champion Spark Plugs are synonymous with dependability, throughout the world.

Characteristic Advantages of Champion Ceramic Insulation Are —

1. Immunity from heat and chemical reactions.
2. Freedom from fuel, oil, or moisture absorption which causes "shorts".
3. Inherently high heat conductivity with consequent wider range between pre-ignition and fouling.
4. Absolute uniformity of material.
5. Homogeneous structure eliminates air spaces which cause current leakage.
6. Easily cleaned and serviced—no specialized equipment or factory returns necessary.
7. Scientifically controlled manufacture.



Call it Lightning! **- SAY THE PILOTS**

Nobody had time to name this Lockheed fighter plane when it was born. They just called it by a number, P-38.

Then the pilots sent it climbing over eight miles straight toward the stratosphere, up where even the highest-flying bombers couldn't go. They brought it screaming down out of the clouds like forked vengeance. They jammed down the throttle and it flew faster than any fighter ever flew before. They pressed the trigger-button and saw how *concentrated* fire-power from its cannon and machine guns could rip apart anything on wings—and there was only one name for it: *Lightning*.

So that's its name, a name it's earned from British and American pilots alike, a name to watch: Lockheed *Lightning*. Lockheed Aircraft Corporation... Vega Aircraft Corporation... Burbank, Calif.

**for protection today, and
progress tomorrow, look to**

Lockheed

FOR LEADERSHIP
Member Aircraft War Production Council, Inc.



Copyright, 1943
Lockheed Aircraft Corporation

1920: Combination machine gun and Davis cannon was tested on navy flying boat.



In 1915 this Duperdussin sported a machine gun firing over the prop. Gunner took worse licking than enemy.



Familiar to old-time combat pilots was the Scarff mount for twin Lewis guns.



The powerful .50-cal. tail gun in a Martin B-26 typifies the modern armament on aircraft. Bigger and better guns are on the way.

GUNS UP TO NOW

FLEXIBLE guns have kept pace with aircraft development. From the days when flexible armament consisted of a few bricks to be tossed at enemy propellers, it has shot ahead by leaps and bounds. The increased speeds of modern aircraft made it impossible to swing these guns against the slipstream; necessity was the mother of inventing the inclosed power turrets of today. From the single flexible .30-caliber gun of 1915 we have come to turrets housing four or more .50-calibers. Even before the outbreak of World War II, the French and Italians were experimenting with flexible 20-mm. cannon. Maybe we'll do even better.



Before the days of powered turrets it took strength and skill to swing even two light .30-cal. Lewis guns against slipstream at 125 m. p. h.



Single guns were also mounted on Scarff ring-mounts. Yoke raised and lowered and entire mount swung in circle. Gunners were ho-men.



By William Winter

THE JAP AIR FORCE

BECAUSE JAPANESE MILITARY AVIATION IS UNNECESSARILY MYSTIFYING, WE PRESENT THIS LATEST INFORMATION AND HISTORICAL DATA ALONG WITH DRAWINGS OF REPRESENTATIVE JAP AIRCRAFT.

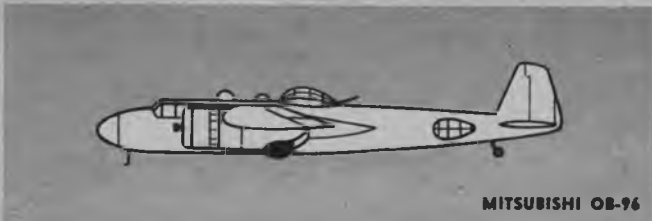
PEARL HARBOR was the beginning of the last chapter in Japan's book of hatred for America. We, as well as the French and British, helped write the earlier chapters. The white man helped to make Japan what she is in the air today just as he helped her organize her army and navy in 1845 and 1875. Even today she is not self-sufficient, for what she has not already obtained from Western civilization by purchase or larceny she is receiving from Germany.

The development of Japanese military aviation divides into three eras. From 1910 to the close of World War I she made her own faltering attempts. There followed a wholesale importation of foreign technical advisers, airplanes and designs. Then, dating from the Imperial Decree of July 26, 1936, which covered thoroughly the implementation of her war plans, Japan emerged gradually as a major air power capable of quantity production of good aircraft domestically designed.

Early Japanese attempts to design and build aircraft were miserable failures. To produce, train and organize an air force was much too difficult for a nation which, almost overnight, had

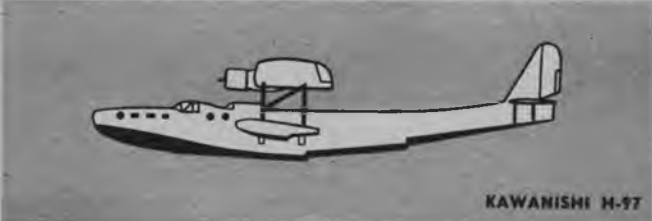
to overcome centuries of self-imposed isolation. Two of Japan's aviation pioneers stand out. One is Lieut. Gen. Baron K. Tokugawa, now director of military air force headquarters in Tokyo; the other is Kiyochi Nakajima, now president of the Nakajima Aircraft Co., Ltd. Tokugawa, then a lieutenant, built and flew the first Japanese airplane (powered by a 50 h. p. Gnome-Rhone engine). Both men lost no time in taking the time-honored Japanese shortcut of turning to the West for the ingredients of their air power. For his work in importing foreign airplanes for training and study, Tokugawa was made a lieutenant general and a baron. Nakajima, one of two experts sent to France and America in 1910 to observe "military aviation problems," brought back two Curtiss seaplanes. A very bright boy indeed, Nakajima later imported World War I Nicuports and Spads and manufactured them for the army air force.

After 1918 a flood of foreign advisers, airplanes and designs poured into Japan. Japan was a virgin market, and opportunists of every Western nation flocked to her shores. With the sanction of the British government Lieutenant (now Lord) Sempill



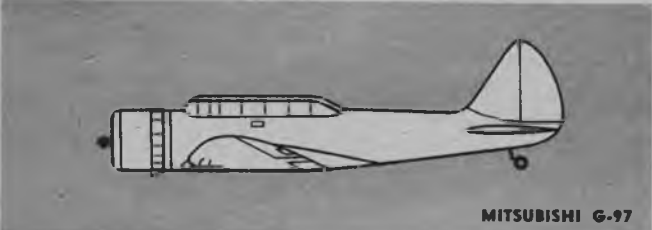
MITSUBISHI OB-96

Span, 82 ft.; speed, 230 m. p. h.; range, 950 miles; two 1,000 h. p. engines.



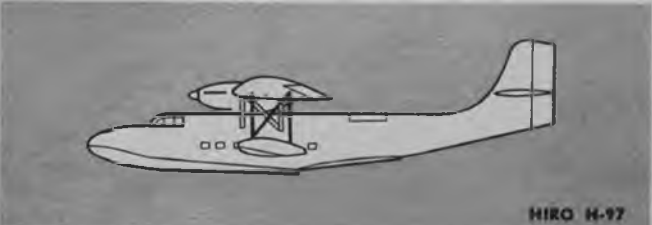
KAWANISHI H-97

Span, 131 ft.; speed, 215 m. p. h.; range, 1,500 miles; four 900 h. p. engines.



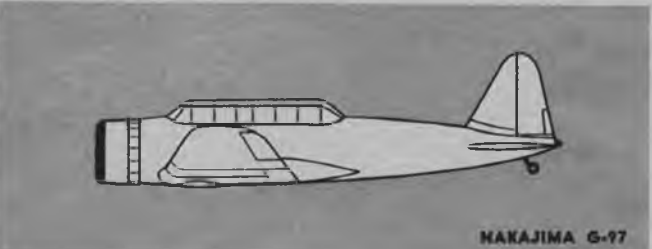
MITSUBISHI G-97

Span, 50 ft. 9 in.; speed, 195 m. p. h.; range, 470 miles; 900 h. p. engine.



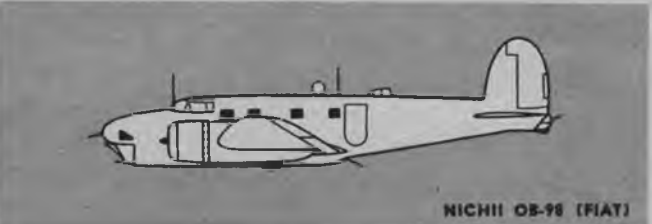
HIRO H-97

Span, 104 ft.; speed, 208 m. p. h.; four liquid-cooled 720 h. p. engines.



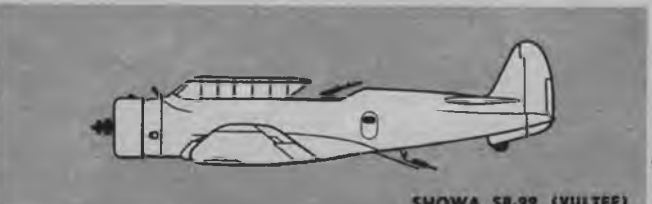
NAKAJIMA G-97

Span, 51 ft. 2 in.; 700 h. p. engine. Same specs. as the Mitsubishi G-97.



NICHII OB-96 (FIAT)

Span, 70 ft. 6 in.; speed, 268 m. p. h.; range, 1,863 miles; 1,030 Fiats



SHOWA SB-99 (VULTEE)

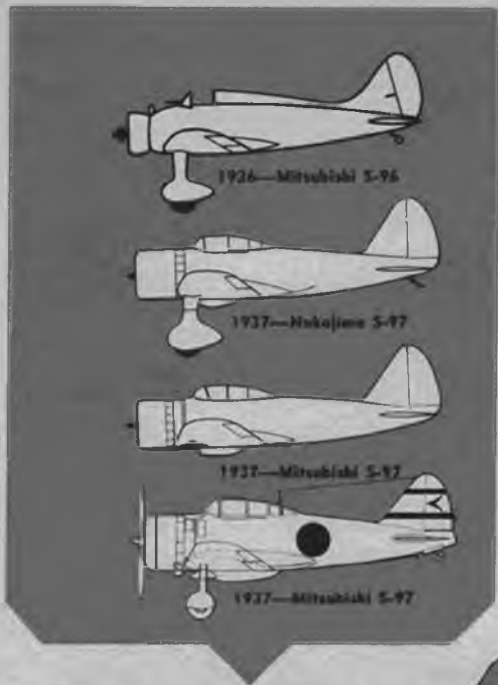
Span, 50 ft.; speed, 220 m. p. h.; range, 950 miles; 850 h. p. Showa engine.

organized a British aviation mission of some forty men and took to Japan England's best airplanes of the time. At the same time, several British designers were conscientiously helping the Japanese to found an aircraft industry. In the imposing array of equipment taken East were a Martinsyde and S. E. 5A fighter, a D. H. 9, a Sopwith Cuckoo torpedo plane, a Blackburn Dart shipboard torpedo plane, a Short F. 5 flying boat and an assortment of trainers and seaplanes. While the British were taking such pains to organize and train Japan's naval aviators, the army air force was being remodeled by the French Lieut. Gen. Faure and sixty French assistants. In 1927, Doctor Dornier remained long enough in Japan for the Kawasaki Dockyard Co. to develop to the production stage Dornier-type flying boats. Later, Richard Vogt (of the asymmetrical airplane), chief designer of Blohm and Voss, Hamburg, spent many years in Japan as production adviser. Japan herself imported eighty Fiat B. R. 20 heavy bombers from Italy in 1938, Douglas DC-2s and DC-3s, Heinkel He-111s and He-116P's (pressure cabin jobs with four Hirth engines), Junkers Ju-87s and Ju-52s and engines.

Japanese-held licenses on foreign equipment tell the story of her desperate drive to build the largest possible air force in the smallest possible time. Mitsubishi alone has licenses for Hanriot trainers, Blackburn reconnaissance and torpedo planes, Curtiss fighters, Junkers airplanes and engines, Hispano-Suiza and Armstrong-Siddeley engines, Reed-Levasseur propellers, Claudel carburetors, Lamblin radiators, Farman engine reduction gears, Herzmak and Letombs engine starters, and Handley-Page slotted wings. Aichi builds liquid-cooled engines under Lorraine license. Kawanishi makes Short flying boats and is sole agent in Japan for Rolls-Royce engines. Kawasaki had Dornier and B. M. W. licenses, and the Kawasaki liquid-cooled engine is a B. M. W. Tokyo can make Beechcrafts, Showa the Vultee attack. Oerlikon and Hispano-Suiza cannon are made in Japan. Nakajima, as one might expect, has some juicy plums in the Fokker and Douglas licenses; it was he who brought in the DC-4. From Germany he obtained rights to the Rheinmetall-Borsig shell gun, which is nothing but a short-barreled Oerlikon which in turn is reported to be the result of the purchase by the Swiss of certain features of the old German Becker gun. Japan always bought three of any new military item. She habitually copied salient features of licenses granted to her and combined them with other features lifted here and there from similar items. Her Mitsubishi Kinsei engine has recognizable parts of Wright, Pratt & Whitney and British radial engines; it is reliable and fairly well made.

The Imperial Decree of 1936 cast Japan's gauntlet into the war ring, but no one seemed to take any particular notice. All eyes were on Germany. Japan's plan established her army air force in highly strategic positions: in Korea, close to Vladivostok; in Formosa, near the Philippines; and at Gifu for the defense of Japan proper. It called for the expansion of her manufacturing facilities. The Chinese "incident" was a wonderful opportunity for Japan to begin the large-scale production necessary for war with the United States. Her pattern of conquest was fully formed and evidently had been for many years; foreign experts were consistently puzzled by the seemingly unreasonably large Japanese army, navy and aviation plans.

In 1938, twenty-three Japanese concerns were making twenty-five types of aircraft. Almost seven years ago, Kawasaki, Mitsubishi and Nakajima pooled their fighter production, a fact doubly interesting in view of the recent report that there are three makes of Zeros. *The Aeroplane* and *The Aeroplane Spotter* estimated production at four hundred units a month. Dr. V. L. Gruberg, writing in *Flight*, points out that the value of machine tools purchased by the Japs between 1937 and July, 1940, increased five hundred percent—and only munitions and export industries were permitted these machines. The number of workers in the metal, machine and tool industries jumped two hundred percent during the same period. Mitsubishi, Japan's greatest aircraft manufac-



Origin of the Zero. Nakajima, Mitsubishi, Kawasaki, often build same fighter designs.

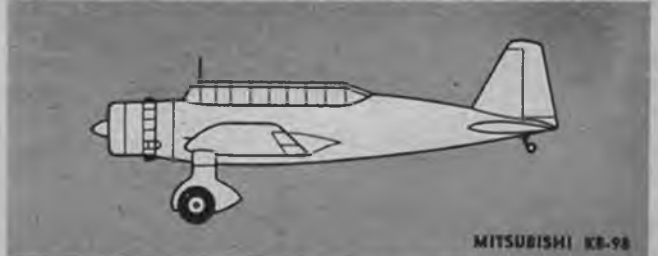


1940—Mitsubishi S-00



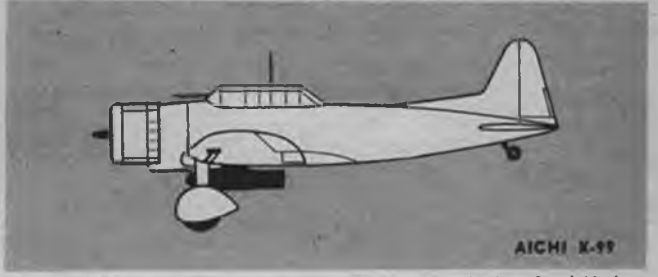
KAWASAKI KB-97

Span, 47 ft. 8 in.; speed, 236 m. p. h.; range, 490 miles; 900 h. p. engine.



MITSUBISHI KB-98

Span, 39 ft. 5 in.; speed, 250; range, 1,490 miles; 900 h. p. engine.



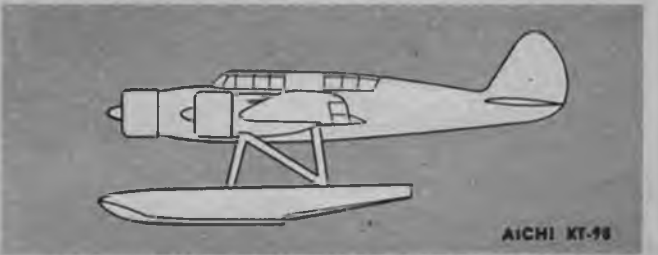
AICHI X-99

Span, 48 ft.; speed, 250 m. p. h.; 900 h. p. engine. Used at Pearl Harbor.



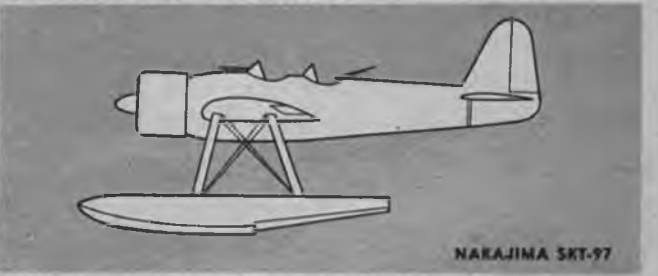
MITSUBISHI KB-98

Span, 46 ft.; speed, 250 m. p. h.; range, 280 miles. 900 h. p. Mitsubishi.



AICHI KT-98

Span, 87 ft.; speed, 230 m. p. h.; range, 1,000 miles. Three 770 h. p. engines.



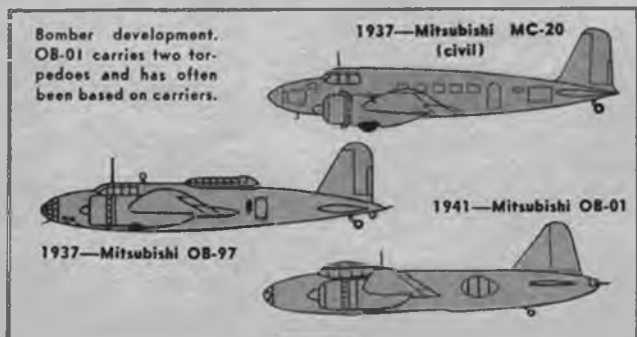
NAKAJIMA SKT-97

Span, 36 ft. 9 1/2 in.; speed, 220 m. p. h.; range, 325 miles. 750 h. p. Nakajima.

turer, had over six thousand employees in 1940; its main plant covered seventy-one acres. Japan's present production is estimated at ten thousand planes a year.

Japan's highly concentrated industry is still extremely vulnerable to attack. Recently a Chinese spokesman pleaded for an early bombing of her industry before the Japanese can move any great part of it to the Asiatic mainland. Imperial Decree 130 of 1938 called for the establishment of a less vulnerable aircraft industry in Manchuria. By 1940 at least two plants had been built, one at Mukden and the other at Tatung Harbor, by the Manchuria Industrial Development Corp., with a capitalization of 100,000,000 yuan (\$5,500,000). Lest the amount seem small, it must be remembered that Oriental labor is fantastically cheap and foreign exchange is in the favor of Western currency.

Japanese military production has glaring weak spots. She suffers continually from shortages of raw materials. When the China "incident" gave Japan the excuse and opportunity to expand her industry in 1937, she immediately ran into production headaches. Sixty percent of her tungsten came from China; ninety percent of her bauxite is from Malaya and the East Indies; ninety percent of her oil came from the United States (Turn to page 50)



Bomber development. OB-01 carries two torpedoes and has often been based on carriers.

1937—Mitsubishi MC-20 (civil)

1941—Mitsubishi OB-01

1937—Mitsubishi OB-97



Aviation service schools provide unlimited opportunity for the ambitious. This mechanic at lathe on carrier Ranger.



Like the Seabees he learns lathe work, simple machine tooling so he can repair machinery, maintain equipment.



These enlisted students of metalsmith school at Pensacola get acquainted with power shears under expert instructor.



He both flies with them and keeps them flying. Here he cranks inertia starter on SNJ.

MACHINIST'S MATE

By Lieut. Robert C. Du Soe, USNR

THE navy calls them AMM's—aviation machinists' mates. They man the guns up there and keep them firing. They're men like C. J. Bannowsky, who brought down safely a plane whose wings were almost stripped of fabric. And Harold Dixon, who survived thirty-one days on a tiny rubber raft. And Donald Francis Mason, who "Sighted sub sank same."

These navy specialists are being trained in many Aviation Service Schools. The best-equipped schools of their type in existence, they teach metalsmiths, machinists, welders and other skilled men. They want men who can patch up two wrecked ships into a plane that can fly.

After months of arduous training, a machinist's mate gets his assignment to a carrier. No ship, except for the submarine, is so complicated. No station demands so many men trained for a specific task. The machinists' mates are usually the men who perform them. When a "flat top" loses its deadly cargo, it's the mates who have put them into the air and keep them there.



The machinist's mate is a fighting man. He mans the flexible guns and may even fly. Gleaming tubular muzzle device of this .30-caliber Browning hides gun flash.



Men of all trades are in demand. Six-months primary course in Class A schools, three months for vocational-school grads. After fleet service come advanced classes.



The women in the middle is deaf; the other two are deaf mutes. But their handicaps do not hinder their performing useful work at North American Aviation, Inc.

PHYSICAL HANDICAPS CAN'T PREVENT THESE AMERICANS FROM DOING THEIR SHARE OF WORK TO HELP WIN THE WAR.

Everyone

CAN

HELP



Frank Richman is one of many deaf-mute workmen employed at North American. He works in the paint shop.



Joseph Barista's wooden leg is no barrier to his being assistant foreman of instrument-panel assembly.



Blind Elsie Ronchetti is employed at the Lockheed paint shop to mark off areas which must not be painted.



Months ago Charles A. Kime of Lockheed lost his sight. Now he is back on the job. His dog Pepper brings him to and from work.

TALENT TESTS

PSYCHOLOGICAL TESTS HELP DETERMINE WHICH CADET IS BEST SUITED AS PILOT, NAVIGATOR OR BOMBARDIER.



Student in upper picture taking steadiness test must remain calm while his pal tries to make him jump by yelling. In lower picture, "Sway Compensator" measures balance sense and fear of height.

TWO boys in khaki are relaxing after their first day in pre-flight school. Too excited to sleep, they sit on their bunks and talk about the past four weeks, weeks of physical examinations, aptitude tests, drills and inoculations.

"Those exams were really something! Now they've got me down as a bombardier. I guess I shouldn't kick, but I sure wanted to be a pilot," says one of them, unconsciously fingering the shiny propeller insignia on his cap.

"Me, too," sighs the other. "It's a mystery to me how they know where to send all these guys."

It's no mystery to the men behind the scenes who must decide

which of the many thousand flying-officer candidates should be pilots, which should be bombardiers, and which navigators. It isn't done by pulling names from a hat. A corps of men with experience in psychology and personnel work have spent many months preparing psychological tests to be used as the basis for selection and classification. They work on the theory that no two people are born exactly alike; one is suited for one occupation and another for another. The candidate's answers to the questions decide where he belongs—even though he may have requested another type of job.

The program is still new and undergoing improvements every day. So successful has it been, however, that our two preflight-school students, if they run true to form, will write home after a few more weeks that "the pilot is only the chauffeur. We do the real work." The navigators are developing the same pride in their division.

In the early days of the army and navy air forces, if an aviation enthusiast had been to college for two years, was between nineteen and twenty-six years of age and could pass a rigorous physical examination, he was admitted to flight training. It was up to his instructor to decide whether he was officer material. And, somewhere along the line, about half of those who entered training were eliminated.

Today all that has been changed by war, by a greater demand for aviation cadets, and by the necessity for getting the most out of training facilities. When selection standards were relaxed, a written examination replaced the college education requirement. Aviation men were given the opportunity to select individuals with aptitude for military aviation training, an opportunity desired by aviation heads of this country and others ever since the last war.

When the army air force established a psychological research agency in July, 1941, to develop tests for use in the selection of aviation cadets, a project was launched to study the method of selection for navigators and bombardiers. The two units worked separately until December, 1941, when the need was seen for a coordinated program of selection and classification of total air-crew personnel. To the Medical Division was assigned the responsibility of the preparation of tests and all the research connected with it.

In January the Chief of Staff issued a directive abolishing all formal educational requirements and substituting a blanket Aviation Cadet Qualifying Examination to insure a satisfactory level of intellectual competence. If the applicant passes this, he is given psychological tests to determine whether he is best suited to be pilot, navigator or bombardier. A psychological division of the Air Surgeon's Office was created as a governing board, and to the Flying Training Command went the job of collecting and analyzing the data obtained from the tests.

To head the psychological division, Lieutenant General H. H. Arnold, Chief of the Army Air Force, appointed Lieutenant Colonel John P. Flanagan, who immediately set to work gathering about him a staff of experts. He selected civilians and reserve

officers who were known to be top men in their fields of either psychology or personnel work. He took men with excellent theoretical, if not practical, experience from universities and business research groups. Today he has a staff of fifty officers with the rank of major, all between thirty-five and forty years of age; and about two hundred technical assistants who have college degrees and are sergeants of various ranks.

Col. Flanagan divided his staff into groups, giving to one group the task of studying and developing tests for intelligence and judgment; to another, tests in alertness and observation; to a third, co-ordination and technique; and to the fourth, personality and temperament.

The military psychologists have not made up one set of questions and ended their work there. It is a continual process of analyzing, developing, checking and revising. *The (Turn to page 48)*

By Alice Rogers Hager

Peg test measures arm and hand dexterity. Cadets move pegs from holes in one board to holes in another rapidly as possible in given length of time.



Feet on rudder bar and hand on stick, cadet tries to bring red and green lights on reaction board into straight lines.

In this test, co-ordination between both hands of student is measured by moving pin in straight line around a triangular course with the two levers.



Fabric on tail surfaces of gliders is often torn in landings on rough terrain. Students are taught to make quick field repairs.



Graduating class of Condor Field, Twenty Nine Palms, Cal., is lined up to receive its wings. Gliders are Aeronca trainers.



CONDOR CADETS

NOT far from the fashionable California resort, Palm Springs, lies Condor Field, training center for Uncle Sam's military glider pilots. Equipped with all modern conveniences, it sends hundreds of motorless pilots each month into the army glider corps.

All students arriving at the school are qualified power-plane pilots who have had primary training on light planes, including several hours of "dead stick" landings. They are given a two-week course flying two- and three-place gliders, and are taught the technique of following a tow plane, spot landings and precision maneuvers. The training includes night flying and Link time. A short course in thermal soaring familiarizes the student with the use of rising air currents. Ground-school instruction includes meteorology, navigation, aerodynamics, towing methods, wire and rope splicing, emergency repairs.

Seated in the cockpit of the glider, student waits for the ray gun shown on the left to clear tow pilot for take-off.





Two Schweizer TG-2 gliders are being towed on a training flight. Towing ropes of unequal lengths prevent accidental collisions.



Before doing any actual night flying, the student is taught the rudiments of instrument technique on this Link trainer.



Student in the front seat of an Aerona TG-5 three-place glider. Note large "greenhouse" allowing exceptionally fine visibility.

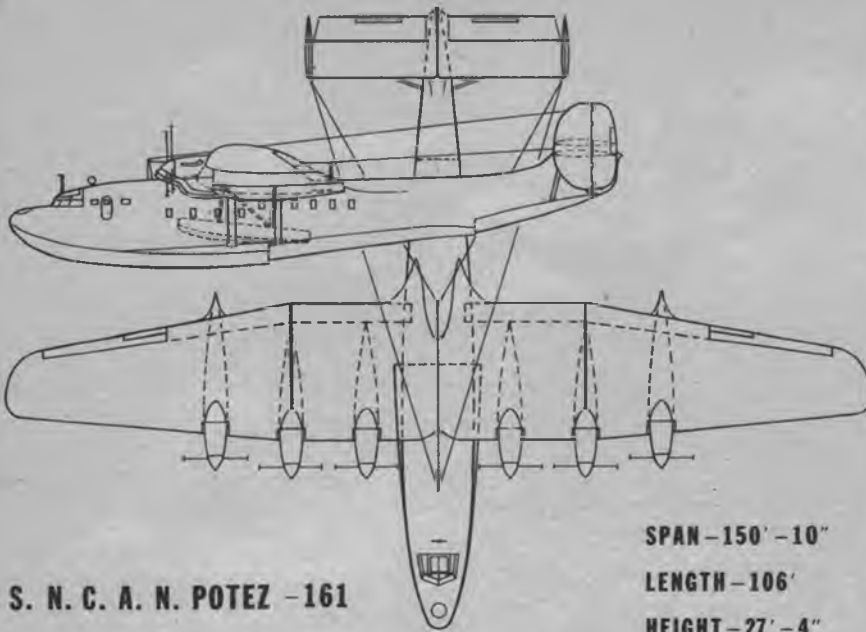
Rear cockpit during training flight is occupied by the instructor. Students are ready to solo after two weeks of dual time.



Into the swimming pool go two Condor students after a successful solo flight. A popular ritual with military flying schools.

TRANSPORTS OR BOMBERS?

By Thomas Nayler

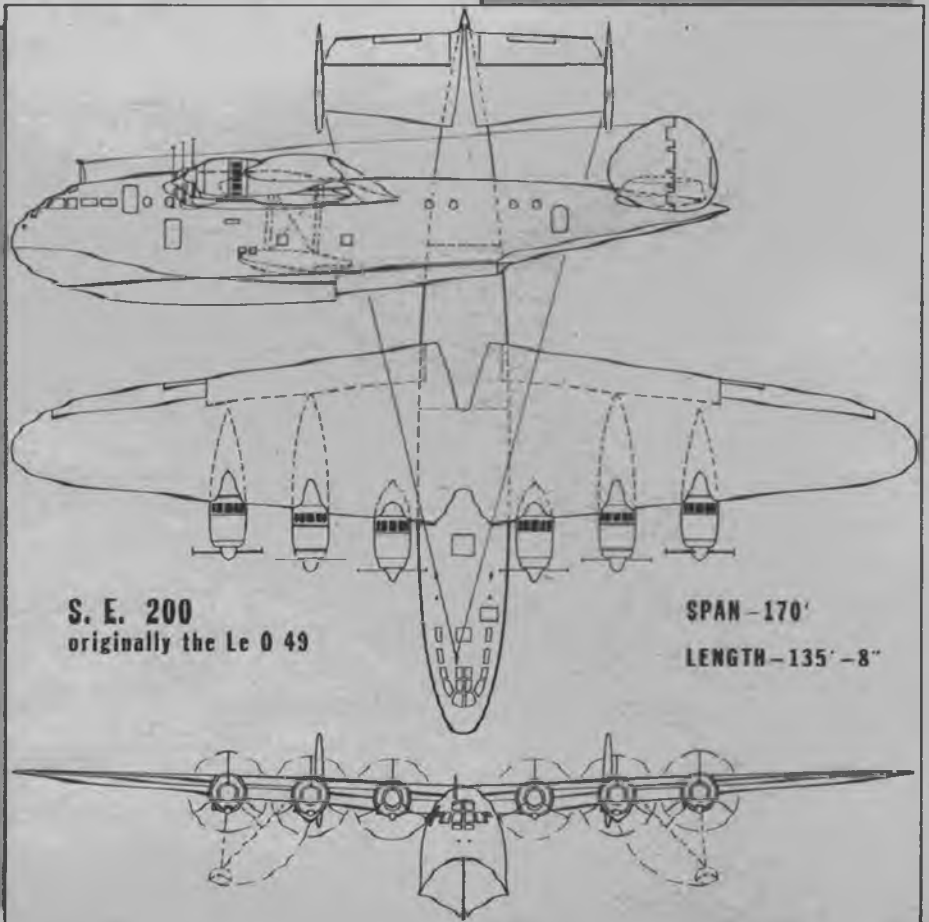


S. N. C. A. N. POTEZ -161

SPAN - 150' - 10"
LENGTH - 106'
HEIGHT - 27' - 4"



BUILT before the Nazi invasion of France, these giant flying boats were destined for transatlantic passenger service. The S. N. C. A. N. 161 can lift twenty tons; fully loaded, it weighs 94,800 pounds. It is powered by six liquid-cooled engines of 900 h. p. each. The S. E. 200, even larger, is powered by six Gnome-Rhone radials developing 1,650 h. p. at take-off. The gross weight is 67 tons; it can lift the incredible load of thirty tons. The tremendous weight-carrying capacities of both designs could easily be translated into bomb loads. Their cruising range enables them to visit our eastern seaboard.



S. E. 200
originally the Le O 49

SPAN - 170'
LENGTH - 135' - 8"

HIGH SCHOOL FLIGHT TRAINING

**OFFICIAL TRIAL FLIGHT-INSTRUCTION PROGRAM
PROVES PRACTICAL FOR HIGH-SCHOOL STUDENTS.**

PRESIDENT ROOSEVELT'S call for an air force of hundreds of thousands of pilots compels complete mobilization of every means of training at our disposal. Anything that accelerates military pilot training will hasten the achievement of the goal and the downfall of our enemy. One demonstrated method of accelerating the pilot mill is flight training, not pre-flight training, although the latter is helpful as far as it goes—in the high schools. Experience has proved that such training can be given with approximately the same success as the collegiate Civilian Pilots' Training program which has well proved its value to the services. Moreover, there are 22,000 light planes which, with the exception of those used in the CIP program, are standing idle on the ground. As long ago as 1938 there were at least four known schools with successful flying clubs; there may have been more. Yet, until the summer of 1942, no attempt was made to take advantage of their proven success.

The first regulated tryout to determine the possibilities and problems of actual flight training in the high schools was made last summer. Experiments were conducted in twenty-two widely scattered locations, from Jamestown, N. Y., to Prosser, Wash.; from Alturas, Calif., to Birmingham, Ala. Each school picked ten junior or senior students who had to be at least seventeen years of age. This represented a one-year drop in the age limits of the pilot-training program conducted by the CAA for army and navy reservists. Physical requirements remained the same and trainees had to enlist in one of the reserves or pledge that they would when they reached the eligible age.



Thousands of light planes, now grounded because of the war, are available for an official high-school pilot-training program.

Performance reports on these youngsters offer striking statistical evidence that they can learn to fly as readily as boys of college age. They required an average of thirty-eight hours of flying to complete the elementary course—exactly the same time averaged by 68,000 college trainees—and scored an average flight grade of seventy-seven percent, compared to seventy-nine percent for the collegians. They did not do too well in ground-school subjects, but this is attributed to the fact that, at the time the program began, high-school teaching staffs had no opportunity to prepare themselves for giving instruction in aeronautics. Regular CIP ground-school classes have since been thrown open to secondary schoolteachers; many teacher colleges have instituted special courses in aeronautical subjects.

Although the number of hours flown by the high-school students was not large enough to justify conclusive comparisons, their safety record is even better than that made by CAA students in the colleges. None of the three accidents in the high-school program involved a trainee fatality. (Turn to page 66)



This group of students was selected by Danville High School, Illinois, for the experimental training project sponsored by government agencies.



Flight instruction followed complete fundamental courses. Statistics proved high-school students could be taught as readily as college students.

Certificate of Flying Merit

In recognition of air-minded young America's interest in the advancement of aviation thru building and flying model airplanes

This certificate is awarded:

EDWARD ZINTER

for participation in the Junior Model Airplane Meet
sponsored by the
Syracuse Exchange Club and The Post-Standard,

★ ★ ★
JULY
1942
★ ★ ★

Harry C. Copeland
Contest Director
The Post-Standard

Large certificates were awarded to contestants who entered this contest. Right, a clipping showing newspaper publicity.

★ ★ ★ all out BEGINNERS!
★ ★ place your entries NOW!
★ for the

MODEL AIRPLANE MEET

THE DATE
IS ★ ★

12TH
ADLER FARM
EAST SYRACUSE



NOTICE:
The date of July 27th previously announced in a news story in that column was in error. THE DATE IS
JULY 12th

40 PRIZES

FOR BOYS AND GIRLS 15 YEARS OLD AND YOUNGER

- ★ 40 Model Airplane Kits
- ★ Model Supplies
- ★ Certificate of Flying Merit for Each Contestant

RULES

ALL BOYS AND GIRLS 15 YEARS OLD AND UNDER ARE ELIGIBLE TO ENTER MODELS.

FILL IN THIS ENTRY BLANK TODAY!

PRIZES WILL BE AWARDED

CONSIDER THE BEGINNER

By Harry C. Copeland

WE are still waiting for someone with a flair for statistics to complete this sentence: "If all the model-airplane kits sold in the United States in 1942 were laid end to end, they would reach from to"

While many of these kits reached the hands of model builders who were seasoned contest veterans, doubtless an even greater number was sold to beginners. Surely these hordes of beginners should have provided a reservoir that could be drawn upon to

replace contestants who entered the services or went into war work. This is not what happened, however. Instead of additional and bigger clubs and contests, we learn that many clubs are disbanding because of the loss of older contest builders.

Our club, too, lost most of its contest fliers in 1941 and 1942, and we were faced with the problem of rebuilding our membership, which had dwindled to about one fourth of its former size. The solution, obviously, was to induct these new (Turn to page 66)



A few of the model builders who entered this meet. Unlike other contests, every entry received a suitable prize.

**YOUTH IN
AVIATION**

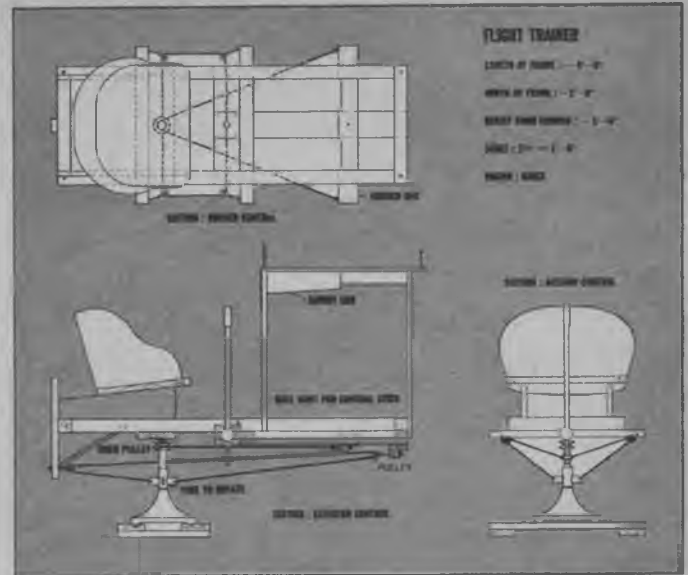
INSTRUCTORS—TO INCREASE YOUR CLUB ACTIVITY TRY A CONTEST SOLELY FOR THE LONG-NEGLECTED BEGINNER.

YOUTH IN AVIATION

TODAY most young fellows in their teens are itching to get their hands on the stick of an airplane. They want to climb into a cockpit, soar up above the clouds and dip and turn and glide. The great majority are out of luck until they are able to take flying lessons or enter the air forces as pilots. But Canada's air cadets, who are taking a course in aviation to fit them as airmen for the Royal Canadian Air Force, have their own solution to the problem. They have built flight trainers which give them the sensations of airplane operation even though the machine does no more actual flying than a barber chair.

Like all air-minded boys, the air cadets of No. 5 Flight (Arvida, Quebec) have a keen interest in full-sized aircraft and their cockpits and controls. When they first formed up, their instructor saw that a device to let them have the actual feel of a plane's controls and give them firsthand training in the operation of the rudder bar and control column would make their instruction much more realistic. He designed a simplified flight control trainer on a see-saw principle. The final design as outlined here is light enough to be carried by two cadets and costs about fifteen dollars. In operation it gives the impression of diving, climbing and banking or turning to either side. It responds to rudder control 120 degrees each way.

The main frame consists of two lengths of 2 in. square birch 4 ft. 6 in. long; similar pieces 1 ft. 6 in. long are bolted across



TEACHERS—AMPLIFY TEXTBOOK INSTRUCTION WITH THIS FLIGHT TRAINER AS USED BY THE CANADIAN AIR CADETS.

TIPPY TUTOR

By Bruce Keith



each end. Three feet from the front, another cross piece 1 in. x 4 in. x 1 ft. 6 in. is bolted underneath the main frame as a support for the pivot—a large furniture caster of ball type (1 in. in diameter). This cross piece takes the entire load of the moving structure. Another cross piece of the same dimensions is fastened 10 in. ahead of the pivot structure as the support of the control stick.

Down the center of the main frame, from the front cross piece to the control-stick support, is another piece of birch 1 in. x 4 in. on which the rudder bar pivots. The rudder bar is made of hardwood 1 in. x 3 in. x 2 ft., pivoted in the center with a rod and a metal bearing one half inch in diameter. It is best placed an easy leg distance from the seat.

The control-column ball joint consists of an iron bail 2 in. in diameter drilled to take a half-inch round rod through its center. The rod, 12 in. long, is pressed in and pinned midway. The control column is made of half-inch pipe reamed to a sliding fit over the rod so that it can be removed when the trainer is not in use. Care should be taken to secure the ball to the wood frame so that the control stick will move freely in all directions without being slack.

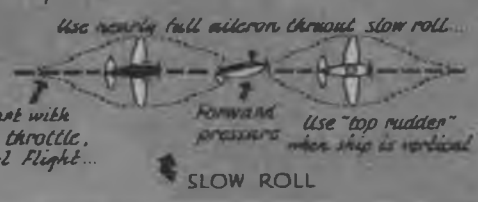
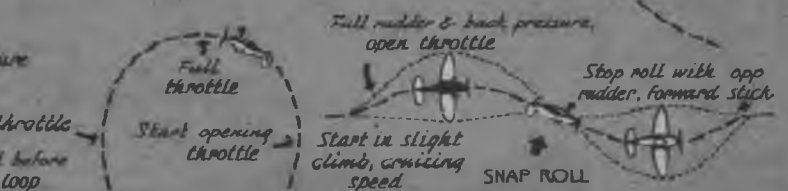
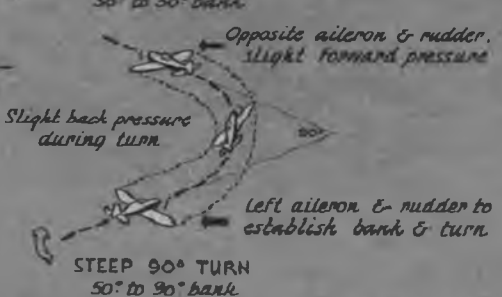
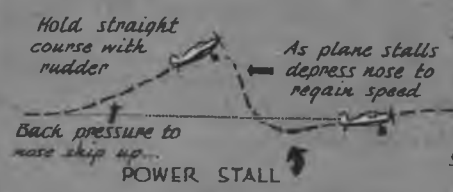
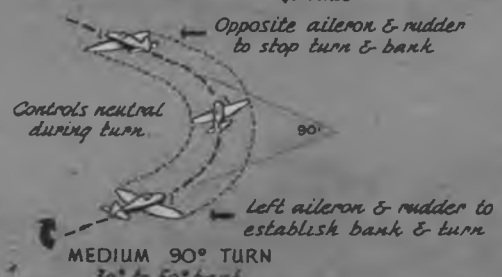
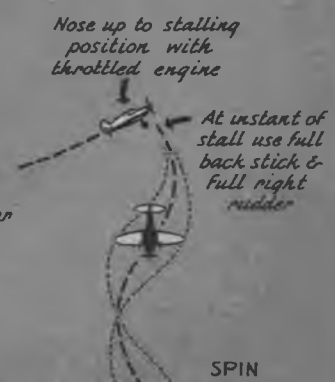
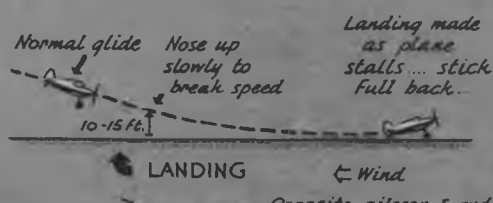
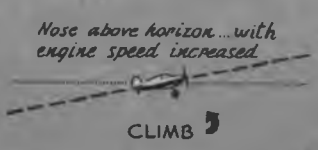
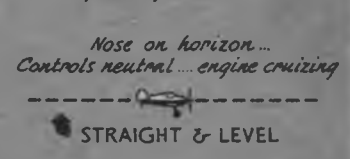
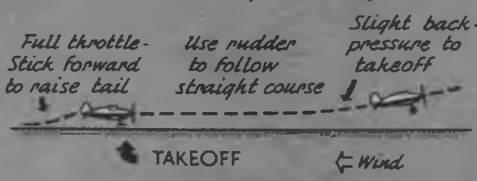
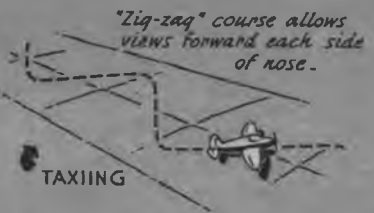
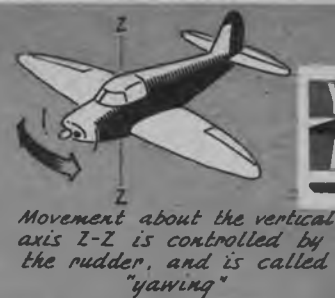
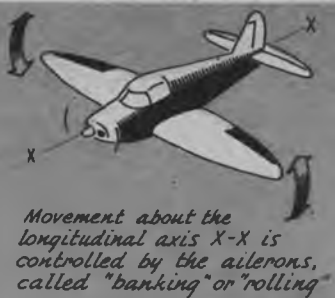
The base is made from a cast-iron stand like those used to support clothing models. The wooden frame on which it rests should be large enough to give it stability. The top of the base is drilled and reamed with a 1½-in. hole to take a piece of Shelby tubing of 1 in. outside diameter and ⅛-in. wall.

A large V-type belt pulley with a bottom dimension of 2½ in. is pressed and pinned on the tubing flush with the top, providing the fulcrum for the ¼-in. flexible wire cables attached to the rudder bar. The cables are secured to the rudder bar with clamps and large eyelets.

Between the top of the cast-iron base and the bottom of the pulley is a piece of 1-in. pipe with four 1 in. x ¼ in. flat bar arms 1½ in. long, welded on at 90-degree spacing. The flat bars are drilled to take ¼-in. wire cables which are passed through small clothesline pulleys fore and aft before being secured to the bottom of the control column. Thumb screws are used to maintain the proper tension. This is the mechanism that raises or lowers the nose of the trainer.

The banking mechanism utilizes four clothesline pulleys secured to two pieces of birch 1 in. x 2 in. x 2 ft. The tension is maintained by two turnbuckles between the flat bars and the ¼-in. cable.

With the trainer assembled and operating in (Turn to page 67)



AIR MANUAL, LESSON NO. 7—FLIGHT MANEUVERS



This picture should convince you of the scale authenticity of this Warhawk. Note landing-gear details.



She's off on a 40 m. p. h. test hop! Controlling's a cinch, just keep the lines taut and rudder well offset.

PUT THIS P-40F THROUGH ITS PACES AND YOU'LL FIND THAT CONTROL-LINE FLYING OFFERS MORE POSSIBILITIES THAN JUST RACING.

THE WARHAWK

By Claude McCullough

YOU can have your screaming hot wires and engines-on-a-broomstick. Me, I'll take scale jobs. Of course, I'm the type of guy (as if there were any other) who goes huzzing around the room with a scale model *rat-tat-tatting* imaginary Zeros to the amusement of any nonmodelers present who exchange knowing glances and tap their heads significantly. But there is a certain thrill obtainable from an authentically realistic buzz-buggy that the most surrealistically streamlined brain wave fails to arouse—and they have lots of other advantages, too. You'll realize this especially the next time you watch a half foot of horsepower make like a bomb.

This control-line edition of the P-40F is just fast enough to make it interesting without involving the clinical type of interest required in assembling the scattered bits of wood and metal found in a landing crater. The construction would be husky even in balsa, and in bass it's practically gravity proof. The beginner will find this stable control liner easy on props and nerves. Any Class A or B engine may be used successfully, but anything larger than a .20 is a little too speedy for comfort. If you want superspeed, you don't want this job. But if you want dependable performance

and control with a plane that can double in brass as a slick display job and still be in one piece after landing, here she is.

The fuselage is carved from two basswood blocks, $2 \times 2\frac{1}{2} \times 22''$, and $2\frac{1}{2} \times 2\frac{1}{2} \times 22''$. Trace the top and side views on the block. You will note that the cowl is just a little deeper than two and one half inches below the thrust line. Cement a piece of sheet bass to the bottom of the block to allow for this. With a band saw, cut to top outline. Replace the cut offside pieces with pins or small brads and saw to top outline. Draw a center line as a guide on the top and bottom of the fuselage; during carving operations, do not carve this away.

Clamp in a padded vise and begin carving to general shape with a draw knife or spoke shave. Carve with care from the cockpit forward and backward. When it is roughed to shape, begin to check with templates, using a sharp knife to bring the block to accurate cross section, leaving it a little oversize to allow for sanding. Smooth with the fine side of a wood rasp until the fuselage is free of bumps, and then sand with sandpaper wrapped around a small block.

Split the fuselage blocks apart at the thrust-line joint. With a common cupped chisel and mallet, begin removing wood with smart smacks of the mallet at first and careful taps when the shell begins to thin. Work according to the dotted lines on the plan. This is really very easy, since basswood is a perfect carving wood. Note that the back-view part of the cabin is cupped in; be sure to allow for this when carving.

Cut off the removable forward part of the fuselage. If you like, the entire top shell may be made removable, but it will serve little purpose since the control system is contained in the top. The front hatch is held on with a tube-wire stop at the back and small hooks with a rubber band at the front. A cooling vent made from light bristol board is attached to the right side of the cowl and the cooling flaps are cut from tin salvaged from a tobacco can and hinged on a wire hoop. When you fly it, open the flaps for ample cooling.

The control mechanism is fully explained on the plan. The control plate is fastened to a $\frac{1}{8}''$ flat piece of bass. Place several washers between the control plate and base. A (Turn to page 61)

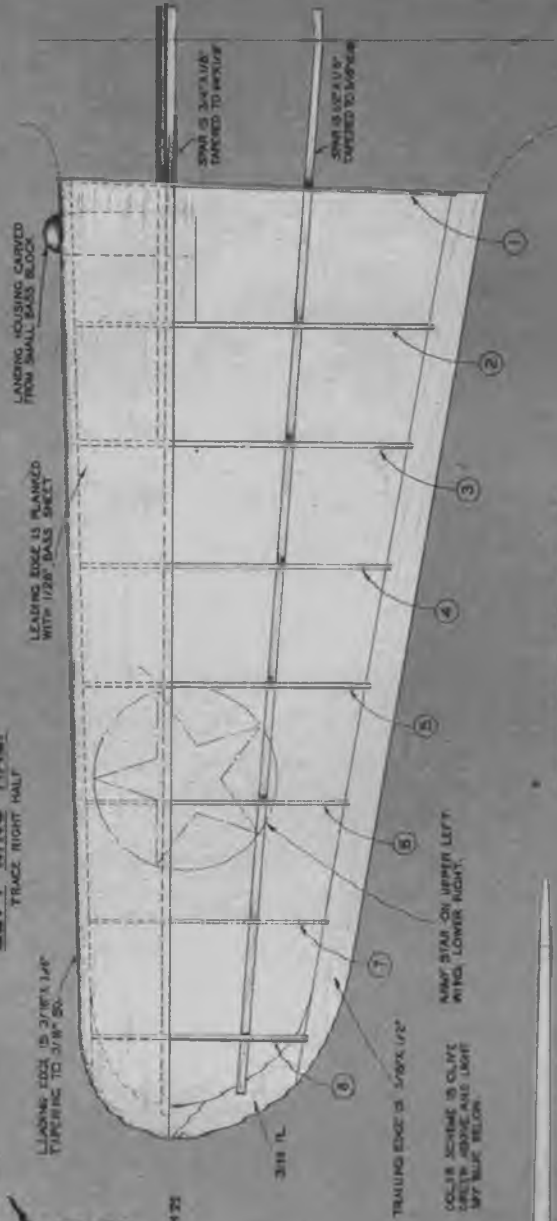


**CURTIS
P-40F**

DESIGN BY CLAUDE W. HULLOUGH

FULL-SIZE PLANS of this model may be obtained by sending fifteen cents to
AIR TRAILS FULL-SIZE PLANS, 79 7TH AVE., NEW YORK, N. Y. 15c

LEFT WING HALF
TRACE RIGHT HALF

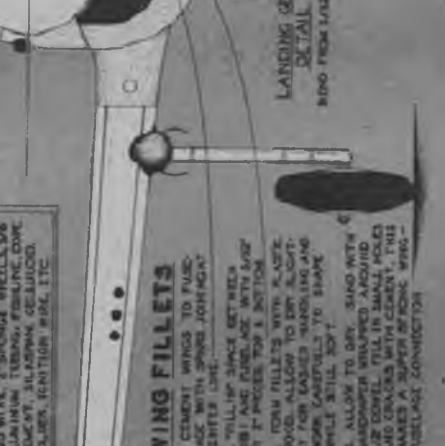
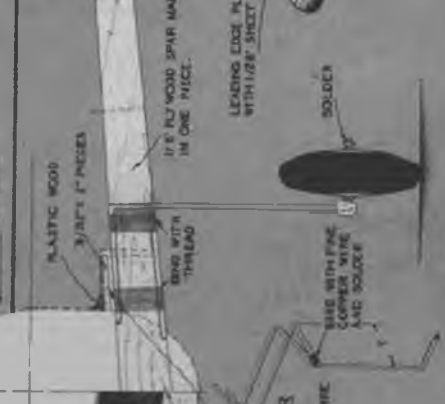
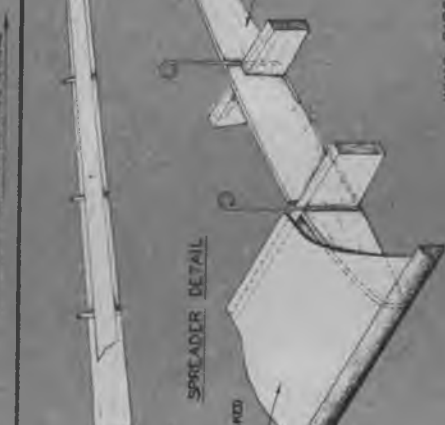


LIST OF MATERIALS

1	1/4" X 1/4" X 1/4" NICKEL ELIMATOR
2	3/8" X 3/8" X 1/4" WING
3	1/2" X 1/2" X 1/4" PLANKING
4	1/8" X 1/8" X 1/4" WING RIBS
5	3/32" X 1/2" WING FILLET
6	1/4" X 1/4" X 1/4" TAIL OUTLINE
7	3/4" X 1/2" X 1/2" BASS BLOCK
8	1" X 1/2" X 1/2" BASS BLOCK
9	1/2" X 1/2" X 1/2" BASS BLOCK
10	1/4" X 1/4" WOOD FOR WING SPAR
11	1/4" X 1/4" WOOD FOR WING SPAR
12	1/4" X 1/4" WOOD FOR WING SPAR
13	1/4" X 1/4" WOOD FOR WING SPAR
14	1/4" X 1/4" WOOD FOR WING SPAR
15	1/4" X 1/4" WOOD FOR WING SPAR
16	1/4" X 1/4" WOOD FOR WING SPAR
17	1/4" X 1/4" WOOD FOR WING SPAR
18	1/4" X 1/4" WOOD FOR WING SPAR
19	1/4" X 1/4" WOOD FOR WING SPAR
20	1/4" X 1/4" WOOD FOR WING SPAR
21	1/4" X 1/4" WOOD FOR WING SPAR
22	1/4" X 1/4" WOOD FOR WING SPAR
23	1/4" X 1/4" WOOD FOR WING SPAR
24	1/4" X 1/4" WOOD FOR WING SPAR
25	1/4" X 1/4" WOOD FOR WING SPAR
26	1/4" X 1/4" WOOD FOR WING SPAR
27	1/4" X 1/4" WOOD FOR WING SPAR
28	1/4" X 1/4" WOOD FOR WING SPAR
29	1/4" X 1/4" WOOD FOR WING SPAR
30	1/4" X 1/4" WOOD FOR WING SPAR
31	1/4" X 1/4" WOOD FOR WING SPAR
32	1/4" X 1/4" WOOD FOR WING SPAR
33	1/4" X 1/4" WOOD FOR WING SPAR
34	1/4" X 1/4" WOOD FOR WING SPAR
35	1/4" X 1/4" WOOD FOR WING SPAR
36	1/4" X 1/4" WOOD FOR WING SPAR
37	1/4" X 1/4" WOOD FOR WING SPAR
38	1/4" X 1/4" WOOD FOR WING SPAR
39	1/4" X 1/4" WOOD FOR WING SPAR
40	1/4" X 1/4" WOOD FOR WING SPAR
41	1/4" X 1/4" WOOD FOR WING SPAR
42	1/4" X 1/4" WOOD FOR WING SPAR
43	1/4" X 1/4" WOOD FOR WING SPAR
44	1/4" X 1/4" WOOD FOR WING SPAR
45	1/4" X 1/4" WOOD FOR WING SPAR
46	1/4" X 1/4" WOOD FOR WING SPAR
47	1/4" X 1/4" WOOD FOR WING SPAR
48	1/4" X 1/4" WOOD FOR WING SPAR
49	1/4" X 1/4" WOOD FOR WING SPAR
50	1/4" X 1/4" WOOD FOR WING SPAR
51	1/4" X 1/4" WOOD FOR WING SPAR
52	1/4" X 1/4" WOOD FOR WING SPAR
53	1/4" X 1/4" WOOD FOR WING SPAR
54	1/4" X 1/4" WOOD FOR WING SPAR
55	1/4" X 1/4" WOOD FOR WING SPAR
56	1/4" X 1/4" WOOD FOR WING SPAR
57	1/4" X 1/4" WOOD FOR WING SPAR
58	1/4" X 1/4" WOOD FOR WING SPAR
59	1/4" X 1/4" WOOD FOR WING SPAR
60	1/4" X 1/4" WOOD FOR WING SPAR
61	1/4" X 1/4" WOOD FOR WING SPAR
62	1/4" X 1/4" WOOD FOR WING SPAR
63	1/4" X 1/4" WOOD FOR WING SPAR
64	1/4" X 1/4" WOOD FOR WING SPAR
65	1/4" X 1/4" WOOD FOR WING SPAR
66	1/4" X 1/4" WOOD FOR WING SPAR
67	1/4" X 1/4" WOOD FOR WING SPAR
68	1/4" X 1/4" WOOD FOR WING SPAR
69	1/4" X 1/4" WOOD FOR WING SPAR
70	1/4" X 1/4" WOOD FOR WING SPAR
71	1/4" X 1/4" WOOD FOR WING SPAR
72	1/4" X 1/4" WOOD FOR WING SPAR
73	1/4" X 1/4" WOOD FOR WING SPAR
74	1/4" X 1/4" WOOD FOR WING SPAR
75	1/4" X 1/4" WOOD FOR WING SPAR
76	1/4" X 1/4" WOOD FOR WING SPAR
77	1/4" X 1/4" WOOD FOR WING SPAR
78	1/4" X 1/4" WOOD FOR WING SPAR
79	1/4" X 1/4" WOOD FOR WING SPAR
80	1/4" X 1/4" WOOD FOR WING SPAR
81	1/4" X 1/4" WOOD FOR WING SPAR
82	1/4" X 1/4" WOOD FOR WING SPAR
83	1/4" X 1/4" WOOD FOR WING SPAR
84	1/4" X 1/4" WOOD FOR WING SPAR
85	1/4" X 1/4" WOOD FOR WING SPAR
86	1/4" X 1/4" WOOD FOR WING SPAR
87	1/4" X 1/4" WOOD FOR WING SPAR
88	1/4" X 1/4" WOOD FOR WING SPAR
89	1/4" X 1/4" WOOD FOR WING SPAR
90	1/4" X 1/4" WOOD FOR WING SPAR
91	1/4" X 1/4" WOOD FOR WING SPAR
92	1/4" X 1/4" WOOD FOR WING SPAR
93	1/4" X 1/4" WOOD FOR WING SPAR
94	1/4" X 1/4" WOOD FOR WING SPAR
95	1/4" X 1/4" WOOD FOR WING SPAR
96	1/4" X 1/4" WOOD FOR WING SPAR
97	1/4" X 1/4" WOOD FOR WING SPAR
98	1/4" X 1/4" WOOD FOR WING SPAR
99	1/4" X 1/4" WOOD FOR WING SPAR
100	1/4" X 1/4" WOOD FOR WING SPAR

WING FILLETS

1. CEMENT WINGS TO FUSELAGE WITH SPREADER JOINTING CENTER LINE.
2. FILLING SPACE BETWEEN RIBS AND FUSELAGE WITH 5/32" X 1/2" PLY FOR 1/2" SECTION.
3. FILL FILLET WITH 3/32" X 1/2" PLY. ALLOW TO DRY ALIGHT. WORK CAREFULLY TO SHAPE WHILE STILL SOFT.
4. ALLOW TO DRY. SAND WITH SANDPAPER UNWRAPPED. ACQUAINT 1/2" DOWEL. FILL IN SMALL HOLES AND CRACKS WITH CEMENT. THIS MAKES A SUPERIOR RIBS WING-FUSELAGE CONNECTION.



SPINNER

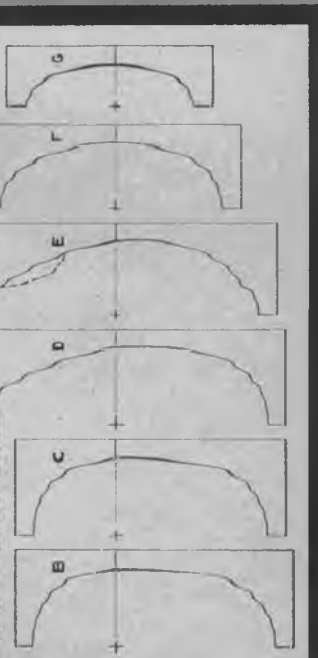
TURN ON LATHE OR CUT TO SHAPE - GRANT 1/8" WIRE IN CENTER - REST IN HAND DILL - SAND TO SMOOTHEN WHILE TURNING

WENT

FOR DOORING FROM LEFT SIDE - MAKE FROM LEFT SIDE - BEHIND COAT HESDI WITH CENTER - BEND TO SHAPE WHILE DRIVING

TEMPLATE SHEET

GLUE TO LIGHT CARBON PAPER. CUT OUT TEMPLATES



NOTICE POINT IS CARVED AS PART OF FUSelage. THIS POINT IS NOT TO BE MOVED IF LOCKED BY A RUBBER BAND OR SCREW AND FULL HOLES WITH PLASTIC WOOD.

TOP VIEW SHOWS UPPER RIGHT FUSelage SHELL REPAIRED FOR CLARITY.

TRACE RIGHT HALF OF STABILIZER

RUDDER AND STABILIZER HAVE BEEN ENLARGED FROM SCALE

SLOT IN RUDDER TO PASS CONTROL WIRE

1/8" WIRE

PLANK FRONT OF STABILIZER WITH 1/2" BALSWOOD SHEET

1/8" FL

ELEVATORS ARE CUT FROM 3/8" BASS SHEET CONTROL ROD ROLLED SANDY AROUND HORN

1/16" x 1/4"

1/32" SHEET METAL

ALUMINUM WIRE

1/8" FLAT

ELEVATOR HINGE DETAIL

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

1/8" FLAT

FUSelage CARVING

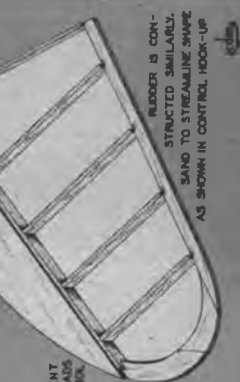
1. GLUE TOGETHER LIGHTLY AT THINEST LINE TWO BASS BLOCKS 2 1/2 X 2 X 22 AND 2 1/2 X 2 1/2 X 22.
2. TRACE SIDE AND TOP VIEWS ON.
3. WITH BAND OR COPING SAW, CUT TO TOP OUTLINE. REPLACE CUT OFF SIDE PIECES WITH PINS OR SMALL BRASS.
4. SAW TO SIDE OUTLINE. DO THIS SLOWLY AND ACCURATELY. REMOVE SIDE PIECES.
5. DRAW CENTERLINE ON TOP AND BOTTOM OF FUSelage.
6. CLAMP IN PRODD. VISE AND BEGIN CARVING. REMOVE WOOD FROM FUSelage HALF ON SPINE SHAVE. DO NOT CARVE AWAY CENTERLINES. CARVE FROM COCK PIT FORWARD AND BACKWARD.

ELEVATOR SETTINGS



7. WHEN ROUGHED TO SHAPE BEGIN TO CARVE THE FUSelage. USE SHARP SAW TO REMOVE WOOD TO ACCURATE CROSS-SECTION, LEAVING A LITTLE OVER SIZE TO ALLOW FOR SANDING.
8. SMOOTH WITH FINE SIDE OF A WOOD RASP. SAND WITH COARSE SANDPAPER WRAPPED AROUND A SMALL BLOCK UNTIL THE SURFACE IS SMOOTH. THEN SAND WITH FINE SANDPAPER.
9. SPLIT FUSelage BLOCKS APART AT THURTY LINE.
10. WITH CURVED CHISEL AND MALLET BEGIN REMOVING WOOD FROM FUSelage HALF WHICH HAS BEEN CLAIMED IN A PRODD. VISE. WORK DOWN TO A SHELL APPROXIMATELY 1/8" THICK. CUT LOOSE REMOVABLE FUSelage TOP.

ELEVATOR CONSTRUCTION



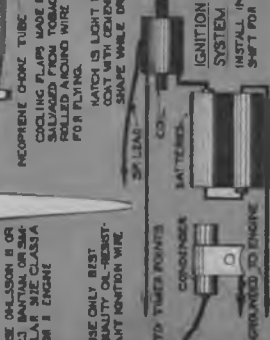
ADJUST MOVEMENT WITH SMALL BRASS STUCK IN CONTROL PLATE BASE

RUDDER IS CONSTRUCTED SIMILARLY, SAND TO STREAMLINE SHAPE AS SHOWN IN CONTROL HOOP-UP

DOTTED LINE INDICATES WIDTH OF SHELL

RECYCLE HOOP-TUBE COOLING FLUID MADE FROM TIN SALVAGED FROM TOBACCO CAN. ENDS ROLLED AROUND WIRE HOOP. OPEN FOR FLYING.

MATCH IS LIGHT BRISTOL BOARD - COAT WITH CERAMIC - CURVE TO SHAPE WHILE DRIVING



USE ONLY BEST QUALITY COIL - MUST HAVE SPARK WIRE TO THREE POINTS

CONNECTIONS TO THREE POINTS

IGNITION SYSTEM INSTALL IN LOWER FUSelage HALF SHIFT FOR BALANCE

SPRINGS ATTACHED TO HOOP WITH ENDS SHARP - CENTER HEAVILY

HOOKS FOR HOLDING TOP ON WITH PLUMBER BANDS

SLOT FOR THREE-PIN

THREE-BLAD PROP FOR DISPLAY ONLY. USE ONLY GOOD BLADES OF PROPS BROKEN 8" PROPS

USE COLLISON IS OR 23 INCHAL OR SMALLER SIZE CLASS A OR B ENGINE

USE ONLY BEST QUALITY COIL - MUST HAVE SPARK WIRE TO THREE POINTS

CONNECTIONS TO THREE POINTS

IGNITION SYSTEM INSTALL IN LOWER FUSelage HALF SHIFT FOR BALANCE

USE ONLY BEST QUALITY COIL - MUST HAVE SPARK WIRE TO THREE POINTS

CONNECTIONS TO THREE POINTS

IGNITION SYSTEM INSTALL IN LOWER FUSelage HALF SHIFT FOR BALANCE

USE ONLY BEST QUALITY COIL - MUST HAVE SPARK WIRE TO THREE POINTS

CONNECTIONS TO THREE POINTS

IGNITION SYSTEM INSTALL IN LOWER FUSelage HALF SHIFT FOR BALANCE

USE ONLY BEST QUALITY COIL - MUST HAVE SPARK WIRE TO THREE POINTS

CONNECTIONS TO THREE POINTS

IGNITION SYSTEM INSTALL IN LOWER FUSelage HALF SHIFT FOR BALANCE

USE ONLY BEST QUALITY COIL - MUST HAVE SPARK WIRE TO THREE POINTS

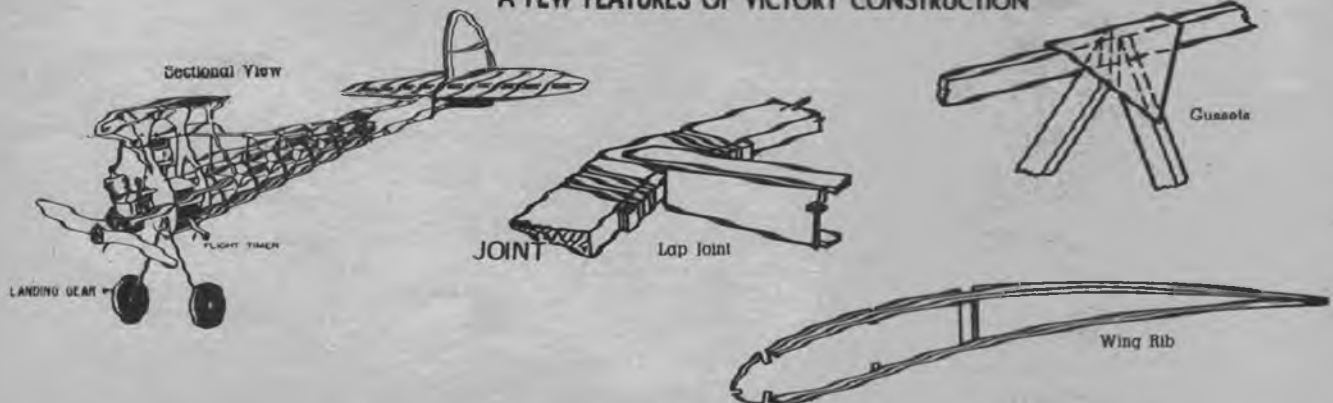
CONNECTIONS TO THREE POINTS

IGNITION SYSTEM INSTALL IN LOWER FUSelage HALF SHIFT FOR BALANCE

Meadow's **V** Victory



A FEW FEATURES OF VICTORY CONSTRUCTION



Construction

... featured in the Newest and Greatest Gas Model... the "Jap-Slapper"

Every day new and better methods are being found. Instead of *limiting*, War Requirements are actually causing the production of stronger and better things. In model airplanes, Megow's VICTORY CONSTRUCTION reaches a new high in strength with all the lightness of balsawood.

Introduced in the "Jap-Slapper," Megow's newest gas model kit, the new VICTORY CONSTRUCTION, developed exclusively by Megow, features interlocking formers and fully gusseted joints that require only the regular model builders' cement. Many ideas gained in real aircraft production appear in this latest Megow sensation. Designed especially for contest work, the "Jap-Slapper" not

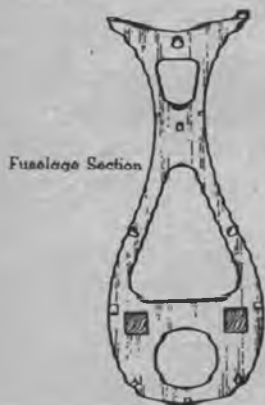
only meets the construction problems of the model builder, but advances every opportunity to beat the record.

The "Jap-Slapper's" wingspan is 42 inches, and overall length 32 inches. Wing area, 300 square inches with loading capacity of 9½ ounces per square foot. A class B model, for motors of .20 to .29 displacement, and a ready-to-fly weight of only 20 ounces!

If you build model airplanes, be sure you build NEW types, engineered for today's materials as found in Megow kits. If your dealer cannot supply you, order direct from us.

Megow

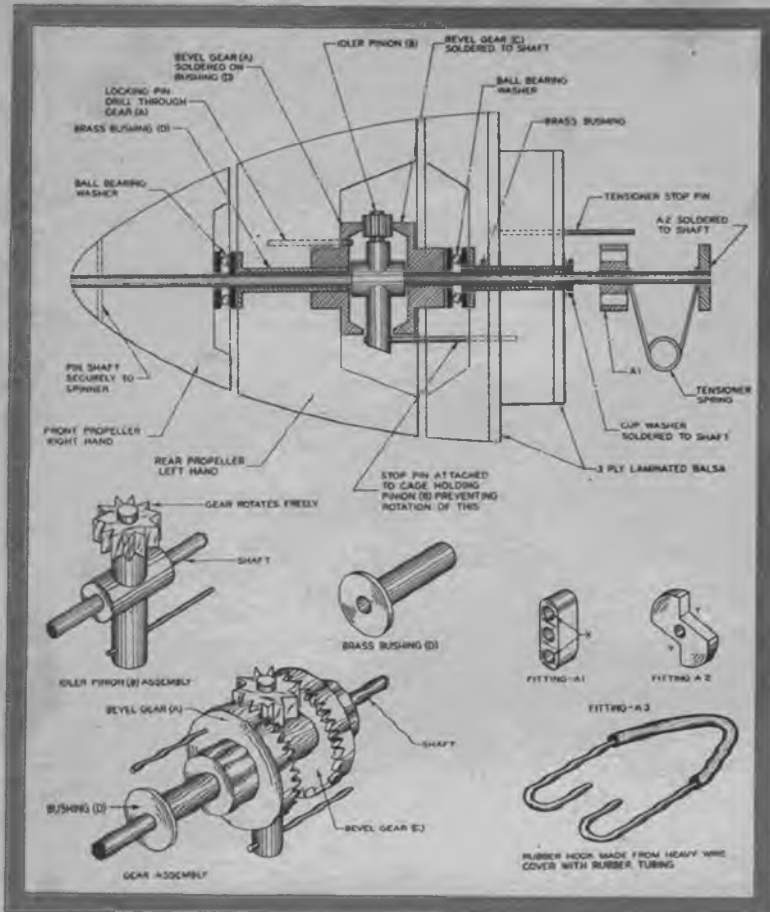
PHILADELPHIA, PENNA.



The fact that a large part of the Megow plant is now engaged in war production is not seriously curtailing the production of regular lines, and new models, meeting the demands of today both in types and in construction, are constantly coming through. Watch for them!

CO-AXIAL PROPS

Redrawn from "The Aeromodeller"



CO-AXIAL propellers (two propellers on the same shaft which turn in opposite directions to neutralize torque) are used on dream-ship designs of all model builders; the actual creations never seem to have them. Two English builders, C. H. Hedges and R. V. Bentley, have worked out a simple and certain method that can easily be incorporated into your next super contest job.

The rubber is wound by a special attachment onto the winder engaging fitting A3. It is then connected to the shaft by passing the ends through holes X in the fitting A1, compressing the tensioner spring, and engaging them into the notches Y of fitting A2. The drive operates easily. Fitting A3 turns the shaft through A2. The shaft turns the front propeller by means of two soldered pins, a disk and gear (C). Gear C turns gear A in the opposite direction by means of the idler-gear assembly (B) which cannot revolve because it is pinned. Gear A is pinned to the rear propeller, which revolves in a direction opposite to that of the front propeller. On the original device the gear was a differential salvaged from a scrapped clock-type D. C. electric meter, but any small differential can be used.



MORE like a rubber-powered flying scale model than the usual control-line job, this Spitfire is a wonderful example of interesting results of building actual models of fighter craft rather than speed models. Built by Paul Van Sant of Chicago, its top speed is 47 m. p. h.; but what it lacks in speed is made up for by its maneuverability. It can dive straight down to within ten feet of the ground and pull out with nearly straight-up zooms. The model is powered by an Ohlsson 60 and covered with silk; its span is 45 inches. The Spitfire shows the possibilities in using the Air Trails Planbook three-view drawings to design your own models of fighter craft.



SPINDIZZY SPITFIRE

BOMBERS, FIGHTERS, ALL MAY BE CONTROL-LINED.
BUT FOR REAL FUN, TRY FLYING A COMBAT MODEL.



DETHERMALIZER SURVEY

DON'T RISK VALUABLE ENGINES AND MATERIALS. GET ANTI-OUT-OF-SIGHT INSURANCE BY USING DETHERMALIZERS ON MODELS.

By H. A. Thomas

NEARLY a decade of gas-model building and flying has witnessed remarkable refinement in design of planes and engines and corresponding progress in flying technique. The problem of achieving consistently good flights has changed to one of limiting flights to prevent widespread loss of models. Model builders were quick to perfect a variety of devices to limit motor runs to split-second accuracy. But the shortest of motor runs was often sufficient to start present-day gas models on out-of-sight flights. Rubber models, too, presented much the same problem.

That, briefly, was the condition which brought about first experiments with "dethermalizers." A few prominent model builders set about to perfect gadgets to bring down models which would have otherwise soared from sight. Besides the considerable expense involved in the loss of gas models, more important reasons made this development necessary. War-time restrictions on model-engine production and the scarcity of model building materials required the strict conservation of engines and models on hand. And aircraft spotters might be confused at the sight of wandering gas models. Spiraling slowly, these can be easily mistaken for real aircraft. Because of these facts, current AMA rules disqualify long flights and point to the use of dethermalizers.

Among the first rubber-model dethermalizers were those of Dick Korda and Chester Lanzo. Korda's rudder-tab device and Lanzo's hinged cabin air brake are both successful. (Turn to page 50)





DOUGLAS A-20A

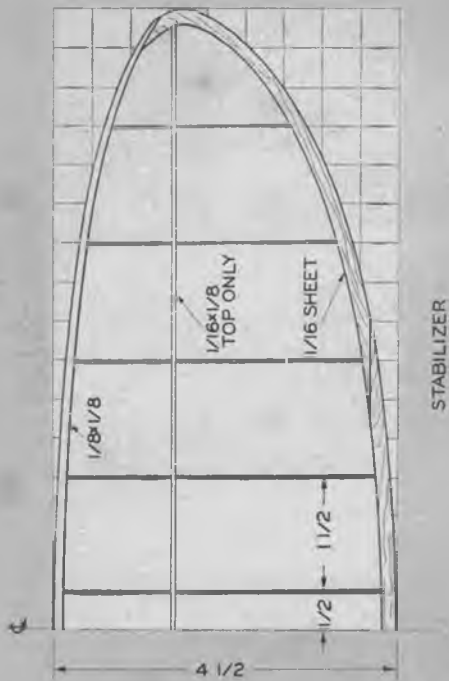
ONE OF THE GREAT PLANES OF THE WAR, THE DOUGLAS A-20A IS A FA



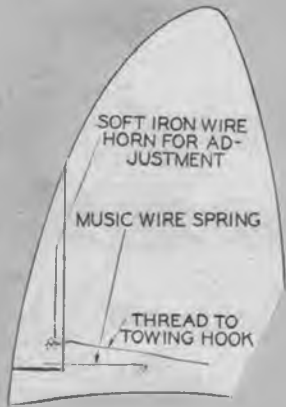
Kodachrome for Air Trails Pictorial by Hans Groenhoff

ST BOMBER WITH NEAR FIGHTER CHARACTERISTICS. IN ENGLAND IT IS THE BOSTON OR HAVOC.

PIONEER



STABILIZER



AIR-FOIL



3

WHEN the government froze balsa for the duration, we cast about for a substitute. White pine was selected because it's so readily available. A slightly different construction must be used in any hardwood design to overcome the weight handicap. Fairing blocks, double curves, and solid bulkheads should be avoided. The design of the Pioneer managed to avoid these pitfalls so well that the completed model was actually underweight. Its strength was even greater than the average balsa job. Build this towline glider and you'll stick to pine even after the duration.

Construct the crutch first. Use $\frac{1}{8}$ " square for longerons and forward cross members, and $\frac{1}{16} \times \frac{1}{8}$ " cross members aft the wing mount. Set up the short member under the wing mount on blocks until the uprights can be cemented into place. While this is drying, cut out the nose pieces; cement the top one into place and add the uprights. Now construct the fin and cement it to the crutch. After the fin is set, add the top fuselage stringer and the remaining uprights. Remove the top half of the fuselage and complete the bottom in the same manner. Add the remaining stringers, stab mounts, celluloid windshield and the automatic rudder hook-up. Cover with gas-model paper and dope well.

Cut the wing ribs from a metal template; if a band or jig saw is available, put together with dope $\frac{1}{32}$ " sheet rectangles large enough to form the ribs and saw to the proper outline. Sand and split them apart. Build the wing flat and form a dihedral after the cement has set. Add the wing-mount pad to match the fuselage. Cover with tissue.

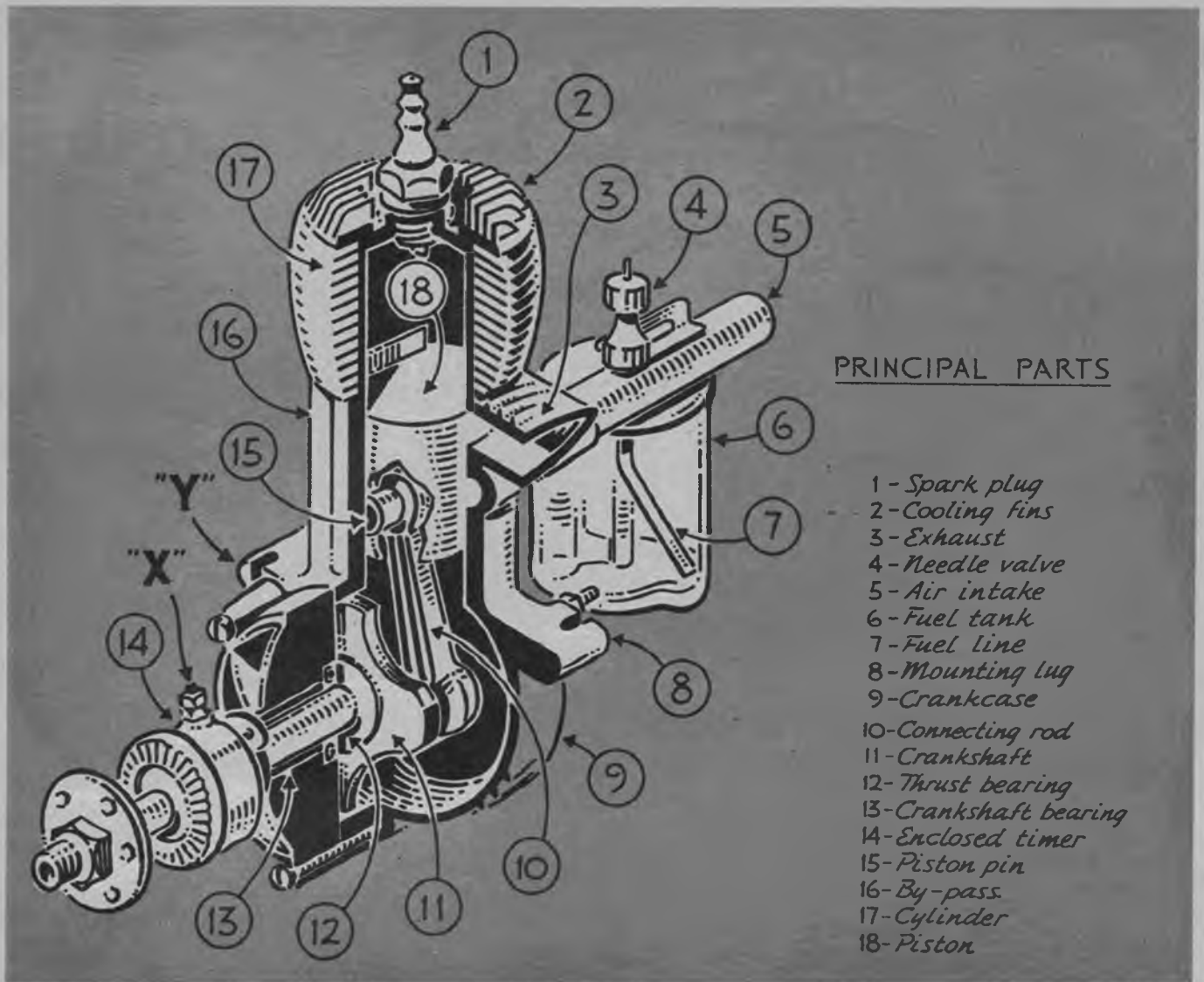
Cut the template for the center ribs and form the outer ribs by cutting off the trailing edges to match the chord. Moisten the leading edge before assembly. Cover with tissue and fit to fuselage. Cement it into place at zero degrees incidence.

A heavier covering than tissue is recommended. Be certain that the automatic rudder control works freely. Adjust a soft wire horn on the tab to give straight flight during towing and about a hundred feet of left circle in the glide. For windy weather use the forward hook for towing.

**RUBBER'S OUT! CHANGE OVER TO GLIDERS;
DUPLICATE THIS ALL-PINE CONTEST WINNER.**

By Caldwell Johnson





PRINCIPAL PARTS

- 1 - Spark plug
- 2 - Cooling fins
- 3 - Exhaust
- 4 - Needle valve
- 5 - Air intake
- 6 - Fuel tank
- 7 - Fuel line
- 8 - Mounting lug
- 9 - Crankcase
- 10 - Connecting rod
- 11 - Crankshaft
- 12 - Thrust bearing
- 13 - Crankshaft bearing
- 14 - Enclosed timer
- 15 - Piston pin
- 16 - By-pass
- 17 - Cylinder
- 18 - Piston

KEEP 'EM PURRING

By Larry Eisinger

NO MORE NEW ENGINES SINCE YOUR MANUFACTURER BEGAN TO AID THE WAR EFFORT. HELP YOURSELF. HERE'S THE SECRET OF MAKING YOUR REMAINING ENGINE LAST.

CONSERVE! America's war cry on farms and roads, in factories and kitchens—yes, and even on the modeler's bench! We modelers, like everyone else, might as well face the fact that our necessary supplies won't be so plentiful in the future. And your engine manufacturer is going to be particularly affected. That precision-built power plant you bought last year won't be replaced so easily as it was purchased. *Take better care of your engine!* Give your power plant the care and consideration you would give a priceless mechanism, for in the not-too-distant future

your engine may be not only priceless, but irreplaceable.

Go to almost any contest or flying session and you'll find that over seventy percent of the modelers cannot even start their engines, let alone keep them running. It's an extravagant percentage at any time and an unpatriotic figure at present. The failure of these engines to perk is, in the majority of cases, directly attributable to a lack of adequate care on the part of the modeler. Engines that become balky before their time not only discourage builders, causing them to drop an interesting and worth-while

hobby, but indicate an appalling waste of almost irreplaceable machinery. Proper care will keep an engine running smoothly for years without an appreciable loss of power.

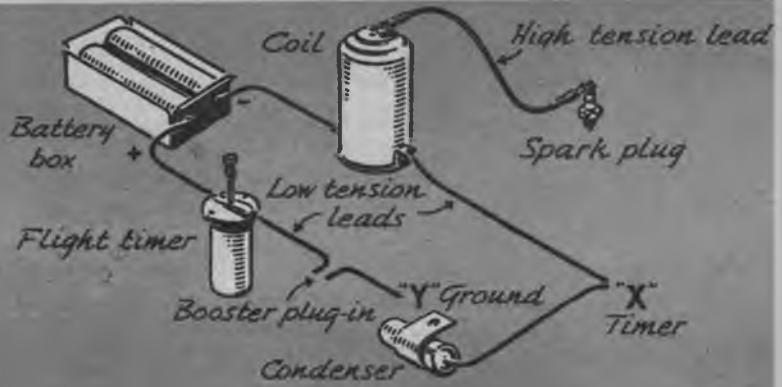
These proven methods of caring for your engine will guarantee it a long working life. For a clearer explanation we shall divide this article into two units, ENGINE and IGNITION, and treat each one separately.

Engine Care

As with all precision machinery, friction is responsible for the eventual inefficiency of the engine mechanism; decreasing the amount of friction increases the life of the mechanism. Our principal aim, therefore, is to keep the amount of friction created by the moving parts at a minimum.

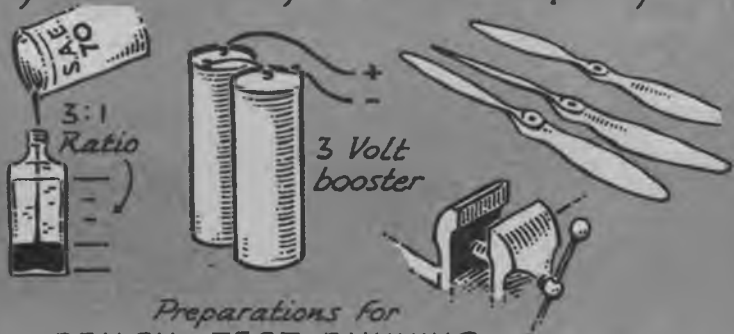
One must at all times make certain that the engine is sufficiently lubricated, and that the lubricant does not contain particles of dust or grit which would increase the amount of friction. Your engine manufacturer recommends the type of lubricant which makes his engine perform best. While not all engines employ the same lubricants, S. A. E. 70 oil is generally considered ideal. This type of oil is best suited for lubricating purposes in a two-cycle engine because its extremely viscous nature discourages quick evaporation. Consequently, when the fuel mixture is ignited, the oil does not burn, but remains to form a smooth film on the piston, cylinder walls and other moving parts, cutting down the amount of friction.

Foreign substances in the oil increase the amount of friction, so extreme care should be exercised in mixing fuel. Oil should be kept in a sealed container at room temperature. Always use the fuel ratio recommended by the manufacturer of your engine. He knows best; it's his business. The type of gasoline used in your fuel mixture is also an important con- (Turn to page 56)



WIRING DIAGRAM

Low tension wires should be stranded, connections soldered, wires short but not under tension. Condenser & ground wire may be bolted anywhere on engine. Check battery box contacts frequently.



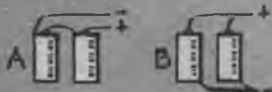
Preparations for BENCH TEST RUNNING

Use only heavy oil and fuel ratio recommended by manufacturer, fresh doorbell battery, propeller of correct diameter & pitch. Bolt or screw engine to wooden block, clamp firmly in bench vise.



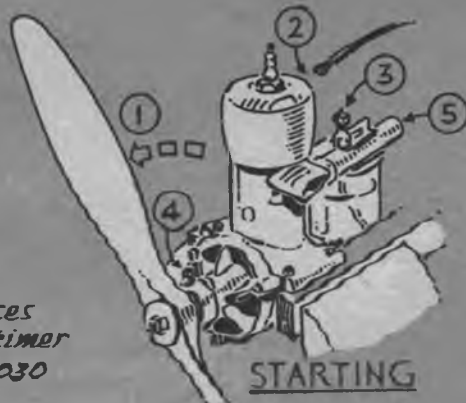
CLEARANCES

Spark plug point clearances vary from .010 to .015 in., timer points vary from .010 to .030 in. Keep points clean.



A = Series battery hookup, 3 volts.

B = Parallel hookup, 1 1/2 volts.



STARTING

1 - Attach propeller in position for easy cranking against compression 2 - Test spark, holding lead 1/8" from cylinder. Spark should jump gap as propeller is turned 3 - Open needle valve as per engine instructions 4 - Set spark to neutral position 5 - Hold finger over air intake, turn propeller smartly several revolutions to prime. Crank engine, lean mixture down, advance spark.



DIRECT PRIMING

Cold weather or new engine stiffness may require priming through exhaust or intake tube with an eyedropper. Take care to avoid flooding.

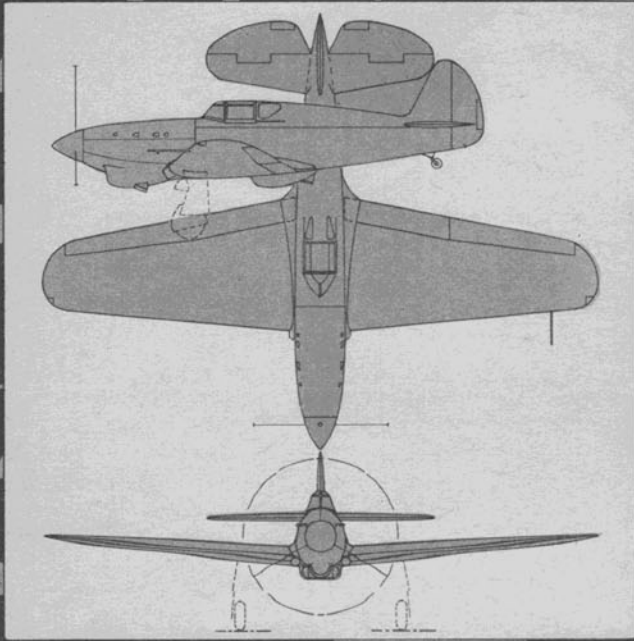


When engine must be taken apart use proper tools -

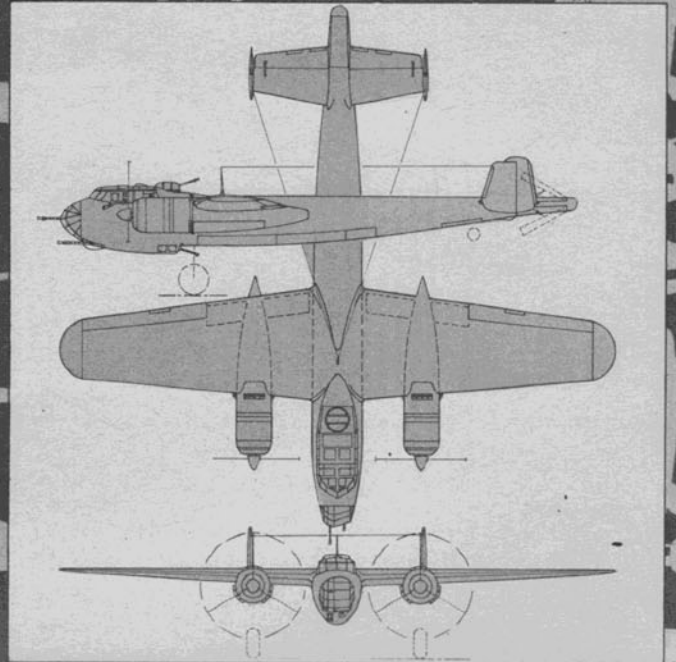
Thomas

AIR TRAILS PLAN BOOK NO. 1

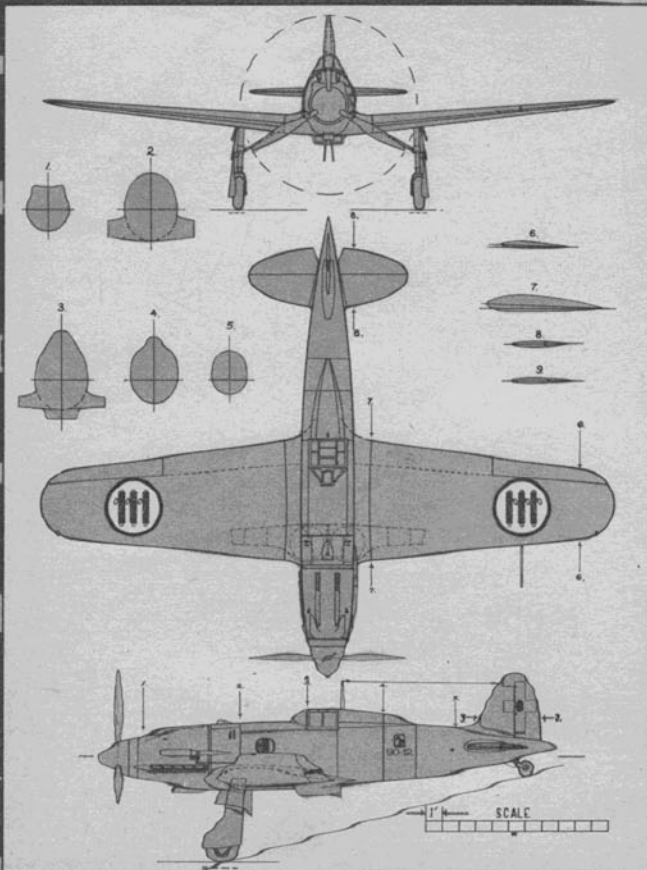
By Thomas Nayler



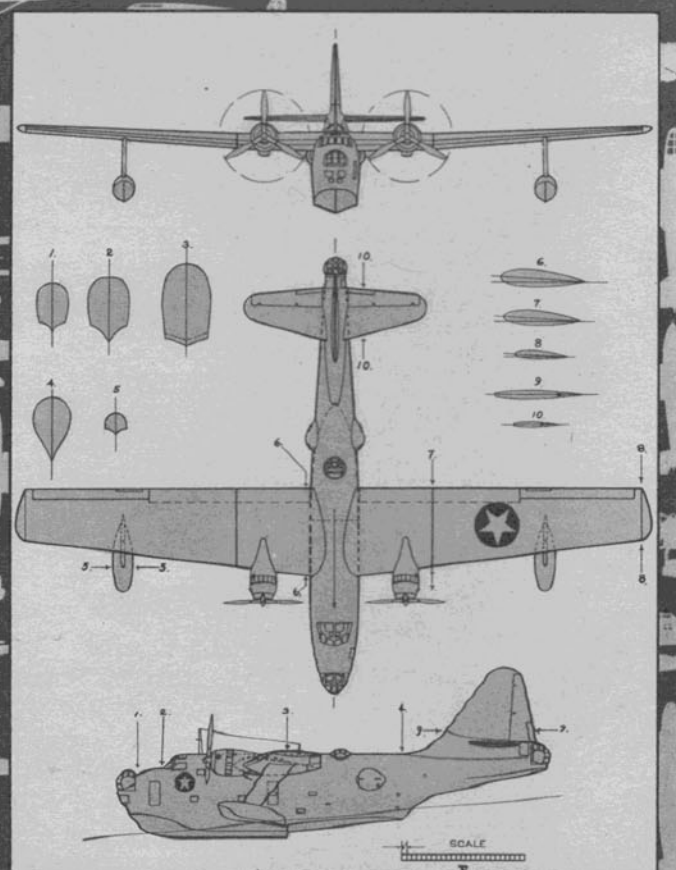
RUSSIAN I-26 ("YAK-1")



DORNIER DO-217-E.2



MACCHI C-202



SAVOIA MARCHETTI SM.79 SPARROWHAWK

THE SKYRANGER

HERE'S YOUR LAST CHANCE TO BUILD AN ALL-BALSA REARWIN, SCALED EVEN TO SLOTS.

By Gregory Kohn



THE latest Rearwin introduction into the light-plane field is the Skyranger. Side seating, anti-stall slots and a 75 h. p. horizontally opposed motor mark its difference from the other Rearwin planes. As a flying scale model, its performance is remarkable. With all its tail surfaces true to scale, it is a very stable flier which, adjusted properly, will turn in excellent flights.

Lay out the sides of the fuselage, using medium $\frac{1}{8}$ " square longerons and hard balsa for the uprights. If you prefer, the doors can be made to open, but they must fit snugly. Assemble the sides and add the top and bottom formers. Formers #1 and #7 are of hard $\frac{3}{32}$ " sheet balsa; the other formers are of $\frac{1}{16}$ " soft sheet balsa. Notch and glue the base ribs A to the top of the cabin. Insert ribs B and the center-section spars. Add the trailing-edge fillets.

Select a medium block of balsa and, using the templates for the engine block, carve and sand it to shape. Refer constantly to templates for accuracy. Cut off the nose block, as shown in the perspective view, and cut the engine block through the center. Hollow each half and then glue them together. Glue

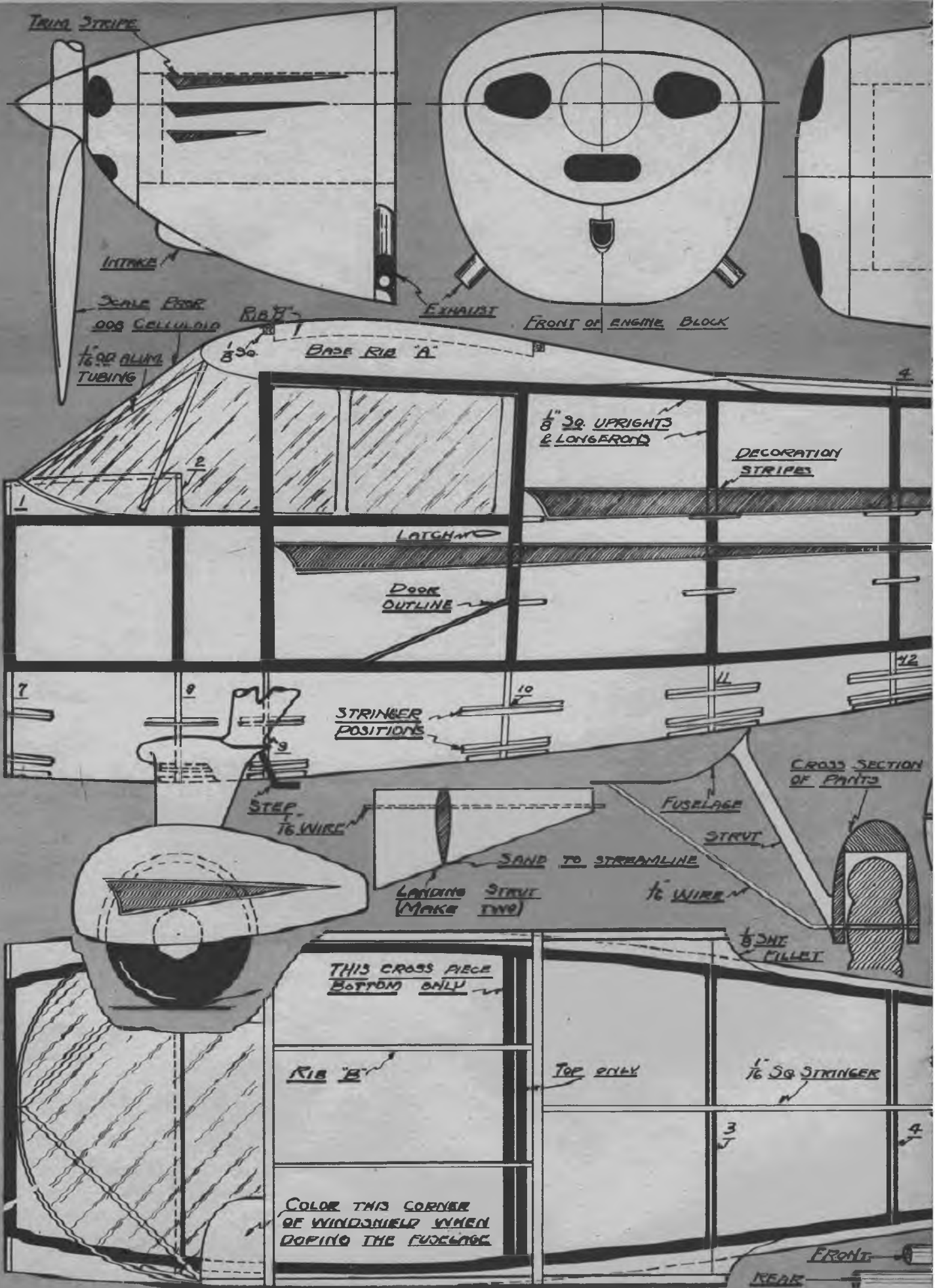
a large-face bushing to the nose block. Great care must now be taken. Center the engine block on formers #1 and #7; glue it to them. Cut some very soft $\frac{1}{8}$ " x $\frac{3}{16}$ " strips and plank the nose flush from the rear of the engine block for former #2 on the top, to the rear of the doors on the sides, and to #9 on the bottom. Add the stringers and landing-gear legs. The wheel pants are made in the same manner as the engine block. Shape the fillets and sand the fuselage smooth. Rub in three coats of thin glue, sanding between coats.

The tail surfaces are built up of hard balsa to prevent warping. The spar in the rudder serves as the tail post, and the rudder is built into the fuselage before it is covered.

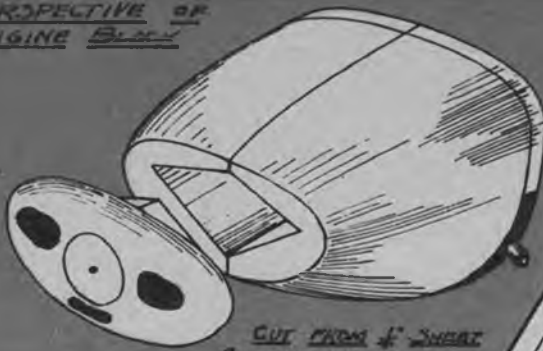
Lay out the spars for the wing; $\frac{1}{8}$ " x $\frac{3}{8}$ " hard balsa is used. Cut enough ribs and fit the spars into them. The aileron spar is of hard balsa. Fit the trailing and leading edges. Now cut the leading edge away and insert the anti-stall slot. Attach the wing tip and cover the leading edge with $\frac{1}{32}$ " soft sheet. Sand the framework. Cut the wing struts to shape. Carve propeller as shown.

The original model was silk-covered except for the wings and tail surfaces which were covered with superfine tissue. Spray the entire model with water to shrink the covering. Apply three coats of clear dope and sand lightly with 10/0 sandpaper. The number of coats of pigmented dope is optional, depending on the finish one wants. The original model had ten coats of berry red on the fuselage and rudder and five coats of colored dope on the wings and tail. Rub the en- (Turn to page 62)

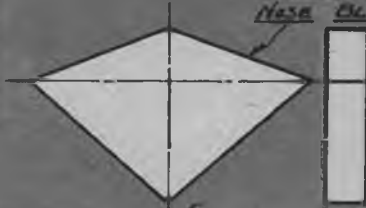




PERSPECTIVE OF
ENGINE BLOCK



TOP VIEW



CUT FROM 1/2" SHEET
CEMENT TO BACK OF
NESE BLOCK

TAIL LIGHT

1/8" SHEET
OUTLINES

GUSSET

1/8" RIBS
AND SPARS

IRON WIRE HINGES

THREAD

LICENSE NUMBERS

SILK FILLET

NC
6235

STABILIZER
POSITION

5

6

13

14

15

16

1/8" SPARS
AND RIBS

IRON WIRE
HINGES

1/8" SHEET
OUTLINES

GUSSETS

17

18

SIDE FINING
STRINGERS

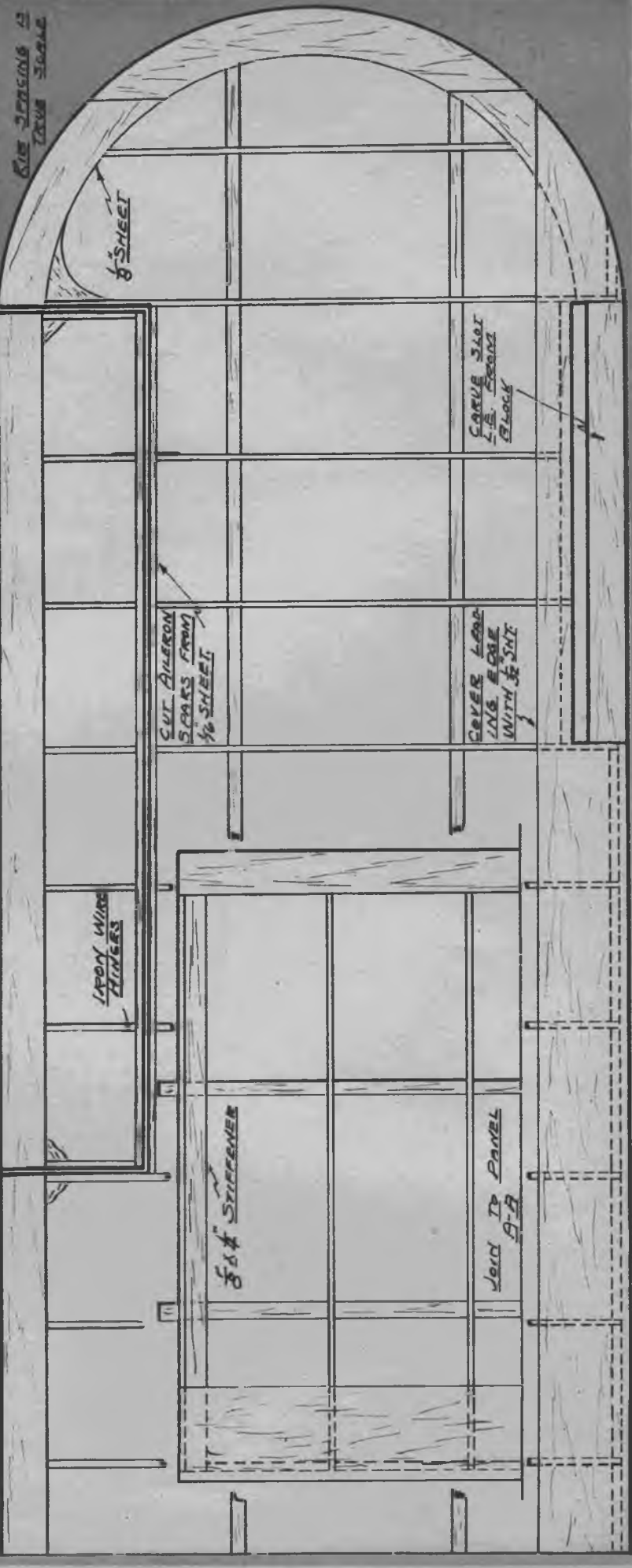
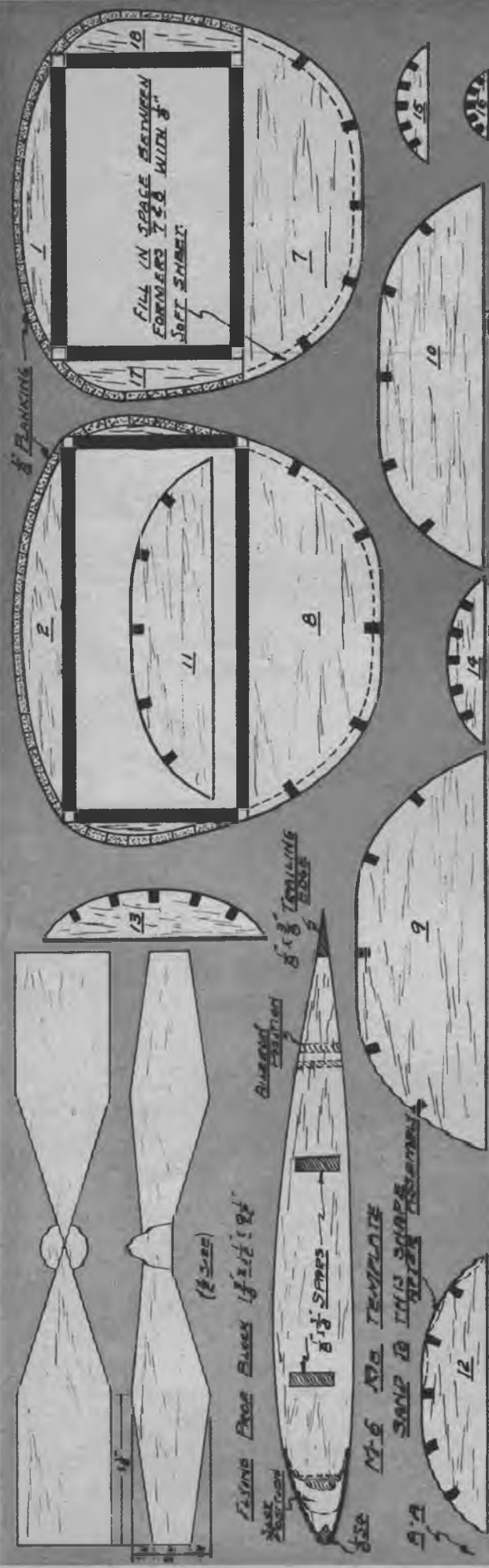
INTER-PLANE STRUT (VARI 4)

WING STRUTS

REARWIN SKYRANGER

DESIGNED BY GREG KOHN

DRAWN BY J. NOONAN





"Eyes of the Artillery"
... PIPER L-4

FREE BOOKLET ON HOW TO FLY. Send today for your copy of the easy-to-understand booklet, "You, Too, Can Fly!" If you also want the full-color Piper catalog, enclose 10c in stamps or coin for postage-handling.

INSTRUCTORS and TEACHERS. Write for new, helpful Teacher's Kit of Junior Aviation Instruction Material. Includes 5 Wall Charts (22" x 34½"), Model Plane Blueprint, Literature. Send \$1 bill or check.

**PIPER AIRCRAFT CORPORATION,
DEPARTMENT T 29,
LOCK HAVEN, PENNA., U. S. A.**

THE Piper L-4 plane is already proving its worth as the "Eyes of the Artillery" on the fighting fronts. Called the "Grasshopper" by artillerymen, the L-4 does a job greatly superior to the vulnerable observation balloons of the last war . . . and with relative safety!

The observer radios firing corrections to the battery until the guns are dropping shells directly on the target. The "Grasshopper's" protection is low-altitude flying, its ability to land quickly almost anywhere, the ease with which it can be hidden and the fact that it is practically invisible from above, even when in flight!

Its uses are not limited to the Artillery. It is now serving Uncle Sam in the Tank Corps, Cavalry and Infantry . . . directing troop movements, transporting officer personnel, delivering messages and spotting enemy infiltration.

And, when victory is won, you will benefit by a smart, easy-to-fly peacetime version of this remarkable plane. You'll be able to make quick, safe, restful flights to your favorite hunting, fishing and vacation spots, and streamline your business trips . . . saving time, gasoline and tires.



PIPER POINTS THE WAY TO WINGS FOR ALL AMERICANS



WHITHER THOU GOEST BROTHER!

I'll be right on your tail—from Tunis to New Guiana. All of us have learned one thing in a year of war—you play for keeps, you kill the Jap or Nazi before he kills you. But the best pilot in the world is useless unless he gets the ships to fly and the guns to shoot. That's where the folks at home come in. What are you doing about us?

THE HUMAN FACTOR . . .

The results show that the American Aircraft industry is producing pursuit and interceptor planes equal if not superior to any in the world. Curtiss, Bell, Republic, Lockheed, Gruman and the other organizations are responsible but it is the human factor—the ingenuity, the patriotism, and the skill of the designers, the sheetmetal workers, the mechanics—that make it possible. To these workers—the men and women who build our pursuits and interceptors, we owe a great debt of gratitude.

Send for our free beautifully illustrated 24 page booklet giving details of our aviation specialist courses. Address Dept. 5

"Keep 'em Flying"



SCHOOL OF AVIATION

3240 N. W. 27th AVENUE • MIAMI, FLORIDA

Name _____

AT-2-43

Address _____

City _____

State _____

Contractors to

U. S. ARMY AIR CORPS • CIVIL AERONAUTICS ADMINISTRATION

UNITED STATES STATE DEPARTMENT • ROYAL AIR FORCE

Talent Tests

(Continued from page 21)

project must keep pace with changes in training and combat procedures. Nor is the job completed when a young man passes his exams and is sent to training school. Each cadet is watched throughout his entire training; if he flunks out somewhere along the road, the division wants to know why. Such information is obtained through interviews with instructors and with the cadets themselves.

Already the results of this new type of examination have revealed certain hitherto unknown facts. The psychology experts now know that the academically minded person does not always make the best flying officer; a practical and mechanically minded man is usually the best bet. They know, too, that the majority of the 1,000 cadets who have been eliminated from training have failed because of their inability to observe, keep alert, and orient themselves properly. This factor had been almost completely overlooked in previous examinations.

If you indicate that your preference is to be a flying cadet, you are not denied the privilege of requesting what you prefer. The examiners don't hold a stick over your head and proclaim, "You'll be a bombardier if we say so!" If you pass your Aviation Cadet Qualifying Examination, you are given information concerning the training and duties of the bombardier, pilot, and navigator and are asked to rank the various types of training in the order of your preference. In indicating your preference, you consider your interests, abilities, and previous training in relation to the requirements of the specific types of assignment.

Then comes a comprehensive battery of aptitude tests. They are divided into four groups and require several hours to complete. The apparatus tests are given individually. The others are given to a large group of cadets at one time and the results are graded on an electrical test-scoring machine. The first batch includes tests of intelligence, judgment and proficiency; they are of the same general type as the placement examinations given high school and college students. The questions are entirely objective and concern such subjects as mathematics, history and social and political science. All are of the multiple-choice variety.

The second group measures alertness, observation and perceptual ability. You are given maps, dials, charts and tables with which you must perform certain problems to determine ability to learn, to grasp details, and to size up what you see.

The third is another objective, paper-and-pencil questionnaire, similar to the first, which tests personality, temperament and general interest. Here again the questions are of the multiple-choice type.

In the fourth group, various types of mechanical apparatus are designed to measure ability to co-ordinate, as well as skill in performing and specific functions of the various air-crew

members. If you perform your problems without becoming confused or too tense, even with such disturbing elements as noise added to make it harder, then the air forces want you.

A good score on all the tests gives a cadet his first preference, even though his predicted aptitude is greater for another type of training. If the score is relatively low on all grades of training, he is assigned on probation. But if his score is average, he is assigned by the Classification Board at the Air Forces Classification Center according to the data available concerning his aptitude and preferences.

Only seven percent of the cadets insist that they want to be classified for one duty and no other, even if it means being "washed out." Most of them (thirty-eight percent) want first preference unless it would mean being washed out; thirty percent want their first preference unless they are definitely higher in another group; and twenty-five percent take anything they can get.

The air forces have evidently done a good job of selling the importance of bombardiers and navigators; what is better, they have kept their cadets open-minded and willing to do the job for which they are best fitted. Although the pilot grade is naturally the most popular, the psychologists believe this is only because the movies and fiction writers have endowed the pilot with glamour.

Cadets are fast learning that although there are significant differences in the three grades, the requirements for the various duties have much in common. One type is as important as the other, and they're all interdependent. The crew of a heavy bomber is a co-ordinating group of teammates. Just as one man may be suited to play quarterback rather than center of a football team, so is one man more suited to the role of bombardier. The tests are designed to bring out each man's peculiar qualifications so that, as a whole, the bomber team is as efficient as possible.

Little tangible evidence of the exact success of this personnel job being done by the air forces exists. It is known, however, that the boys who pass their psychological tests gain confidence in their ability to lick their courses. The tests have produced a noticeable reduction in the washout rate. They have also shown that boys with little educational background are doing as well as, and in many instances better than, the boys with two years of college did under the old program; moreover, the air forces are thousands of men richer since the abolishment of the college education requirement.

The best evidence of the program's success is found in the reports from the boys on their jobs. Their enthusiasm warms Col. Flanagan's heart, and he feels sure that not one of the boys who is well along in his course would trade his job for Henry Ford's income tax!

Again Available! **5¢ TUBE**



TESTORS

MODEL AIRPLANE CEMENT

AT ALL LEADING 5-AND-10¢ STORES AND HOBBY SHOPS

This is it! - the first simple, understandable, fascinating story of how a plane flies



- How instruments guide and protect fliers
- How the weather affects flight
- How airlines and airports are operated
- How airplanes are built and serviced
- How the motor works
- How navigation is done aloft
- How radio beam and radio compass work
- How ailerons, rudder, stabilizer, tabs, and flaps control flight
- How to read the instrument board
- How pilots and mechanics are trained
- How propellers are precision built — and why
- How air traffic is ruled and regulated — the C.A.A.
- How pilots plan and execute important flights
- How the supercharger and other accessories work
- How to fly without a motor — the gliders
- How the helicopter flies
- How to learn to fly
- How everyone will come to fly

Ideal introduction to aviation for High School Boys and Girls

DOCTOR, lawyer, merchant, chief, school boy, farmer, worker — all of us, men and women, are going to fly, either as passengers or pilots. And, if we are to be at home in the air, we must know now how a plane flies. At last, for Americans of any age eager to understand, here is a book which reveals as no other ever has the wonders of flight.

Air — the solid, concrete highway of tomorrow's travel

Few people know that air is actually a solid substance, or how it supports the planes that roar overhead. Here is a book that describes the whole theory and practice of modern aviation, with nothing technically intricate in it to confuse or mystify you. Simply and clearly, with the warm enthusiasm of a man who loves his subject, the author tells about flying in the terms of the planes and men who perform this daily miracle. If you never knew before, you will now know how a plane flies, how instruments guide and protect fliers, how air is utilized by modern science and made a safe highway.

But facts aren't the only things this new flying book offers. In these pages you feel the excitement of silver wings and roaring motors as you discover the fascinating way they operate. Beautifully illustrated, warmly written, **HOW A PLANE FLIES** is both a thrill and an education. Send for it today. If you don't agree that it is one of the best aviation books ever published, it won't cost you a penny.



Illustrated, \$2.00, at all bookstores

How a Plane Flies

Are you sure YOU know?

By CHARLES GILBERT HALL

Frank & Wagnalls, publishers of the sensational, successful Jordanoff pilot-training books, YOUR WINGS, THROUGH THE OVERCAST, & SAFETY IN FLIGHT.

SEND NO MONEY

Tear out, sign, and mail to

FRANK & WAGNALLS COMPANY
Dept. 816, 334 Fourth Ave., New York, N. Y.

I want to know *How a Plane Flies*. Send me a copy by return mail for 7 days free examination. I will deposit \$2.00, plus the few cents postal charges, with postman on delivery. If I am in any way dissatisfied, I may return the book within 7 days for full refund.

Name:

Address:

City & State:

62¢ Postage FREE if you enclose same return privilege.

Dethermalizer Survey

(Continued from page 35)

Another good idea, by Tony Schott, releases flaps in the stabilizer, causing a nose-high mushing descent. Similar to Schott's stabilizer flap but intended for gas models is an arrangement which permits the entire tail group to pivot at the leading edge. The greatly increased negative incidence causes the model to mush downward.

The average model builder runs into many problems when he decides to equip his model with a dethermalizer. It must be light, must not hinder the model's flight before its operation, and must be effective enough to bring down the model even in strong thermals at such an attitude and rate as to prevent damage.

Many modelers tend to overestimate the area and angle needed in rudder-tab dethermalizers and also the area of "spoiler" and flap devices. Rudder-tab dethermalizers are best on the lighter, slower, rubber models, but they frequently cause violent spins in gas models, even with very slight movement.

Light, pneumatic timers, adjustable over a wide range of time, are most widely used to set off the various gadgets, both in rubber and gas models.

"Spoilers" must be of ample size relative to wing area to "spoil" enough lift and cause the model to descend even when in a thermal. Those devices built like wing flaps, and meant to cause excessive drag, must also be large-sized. It isn't a good idea to try to duplicate the flaps used on real aircraft. They are used under entirely different conditions to serve a different purpose. A heavily loaded airplane needs extra lift as well as drag to permit slower flying speed at a steeper than normal angle of approach. But the average model plane has an extremely low wing loading and consequently needs plenty of drag to lower speed and lift to the point where the model will descend. So, instead of flaps lowering at about forty-five degrees as in the case of real planes, dethermalizer flaps can

be lowered at right angles to the chord for most drag.

Any device which alters the wing or tail of the model should be tested with caution to avoid unexpected dives or whipstalls which can wreck the model. For this reason, wing pylons flaps or "door" flaps built into the fuselage sides might be a safer solution. The latter idea has been tested.

The idea of releasing a small chute, possibly twelve inches in diameter, which trails the model and retards it, has been used with success. The problem is to manage to pack the chute to minimize drag and yet allow foolproof operation. Fastening the chute string to a point away from the center of the wing to cause a spiraling descent may offer possibilities.

Another gadget releases a spool of thread, one end being fastened to a wing tip, the other tied to the spool. Air resistance and the weight of the spool cause a spiral dive. The length of thread is supposed to permit the model to recover from the dive when the spool reaches the ground. Perhaps by fastening the thread midway in the wing panel, instead of at the tip, the descent might be made a bit safer.

Split trailing-edge flaps of the dive bomber variety may offer an advantage since the extent of upper and lower flap opening may be adjusted to govern the model's attitude during its descent.

The most novel dethermalizer is the one designed by Frank Ehling. Two large fins, built against the stabilizer tips, are released by the timer and open to triple the fin area, causing a weathervane effect. The model heads into the wind and, although it may not come down at once, it does not drift away with the wind.

With such a variety of ideas under development, no doubt in the near future several sound, practical dethermalizers will be widely used to permit model flying with all the old-time zip, but without the loss of so many models.

The Jap Air force

(Continued from page 17)

and the East Indies; eighty-five per cent of her manganese and molybdenum from Latin America and Malaya. The very major portion of her tin, iron ore, pig iron, scrap iron, copper came from abroad.

Japan lacks technical skill, design knowledge and machine tools sufficient for sustained large-scale production. She has a serious shortage of skilled workers; subcontractors have small, poor staffs with inadequate equipment. Training centers and "training factories" have been established, but it is improbable that she will ever acquire enough skilled labor to rival the Western countries. Japan

has no industrial center like Detroit and no prospect of one. Time is her great need, time to disperse her industry—if it can be done at all, time to glean raw materials and resources from the captured lands to the south.

In 1941 the Jap air force was estimated at about 4,500 aircraft. The army had 800 first-line and 850 second-line planes; 36 reconnaissance squadrons of 300 aircraft; 35 fighter squadrons of 150 aircraft. The navy had 600 flying boats, 400 carrier-based planes and 1,000 planes in reserve. Other estimates run to 3,000 and less.

(Turn to page 52)

"I consider my modeling experience a priceless education,"

writes A/C Lee M. Sherman of the AAF.

Read what he says! "As I look back over my boyhood days and think about the wonderful hours spent with models, I see that I never fully realized the importance and help such training was going to mean to me. I never dreamed that that one day I would be a flying officer in the U. S. Army Air Corps. Yesterday I was flying models—today I am flying the real thing. After reading several other statements about the importance of model building in helping one understand planes, I can say this is very true—but it goes even further. One learns all about right turns, flying characteristics, theory of flight, engines and even a little weather. I consider my model experience a priceless education. I am now ready to graduate from advanced flying school, and get my commission, and as I look back over my rigid training I can now realize how much my previous experience with models has really meant to me."

Paging Pilot SHERMAN!

Congratulations—but you failed to include your address on this letter. Please send it to us at once, so we can mail the P-38 kit award you requested.



Navy's Hard-Hitting Scout Dive Bomber CURTISS "HELLDIVER"



Vought Sikorsky "CORSAIR"

A Navy fighter in the 500 m.p.h. Class. Span 30'3/16". C-D Master Kit SF-79.....

\$3.50



Nazi JU-87 STUKA DIVE BOMBER

One of Nazis' greatest weapons for terrorizing and wreaking heavy destruction upon Europe. Span is 34". C-D Master Kit SF-84.....

\$3.50



British "SPITFIRE"

Pride of the R.A.F. Gave a marvelous account of itself in the Battle of Britain. Model Span is 27 1/2", and flies well because of its large wing area. C-D Master Kit SF-73.....

\$3.00

Prize Winning Gas Models



PLAYBOY SR. Class C Gas. Hoge 80" span. Breaking records everywhere. 800 sq. in. Kit SF-8019 (except motor units).....

\$4.75

PLAYBOY JR. Class B Gas. Span 61 1/2" (860 sq. in.) Kit SF-8066 (c.m.u.).....

\$2.75

BABY PLAYBOY Class J Gas. Span 23". Biggest gas value on market. Kit SF-8068 (c.m.u.).....

\$1.00



Class B 2 1/2" STINSON RELIANT 2" scale. America's most popular radio-controlled design. Builds up and flies like real plane. Kit SF-99 (c.m.u.).....

\$1.50

Navy's famous scout dive bomber, capable of blasting war vessels with either a 500 or 700 lb. bomb, mounted under fuselage. Also 2 demolition bombs, one under each wing. Carries a 30 or 50 calibre machine gun, firing through propeller, and a 30 calibre on rear deck. Model is a real beauty and the last of famous biplanes. Span is 26 1/2". C-D Master Kit SF-80.....

\$3.50

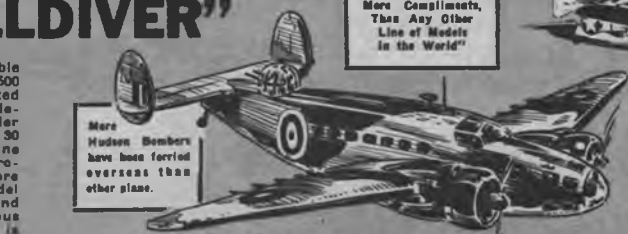
Douglas SBD "DAUNTLESS"

The famous carrier dive bomber or scout widely employed by the U. S. Navy and Marine Corps. Known as the A-24 in the Army. World's hardest hitting dive bomber. Span 30 1/2". C-D Master Kit SF-88.....

\$3.50

A Real VICTORY HOBBY!

Building C-D models is more than just an exciting hobby wherein pre-flight aviation fundamentals of aerodynamics, plane structure, and design identification unfold themselves—it's a most fascinating way of enjoying your spare time to the utmost, and at the same time making possible savings that may vary profitably be used for purchasing war stamps and bonds. With gasoline rationing giving America more time to spend at home, no other hobby can so interestingly fill so many spare hours at so little expense, as the building of C-D models. Invest in War Savings Stamps or War Bonds—with the pastime money you save by building C-D models!



More Hudson Bombers have been ferried overseas than other plane.

Lockheed "HUDSON" Bomber

Called "Old Boomerang" by the British, for it always seems to come back. A powerful bomber, also used for reconnaissance and has done some fighting, too. Has seen plenty of action over Europe, Africa and the wide stretches of the Pacific. A "must" model among dyed in the wool model-builders. Span 46 1/2". C-D Master Kit SF-85.....

\$7.50



Brewster "BUFFALO"

Highly maneuverable and fast. Climbs 4,000 ft. per min. Speeds around 350 m.p.h. Nicknamed "Peanut Bomber." Span 28 1/2". C-D Master Kit SF-87.....

\$3.00

Navy Shipboard Fighter Grumman F4F "WILDCAT"

Lives up to its name—in the case, for instance, where one of our men downed 5 Jap bombers in 5 minutes. Very maneuverable. Has a speed of 325 m.p.h. Span 28 1/2". C-D Master Kit SF-83.....

\$3.00

Big 3-Ft. War Models, only \$1.50 each

All Victory models are extremely authentic for their giant size. Biggest values on market. All Kits are complete.

- T91-"Mustang"
- T76-"Airacobra"
- T77-"Warhawk"
- T74-Messerschmitt ME-109
- T78-Hurricane
- T85-Lock-P-38 "Lightning"

These models are also available in C-D Master Kits—all 1/4" scale.

- ★ ★
- SF-74, \$3.00
- SF-76, 3.00
- SF-77, 3.00
- SF-78, 3.00
- SF-85, 4.00
- SF-91, 3.00

ORDERING INSTRUCTIONS

If your dealer can't supply you, send check or money order—cash at your own risk. Minimum order \$1.00. No. C.D.D. Shipments to Canada by Mexico, add 10%. Foreign & Overseas Military Customers: D. O. regulations restrict shipments to Aircraft Master Kits (in 6 including \$4.00 Kits) and Supplies under 18" in length, so please order as others. Postal restrictions now prohibit any overseas shipments unless order is signed by a Commissioning officer. Non-military customers may order from us only by 2nd class retailing \$2.00 to \$5.00 without invoice as letter we not traceable through mail by post. Credit 7% from advertised price for this when making remittances, but include regular 10% foreign service charge. For service mail still shipped in the U. S.—we advise against using A.P.O. or Fleet P.O. box numbers; to avoid mail delays because of parcel size restrictions. Use a local address near you if possible. For P.O. Special Delivery in U. S. only add 10c. (Ohio residents only, add 2% sales tax.) All kit contents and prices subject to change or cancellation without notice. The most C.D. "Lightning Service" guaranteed—No Waitlist!

Cleveland Model & Supply Company, Inc.

World's Largest Manufacturers of Quality Model Aircraft—Since 1919
4180C71 Lorain Ave. ★ ★ ★ Cleveland, Ohio, U. S. A.

When You Build CLEVELAND MASTER MODELS You're Building Models that Pilots, Instructors, Cadets-in-Training and Mechanics of all Classes in the Air Forces Build

NAVY COMMUNIQUE:

Douglas dive bombers, escorted by fighters, bombed and strafed the airfield at Munda on New Georgia Islands, on the same day. Results were not reported.

DOUGLAS DEVASTATOR

RUBBER POWER FLYING MODEL OF



one of
11 FAMOUS PLANES
doing great work
as Jap & Nazi
Extremists!

THE PLANE THAT "Dood it!"

65¢

Regular MODICAL: United Nations, 3 sheets contain England, Russia, China decals. 12 each of bases, authentic official designs. Total of 35, complete 40c

"MODECAL LUMINA" SLIP and DIP DECALCOMANIA

35¢

40c



Unique modeler's item, a brand new invention! Gives a fluorescent glow visible at great distance, remains luminous 3 to 8 hours. For use on night flying. "LUMINA" new airforce insignia sheet contains 7 pairs (14 decals) includes: 2" (2) 2" (2) 1 1/2" (4) 1" (2) 1/2" (4).

Regular MODICAL: German and Japanese: 4 Black crosses, 6 swastikas in red & white, 2 Sag Wheel Circles, 2 Rising Suns, 22 in all 25c

AXIS SET OF MODICALS

SECRET BOMB SIGHT No. 1050



NEW! SENSATIONAL! TIMELY!

U. S. NEEDS BOMBARDIERS! Designer ingenuity has reproduced a 'bomb sight' which rivals imagination! 'SECRET BOMB-SITE No. 1050' is a complete, self-contained unit! Sighter, target, bomb holders and release! Reproduces approach to target, precision sighting and split-second release! Real-action bombs are harmless, of course!

GIANT SCALE SOLIDS
FLYING FORTRESS 18 SPAN
LOCKHEED P-38 14 SPAN

PARTS PARTIALLY CUT - TO - SHAPE!

INSIGNIAS & FULL SIZE PLAN

Here's a practical demonstration of inflationary VALUE, MORE FOR YOUR MONEY THAN EVER BEFORE! Your choice of either of these two 'today's most popular models' in spectacular price range! Includes details found in kits selling up to twice this price! Specify choice in ordering by mail (add 6¢ postage). For Blackout use on helmets, autos, dunks, etc.



29¢

Mail orders filled in order of receipt, as long as quantities last! Order early, avoid disappointment. Send cash, check, money-order—sorry, no 'OD' service until further notice!



Master Craftsman 6" KNIFE

75¢ COMPLETE

Includes a special sharp-sharper for blades strapping. Finest craftsman knife of its kind. Precision wood, hand-fitted handles such as Ebony, Lig-num Vitae, Rosewood, etc. Extra long point for delicate work. Each blade individually tested before accepted for use.

NEW "BONUS" BOOK

Requires copy of current, illustrated catalog while supply remains. Send 1¢ coin or stamps (NOTE: No 'O.D.' orders. No orders less than \$1.00.)

20" POWER DRIVE COMMANDO

\$3.95



Completely sea-fabricated. Each part out-to-shape and finished. Includes: Rudder, Tiller Assembly, Prop (with shaft) included. For 6V Electric Motor or class 'A' gen. Finish, sea green & white. Statically balanced. Easy pre-fabricated. Precision shaped other plans, kits, and braces accurately finished in 21 days. Complete plans include detailed, step-by-step instructions.

CLIPS are "2-to-1" that you'll need **ENDS** one or more of these odds and

3 MODEL "SOLID" PROJECTS ALL 3 FOR 1!

BATTERY BOXES
Model No. 432
TWING collection

MILLCRENT TIMERS \$1.25
TOGGLE SWITCH SPST .35
SPST (Wired, on-off plate) .55
ROLEY Canopy (air wired) .45
HITCHHIKER LEAD .15
NO. 47-010
Palmer's Cork Clips (10x) .15
HOBBS'N' CONSERVE Rubber) .10
ROSTER Plug-in Con. Wired .45

CONDENSERS
Plate Tubular, for A, B or C airplanes, 1/2"-65 or 3/4" x 1 1/2".
DUCTON
Metal covered. Precision battery holder & special tool a special price \$5.

LIGHTNING P.38 (14" span) B-17 Flying Fortress (16" span) and 1/2" scale deep. Complete kits include full size construction plans. All 3 for \$1!

LUSTROID CEMENTS DOPES
From Lakes to Gulf From Coast to Coast IT'S LUSTROID! Finishes! Finishes! Finishes!

EXTRA LARGE 2 1/2 OZS. 15¢
(Colored Dupes 25¢)
Contents—Dupes—Thinners—2 cans of solvers: High-Speed Grease, Sand Brown, Russian Snow, African Pink, Olive, Mitty (Grey). All all dealers! LUSTROID is "DIP-SOLVED" preservative container. (Do not use—dry good)

INTERNATIONAL Models (AT-3) NEW YORK, N. Y.

(Continued from page 50)

In 1939, before the war, the German "Handbuch der Luftfahrt" reported 2,600 planes and 33,000 personnel. In 1937 the navy had thirty-three squadrons stationed at nineteen bases, in Nagasaki. According to Germany, 12,000 have volunteered. Training has been pushed with ruthless determination. The first three carrier pilots needed over 8,000 landings and take-offs before they

JAPANESE AIRCRAFT DESIGNATIONS

Types are designated by numbers which correspond to the last two digits of the Japanese year. Their year 2600 corresponds with our 1940, hence the designation of the Zero as "00." Various letters before the numerals indicate type, such as S for fighter. Others are B for medium bomber, OB for heavy bomber, G for torpedo, K for dive bomber, KT for reconnaissance seaplanes, H for flying boats, KB for light bomber, Y for transport, T for reconnaissance, SH for float seaplane. K for trainer.

The table below lists Japanese planes thought to be in widespread operational service, including some recent new types.

NAVY		
Fighters:		Kawanishi KT-94 Nakajima KT-95
	Mitsubishi S-97 Mitsubishi S-00 Mitsubishi S-00 Mitsubishi S-01 Nakajima S-01	Flying boats: Consolidated H-98 Kawanishi H-97 Hiro H-97
Medium bombers:		ARMY
	Mitsubishi B-96 Mitsubishi B-00 Mitsubishi B-01	Fighters: Kawasaki S-98 Nakajima S-97
Heavy bombers:		Light bombers: Potez B-01 Mitsubishi KB-98 Mitsubishi KB-98 Kawasaki KB-97
	Mitsubishi OB-96 Mitsubishi OB-00 or OB-01	Heavy bombers: Mitsubishi OB-98 Mitsubishi OB-97 Kawasaki OB-97
Torpedo bombers:		Transports: Mitsubishi Y-98 Nakajima AT Junkers Y-95
	Mitsubishi G-97 Nakajima G-97	
Dive bombers:		
	Aichi K-99 Nakajima K-01	
Reconnaissance floatplanes:		
	Aichi KT-98 Aichi KT-97	

NEW

Army or Navy	Number	Maker	Duty
	B-00	Mitsubishi	Medium bomber
	B-01	Mitsubishi	Medium bomber
	K-01	Nakajima	Dive bomber
	S-00	Mitsubishi	Fighter
	S-01	Mitsubishi	Fighter
	S-01	Kawasaki	Fighter
	S-01	Nakajima	Fighter

cluding all the large cities.

German technicians have done more than assist Japanese production. They have helped with the organization and training of the air forces. Modernisms like paratroops have been introduced into schools under German supervision at Kobe and were graduated. But Lieutenant A. Laton, an Avro instructor with the British aviation mission, said, "The Japanese as pilots I consider very good. They are steady and reliable, and I think the average is high . . . they have very few failures. Their

(Turn to page 54)

How to Make YOUR Body Bring You FAME

... Instead of SHAME!

ARE YOU Skinny? Weak? Flabby?

Will You Let Me Prove I Can Make You a New Man?



Charles Atlas

As he looks today, from actual untouched snapshot. Holder of title, "The World's Most Perfectly Developed Man."

I KNOW what it means to have the kind of body that people pity! Of course, you wouldn't know it to look at me now, but I was once a skinny weakling who weighed only 97 lbs.! I was ashamed to strip for sports or undress for a swim. I was such a poor specimen of physical development that I was constantly self-conscious and embarrassed. And I felt only HALF-ALIVE.

But later I discovered the secret that turned me into "The World's Most Perfectly Developed Man." And now I'd like to prove to you that the same system can make a NEW MAN of YOU!

What "Dynamic Tension" Will Do For You

I don't care how old or young you are, or how ashamed of your present physical condition you may be. If you can simply raise your arm and flex it I can add SOLID MUSCLE to your biceps—yes, on each arm—in double-quick time! Only 15 minutes a day—right in your own home—is all the time I ask of you! And there's no cost if I fail.

I can broaden your shoulders, strengthen your back, develop your whole muscular system

INSIDE and OUTSIDE! I can add inches to your chest, give you a vise-like grip, make those legs of yours lithe and powerful. I can shoot new strength into

your old backbone, exercise those inner organs, help you cram your body so full of pep, vigor and red-blooded vitality that you won't feel there's even "standing room" left for weakness and that lazy feeling! Before I get through with you I'll have your whole frame "measured" to a nice, new, beautiful suit of muscle!

Only 15 Minutes a Day

No "ifs," "ands," or "may-bes." Just tell me where you want handsome, powerful muscles. Are you fat and flabby? Or skinny and gawky? Are you short-winded, pepless? Do you hold back and let others walk off with the prettiest girls, best jobs, etc? Then write for details about "Dynamic Tension" and learn how I can make you a healthy, confident, powerful HE-MAN.

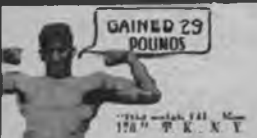
"Dynamic Tension" is an entirely NATURAL method. Only 15 minutes of your spare time daily is enough to show amazing results—and it's actually fun. "Dynamic Tension" does the work.

"Dynamic Tension"! That's the ticket! The identical natural method that I myself developed to change my body from the scrawny, skinny-chested weakling I was at 17 to my present super-man physique! Thousands of other fellows are becoming marvelous physical specimens—my way. I give you no gadgets or contraptions to fool with. When you have learned to develop your strength through "Dynamic Tension," you can laugh at artificial muscle-makers. You simply utilize the DORMANT muscle-power in your own God-given body—watch it increase and multiply double-quick into real, solid LIVE MUSCLE.

My method—"Dynamic Tension"—will turn the trick for you. No theory—every exercise is practical. And man, so easy! Spend only 15 minutes a day in your own home. From the very start you'll be using my method of "Dynamic Tension" almost unconsciously every minute of the day—walking, bending over, etc.—to BUILD MUSCLE and VITALITY.

Mail Coupon For My FREE BOOK!

LET ME START SHOWING RESULTS FOR YOU



FREE BOOK "Everlasting Health and Strength"

In it I talk to you in straight-from-the-shoulder language. Packed with inspirational pictures of myself and pupils—fellows who became NEW MEN in strength, my way. Let me show you what I helped THEM do. See what I can do for YOU! For a real thrill, send for this book today. AT ONCE, CHARLES ATLAS, Dept. 1533, 115 East 23rd Street, New York City.



CHARLES ATLAS, Dept. 1533
115 East 23rd Street, New York, N. Y.

I want the proof that your system of "Dynamic Tension" will help make a New Man of me—give me a healthy, husky body and big muscle development. Send me your free book, "Everlasting Health and Strength."

Name (Please print or write plainly)
Address
City State

Check here if under 16 for Booklet A.

Be an Instrument Technician...



...and Set Your Own

Rate of Climb in Aviation

*** The Rate of Climb Indicator**

...helps the pilot maintain level flight and indicates rate of climb and descent. It is one of the most important flight instruments. Extremely sensitive, its maintenance demands the technical knowledge and skill of the trained instrument technician.

It Pays To Be An A. S. A. I. Graduate

Civil Aeronautics Administration approved repair station No. 1028 • Contractor to U.S. Army Air Corps • 6 month course qualifies graduates for U.S. Civil Service appointment.

You want to be important to your country in these days of war. You want to climb steadily toward success in the days of peace to come. Do both—as an instrument technician.

The instrument technician is one of the most important experts in BOTH military and commercial aviation. Right at the start this is one of aviation's better jobs. It is in one of the most seriously undermanned divisions of the industry—the maintenance, overhaul, testing, and installation of the many sensitive precision instruments on which the safe, sure, flight of modern commercial, private, and fighting planes depends.

Here is a highly specialized position that you will be proud to hold... that will pay you well from the start... a LIFETIME CAREER, with greater and greater security and opportunity as aviation expands now, and IN THE FUTURE.

FOR COMPLETE INFORMATION on instrument opportunities and training SEND COUPON NOW

AMERICAN SCHOOL OF AIRCRAFT INSTRUMENTS
 Oldest Largest
 DEPT. AT-3 3903 SAN FERNANDO ROAD
 GLENDALE (Los Angeles County), CALIFORNIA

Please send complete information on aircraft instrument on your specialized training course.

Name: _____ Age: _____
 Address: _____
 City: _____ State: _____

MODEL CRAFT
 Largest Supply House in the West

LARGEST SUPPLY HOUSE IN THE WEST

FLYING MODEL KITS EVERYBODY WANTS AND NEEDS For a collection of the best World War II Plans. A huge production line enables us to offer them at this sensational price. Easily built. Super Plans. Clear Detailed Plans.

25c EACH

THE PICK OF THE FIGHTERS Modelcraft has deliberately set out to provide the thousands of customers with the LEAST EXPENSIVE strips to each class of model—the planes the modeler will LEARN MOST from building and get the most pleasure out of showing.



HAWKER HURRICANE Companion of the famous Spitfire, the Hurricane is an all-weather fighter, used as an attack plane, light bomber, and ground attacker. Can carry 12 machine guns or 4 cannons. Must be a terrific hit which cannot be challenged. 18" w. 24" h.



JAP ZERO Mitsubishi 00 (Zero). If you haven't got a zero, you have probably been considering one. Plans for this modelcraft kit were checked against a captured Japanese plane brought back to the West Coast and are therefore the most accurate obtainable. 15" w. 24" h.



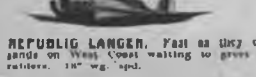
VULTURE VANGUARD Best known Vulture—very popular performer. 10" w. 24" h.



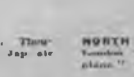
CURTIS HELL-DIVER The London Times writes: "The Hell-Diver is the world's best dive bomber." was even used by British bombers. 18" w. 24" h.



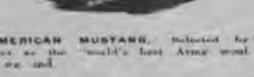
BREWSTER BUFFALO Army parent being used as report on the bombing raid over Europe. 10" w. 24" h.



REPUBLIC LANGER Fast as they come. These girls on West Coast waiting to give you the ride. 18" w. 24" h.



NORTH AMERICAN MUSTANG Selected by London Times as the "world's best Army model plane." 18" w. 24" h.



Complete List of Modelcraft Fighters and Bombers in Solid and Flying Balsa Kits on Request.

7306 SOUTH VERMONT AVE. MODEL CRAFT LOS ANGELES CALIFORNIA

(Continued from page 52)

great failing is that they are not quick enough in emergencies." Once, on the Saishu maneuvers, thirty carrier crews perished on a single mission. Ten percent of her aircraft crashed in 1935, almost as many in 1936. A report in *Flight* describes Japanese training today as not inferior to other nations. Air-crew training was once described as taking eight years, the average volunteer being from fifteen to seventeen years of age. Germany's goosestepping is evidenced by Japan even to glider training. Wulf Hirth, brother of Engine Builder Helmuth Hirth, organized many glider clubs—and "bring Goepfingen sailplane, yes, please?" Two Tokyo newspapers offered a prize of 10,000 yen for the first glider flight from Tokyo to Osaka, 265 miles. There have been no claimants. Training eventually got into the groove. By 1939 Japan had at least nine military training fields, seven of which (together) turned out 1,000 pilots a year. Six big army schools are known: flying and technical at Tokorozawa; air fighting at Akeno; observer and specialist at Shinosuzuki; bomb dropping at Hamamatsu; flying at Kumagi; air defense at Inagema-chu.

Japan is highly original in her tactical employment of aircraft. Few precedents, of course, hinder her unorthodox tactics. Her biggest and fastest twin-engined bombers can be flown from carriers. Such machines were flown daily for months from a small carrier off the south China coast to bomb for hundreds of miles inland. Her fighters convoyed extra fuel tanks which could be dropped if they had to fight. Because uncertain replacement of equipment made Chinese aerial resistance spotty, Japan went to extremes in aircraft designed for strafing. Some fighters had machine guns fixed at downward angles. One trimotored bomber on floats had four machine guns on the leading edge of the wing, plus a 37-mm. cannon, possibly synchronized, for the ship had a nose motor. Other bombers had swiveling cannon in the nose and sometimes in the tail. Her small fighters had rearward-firing machine guns in the fuselage turtleback; they were aimed by mirrors and, in one known example, could be aimed directly astern merely by kicking the tail slightly to one side.

Appreciating the significance of the

carrier in Pacific warfare, she had nine or more carriers in service by December 1, 1941, with three building. Three were believed to be converted battleships. Jap carriers are truly "flat tops," for they lack the "islands" that contain bridge, stacks and gun turrets on British and American carriers. There is possibly a connection between the lack of "islands" and the Japanese routine operation of twin-engined bombers off carriers. Unique are her seaplane carriers and catapult ships of which she had at least seven by 1938; they have no landing decks. These carriers are undoubtedly her means of placing fighter seaplanes in such places as the Aleutians. The tonnage of her newer carriers averages about 10,000 tons, that of the *Akagi* and *Kaga* class about 27,000 tons. Their plane capacities vary from twenty to twenty-six on the 7,470-ton *Hosyo*, the first true carrier in the world, to fifty to sixty on the *Kaga*.

It hurts to remember that we leaned over backward in not fully fortifying Guam so that Japan would not feel that we had wicked intentions. About the same time, she established an "air-line" base at nearby Saipan. Flying big copies of French LeO. and American Sikorsky flying boats, she operated this bogus air line to the Palaos Archipelago east of the Caroline Islands. Only two months before Pearl Harbor, these ocean air lines, developed beyond all proportion to what was supposedly required, were extended to Portuguese Timor off northwestern Australia. After war began, she was operating a ferry plane delivery via Marcus, Wake and the Carolines. All these points have been paid unsocial visits by Admiral Halsey.

Looking back, it seems incredible that the Occidental nations could have been so trusting and naive as to play into the hands of Japan in helping her to amass the very weapons she needed to attack them. But Lieut. A. Laton prophetically remarked twenty years ago, the Japs are not quick to react in emergencies. One thing is certain, and that is that the crafty Jap will be faced with ever-increasing emergencies as the output of our industry begins to wear him down. Our industry is one founded on the bedrock of our own experience, and it will continue to develop bigger and better war materiel at a pace the Japs cannot hope to equal.



British experts trained these Japanese naval aviators. The Sopwith Cuckoo torpedo plane made in England, assembled in Japan, was in the Jap navy.



Gremlins are those unchartable, unpredictable 'WHOOZITS' that gimmick up the works! Guilty of every crime of omission and commission: Flood Carburetors, Ice-up Wings, make valves stick, take the mind off the job—on-hand! LIFE MAGAZINE recently featured pages of publicity on these pestiferous creatures! One way to outwit the breed is check and double check—replace and repair equipment promptly! BLITZ 'em, keep 'em on the run by keeping your engine, your plane—EVERYTHING—in shipshape condition!

POWER SAW
No rotating parts, nothing to get wrong, no slicing. Heavy uses, extreme flexibility. 7200 strokes p.m. assures smooth cutting. Very portable, 10" sq. table, 1 1/2" throat. 110-120v, 60 cycle, AC only (Express collect) \$14.75.

JEEP
Paper construction model 25c (plus 10c postage) in one & wood and combination for \$1.25, 50c & 29c

AIRPLANE BOOKS
Model Aircraft Handbook: \$2.00, 300 pp., 100 illus. By Wm. Winter (Air Trails). Model Airplane Design, \$3.00, 520 pp., 205 illus. By C. H. Great (M.A.M.). Aerodynamics for Model Aircraft, \$3.00, 257 pp. By Aurum Zivov: Building Flying Model Planes, \$2.00; Youth in Aviation (Program manual for teachers & contacts) \$2.50; Model Airplane Contacts (Official rules, etc.) \$1.25. How To Get A Job in Aviation, 96 pp., By C. F. Matson (Curtis-Wright) 25c. Flying Models—How to Build Them and Fly Them, 30c; Tom's Book of Flying Models, 10c.

PURSUIT & INTERCEPTOR SQUADRON
Makes an interesting dog-fight! Includes 10" prop. By: Pursuit Interceptor Squadron Interceptor-Glider with trailing wings. Ready to fly. Both by mail add 10c \$1.00

ZIPPROS 25c
Delivers fast, high climb with minimum slip. Perfect "acrobatic" design guarantees absolute stability.

HURLEMAN SPARK PLUG
Plane made, fits all motors with 1/2" spacing. Easily taken apart for cleaning. Painted aluminum. \$50c

BOAT KITS
The following are outstanding values in ship construction kits. Each is designed for rapid assembly. All parts are precision cut to shape. They're in the stock daily.

TORPEDO BOAT
Hornie Macavilla boat—writing naval history. 16" long. Most popular 300 model to-day. Others with shaped hull and super detailed. \$1.00

DESTROYER
Crested of the U.S. Coast Guard convoys. 20" long. Invaluable to builders. \$1.00

HARBOR PATROL
Said in every port! Ref. Dr. Corfice 180 deck gun. 10" long. Very easy build. \$1.00

FREIGHTER
These three make the life live in Europe—the U.S. Merchant Marine. 10" long. \$1.00

ORE BOAT
Deck on the Great Lakes. Every feature of design, size and use. 16 inches long. \$1.00

128 PAGE ILLUSTRATED BOAT BOOK
Above and many other models, supplies, accessories featured in newest boat book (pocket size). Send 20c (coin or stamps) for copy which contains 200 CASH VALUE COUPON.

NEW 'HO' RAILROAD CATALOG
136 pages, 56 coin or stamps (contains 25c each value coupon)



CLEAR AWAY THE COBWEBS BRUSH 'EM BACK TO LIFE!

BRING 'EM BACK TO LIFE!
Pity the gas engines and finished models which are pining away in store-rooms, dens, club-rooms, even under many beds across the nation! Now is the time for every good modeller to come to the aid of his country: TAKE 'EM OUT OF RETIREMENT, PUT 'EM BACK IN SERVICE! If some good reasons prevent YOU from using them, make it possible for another modeller to use it! Donate or sell your unused equipment—almost every item has real value in these times of progressive stringency! If no market exists near you, we will be pleased to co-operate with you. Bring or mail your engine (regardless of age or condition) for immediate cash. Advise what other equipment you may have for restoration to use, large or small—we want to 'KEEP 'EM FLYING'!

WIND TUNNEL
Here's what every scientific and serious modeller has been waiting for! For your own club or classroom use. Made of durable materials and includes complete directions for demonstrating many aerodynamic theories and several test models. Accurately indicates lift and drag forces to 1/100th ounce. Measures 28" high, 27" wide, 41" long.

Place Your Order Now. Price on Request
Ott-O-Former KITS

Build airplanes easier, quicker with these famous kits. Ready-to-fly, ready-to-fly. Ready-cut, pre-arranged basswood wing ribs. No pre-construction required. Long, straight, smooth basswood strips. Ready-cut prop. Ready-cut neck-and-throat parts.

- 45" WINGSPAN DELUXE KITS, \$1.50 p.p. Lockheed P-38 and Supermarine SPITFIRE
- 40" WINGSPAN DELUXE KITS, ea. \$1.00 Mustang N. A. By Mail: 15c Curtiss O-52 Vulture Vespacite packing postage, Grumman Avenger
- 30" WINGSPAN BOMBERS, ea. 90c p.p. Young Sikorsky, Martin Maryland, Brewster Dive Bomber
- 32" WINGSPAN BATTLERS, ea. 60c p.p. Albatross Lockheed Young Sikorsky Grumman Spitfire Stuka Dive Bomber
- 29" WINGSPAN FIGHTERS, 3 for \$1 (p.p.) Spitfire Mustang Grumman Kingfisher Curtiss Douglas

22 PLANES, 5 for \$1 (p.p.)
Curtiss Hurricane Messerschmitt Stuka Dive Bomber Consolidated Catalina North Amer B-25 Albatross Vought Sikorsky

MIKE \$1.49
THE SMALLEST KIT IN THE WORLD! History, 40" wings, 1/2" scale! "No-copied" wings! Kit includes floats (float wheels only) \$1.49.

PACER \$3.95
Set Tait's National Champ adapted from 100 3/4" span, 21" length. Complete \$3.95. (PACE) "C" The ultimate National Champ. 21" span, 20" long. 45" long \$4.05.

DIAMOND DEMON 40" & P. 51.40 TOPPER 'A'
Includes Gloriosa whale Skywalker wings, complete kit \$3.50. XACTO \$2.00

Treat yourself to a marvelous knife set. Makes modelling easier. Ladder and motor. Set has 7 handles and 12 different blades. FREE book on building solids with each purchase.

XACTO 50c ea.
No. 1 for box work, No. 2 for bagging work. With one blade. Xtra blades, choice of 10, 10c each.

POCKET KNIFE
Stays in a convenient pocket! Knife with two sharp carbide steel blades. Beautifully gift. \$1.00

BUY WAR STAMPS & BONDS!



40" RUBBER-POWER CAPITOL SPITFIRE

Formed "shell-stringer" construction kit with full size, photographic step-by-step plans. Includes 1/2" diameter, 2" long propeller. Also N. A. Aquatic or Curtiss P-38. (By mail, add 20c.) \$1.25

30" RUBBER 65c
Choice of a 30" wingspan job! Features exclusive M.U.L. 1/2" BEARING construction. Full size, super-detailed, 3 view photographs plus detailed, 48 p. instruction manual, 48 p. pictures, etc. Mustang (1118) 65c

CURTISS WARHAWK 65c
Another CAPITOL Star. Other kits: Douglas Devastator (37") 65c; Vought CORSAIR 30" 65c; Grumman WILDCAT 30" 65c; SUPERMINE SPITFIRE 30" 65c. (BY MAIL, add 10c to save packing and postage.)

FOLDING PROP \$1
Increases glide efficiency. Reduces resistance. 9.18.11 only. Ea. \$1.00 p.p.

CLEVELAND PLANE KITS
Complete instruction of ALL C-20 kits in 100% book! Come in or send for copy kit you also in contact. LOGGED HOURS OF (1118) \$7.20; STORMING HELIPLANE \$5.00 model \$1.50. (Cleveland also new 3 ft. industrial training kit \$8.50.)

CAMOUFLAGE KIT 60c
6 Official Army colors with 100000. Waterproof. Can be applied over dead varnish. Quick drying. For planes, ships, guns. \$1.50 tanks, etc. \$1.50

HURLEMAN QUALITY PRODUCTS
BIG CARBURETOR \$3.50
Made integral with 1 1/2" ea. capacity metal tank. Mounted on floats. Designed for large bore motors and midsize jets. Increases H.P.M. up to 1500 "torrs."

MEDIUM \$3 1/2
oz. tank made integral with carburetor. speeds up 1/2" P.M. easily taken apart. 1000 lbs. Use weight or inverted.

Super ATOM

A limited quantity remains. No more "for the duration" when these are gone! Lightest Class "A" engine ever perfected, weighs less than 2 ozs. with plug and condenser. Develops highest power-to-weight ratio! 9,500 RPM, .097 cu. in. \$15.50 displacement. Complete with plug and condenser.

CLASS 'A'—GAS OR RUBBER PLANE
33" span. Excellent beginners' model. Atom design.

ITSY-BITSY \$1.00
Unique design, brilliant flying. "Parasol" polyhedral wing and wheel gear.

Rogers Motors
R. M. C-2... \$ 9.75
"29" 14.00
"35" 14.50

DYNA FLASH COIL
For all A, B or C motors. Quick start, low draw, lightweight (17% ozs.). Uncond. flashily guaranteed..... \$1.75

"JAP SLAPPER" \$2.00
Interlocking plywood formers, guaranteed joints. Newest "3" 4 1/2" span.

AIR YOUTH SET
A complete course in model building, includes Glider, Baby R.O.G., Sr. R.O.G., Indoor & Outdoor Cabin Models and book on modelling Postcard \$2.00

ARMY TRUCK \$1.50
First scale model of all purpose 2 1/2 ton vehicle. Detail marks cut to 1/32". Kit includes wheel covers, 100 headlights, fenders, grill, windshield, doors, 10 wheels and spare. Rigid construction.

C-Z SOLIDS
New, unparallel material set. 10c: GRUMMAN AVENGER 35c: CURTISS HELL DIVER 70c: CURTISS P-40-F 30c: Republic Thunderbolt 50c: Hurricane 40c: Spit. 60c 10c. (By mail, add 10c per kit.)

JAP ZERO 50c ea.
1/2" scale, shaped body, rigid prop. Kit also STORM-VIX: MUSTANG; SKY-HOOPER; WILDOUT; LOCK-TREK; and TURBO-PROBOL; or VOUGHT-SIKORSKY.

BATTERIES
New, economical "atom" type batteries. Lightest weight for heaviest service. 222-P1 (2 1/2" dia.) 35c; B-450 (3 1/2" dia.) 30c.

NEW CATALOG
New "BLUE BOOK" Gas model airplanes, accessories, supplies. Indexed in order including all items available and current prices. Many new "alternates" from suggestions have been incorporated. Features instructive IGNITION CATALOG by Nathan H. Smith. Send 20c (coin or stamp) for your copy.

POLK'S Model Craft HOBBIES
"Nation's Leading Hobby House!"
[DEPT. AT-3] 429 7th AVE. ENTIRE 2nd & 3rd FLOORS
Del. 33rd & 34th Sts., Opp. Penn. R. R. Station. Open Thurs. Till 9:30 P. M.

SUPER "G" LINE FLYING ENTIRELY NEW & DIFFERENT



ANNOUNCING THE SUPER "G" SHARK

KIT COMPLETE \$3.95 POSTAGE 30c

THE SHARK. A Sensational New Directional Control System, SUPER "G" LINE FLYING, and a Sensational New Elevator Control Model, the SUPER "G" SHARK illustrated above. Especially designed for Super Speed and Stunt Flying, this mighty Shark roars through space at tremendous speeds of over 100 M.P.H. Yet, so simple in construction and operation that even the beginner will experience no trouble. May be powered with any Class "C" Motor, such as the Ohlson "C", the Tiger Aero, the Super Cyclone, etc.

The New Super "G" Shark Construction Kit is most complete in every detail. Containing plenty of fine quality carefully sawn wood and hardwood strips, sheets, blocks and printed parts. Cement, Glue, Covering Paper, Spring Steel Wire, Streamlined Wheels, Super "G" Line Control Parts, etc. Together with a large fully detailed plan and instructions for building and flying.

REGULAR "G" LINE & FREE FLIGHT MODELS

 <p>TEXAS RANGER Combination Model The TEXAS RANGER is a combination model, designed for both of late flying and Free Flight. It may be used with any Class "A" or "B" motor. DELUXE KIT \$4.95 Postage 30c</p>	<p>APPROVED "G" LINE FLYING MOTORS Class "A" & "B"</p> <table border="0"> <tr><td>Ohlson "A"</td><td>\$14.50</td></tr> <tr><td>Ohlson "B"</td><td>\$16.50</td></tr> <tr><td>Super Atom</td><td>\$16.50</td></tr> </table>	Ohlson "A"	\$14.50	Ohlson "B"	\$16.50	Super Atom	\$16.50
	Ohlson "A"	\$14.50					
Ohlson "B"	\$16.50						
Super Atom	\$16.50						
	<p>Class "C"</p> <table border="0"> <tr><td>Ohlson "C" Special</td><td>\$10.50</td></tr> <tr><td>Kunch Tiger Aero</td><td>\$18.50</td></tr> <tr><td>Roop's "C"</td><td>\$14.50</td></tr> </table> <p>(On all Ohlson Motors Call and Condenser Optional—\$1.50 Extra)</p>	Ohlson "C" Special	\$10.50	Kunch Tiger Aero	\$18.50	Roop's "C"	\$14.50
Ohlson "C" Special	\$10.50						
Kunch Tiger Aero	\$18.50						
Roop's "C"	\$14.50						

SHARK P-60 "G" LINE MODELS INTERCEPTORS UP

 <p>New Rubber Power & Gas Power Kits Build and Fly one of these thrilling new ARMY PVTOR PLUMMET Line-Knot Ships. All kits are assembly complete throughout.</p> <p>Complete Shark P-60 Kits</p> <table border="0"> <tr> <td>RUBBER POWER KIT Complete \$1.95 Postage 20c</td> <td>FOR ALL CLASS C 1/5 H.P. MOTORS \$2.98 Postage 20c</td> </tr> </table>	RUBBER POWER KIT Complete \$1.95 Postage 20c	FOR ALL CLASS C 1/5 H.P. MOTORS \$2.98 Postage 20c	 <p>Fly the Sensational New INTERCEPTOR, Class "B" Free-Flight Model, Super Performance in Handling and Altitude. One Kit is Assembly Complete.</p> <p>Kit Complete \$2.98 Postage 30c</p>
RUBBER POWER KIT Complete \$1.95 Postage 20c	FOR ALL CLASS C 1/5 H.P. MOTORS \$2.98 Postage 20c		
<p>TIGER SHARK SPEED DEMON</p>  <p>The TIGER SHARK, Super Speed Demon. Is designed for all 1/5 H.P. motors. It may be powered with any of our magnificent models of Class "C" or "B" M.P.H.</p> <p>DELUXE KIT \$4.95 Postage 30c</p>	<p>BABY SHARK SUPER SPEEDSTER</p>  <p>The new BABY SHARK Super Streamlined Speedster which is designed for all Class "C" and "B" motors. This exciting little kit flies at tremendous speeds of over 50 to 75 M.P.H.</p> <p>COMPLETE KIT \$1.98 Postage 30c</p>		

VICTOR STANZEL & CO., Dept. A SCHULENBURG, TEXAS

Keep 'Em Purring

(Continued from page 41)

tributor to long engine life. Plain low-test gasoline is best suited for miniature engines. Don't use high-test or any of the ether-alcohol "racing fuels." These fuels will produce higher r. p. m.'s, but your engine will pay for it dearly in terms of wear. Keep your fuel mixture in a metal container refill tank and, when filling your tank, always filter the fuel with filter paper.

A common and often practiced fault is unnecessary running of an engine. If your "hot iron" gets too hot it may "freeze"; the cylinder may twist; your plug may crack—and the engine may even explode! With the foregoing possibilities a standing threat to engine life, you'd better try prevention; right now there's no cure.

When flying your model at "dust bowl" sites, a not infrequent situation, it is practically impossible to prevent dust and grit from getting into the interior of your engine. Very often the dust enters the cylinder through the air intake tube and slowly works its way to the vital parts—the piston cylinder and crankcase. An air filter over the intake tube will prevent dust particles from ruining your engine, and we strongly advise the use of such a unit.

Sometimes, of course, even an air filter cannot prevent dust and grit from getting into the cylinder. Too often, models attempt to plow up the ground. Should that happen to yours, remove the engine carefully from the model and do not attempt to find out first whether your shaft is bent by turning it over. Remove the spark plug, soak the entire engine in a can of clean gasoline and then use a hard bristle brush to help remove the grit from the exterior parts. A few turns of the shaft will help circulate the gasoline through the interior to remove the grit and dust. Using clean gasoline, repeat this process until you are certain that the interior is spick-and-span. Only in extreme cases should the engine be taken apart.

Because of the oil-gas fuel mixture used by two-cycle engines, spark plugs have a tendency to foul up rather frequently. Clean your fouled plug by soaking it in plain gasoline and then blow the oil free from the electrodes with the aid of an automobile or bicycle tire pump.

Once you crack the porcelain you're in the market for a new plug, so use only a spark-plug wrench. Hide those pliers! Too many plugs have been ruined by using pliers instead of the correct wrench.

Your timer points should also be carefully watched. Timer points will outlast your engine; your only care should be to clean them occasionally by inserting a piece of paper between the two points and then pulling the paper through when the points are closed. Do not follow the common practice of using sandpaper or a fine file to clean your points!

Ignition Care

When engines "just won't perk," ninety percent of the fault can be

STAMINA!

FOR WAR OR PEACE



The skilled mechanics who built the world-famous Harley-Davidson Motorcycle in times of peace, are now building military models for the Armed Forces. It's all-out production of sturdy, powerful Harley-Davidsons that stand up under the grueling punishment of combat action on all fronts. And you can depend on it that the improvements made to meet wartime needs will make alter-victory Harley-Davidsons the best, most dependable and rugged that money can buy — for pleasure, business or police work.

Keep posted on motorcycle doings — in the army and on the home front. Send for free copy of "ENTHUSIAST" magazine.

HARLEY-DAVIDSON MOTOR COMPANY
Department AT MILWAUKEE, WISCONSIN

HARLEY-DAVIDSON MOTORCYCLES

★ THINK ★

OVER THE MATTER OF PROPELLERS

Yes, think back to last fall and summer when some of the fellows were catching thermals and winning contests and then think what would have happened if you had had a Flo-Torque prop on the nose of your ship and could have had the added advantage of 10 to 20% greater efficiency. Think of who might have won that contest.

And then think about the difficulty of the great wind when the contest wasn't postponed. Somebody won that contest, somebody that had just a little plus that put them over the top. There are if your ship would have been equipped with a Flo-Torque that extra 10 to 20% we always talk about might have made "that someone" . . . you.

You can follow the plans, you can follow your own design and you can build the best job aerodynamically possible, but if you do not get maximum prop results you will miss out considerably on maximum.

Fellows who are using Flo-Torques regularly tell us that that extra 10 to 20% efficiency gives them the advantage that additional 10% would give them in the same class. It is no use kidding or talking about Flo-Torques. These props are designed by men who have spent every one quarter century in the prop field, by men who have spent neither time nor expense to design and produce model props that stand head and shoulders above anything the market offers. Think about some of these things seriously and then also remember that any fair test you could give the Flo-Torque must show up to your satisfaction or you can send back the prop for a full cash refund. You alone will be the judge. All the better dealers handle Flo-Torques at the following prices: The Invader, 10 and 20c, the Sensational Flo-Torque, 25c.



CHOICE OF CHAMPIONS



318 CLEVELAND AVE. CHICAGO, ILL.

traced to inefficiency in the wiring of the ignition unit. Keeping your ignition unit in A-1 shape will insure consistent and efficient running and even eliminate the need for detailed electrical knowledge. Very rarely is engine failure traceable to a faulty coil or condenser on the part of the manufacturer. You may, however, ruin your ignition system by not knowing the proper thing to do.

Both coil and condenser should be protected, from the hot oil spouting through the exhaust parts, since oil is a conductor of electricity and will, after penetrating your coil or condenser, short the circuit. Both coil and condenser are insulated, but both, if subjected to an oil bath, can be shorted by penetrating oil. Remember "an ounce of prevention is worth a pound of cure"—especially in these times.

In a great many instances, too, coils are ruined by leaving the current on when the ignition points are closed. The coil gets hot, the interior insulation melts, and you have a short! Disconnect your batteries after running your engine. Another common fault is to mount coils with a metal band. This impairs the efficiency of the unit.

Batteries should be mounted securely in a reliable battery case and kept away from oil. All leads should, of course, be soldered, and whenever possible, "boosters" should be used when starting your engine. A final point: no more than three volts should be used on your coil; copper wire isn't as plentiful as it used to be. These pointers, if followed, will keep your power plant operating.

But what if your engine has been worn to the degree where it loses compression? Lack of compression in your engine can be attributed to any of three major faults: excessive wear on piston and crankcase bearing, leaky spark plugs and gaskets, and partially blocked intake and by-pass ports. In the case of excessive wear, the piston doesn't fit snugly into the cylinder and the crankshaft virtually wobbles in the crankcase bearing. Therefore, when the air and fuel mixture enters the crankcase, the piston cannot force sufficient fuel mixture to the upper chamber because of the leaking crankcase. When the bearing is at fault it is best to have a new one installed. If your engine is of a design that permits replacement of the bearing at the local hobby shop, don't forget to take your crankshaft with you in order to have it matched.

When a piston becomes worn and fails to produce sufficient compression, it's a long time to have your engine overhauled. While the best procedure is to have the manufacturer do the overhauling, a few inexpensive methods exist whereby the modeler can play mechanic. To build up compression the piston may be electrolyzed with chromum. Any electrolyzing concern will do this for a small charge. After the piston is electrolyzed it should be hand-lapped into the cylinder by using a fine lapping compound which may be purchased at any automobile accessory store.

In a great many cases, lack of com-
(Turn to page 60)

CHECK the AERONAUTICS BOOKS You Need for Immediate Help



AIR PILOTING REVISED AND ENLARGED EDITION A Manual of Flight Instruction

By **VIRGIL SIMMONS**, Assistant Supervisor of Flight Instruction, Pan-American Air Ferries.

FROM first flight to advanced maneuvers, this famous manual will help you go through your training and take your tests with keener understanding, increased confidence and skill! Describing and illustrating the best known means of developing maximum ability, here is training material—fully approved by both military and naval authorities—which will help you in preparing for any rating, including Advanced and Instructors'. Includes over 1,000 questions taken from the C.A.A. exams with the accepted answers. It covers—Primary Flight; Intermediate and Advanced Maneuvers; Instrument Flying; Cross-Country Flying; Flight Instruction; Meteorology; Aerial Navigation; Radio; Seaplane Flying; etc.

Over 700 Pages 160 Illus. Price \$4.00

GENERAL AERONAUTICS

by **HILTON F. LUSK**, Director, Technical Institute of Aeronautics, Sacramento Junior College.

If you are preparing for a Pilots' or Mechanics' Certificate, or if you see where a broader understanding of aeronautics will give you a better grasp on the advantages offered in this promising field, then be sure to get Lusk's clear explanation of fundamentals and their applications. Although designed for ground schools and technical institutes, his famous book is well adapted to home study. Written in easy-to-understand, everyday language, even the beginner will have no difficulty in getting the meaning of every word.

COLORS—Occupations in Aeronautical Industry. Flight Principles. Construction of Airplane, Airplane Operation. Propellers. Engine Principles. Engine Construction, Operation. Dual Flying. Instruments. Engine Instruments. Safety Appliances. Charts and Plotting. Dead Reckoning. Aviation Instruments. Atmosphere. Applied Meteorology. **530 Pages 250 Illus. \$3.75**

WEATHER STUDY

by **DAVID BRUNT**, E. B. S., Prof. of Meteorology, Imperial College, London. **FIRST** book in meteorology designed for air cadets. Principles are stated so simply that material quite technical in character can be readily understood. Same mathematics is included, but this is designed so that the beginner may omit it without affecting his grasp on the subject. **\$2.25**

AIRCRAFT PROPELLER HANDBOOK

by **KARL M. FALK**, United Aircraft Corporation. **NEW EDITION**. Organizes and condenses into usable form for practical application, a tremendous store of latest information on design of aircraft propellers. Deals with the various problems encountered in propeller work. Numerous curves and sketches clearly illustrate each point explained. **\$4.00**

Pilots' and Mechanics' AIRCRAFT INSTRUMENT MANUAL

by **G. C. DE BAUD**, Captain, U.S. Army Air Forces.

HERE is a book giving the pilot or trainee in a simple, organized way, without confusing him with overwhelming, specialized detail, the things that are of vital importance in these days of instrument flying and maintenance. For a complete understanding of what each instrument is, how it operates, its possible errors, and how it performs during actual flight, be sure to read this practical book. 500 pages. **\$4.00**

SIMPLE AERODYNAMICS and the airplane

by **C. C. CARTER**, Colonel, U.S.A., Ret.; Prof. U.S. Military Acad., West Point, 1917-1919.

A **CLEAR**, easily-understood explanation of the fundamental aerodynamics involved in design and operation of the airplane. Ranges in scope from air flow and the production of lift to stability, maneuverability, and performance of complete plane. 510 pp. 300 Illus. **\$4.00**

ELEMENTARY MATHEMATICS

by **HYMAN LEVY**, D.Sc., F.R.S.E., Professor of Mathematics, Imperial College of Science and Technology, London.

DESIGNED to refresh and reorganize a previous knowledge of ordinary mathematics for aeronautical use; to introduce the essential applications new to the beginner in scientific subjects; to act as a guide to the fundamental reasoning necessary to skill in aeronautical applications. 216 pages. **\$1.50**

THE RONALD PRESS COMPANY
Dept. M707, 15 East 26th St., New York, N. Y.

Please send me the Aeronautics Books I have checked below—

- Air Piloting, Simmons \$4.00
- General Aeronautics, Lusk... 3.75
- Weather Study, Brunt..... 2.25
- Modern Trigonometry, Hearley 1.75
- Aircraft Propeller Handbook, Falk 4.50
- Simple Aerodynamics, Carter 4.50
- Mechanical Physics, Dingle... 2.25
- Pilots & Mechanics Aircraft Instrument Manual, DeBaud 4.50
- Aircraft Electricity, Clark & Corbitt 3.50
- Elementary Mathematics, Levy 1.50

On receiving the books, I will pay postman prices shown above, plus a few cents C.O.D. charges. If I am not entirely satisfied with any, I have the privilege of returning them within five days. (We pay postage when you remit with order. Same satisfaction guarantee.)

Name.....
Home Address.....
City..... State.....

Clip, Fill in and Mail this Coupon TODAY!

AIRCRAFT ELECTRICITY

by **NORMAN J. CLARK**, U.S.N.R., formerly Electrical Engineer, Lockheed Aircraft Corp.; and **HOWARD E. CORBITT**, Electrical Engineer, Lockheed Overseas Corp.

REVISED, Enlarged Edition. *Electrician's Dictionary*. Here is up-to-the-minute information you want today in practical shop installation, inspection, and design calculations. This is the "what, why, and how-to-do-it"—exactly suited for rapid individual or group training. Furnishes data in the most modern methods and practices in design and construction of military and naval aircraft, insofar as the electrical system is concerned. 200 drawings, diagrams, illustrations. 350 pages. **\$2.50**

MODERN TRIGONOMETRY

by **M. J. C. HEARLEY**, B. Sc., Acting Flying Officer, R.A.F.V.R.

ORIGINAL, distinctive introduction to the subject for aeronautical purposes. Requiring of the user only arithmetic and the most elementary algebra, it is designed to give him a sound, usable knowledge in the simplest quickest way. Suitable for both individual and group use. **\$1.75**

MECHANICAL PHYSICS

by **HERBERT DINGLE**, Professor of Natural Philosophy, Imperial College of Science and Technology, London.

COVERS properties of matter, heat, and sound for aeronautical application. Assuming only a knowledge of elementary mechanics and some of physics, it gives a clear account of fundamental ideas in such a manner that their uses in aeronautics can be readily understood. **\$2.25**

The Ronald Press Company, Publishers
15 East 26th Street ESTABLISHED 1900 New York, N. Y.

★ Ott-O-Formers are Ready-Cut in Sheets Like This ★ Remove Them in a Jiffy and They are Ready for Use

Ott-O-Former



Lead the Parade for 1943

Build a model plane today and choose an Ott-O-Former Kit. There's a size and a model to suit everyone. And because all the hard work is already done in the Ott-O-Former factory these kits make better planes easier and quicker. Build with Ott-O-Formers and get 'em flying quicker!

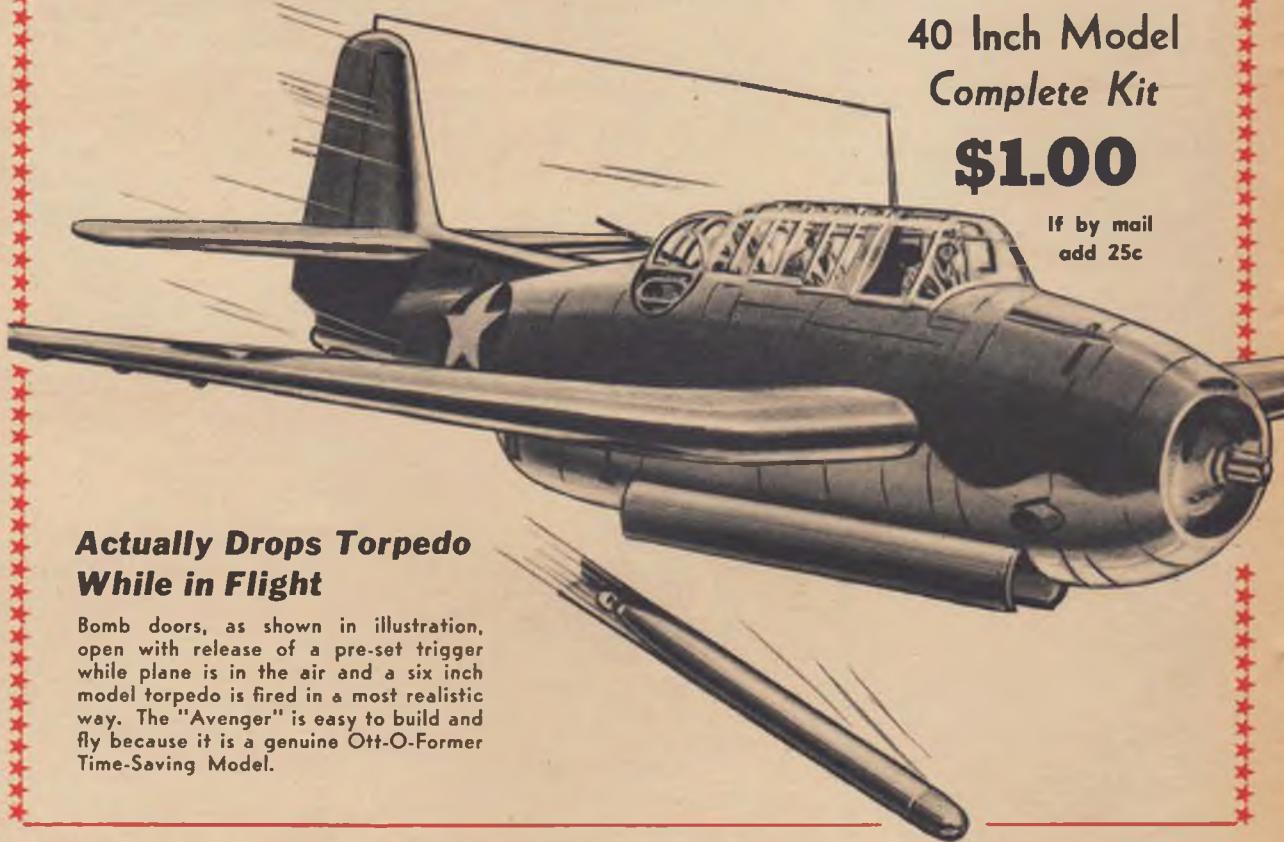
Nose Block Parts are Ready-Cut—Easy to Build Up

Propellers are Ready-Cut and Made "True-Pitch" in a Jig

BUILD THIS SENSATIONAL NEW TORPEDO BOMBER *Midway's Deadly AVENGER*

40 Inch Model
Complete Kit
\$1.00

If by mail
add 25c



Actually Drops Torpedo While in Flight

Bomb doors, as shown in illustration, open with release of a pre-set trigger while plane is in the air and a six inch model torpedo is fired in a most realistic way. The "Avenger" is easy to build and fly because it is a genuine Ott-O-Former Time-Saving Model.

★ Wing Ribs are Ready-Cut—Save Hours of Time

★ Extra Long Straight, Smooth Strips—All



Like This ★ Slip Ott-O-Formers Over Foundation Frame for a Tight Strong Job ★ Ott-O-Formers are Lighter, Stronger

MODEL AIRPLANE KITS AND MODEL BUILDERS MATERIALS

Get Them at Your Dealers Now!

**THIRTY THRILLING KITS PRICED FROM 15 Cents to \$1.39
All With Famous Ott-O-Former Time-saving Construction**

AIRABONITA 22 Inch Wing Span Kit 15c	DOUGLAS DAUNTLESS 27 Inch Wing Span Kit 29c	MESSERSCHMITT 22 Inch Wing Span Kit 15c	STUKA DIVE BOMBER 22 Inch Wing Span Kit 15c 32 Inch Wing Span Kit 50c
AIRACOBRA 32 Inch Wing Span Kit 50c	GRUMMAN 27 Inch Wing Span Kit 29c 32 Inch Wing Span Kit 50c 40 Inch Wing Span Kit \$1.00 ("Avenger", Torpedo Bomber)	MUSTANG 27 Inch Wing Span Kit 29c 40 Inch Wing Span Kit \$1.00	VOUGHT SIKORSKY 22 Inch Wing Span Kit 15c 32 Inch Wing Span Kit 50c 38 Inch Wing Span Kit 75c 27 Inch Wing Span Kit 29c ("Kingfisher")
BREWSTER DIVE BOMBER 38 Inch Wing Span Kit 75c	HURRICANE 22 Inch Wing Span Kit 15c	NORTH AMERICAN B-25 22 Inch Wing Span Kit 15c	
CONSOLIDATED CATALINA 22 Inch Wing Span Kit 15c	LOCKHEED 32 Inch Wing Span Kit 50c 45 Inch Wing Span Kit \$1.39	SPITFIRE 22 Inch Wing Span Kit 15c 27 Inch Wing Span Kit 29c 32 Inch Wing Span Kit 50c 45 Inch Wing Span Kit \$1.00	VULTEE VENGEANCE 40 Inch Wing Span Kit \$1.00
CURTISS PURSUIT 22 Inch Wing Span Kit 15c 27 Inch Wing Span Kit 29c 40 Inch Wing Span Kit \$1.00	MARTIN MARYLAND 38 Inch Wing Span Kit 75c		

GO TO YOUR DEALER for any of these Ott-O-Former Kits and materials. If you cannot find an Ott-O-Former Dealer in your neighborhood then send your order to address below. Minimum order \$1.00 plus 25c extra for postage and packing.

MODEL AIRPLANE CEMENT AND DOPE

The finest quality obtainable in big generous jars and tubes. The same cement packed in Ott-O-Former Kits. 3 Inch Jars 10c

DOPES	Red White	Orange Blue	Green Clear	Black Banana Liquid (Tissue Cement)
CEMENT	5 Inch Tube 10c		4 Inch Tube 5c	



GET AN IDENTOPLANE KIT

Contains material for making 24 silhouette models of American, British, Russian, German and Japanese War Planes for identification purposes. Reduced from Navy's authentic drawings

Same as above with 10 silhouette models



Selected Basswood ★

Joe Oil

MANUFACTURING CO.

415 W. SUPERIOR ST. CHICAGO, ILL.



SOMETHING NEW... AIR NAVIGATOR'S LOG BOOK

At last... available to all airmen, is our new Air Navigator's Log Book. For the Celestial Air Navigator on trans-oceanic flights—or for all pilots making "dead reckoning" flights across country, the "Navigator's Log Book" will provide a permanent record of your navigational flights. Handsome blue leatherette with gold letters (full pocket size). Only \$2.00 postpaid.

Write for Information

FLIGHT INSTRUCTOR: A 1942 edition covering the written examination for flight instructor rating. New authentic Multiple Choice questions with answers included. \$3.00 postpaid or C.O.D.

CELESTIAL NAVIGATION—complete equipment consisting of Air Navigation Note Book and Navigation Plotter, Simplified Celestial Navigation, Air Almanac, Line of Position Book, and Hymess Star Chart; all 6 items only \$11.75 postpaid or C.O.D.

AERONAUTICAL TRAINING. Just off the press. New enlarged edition. For the first time shows separate sections "containing Private Pilot and Commercial Pilot Multiple Choice Examinations." Makes your government test easy. \$3.00 postpaid or C.O.D.

GROUND INSTRUCTOR. Written for the student preparing for "Ground Instructor Rating." Excellent for class work. Covers Navigation, Meteorology, Aircraft and Theory of Flight, Engines and Civil Air Regulations. \$3.00 postpaid or C.O.D.

New Dead Reckoning Equipment

For Defense of Land, Sea and Air
AIR NAVIGATION TEXT with Dept. of Commerce Navigation Plotter. Necessary for Cross-country flights and for Commercial and Instrument rating examination. Difficult radius of action. Off course and alternate airport problems plotted and solutions given in a simple understandable method similar to the text used in the U. S. Naval Academy but improved. Book size 14x8" in handsome red leatherette with gold letters. Plotter contained in patent cover pocket. (Combination only \$4.00 postpaid or C.O.D.). U. S. Coast & Geodetic Computer shown in cut, with instructions \$3.00 extra.

OUTSTANDING NEW AVIATION DEFENSE BOOKS

RADIO AND INSTRUMENT FLYING: By Charles A. Zwanz, Instructor, U. S. Air Corps, New 1941 Edition covering new important material. Written especially to prepare the pilot for government examination for "Instrument Rating." Radio-Telephone Permit included. Radio-Telephone, Radio-Orientation, let-down, off course and alternate airport problems. Only \$1.00 postpaid.

Celestial Air Navigation Training
 Prepare now for this important phase of Air Defense. Our students are now air navigators and instructors in various quarters of the world.

GROUND INSTRUCTOR RATING. Just published. Contains "Multiple Choice" examinations on Navigation, Meteorology, Aircraft and Theory of Flight, Engines and C.A.R. Nomenclature and aviation dictionary in back of book. It's new and different. Something you cannot afford to be without. \$3.00 postpaid. Or it may be purchased in combination with "Ground Instructor" for \$5.00.

AIRPLANE AND ENGINE MECHANICS: Examinations. New authentic Quiz Book now covers the new Multiple Choice examinations fully illustrated with necessary diagrams. Used by Lockheed, Douglas, Northrup, Ryan and outstanding schools. Why fail? Only \$3.00 for both examinations, and C.A.R.

AIR NAVIGATION (Gold Medal Edition) includes meteorology. \$5.00 postpaid.

DALTON MARK VII AIRCRAFT COMPUTER: With book of instruction... \$7.50.

PAN-AMERICAN NAVIGATION SERVICE

12021 Ventura Boulevard, North Hollywood, California

REAL ENGINE VALUE

NOW ONLY \$9.95!

Here is your opportunity to buy the 1943 model of the famous G. H. Q. Gasoline Motor. **ABSOLUTELY COMPLETE WITH COIL & CONDENSER—Every engine assembled by experts, fully bench run and unconditionally guaranteed.**

ORIGINALLY \$35.00—NOW \$9.95—15,000 SOLD LAST YEAR
AN ENGINEERING TRIUMPH..

Never Before at So Low a Price!!

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 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... and just imagine—flex model plans! **CAIS AND STATIONARY USE.** Easy to start and simple to run.

Everything is included: Champion spark plug, coil, condenser, tank and cap, ignition wire, COMPLETE ILLUSTRATED & DETAILED INSTRUCTIONS, etc.

NOT A KIT

FACTORY ASSEMBLED

Fully Bench Run

Unconditionally Guaranteed

OVER 65,000 IN USE TODAY!!

WE HAVE ENGINES

Your order shipped same day as received.

NO DELAY!

SPECIFICATIONS

4 Port 2 Stroke Cycle, 3/4" Stroke, 1 1/2" Bore, 380-7,000 R.P.M. Bearing Surface 1/4" Long. Crankshaft, 3/16" Diam. Rotation, Either Direction. Invertible, 1/3 H.P. Class G under FAA Rules.

FREE Send for free circular or 5c for circular and Jumbo catalog of hundreds of model engine, plane, boat, car and hobby items.

SEND ONLY \$1.00

Shipped Collect C. O. D. Same Day

G. H. Q. MOTORS, DEPT. TX, 40 EAST 21 ST., NEW YORK, N. Y.

(Continued from page 57)

pression can be traced to leaky gaskets. Always use the type of gasket recommended by the engine manufacturer or, if cutting your own, make certain that it is the identical kind of paper used by the manufacturer. If thick gasket paper is used, the volume in the crankcase is increased and the compression, consequently, decreased. Always use as thin a gasket as possible.

To increase the crankcase compression without financial expenditure, a temporary but reliable method is to cut a piece of cork to fit into the hollow interior of the piston. To prevent the cork from working loose and also from burning, hold it in place with a few coats of gasket shellac. The cork, by decreasing the amount of space in the crankcase, increases the compression ratio. This method, while not widely used in the model-airplane field, has proven its worth in speed-boat racing.

If the intake, by-pass and even exhaust ports are partially blocked by the formation of gum (from the fuel mixture), take the engine apart and soak the affected parts in a good gum solvent. (See your local garage man for this.) While formation of gum is usually not sufficient to cut down the compression to any noticeable extent, it does add to engine inefficiency.

All metal being subject to fatigue, your breaker arm (timer) spring will eventually break down under the constant pressure. If an engine with good compression and ignition won't rev, it is probably due to "floating points"—which means that after a certain speed the breaker arm spring just hasn't the "snap" to "break" every revolution. This calls for a new spring, although removing the old one (if it is of the flat type) and straightening it may prolong its life temporarily. For the Ohlsson engine and all others having a similar timer unit this method works very well.

Very often the opening of your needle valve becomes clogged either by foreign matter coming from the fuel tank (if the fuel was not filtered) or by gum formation. In either case the opening should be cleaned by soaking it in gum solvent. Do not attempt to clear the opening by inserting a wire plunger, for this will tend to enlarge the hole and consequently alter the setting.

Faulty ignition, as previously pointed out, will prevent any engine from performing satisfactorily. Should the coil and condenser become defective it is best to replace them rather than to attempt a repair job. Both coil and condenser, if taken care of properly, will outlast the engine. Coil and condenser trouble can be efficiently tracked down only with the aid of ignition testing equipment; too few of which exist. In all cases, however, the wiring should be checked, and once the leads become oil soaked they should be replaced. Your batteries indirectly affect the life of your coil. Don't tax your coil by using weak batteries. With three-volt coils you should have from ten to twelve amperes; and to insure having the correct amperage at all times, always carry an ammeter in your tool kit.



YESTERDAY'S model builders are today's airmen and plane designers. Our country is proud of them. Yesterday they built "flying" models. Are you doing as much?

DON'T sabotage your plane by using inferior materials. SILKSPAN for covering is made to have minimum weight, maximum strength, shrinkage without dulling apart.



THE war has placed many restrictions on us and we have been forced to eliminate colors for the duration. Nevertheless, we recognize the importance of model aeronautics and are filling all requirements regardless of handicaps. SILKSPAN "GM" is the grade for gas models and SILKSPAN "OO" for light jobs. There is no reason for anyone to accept overweight, weak and unsuitable papers. Buy kits that supply genuine SILKSPAN and "build 'em to fly".

ALDINE PAPER COMPANY
 373 FOURTH AVENUE, NEW YORK

KNOW THESE SUPER-KNIVES—AND YOU'LL USE NO OTHERS



Re-blade to re-sharpen. In 5 seconds a new, surgically sharp X-ACTO in any of the utility shapes shown below gives you a NEW knife. Designed for perfect hand-comfort and precise cutting control. Turns out finer, cleaner, more accurate models faster. Carves intricate concave or convex surfaces with ease. Note toughness and simplicity of construction.



X-ACTO CRESCENT PRODUCTS CO.
 448 FIFTH AVENUE, NEW YORK, N. Y.



The Warhawk

(Continued from page 29)

small slot is cut in the back part of the right-hand side of the fuselage to permit passage of the control rod.

To regulate the amount of elevator movement, use small wood screws or brads stuck in the control-plate base to limit the movement. Set the controls to operate as shown on the plan. The cabin is celluloid formed over a foundation of light wire that has been bent to shape. The cabin should be made sliding or removable to permit easy access to the control plate.

The tail section is of conventional construction. The hinges are of 1/32" sheet metal and .035 wire fastened securely to the elevators, which are cut from 3/16" sheet bass. The fillets for the tail are carved as a part of the fuselage and the tail surfaces cemented to them. A slot is made in the rudder to pass the elevator control wire.

Cut out the wing ribs from 1/16" sheet and cement them to the spars, which are cut from 1/8" bass sheet, to fit the notches in the ribs. Add leading and trailing edges. The wings are made in two pieces, with the spars extending to the center line. Cut slots in the fuselage at the indicated position and slide the spars through, cementing them together at the center. The 1/8" plywood dihedral spar is made in one piece, slid in through the slot and cemented securely to the main wing spar.

The landing gear is bent from 3/16" steel wire (see plan detail) and lashed firmly to the plywood spar with liberal applications of cement. The ends of the landing-gear pieces run along the inside of the fuselage shell. A cover of 3/16" aluminum or rubber tubing, brings the landing gear to scale diameter. Plank the leading edge of the wing after the landing gear has been installed with 1/28" sheet bass. A pair of 2" sponge wheels are used, held on with a brass washer soldered to the end of the landing gear.

"Fill in" the space left between Rib 1 and the fuselage with 3/32" sheet pieces on both top and bottom until the space is entirely planked over. Form the fillets over this foundation with plastic wood. Allow it to dry until it can be handled easily and carefully work to shape while still soft. Allow to dry thoroughly and sand with sandpaper wrapped around a 1/2" dowel. Fill in any small holes or cracks with cement. This makes a super-strong wing-fuselage connection and landing-gear stress point, which is certainly required above all else in control models.

Install the engine in the motor mounts with 1" wood screws. The ignition unit is fastened in the bottom of the fuselage shell. An Austin battery box is convenient for medium or penicils. Shift the ignition for balancing.

Cover the plane with Silkspar or G. M. paper. Give two coats of clear dope and follow with regulation U. S. army war paint or any other finishing scheme desired. All upper surfaces are painted olive green and

AMERICA'S REIGNING "Champ":

Sal Taibi's Gas Model Sensation!

Against a 1000 competing modellers—against almost 1500 planes THE PACER demonstrated its marked superiority to achieve top honors at the last Nationals in Chicago! If you're planning a gas-project, by all means choose PACER—a magnificent performer!

24 MINUTES SECONDS

Plan's exceptional time achievement. Individual flights were 1:22 and 2 seconds better than 1:15 and 1:25—over average of 9:30!

SLEEK, STREAMLINED, RUGGED

PACER

Complete "Generously-Filled" Kit

Skillfully stressed to "take it!"

Easily suited for any 1/2" or larger "B" motor. Simple to build. A beautiful model, 22 1/2" wingspan, fits in the box and on display stand. First prize at over 2000 flights. Rugged to be extreme!



60" SPAN, 45" LONG

Built in adjustments with sharp right turn under power and slow left circle in glide.

\$4.95

Postpaid any-where in 48 states. Elsewhere, add 35c mailing-over-charge.

PACER 'B' The original design from which the C Champion was adapted. 53" span, 37 1/2" length, 45" sq. in. area. **\$3.95**

MIKE

Famed as the first small ship in gas model history, originally \$4.95! Complete generously filled kit as always, except for wheels.



TOPPER

One of America's best known "A" fliers with "abysscraper wings". Kit includes stream-line wheels. Use it for any "A" or small "B" engine. **\$3.50**

MIKE \$1.49

DIAMOND DEMON

44" wingspan gas flier, adaptable for "A" or "B" flight. This model is excellent for beginners or contest work. Complete, except for wheels. **\$1.49**

All these famous gas fliers are known to thousands of American builders as original Bay-Ridge productions. They come to you in the same "generously filled kit" as of yore! NOTE: No price increase on any BAY RIDGE MODEL, these are the softest prices as prevailed last year and two years ago!

ACCESSORY KIT for CAMOUFLAGE & METALIZING!

Includes FOIL, COLORS, CEMENT, INSIGNIAS RIVET DETAIL

\$1.00

By Mail Add 15c

The original Accessory and Combination CAMOUFLAGE KIT! Perfect for doing either of these realistic jobs, in a jiffy! Everything needed is in the kit: Contains foil paper (for covering to simulate metal finish), brush, insignia, colors, cement, sandpaper, detailed instructions and camouflage tips as well as the stylus for recreating the rivet detail. (By mail: Add 15c to cover packing, postage, etc.)

BURKARD'S Famous GIANT SOLIDS

\$1.50

Easily convertible to MOVABLE CONTROL models by hinging rudder and "tabs" at hinge line!

17 FAMOUS WAR PLANE KITS

UP TO 22 1/2" WING SPANS

The solids that have established their own classification! Almost every model in the line was revealed and adapted from original plans used in constructing the original flying model. True in detail and true in silhouette appearance! In addition to cut-to-outline shape fuselage (in standard kits) tail surfaces and trailing edges are tapered. Turned wheels, aluminum cowls and nacelles as specified, insignias, numerals, tail striping, celluloid for pilot's cockpit, foil paper for metalizing, blanked prop, large bottle of cement, base paint, etc.

- Choose from these SOLIDS
- | | | | |
|---------------------------|-----------------------------|----------------------------|-----------------------------|
| BREWSTER BERMUDA 17 1/2" | STAND. \$1.50 Deluxe \$2.50 | MEISSERSCHMITT ME109 16" | STAND. \$1.50 Deluxe \$2.50 |
| RYAN STMO-17" | STAND. \$1.50 Deluxe \$2.50 | LOCKHEED P-38 20" | STAND. \$2.00 Deluxe \$3.50 |
| (Gilded Plans Add \$1.00) | | LOCKHEED HUDSON 16 1/2" | STAND. \$1.50 Deluxe \$2.50 |
| GLOSTER GAUNTLET 17 1/2" | STAND. \$1.50 Deluxe \$2.50 | WESTLAND WHIRLWIND 22 1/2" | STAND. \$2.00 Deluxe \$3.50 |
| GRUMMAN F3F-2 15" | STAND. \$1.50 Deluxe \$2.50 | CURTISS P-40 10 1/2" | STAND. \$1.50 Deluxe \$2.50 |
| HAWKER HURRICANE 17 1/2" | STAND. \$1.50 Deluxe \$2.50 | STUKA DIVE BOMBER 22 1/2" | STAND. \$2.00 Deluxe \$3.50 |
| NORTH AMER. B-14 20" | STAND. \$1.50 Deluxe \$2.50 | BELL AIRACOBRA 17" | STAND. \$1.50 Deluxe \$2.50 |
| BOULTON PAUL DEFIANZ 20" | STAND. \$1.50 Deluxe \$2.50 | SPITFIRE 16" | STAND. \$1.50 Deluxe \$2.50 |
| CURTISS HAWK "72" 16" | STAND. \$1.50 Deluxe \$2.50 | | |

FULLY CARVED PLANED & TRIMMED FUSELAGE

All of the work done for you! Only sanding needed. Saves time in a matter of minutes!

MOVABLE CONTROL

In DELUXE KITS, the regular "cut-to-outline" fuselage is replaced by a completely carved (planed and trimmed body) which eliminates all the hard work in assembling your model! Sanding only is needed. VERY AS EASY TO ASSEMBLE!

DIFFERENCE between standard and deluxe kits! All other items are exactly alike, including landing gear, accessories, plans, report, etc.

BANTAM

GENUINE FACTORY REPLACEMENT PARTS

The engine manufacturer, equipped with fully needed national defense efforts has designated CONSOLIDATED as exclusive distributor for all available parts. Wide range, but not complete. Write at once to avoid disappointment.

PARTS AVAILABLE

ROTARY VALVES—BASKETS	TIMER CASE	CYLINDER BELT
GAS TANKS	POINTS (Upper-Lower)	CONNECTING ROD
INTAKE TUBE	CRANKCASES	BACK COVER PLATE
	CRANKCASE BELT	SHAFTS (variety, send catalogue for list)

CONSOLIDATED MODEL ENG. CO.

(Producers of BAY RIDGE, BURKARD & JACKSON KITS)

[AT-3] 3079 Third Avenue, New York



PHOTOS

OF THE LATEST UNITED STATES,
BRITISH, GERMAN, ITALIAN AND JAPANESE WARPLANES

Send for one or all of these fine sets today. Our new 36-page catalogue (Number 18) of Aircraft Photos will be included FREE with all orders of \$1.00 and over. Catalogue only, 10c.

SEND FOR A SET NOW. THE 3 SETS FOR \$2.50

Set # 1. \$1.00 U. S. WARPLANES	Set # 2. \$1.00 BRITISH WARPLANES	Set # 3. \$1.00 GERMAN WARPLANES
THUNDERBOLT AVENGER WILDCAT LIGHTNING WARHAWK AIRACOBRA DEVASTATOR MITCHELL MARAUDER FORTRESS BARS B-19	MOSQUITO SPITFIRE WHIRLWIND BEAUFIGHTER HURRICANE DEFIANT SKUA LANCASTER MANCHESTER HALIFAX SUNDERLAND WELLINGTON	DORNIER DO. 17Z2 DORNIER DO. 215 FOCKE-WULF FW. 187 FOCKE-WULF FW. 200K2 HEINKEL HE. 111K Mk. Va. HENSCHEL HS. 123B JUNKERS JU. 52 3M JUNKERS JU. 88K JUNKERS JU. 87B JUNKERS JU. 90 MESSERSCHMITT ME. 109F MESSERSCHMITT ME. 110

Glossy Kodak Velox photographic paper used exclusively. Guaranteed not to fade. ACTUAL PHOTOS, not imitations.

U. S. CUSTOMERS: Please remit by Money Order, bills or cash. PLEASE DO NOT SEND STAMPS

Our photos are being used by Schools of the U. S. Army Air Forces, U. S. Navy, Royal Canadian Air Force and Royal Air Force for Aircraft Recognition instruction. Our photos have to be good.

WE SPECIALIZE IN PHOTOS FOR AIRCRAFT RECOGNITION LECTURES

AEROPLANE PHOTO SUPPLY BOX 195
TORONTO, CANADA

FLYING MODELS

How to Build and Fly Them
118 Pages—500 Illustrations

At Your Dealer **25c** 35c Postpaid

Contents

HINTS FOR BUILDERS

Tools and Equipment—Model Materials—Selecting Strip Stock—Cutting the Parts—Pinning the Frames—Fitting Problems—Cementing the Frames—Trimming the Frames—Built-up Nose Sections—Cardboard Formers and Ribs—The Plan Sheet

BUILDING THE FRAMES

Fuselage Construction
Side Frame Method—Full Former Method—Crutch Method
Wing Frame Construction
Checking Rib Lengths—Dihedral Angle Block—Bending Root Rib—Wings Without Bottom Spar (Butt, Fishnose and Slotted Ribs)—Wings With Bottom Spar—Single Panel Wings—Wing Panels Built in Two Sections—Wings Without Center Panel—Wings With Center Panel
Stabilizer and Rudder Construction

COVERING THE FRAMES

General Procedure—Applying Stiff Paper—Applying Cellophane—Tissue Pattern Key—Applying Tissue to Round Fuselage—Applying Tissue to Fuselage with Flat Sides—Applying Tissue to Wings and Tail Surfaces

ASSEMBLING THE MODEL

General Procedure—Stabilizer and Rudder to Fuselage—Wings to Fuselage—Monoplanes—Biplanes—N Struts—Wing Fillets—Rear Motor Mounts—Landing Gears—Doping the Model—Assembling Propeller Units—Motor Hook-ups—Hints on Decorating—Adding Guns, Aerials, etc.

FLYING THE MODEL

Balancing the Model—Test Gliding the Model—Powered Test Flights

PAUL K. GULLOW **WAKEFIELD, MASS.**

underneath a light blue-gray. With paint, or use paper letters, put U. S. ARMY on the bottom of the wing. Wheel wells are black and control markings are added with India ink and ruling pen. Army stars are added to both sides of the fuselage and the upper left wing and lower right.

The control lines are made of thirty-pound-test enameled fishline, which should be kept on a reel to prevent tangling. These are attached to a spade-grip handle made from pine. Balance the plane about midway between the control lines.

You will notice that the entire rudder is hinged to avoid a common mistake. Every serious crack-up I have ever seen in control-line flying was due to the fact that the plane was not turning enough against the circle. The right-hand turn tendency must be strong to keep the lines taut and the plane in perfect control. It's hardly possible to turn the rudder too much; even if it is overdone it's far from being the messy result of slackened control lines. The plane will try to veer off to the right but, unable to go because of the restraining control lines (a backward step or two will control the tendency further) it will simply pancake in, meaning at most a broken prop. Turn the rudder at least three fourths of an inch for the first flight, which should be made in absolutely calm weather. Keep the motor throttled down until you get the feel of the model.

The Skyranger

(Continued from page 43)

tire model with auto rubbing compound and polish with a soft cloth. Now put on the windshield and windows, which are made of .005 celluloid. Add all striping and details.

Assemble the entire model. Insert wing-spar stubs in holes in the center section for perfect alignment and glue securely. Attach wing struts and stabilizers. A small opening may be cut in the rear of the fuselage for access to the rear hook. Make up a motor of eight or ten strands of $\frac{3}{16}$ " well-lubricated brown rubber. Bind the motor to the rear hook and to the prop shaft. A strip of $\frac{1}{2}$ " Scotch tape may be placed over the fuselage-wing junction. A few coats of colored dope on the tape will bring the finish equal to the ship's. Attach the tail spring and wheel. Completed, the model should weigh about five ounces.

To keep the finish from getting dull, a coat of wax in paste form may be applied with a soft cloth. Test fly the Skyranger in tall grass to prevent any serious crack-ups.

Why The Mosquito?

(Continued from page 6)

ports, corroborated by the ship's performance in America, the Mosquito has sufficient speed, rate of climb, and all-around performance to enable it to cope with the best of the enemy's fighters at any altitude lower than 30,000 feet. *Flight* magazine quoted

THEY'RE GOING PLACES! Are You?



AVIATION IS PACKED with REAL OPPORTUNITIES FOR YOUNG MEN. . . .

THOSE who are experienced in aircraft production and maintenance are given preference in the armed services, and the Aviation Industry will make it worth while to train for skilled positions.

After the war, it will be the "Trained" men who will occupy the key positions.

Don't overlook this opportunity for a lifetime career.

Start preparing now. Write for Free Folder today.

35 WEEKS
First Approved
MASTER
MECHANICS
COURSE

20 WEEKS
First Approved
ENGINE
MECHANICS
COURSE

20 WEEKS
First Approved
AIRPLANE
MECHANICS
COURSE

8 WEEKS
ENGINE
MECHANICS
COURSE

8 WEEKS
AIRCRAFT
SHEET METAL
COURSE

Atlantic
AVIATION INSTITUTE INC.
61-66 PROSPECT ST., TRENTON, N. J.

RED CHIEF INSIGNIA DECALS!



COLT 45 CAL. Frontier Model

Wood construction kit with working plans and all necessary hardware. Barrel and cylinder are \$4.45 machined.

- COLT 45 Cal. "FRONTIER" model kit, 5 1/2" barrel.....\$1.55
- COLT 45 Cal. "FRONTIER" model kit, 7" barrel.....1.70
- COLT 45 Automatic Pistol Kit.....1.00
- COLT 25 Cal. automatic pistol kit... .50
- THOMPSON SUB MACHINE GUN model kit.....3.00
- Savage Cal. 32 automatic pistol kit.... .75
- LUGER 9 M/M auto. pistol kit w/4" barrel.....1.75
- LUGER 9 M/M auto. pistol kit w/6" barrel.....1.90

All kits make beautiful full scale models. *Postpaid in U. S. A.
GUN MODEL CO., Dept. WB 3, 7001 N. Lincoln Ave., Chicago, Ill.

the Mosquito's armament as consisting of four 20-mm. cannon and four .303-caliber machine guns, which would further enable it to meet and best German fighters and, if necessary, bombers. It would make an excellent night fighter but for the fact that, according to rumor, Britain has some newer and more formidable night battlers on the way.

For a number of reasons, the Mosquito is the finest medium-altitude day bomber of its weight that has yet appeared on the fronts. For both bombing and reconnaissance, a day bomber's worth is determined by its ability to get through to the objective and photograph or bomb it, or both. Of necessity, Adolf has had to ring strategic points in greater Germany and the occupied countries with considerable anti-aircraft; the more vital spots are protected by both anti-aircraft and interceptor-fighters—all of the latter he can spare from Russia and North Africa. Let us consider, first, the problem of attacking well-gunned objectives.

The high fliers such as the Flying Fortress and Liberator can play safe by outranging anti-aircraft fire. The low-flying grasscutters such as the Mustang and Boston III can hedge-hop to avoid the fire of the big guns and force the small-arms gunners to resort to a more or less uncertain method of curtain fire. The medium-altitude bomber, however, usually is forced to operate within range of both the heavy guns and the smaller arms; in many instances, the reconnaissance bomber must come down to between eight thousand and five thousand feet to get a detailed photo of some important objective. Should this reconnaissance bomber be capable of changing speed, direction, and altitude during the time that a flak projectile—or even a number of them—is being fired at the bomber's previously predicted point in space, the shell will never arrive at its target. It will reach and explode at the predicted point, but the bomber will no longer be there. When the plane can avoid this "prediction point" by a distance greater than the danger zone, the bursting radii of the shells, it may, just as readily, escape the fire of a complete anti-aircraft battery. To a large extent, then, the security of a ship depends upon its speed and maneuverability. The Mosquito is blessed with both.

Secondly, we have the problem of attacking objectives which are well protected by fighters. The latter must find and make contact with the bomber; if interception is not accomplished there is no fighter opposition. Even in daylight, the bomber's speed makes this interception less probable. By the time the enemy aircraft warning service discovers and plots the course of the bomber, it is far enough away to give enemy fighters a chase. When discovered over the objective or on the way home, the bomber's ability to survive depends upon its defensive firepower, speed and maneuverability. The more closely the bomber's speed approximates that of enemy fighters the greater its security, because the fighters' speed must greatly exceed the bomber's to enable them to deliver co-ordinated attacks in quick succession. The

greater the speed, the faster the attacking operation; this results in shorter periods of fire from the fighters.

The plane is the first tactical airplane type to be produced by deHavilland, Ltd. Its nearest relative was a very famous ship in its own right, the deHavilland Comet which C. W. A. Scott and T. Campbell-Black flew to victory in the grueling England-Australia race of 1934. Essentially, the Mosquito is a scaled-up version of the Comet. It has a wing span of 54 feet 2 inches (as compared with the Comet's 44 feet) and is 40 feet 9½ inches long (against the Comet's 29-foot overall length) and 15 feet 3 inches high. Just after the Comet had won the Australia Derby, Capt. Hubert Broad, then deHavilland's chief test pilot, suggested that the craft could be made into a fine light bomber with comparatively few modifications. He pointed out how some of the racer's fuel capacity might be sacrificed for bomb load and how extra space and weight would be saved by operating the ship as a single-seater. The Comet carried two principal tanks and had provision for 258 English gallons of fuel that weighed something in the neighborhood of 1,800 pounds. According to Broad's calculations, this fuel load could be reduced to permit the carrying of a 500-pound bomb and still leave enough for 1,500 pounds of fuel. This change would have allowed a range of three quarters that of the Comet, which was close to 3,000 miles.

Both craft were engineered for plywood construction and along exceedingly clean lines with underslung engine nacelles. The Mosquito's fuselage is circular, while the Comet's was flat and oval; the bomber's nacelles had to be enlarged and rounded to accommodate the Rolls-Royce Merlin 20 engines, while the Comet nacelles were flat and inclosed small six-cylinder deHavilland Gypsy Major in-line engines. The Comet's cockpit was located well aft, but the Mosquito's is far forward, even with the leading edge of the wing, and its nose is shortened considerably and fitted with a bombardier's station inclosed in Plexiglas. Both ships have highly tapered, thin wings, but the Mosquito's wing was raised to the mid position to allow for the bomb bay. The new bomber is built on the Duralund plastic-bonded plywood process combined with deHavilland's own laminated wood process. Both the fuselage and wings are of semi-monocoque construction, and the plane is exceedingly strong and light for its size. Aerodynamically, it is probably the cleanest bomber in operation. It represents a beautiful and clever compromise in design because a ship of such clean lines and with such a thin, highly tapered wing rarely boasts such great maneuverability and climb. Speed is to be expected, but the low wing loading that permits such nice take-off and landing characteristics and maneuverability is not associated with the tapered high-speed wing design. The Mosquito's powerful engines and light weight provide a low power loading, and this is also responsible for the ship's climb and maneuverability. It is truly one of the war's great airplanes.

SCALED DETAIL... Quick Assembly



DEALERS AND DISTRIBUTORS: Write for details.

The JEEP is a popular subject . . . but a difficult one for REALISM . . . unless you work in material that suits the job! WEST-CRAFT'S ingenious and exclusive design solves the problem!

This WEST • CRAFT Jeep's a honey! Build in an evening or less from ready-cut materials that bring out all details. Parts die-cut to perfect 1/2" scale in tough fibre-board. Easy, fast, close-fitting assembly. Beautiful body complete with scale detail in windshield, bumpers, seats, trenching shovel, fenders, etc. Three real DECAL insignia with numbers. Wood wheels that roll. Easy-to-follow picture instructions.

ONLY
29c
by mail 35c
postpaid

ACTUAL PHOTO OF WEST-CRAFT JEEP



At your dealer. If he can't supply write:

WEST • CRAFT

2712 Pratt Ave.

Chicago

C-Z New Non-Critical Material

SCALE MODELS

MORE FUN
THAN Balsa
BETTER
THAN TISSUE

DIFFERENT ★ NEW



Actual Photo of Curtiss Hell Diver Model

It's a brand new technique . . . intriguing for the experienced builder and easy for the beginner. Now you can build all the scale jobs you want without balsa or any essential materials. You don't even need paint because this basic material has the proper color painted right on it! Every part accurately numbered and outlined for easy assembly. All hollow constructed with ribbed wings and former type fuselage. Sturdy, tough and more durable than balsa models. Get in on this new fun . . . you'll enjoy

it more than ever . . . and remember all C-Z models are famous for their authenticity.

The following brand new numbers are ready right now.

- 2 Navy Planes Grumman Avenger 85c
- Curtiss Hell Diver 75c
- 2 Army Planes Curtiss P-40-F 50c
- Republic Thunderbolt 50c
- 2 British Planes Hurricane 60c
- Spitfire 60c

If your dealer doesn't have these kits get and direct to us and enclose 15c for postage and packing.

STILL AVAILABLE If you will hurry . . . and if you are lucky you can still get several of the popular C-Z metal covered scale model kits. We have a few on hand as the materials were purchased before they became critical. Get all the information on C-Z models.

SEND 5c TODAY FOR OUR COMPLETE CATALOG

C-Z Model Airplane Co.

Dept. AT, 5055 Archer Ave. CHICAGO . . . ILLINOIS

BOEING B-17 FLYING FORTRESS BOMBER



44" Span. Length 30". Color Silver. Weight 6 oz.

Set has all parts printed on balsa, four 2" finished motor fronts, four 4" carved props, wheels, set of paints, glue, and full size drawing. The most exclusive sensational bomber model in the world. Set, postpaid... **\$4.50**

GRUMMAN F3F1 NAVY FIGHTER



32" Span. Length 25". Color, grey. 1" Scale
A fine detailed model with retractable landing gear, 1" turned balsa motor front, 3 oz. grey dope, 1/2 oz. yellow, 2 oz. glue, etc. All parts printed on balsa, 10" propeller, wheels, rubber motor, full size drawing, and all parts. Set, postpaid... **\$3.75**

SEVERSKY P35 ARMY PURSUIT



32" Span. Length 25". 1" Scale. Color, silver
Set has 4" turned balsa motor front, 10" curved prop, balsa wheels, tail wheel, all parts printed on balsa, insignia, set of paints, and full size scale drawing. Model has retractable landing gear and movable controls from cockpit. Set... **\$3.25** postpaid

CURTISS P40F SOLID



14" Span. Length 11 1/2"
Latest type P40F Warhawk with completely finished solid balsa fuselage, wings, etc. cut to outline, paints, drawing, and all parts. Set... **\$2.50** postpaid

REPUBLIC P43 LANCER SOLID



14" Span. Length 9". 3/4" Scale
Solid exhibition model.
Set has completely finished fuselage, headrest attached, cockpit cut out, etc., scale cast motor, cast propeller, wheels, paints, wings, etc. cut to shape, drawing, etc. Set postpaid... **\$2.25**
Ready built model **\$15.00**

MINIATURE AIRCRAFT CORP.

83 Low Terrace • Dept. A-3 • Staten Island, N. Y.

BUILD THE NEW AUSTIN-CRAFT

\$1.50



U. S. ARMY 2 1/2 Ton Truck

First scale model of the U. S. Army's all-purpose "ten wheeler"—used for both supplies and personnel. Parts cut to measure for precision fit and strong rugged construction. Accurate fusimils detail with complete accessories including 5 overboard shaped fids and regulation O.D. tarpaulin, headlights, bumper, fenders, radiator grill material, windshield, doors, two wheels and a spare. Assembled in one session—Scale 1/4" to 1". Start your motorized Division now. Build the official Austin-Craft Jeep (000) and the Austin-Craft Big Follow (01.00). By mail, the postage extra each.

START YOUR
MOTORIZED
DIVISION!

AUSTIN-CRAFT CO.

431 SOUTH VICTORY BLVD., DUBAOK, CALIFORNIA

Easier Starting—Top Performance With MERCIO IGNITION KIT

With engine production curtailed for the "Duration" the MERCIO IGNITION KIT will enable you to continue flying with the utmost efficiency.

KIT CONTAINS

- 1 Aero Spark Coil
- 1 Champion Spark Plug (mention size wanted)
- 1 Mercio condenser
- 5' coil super ignition wire
- 1 doz. copper terminal lugs
- 1 Mercio Hi-Tension lead

FREE repair booklet with every kit ordered.



ALL FOR

\$3.00
P.P.

MERCURY MODEL AIRPLANE CO. 1592-Y3 Lincoln Place, Brooklyn, N. Y.

Dope Can



BY
GORDON S. LIGHT

FRANK ANTOSH is a model builder who just can't forget. He wanted to build a model so badly he traveled all the way from the Atlantic to the Pacific to get the material. Living in Panama made his trip shorter, of course. The oceans get pretty close together down there. He flies with the Pacific Gas Model Club and took a first in Class B at a contest last summer. He used to fly in contests around his home in Scranton, Pa. Then he got the job as aircraft mechanic at the Middletown Air Depot and was transferred to Panama last year. Does he like his work? The answer is *yes*. In his own words: "It's a model builder's dream come true to have a job with the air force." Scarcity of materials in Panama is his only objection. He has been barely able to scrape enough together for a gas model. Maybe some of you old contest fliers remember him. Even if you don't, he'd still welcome any letters you can find time to address to Box 1211, Ancon, Canal Zone.

Speaking of letters from you and to you model builders in the army and navy, be sure to send your name to the AMA headquarters to be added to the Academy of Model Aeronautics Roll of Honor. (1025 Connecticut Avenue, Washington, D. C.) Tell them what branch of service you're in. Don't tell them where you are unless you're sure the censor won't mind. And before you start that long letter to your girl friend, why not whip out a short note to the Dope Can? We'll mention having heard from you. And that, my boy, is a real honor!

Note to Cahill in Indiana: I don't like being called Broomstick. You're just jealous of my trim, streamlined figure. (Note: He's sore because he lost his chase-my-model waistline.)

Box and kisses, love and hisses have been sent our way following the article on the rules in the December issue. Steve Kowalik said he has long held the same ideas. So we congratulated each other on our progressive viewpoints. We remembered his ships in contests back in the early thirties always looked snappy and still won prizes.

Harry Moyer of Lebanon, Pennsylvania, agrees with us. Maybe we'd better say that we agree with Harry. After all, he's done a lot to make us appreciate a well-designed, carefully-engineered model. He's been building since the early 1900s. As long as we've known him he's always raised



Raiding with the Rangers, 'cross country scouting, front line dispatch riding... those are some of the motorcycle jobs that call for red-blooded riders with daring and courage, cool heads and resourcefulness.

In flashy, flexible performance on a dozen battle fronts, Indian Motorcycles are backing up these riders with all of Indian's famous power and speed and sturdy dependability. The soldier who rides an Indian knows there's no safer motorcycle built.

And you'll know it, too, when you ride the great new Indians that will be yours for good times and economical transportation after this war. In the meantime, let your Indian dealer help keep your present motorcycle in fighting trim... and ask him about his reconditioned "buys".

INDIAN MOTORCYCLE COMPANY, SPRINGFIELD, MASS.



BUY WAR BONDS NOW

★ ★ TO BUY AN INDIAN LATER ★ ★

Latest Developments in RADIO CONTROL

A booklet written for the radio control beginner as well as the expert. Features—"The theory of the RK-62 receiver"—"Control devices"—Table of A and B batteries. A comparison of the electrical and mechanical qualities of bakelite, steelite and polystyrene—Self-neutralizing escapement—sequence solenoid—rubber powered selector—rubber powered indicator—"Radio Control Circuits," an article written in answer to the questions asked in the thousands of letters received by us. Eighteen different radio control hook-ups with hook-up diagrams.

Ask your dealer or send twenty-five cents for illustrated instruction Manual. Stamps will not be accepted.

Radio Control Headquarters
P. O. Box 214 Deal, New Jersey

Rogers

New
Address!

Effective January 11th, we will be in our new plant in Detroit, the "Motor City." Complete factory set-up with the best possible equipment for service, replacement parts and accessories will be in operation at once. To be sure of the best, have your Rogers Motors serviced by the manufacturer.

743
Beaubien
St.,
Detroit,
Mich.

Rogers MOTOR CO.

Detroit, Mich.

his nose at contest freaks. Flyaway flights might appeal to the youngsters who like chasing around. Give him precision flying every time—short controlled flights with realistic take-offs and genuine landings. He spends time with each design, beginning with the original three-view, judging it carefully for eye appeal as well as flight. The result is usually striking. His interest pivots on the new model until it is flying successfully. He makes improvements which repeated sessions of flying prove necessary. Weak points are redesigned. Gadgets are added. The model is soon a veteran of hundreds of flights. But the crate is due for an honorable discharge soon after Harry starts sketching a new three-view. With a new ship on the way, the flying sessions are curtailed and the lights burn late in the shop. The new ship will incorporate some idea which has caught his fancy. The only feature that remains the same is the basic requirement that it looks and flies like an airplane. Few builders are as good as Harry, but fortunately there are thousands who share the technique of getting the most out of the hobby.

Jimmy Metchicas of Greenville, S. C., is with the Army Air Force Ground Training Detachment, studying at Denton, Texas.

Australians are still modeling, even though most of the news from that country is military. Thomas Butler of Paris, Tennessee, relays a photo of a contest line up at the Queensland Model Aero Club's field day. Thomas was born in Sydney, N. S. W. His uncle in Australia keeps him posted on model news from Down Under. Thomas is only thirteen, but has built up quite an interest in modeling, and turns out some fine crates.

The boys talked it over a long time and finally decided to hold it despite the war—and so the 19th Semi-Annual Contest of the Gas Model Airplane Association of Southern California was held December 6th. As usual, this California field day was a success. The thermals didn't show up until early afternoon. One of the rowdier currents grabbed Bill Butler's Westerner for a flight of 10:13. Bill watched it go out of sight twenty miles from the field. He got back two hours later in time to collect his trophy and five bucks for third place in Class C. That perked him up a bit, but a phone call later in the evening gave him the real lift. The good old Westerner had set itself down in an honest man's yard and was just dying to get back home. This Westerner is a reasonably accurate facsimile of the original which holds the Class C national record of over twenty-four minutes, as well as the seaplane record of 2:18, designed and flown by Don Foote of Oakland, California.

Butler's ship carried a parachute-type dethermalizer on the long flight. But he dropped the hull when he forgot to set the timer. Had it been set for twenty minutes he might have dispensed with much of the roadwork. What this country needs is a reliable dethermalizer which can set for as much as twenty minutes.

Probably it's because we're one of them that we'd like to plug a few words for the boys who engineer and

YOU CAN'T BEAT "SCIENTIFIC" KITS FOR QUALITY!... DESIGN!... PERFORMANCE!... VALUE!!!

That's why more and more model builders every day are buying "SCIENTIFIC" KITS!

VICTORY SQUADRON
Flying Scale Models of Planes
You Read About in the Headlines
25" WINGSPAN
50¢ EACH
Postpaid or at your dealer



Curtiss P-40 "Warhawk"

Grumman "Wildcat"

Bell "Aircobra" P-39

GAS CHAMPIONS!

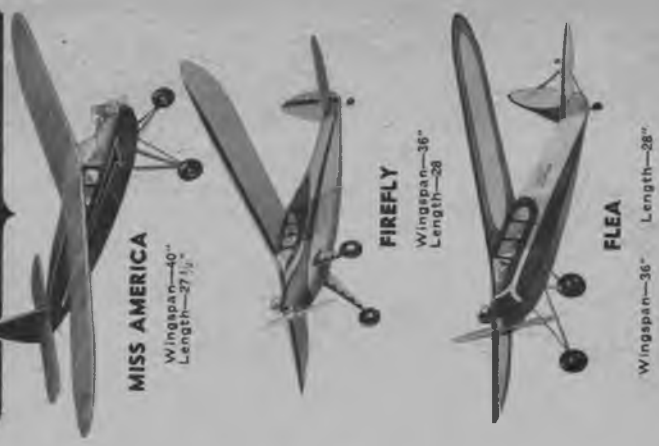
FLAGSHIP . . . Class "C"
Wingspan—71"
Wing Area—850 sq. in.
Overall Length—41 1/2"

Varsity Class "B"
Wingspan—50"
Wing Area—370 sq. in.
Overall Length—33 1/2"

CORONET Class "A" or "B"
Wingspan 46 1/2"
Wing Area—300 sq. in.
Overall Length—30"

Postpaid or at your dealer

GAS TYPE "HITS"
They Look, Fly and Sound
Just Like Gas Models!
ONLY \$1.95 EACH
Postpaid or at your dealer



MISS AMERICA
Wingspan—40"
Length—27 1/2"

FIREFLY
Wingspan—36"
Length—28"

FLEA
Wingspan—36"
Length—28"

30" DEFENSE SERIES

95¢ EACH
Postpaid or at Your Dealer

CURTISS P-42
CURTISS SB2C-1 "HELLDIVER"
BREWSTER "340"
REPUBLIC P-47 "THUNDERBOLT"

build the fighting airplanes. Fifty hours a week on the drawing board are tedious. There's not much fun on the business end of a rivet gun hour after hour. Plenty of model builders are fighting the war with a 4H pencil or a rivet gun. We know it's necessary. But somehow it seems pretty unimportant stacked alongside the job of flying, which many other model builders are doing.

BUILD A PERFECT REPLICA OF THIS BRAVE FIGHTING SHIP!

18" LONG
MOULDED HULL INCLUDED!

AIRCRAFT CARRIER WASP 1.50
postage 15c
Complete Construction Kit
Includes everything needed to build an exact replica; our simplified parts and plans make it easy for anyone!

24-26 WEST 19th ST.
NEW YORK

Complete Construction 10c
IDEAL AEROPLANE & SUPPLY CO., INC.

SCIENTIFIC MODEL AIRPLANE COMPANY

218-220 A-3 MARKET ST.
Newark, N. J.

30 FT. OF BROWN RUBBER WITH EACH KIT. (While supply lasts.)



STRATOMETER
36" Span

ALTIMETER
36" Span

SUPER SOARER
Twinline Glider 44" Span

WHAT YOU GET

Finished ribs of balsam. Finished trailing edges. Fin. drilled nose block. Finest colored tissue. Cement. Mute wire, etc. Stratometer has finished slides of choice stock. Super Soarer has fin. rudder and stab. (No rubber with Super Soarer.)

EACH KIT WITH RUBBER—\$1.50 WITHOUT RUBBER—\$1.25

Add 15c packing charge on every kit. 5c more insures it.

ATTENTION MODEL BUILDERS

New price list includes clear Oregon white pine (almost as light as balsam). We further de-hydrate this wood after cutting without shrinkage! Also new and hard to get items—SEND 5c.

BEST BY TEST MODEL CO.
175 T-3 Main, Ridgefield Park, N. J.

WARPLANE PHOTOS 5c EACH 11 FOR 50c

Here are just a few of our collection of 1500 of the finest U. S. Army, Navy and Foreign Warplane Photos. Clear and Detailed. Printed on Glossy Paper, 2 1/2 x 4 1/4. Guaranteed Not To Fade.

Hawker Hurricane P-50 SBD-1
Bristol Blenheim P-40 PBV-5
Bristol Beaufort XB-24 XF4U-1
Messerschmitt 109 B-26 F4F-3
Heinkel 112 B-25 Y8D-1

SEND 5c for sample photo and free catalogue containing other photos, airplane sketches, naval sketches, books.

CRAFT ART CO. Dept. 346 FIFTH AVE. NEW YORK, N. Y.



10c EACH

MORE THAN 60 AUTHENTIC DETAILED SKETCHES OF THE LATEST U. S. MILITARY, U. S. COMMERCIAL, AND FOREIGN AIRCRAFT. REPRODUCED ON HEAVY WHITE VELLUM PAPER, 1 1/2 x 2 1/2 INCHES.

Send 10c for Sample Sketch and Catalogue containing over 1500 Photographs, Sketches of the U. S. Fleet, Boats, etc. Or send 5c for Catalogue only.

DEALERS: WRITE FOR DETAILS

CRAFT ART COMPANY DEPT. 3 T

246 FIFTH AVE. NEW YORK, N. Y.



10 NEW FLYING MODELS 50c EACH

Each kit is complete, easy to construct and includes cotton ship for purchase of rubber. Order by number.

- No. 401—Noorduyn Norseman 28"
- No. 402—Westland Lysander 28"
- No. 403—Harvard Trainer 28"
- No. 404—Blackburn Skua 28"
- No. 405—Spitfire 30"
- No. 406—Baby Hornet 30"
- No. 407—Baby Maffett 32"
- No. 408—Airacobra 36"
- No. 409—Gliding Sail Plane 36"
- No. 412—Hawker Hurricane 38"

Order from your dealer or write direct, adding 5c to cover packing charges.

MODEL CRAFT HOBBIES LTD.
48 Esplanade St., Dept. 121, Toronto, Ont.

ties were made in order to have a ten-minute film available to show other civic groups what can be done in every community to encourage our air-minded boys and girls—and how to do it. Our first beginners' contest in July was such a success that a second contest was held in September with similar results.

The net results so far might, we think, encourage other clubs to follow a similar program. We have already added twelve new members to our club; have obtained an additional sponsor (a leading bank) for financing our future activities on a larger scale; and have aroused renewed civic interest in model aviation. We confidently expect consistent increases in membership in our AMA Chapter.

On November 16th we announced a scale-model contest, the models to be judged January 12, 1943. Following through on the thought of encouraging beginners we are awarding War Stamp prizes in three classifications: those under fourteen; those fourteen to twenty-one; and those over twenty-one. Thus do we plan to maintain interest in model building for the benefit of the new modelers, whose voices will be heard by thousands next spring in the open spaces all over America, sounding the modelers' battle cry—"T-I-M-E-R!"

Tippy Tutor

(Continued from page 27)

good order, be sure that the pilot's seat is adjusted correctly.

The flight trainer will give the feel of almost all flight maneuvers except loops, rolls off the top and some of the tougher tricks. Climbing and gliding are primary. Sit on the trainer, feet in position—but with the bar even—and move the stick back to the pit of your stomach. See how the nose comes up? That's the sensation you get when a plane glides. Now shove the stick forward again. Back comes the trainer to a line of flight parallel with the ground. Ready? Shove the stick forward and down we go!

Now for the straight bank. Move the stick to the right. Your right shoulder dips with it and you can look straight down at the ground. That's a right bank. Just imagine your right wing tip is extending way out there and pointing down several feet below. Do the same thing to the left. The angling over to the right or left is really all there is to banking.

Now keep her on an even keel and shove your right foot forward. Around she goes! See how the nose swings to the right past the landmarks in the horizon. That's what it would be like if you shoved hard on the right rudder of a real plane; the plane's nose would swing around to the right. Remember that you push on the foot that's on the side toward which you wish to turn.

As you respond to "Dive to the left"; "Climb twenty degrees to the right"; and other commands, you will soon become accustomed to most of the sensations an air-force pilot knows in a good day's work.

Build Models with SPEED and EASE



... bond them permanently with Weldwood Glue

Weldwood Glue is so simple to use it helps build model planes faster. And no matter how fine the contact point, once it is bonded with Weldwood, it's welded for good.

Whether you build balsam, hardwood or the new plastic models described in the February issue of Air Trails, you can get excellent results with Weldwood Glue.

Weldwood is the same waterproof plastic resin adhesive widely used on real Army and Navy planes.

Consider these outstanding Weldwood advantages:

Easy Mixing... dissolves readily in cold water, forms smooth, creamy paste.

Convenient to Use... used cold, sets cold; ample time to use after mixing, cannot "chill off."

Great Strength... when properly applied, bond is stronger than material it holds.

Odorless, Stainfree... excess glue easily removed with damp cloth.

Waterproof... not affected by heat—rot, bacteria, fungus.

At hardware, chain stores, lumber yards—10¢, 25¢, 50¢ and 85¢ sizes or send 25¢ with your dealer's name and address for sample can.

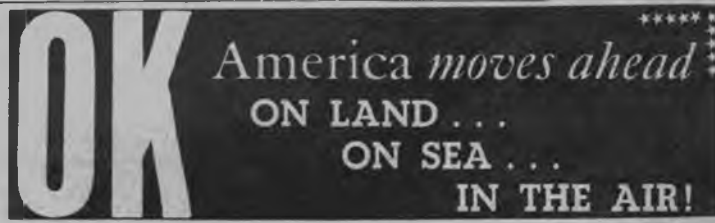
UNITED STATES PLYWOOD CORPORATION
World's Largest Producer of Plywood
Weldwood Glue Dept.
103 Park Ave., New York, N. Y.



Send front page of instruction folder from any 25¢, 50¢, 85¢ can—along with your name and address, and that of your dealer—for helpful Weldwood Glue Manual.



"The Army and Navy needs hundreds of thousands of every plane model, to train pilots and gunners to recognize them instantly. Your help is needed to build them. See any manual training trainer for plans and detailed instructions."



OK DeLuxe



It's a SNAP OK!

HERKIMER TOOL & MODEL WORKS

Herkimer New York

America's momentum is 'sparkling'! The United Nations offensive... as this is being written the glorious stand at Guadalcanal is already historic... Buna, Alaska; Iceland, North Africa. The soldiers, sailors, marines measure no sacrifice too great to preserve liberty for themselves—families—fellow Americans. When mobilized in full strength the mammoth power of this great Nation is supreme!

AMERICA MOVES AHEAD... on land, on sea, in the air! The army back of the army—skilled technicians, craftsmen, laborers—**MEN & MACHINES**—are forging a power to crush the mad ambitions of dictators to enslave the world! We are proud to be enlisted in this world crusade... all our facilities, all our manpower are 'in for the duration!'

"OK" engines possess the precision craftsmanship which is contributing to today's war effort. Sturdy—dependable—powerful—**EASY STARTING!** Is it any wonder these engines have their own loyal army of followers? Your dealer may still have an "OK" on hand. Repair and replacement service available through the factory!

EVERY MODEL OUTLET RECOMMENDS WAR STAMPS AND BONDS

CAPITOL Fliers DISTINGUISHED DESIGN plus That 'XTRA Something!

CURTIS WARRHAWK

CHOICE OF FIGHTER MODELS

30" SPAN

SUPERMARINE SPITFIRE



Features MULTI-STRINGER CONSTRUCTION

Distinction design, full-size PRECISION construction plans (with plenty of illustrations!) and an amply filled kit makes ANY Capitol Model a fascinating "extra-value" project! Multi-stringer construction assures a true prototype reproduction, faithful in silhouette and all characteristics! Big, powerful filers always! Each kit includes specified insignias, legging, tissue, etc.—just add the rubber to fly 'em—HIGH, WIDE and HANDSOME! Watch these announcements for new, spectacular models!

Full size PHOTOGRAPHIC PLANS PROFUSELY ILLUSTRATED

Each kit 4.95 by mail plus—any to follow 3 VIEW TYPE with plenty of photographs of both the original and existing models. P. C. E. G. C. 1938

DEPT. 1613 East New York Ave., Brooklyn, New York

CAPITOL Model Aircraft Co. (DEPT. AT-3)



ALL THE STRENGTH OF CAPITOL PLANNING IN THE AIR—plus the extra strength and assure true fibrocrete.



Ask Balsa Butch

Model builders' questions answered here or by mail; inclose stamp to insure reply.

D. E. C., 405 Applegate Court, Brooklyn, N. Y.—After a rainstorm, model covering has a tendency to sag, making the airfoil less efficient. Unless the sun is out, the air is still heavy, and this also affects the flying. As to your pitch problem—3.1416 is constant. For navy identification plans, consult your nearest high-school shop instructor. He has them and will give you additional dope on making of the planes and where to deliver them. The airfoil you drew looks bad. Change it and you would probably have a better flying ship. Obviously the ship would be heavy, and that may have had something to do with it. In your gull-wing, don't have the outer panel point down; it's a bad form, and no planes we've seen using that (in models) ever amounted to much. Personally, if we were building that wing we'd use straight polyhedral, with a Clark Y, and use 1/8" square leading edge, two 1/8" square spars (top and bottom) and a 3/8 x 1/2" trailing edge.

L. F. S., 3220 Woodhome Avenue, Baltimore, Md.—The Joe Ott Manufacturing Co., 415 West Superior Street, Chicago, Ill., markets a model of the Turner Racer, and we believe they have several photographs of both the model and original. If they do not, write any of the news services as they may have one. We do not have them in our files.

C. A. R., 7184 Walton Ave., Bronx, N. Y.—There is a difference of opinion about control wires (or strings) for models. We advise you to consult leading model magazines and check with what the experts are using. They know from experience. You probably can fly a control-line model in Van Cortlandt Park. We've kept cement in a sealed can for over a year. Rubber in a proper air-tight container may be kept over a year. Glue in tubes will keep even longer than in bottles or cans. Radio-control ships (about eight-footers) would cost about \$75 to build. Two coats of dope are sufficient for most rubber jobs. Color dope is O. K., but adds weight. There were several model clubs in New York, but most

of them have practically ceased activity. The Mercury Mites are still active in Brooklyn, we know. The stabilizer does not have to be directly on the thrust line on a gas model. A balsa stripper used to be marketed by several concerns, but to our knowledge is no longer available.

R. L., 1113 Fifth Ave., Valley City, N. D.—With a Rogers, or any motor, a timer should be used to cut the motor after a maximum of 15 seconds. A longer motor run might result in an out-of-sight flight, which means a lost ship or a long chase. A timer is usually inserted in the wire between the battery and the ground (motor base). A booster may be made from four or eight flashlight batteries, although such a booster is not as good as two dry cells. The batteries should be connected in series parallel. Most builders use ordinary electric-light wire for booster connections. For a book on gas jobs, read William Winter's, *Model Aircraft Handbook*, sold by the T. Y. Crowell Co., 432 Fourth Ave., New York, N. Y. It costs \$2.00.

N. R. B., 61 Crescent St., Swampscott, Mass.—Get the October issue for plans for a swell towline glider which will probably fill the bill for you. All the models in *Air Trails* have been pre-tested, and thoroughly proven before publication.

K. B., 55 Glenwood, Mobile, Ala.—There is a formula for turns that can be stored in a rubber motor in Frank Zaie's 1939 Yearbook. It is:
 turns = 162 1/2 length of motor in inches (think to hook) number 16 strands (or 1/2 number of 8 strands)
 For a nice-flying medium-sized model try Wally Simmers' Jabberwock (marketed by the Midwest Model Supply, 445 W. 60th St., Chicago, Ill.) which costs \$1.25. Frames can be doped, but this is generally a fill that's too expensive to pay for the bother.

Unsigned Letter, 15 Roff Ave., Palisades Park, N. J.—Try a Rogers 29 motor with a Ray Ridge Mike or a Berkeley Brigadier for your first gas job. Both ships are easy to build and fly very well.

Photo Credit List

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

Page 6—T., British Combine; Cen., International News photo; Bot., Famous Picture Co.

Page 12—All by Rudy Arnold.

Page 14—T.C., Harnood International Photo Service; all others official U. S. navy photos.

Page 18—Official U. S. army photo.

Page 19—L.L., U. R., Cen., courtesy North American Aviation, Inc.; L.B., L.R., courtesy Lockheed Aircraft Corp.

Page 20-21—Official U. S. army air force photo.

Page 22-23—All International News photos.

Page 25—T., Hans Grunloff.

Page 28-29—Hans Grunloff.

6 big books ON AVIATION shipped Free FOR EXAMINATION

★ Get into Aviation with the help of this brand new cyclopedia just off the press. It is the most complete, most up-to-date set of books on this subject we have ever published. Aerodynamics, Engines, Parachutes, Propellers, Ignition, Aircraft engines, Blueprint reading, Welding, Weather maps, Aerial photography, Air instruments, and hundreds of other subjects, all well covered.

for Beginners or Experts

Every man interested in flying, whether amateur or expert, should have these books. Written by a group of well-known experts in simple language so that anyone can understand them. Quis questions and answers help to make this a complete reading course in Aviation. National Professor has opened up tremendous opportunities in this field. It is the fastest growing industry today with hundreds of opportunities for good jobs at big pay. Send the coupon for free examination. The complete set will be sent to you promptly.

Consulting Service Included
 A full year's consulting privilege with our engineers now given without extra charge to every buyer of these books.

AMERICAN TECHNICAL SOCIETY
 Dept. H356, Drexel at 58 St., Chicago, Ill.

American Technical Society, Dept. H356
 Vocational Publishers since 1906
 Drexel at 58 St., Chicago, Ill.
 Send for 10 days' trial, BRAND NEW 6 volume set, Aviation. I will pay the delivery charges only. If I wish I may return books in ten days and see you nothing, but if I decide to keep them I will send \$2.00 after ten days, then only \$3.00 a month until \$15.00, the total price, is paid. Send BRAND NEW edition which includes Aviation Blueprint reading and free consulting service for one year.

Name.....
 Address.....
 City..... State.....
 Please attach letter stating age, occupation, employer's name and address and that of at least one business man as a reference.



Build your own "SPORTSTER" lightplane from easy construction kits. Complete details and 3 view drawing 25c.

J. W. Peterson Aircraft Co.
 1139 Veto St. :: Grand Rapids, Michigan.

Build those "Man-Size" Models with

LEPAGE'S special AEROPLANE GLUE

Build models quickly... securely with this water-white, transparent glue. It's feather-weight and fast setting. Leaves no stains on the wood. Every tube contains plenty of glue for making high fliers. Buy a 10c tube today!



MODEL FANS

Air Trails Pictorial

Advertisers, March 1943

SCHOOLS

Aero Industries Technical Institute	Back Cover
American School of Aircraft Instruments	54
Atlantic Aviation Institute, Inc.	62
Curtiss-Wright Technical Institute, Inc.	5
Dallas Aviation School	4
Embry Riddle School of Aviation	48
International Correspondence Schools	66
Parks Air College	3
Roosevelt Aviation School	11
Ryan School of Aeronautics	8
Spartan School of Aeronautics	Second Cover

MODEL AIRPLANE KITS, MOTORS and SUPPLIES

Aldine Paper Co.	60
Austin-Craft Co.	64
Berkeley Models, Inc.	70
Best By Test Model Co.	67
Capitol Model Aircraft Co.	68
Cleveland Model & Supply Co.	51
Comet Model Co.	Third Cover
Consolidated Model Engineering Co.	61
C. Z. Model Airplane Co.	63
Flo-Torque Gas Model Propellers	56
C. H. Q. Motors, Inc.	60
Paul Guillow	62
Herkimer Tool & Model Works	67
Ideal Aeroplane & Supply Co.	65
Imperial Model & Supply Co.	66
International Models	52
Art Kronfeld	62
Le Pages, Inc.	68
Master Modelcraft Hobbies	69
Megow's	32 & 33
Mercury Model Supply Co.	64
Miniature Aircraft Corp.	64
Modelcraft	54
Model Craft Hobbies Ltd.	67
Ohlsson & Rice Mfg. Co.	10
Joe Ott Mfg. Co.	58 & 59
Polk's Modelcraft Hobbies	55
Radio Control Headquarters	64
Red Chief Industries	62
Rogers Motor Co.	64
Scientific Model & Supply Co.	65
Selley Mfg. Co.	66
Skyway Model Aircraft Co.	69
F. R. Smith Decalcomania Products	69
Victor Stanzel & Co.	56
Testor Chemical Co.	49
United States Plywood Corp.	67
West Craft	63
X-acto Crescent Products Co.	60

GENERAL

Aerocna Aircraft Corp.	7
Aeroplane Photo Supply Co.	62
American Technical Society	68
Charles Atlas, Ltd.	53
Champion Spark Plug Co.	12
Cicerone's Magazine Center	66
Craft Art Co.	67
Funk & Wagnalls Co.	50
Gun Model Co.	62
Harley-Davidson Motor Co.	56
Indian Motorcycle Co.	64
Lockheed Aircraft Corp.	13
Lycoming Division, The Aviation Corp.	9
Nelson Co.	66
Pan American Navigation Service	60
J. W. Peterson Aircraft Co.	68
Piper Aircraft Corp.	47
Ronald Press	57

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

THE AIR TRAILS MODEL ANNUAL

Imagine—96 pages of model airplane plans and photo features . . . 16 pages of blue and white, The Plan Book of famous planes and models . . . special sections for seaplanes, engines, scale models, gliders, radio control . . .

Including some material that you have requested reprinted from AIR TRAILS—with two thirds all new material!

It's the model builders' dream of a wonderful time. Buy one now—either for yourself or for that boy you know who loves to build models.

AIR TRAILS MODEL ANNUAL

25c (30c in Canada) At All Newsstands

If your dealer cannot supply you, fill out the coupon below.

AIR TRAILS MODEL ANNUAL 79 SEVENTH AVENUE NEW YORK CITY

Inclosed is a quarter (thirty cents in Canada). Kindly send me a copy of the new AIR TRAILS MODEL ANNUAL.

NAME _____
ADDRESS _____
CITY _____

SKYWAY

KEEP BUILDING! KEEP FLYING! KEEP SAVING!!

SAVINGS ON ALL SUPPLIES

WHY PAY MORE? THE EQUAL OF ANY 50c OR \$1 KNIFE

SKYWAY'S ALL METAL MODELERS KNIFE 10c

6" TIP-TO-TIP CAN'T S'IP

5 FOOT Balsa PROP 10" \$1.00

RITZ FOLDING PROP 10" \$1.00

Balsa Bargains

SWEETS - STRIPS - BLOWERS! Irregular sizes—BUT EVERY PIECE USEABLE! EVERY standard sheet (About 3 lbs. shipping weight) while they last, only 50c

AVIATORS TRAINING COCKPIT

COMPLETE PRE-FLIGHT TRAINING COURSE. Complete kit contains full size instrument panel with movable dials, full size 'jay' stick for control manipulates; 30 pages, 50 illustrated instructions book and instructions for plane identification.

CAMOUFLAGE KITS

7 bottles various camouflage colors with instructions booklet. \$2 NOTE: above 3 items MUST be accompanied by postage to purchaser's zone!

ALUM. FOIL 6" ROLL 15c

Perfect for covering metal surface planes, etc. LIBERAL ALLOWANCE for OLD MOTORS (overhaul purchase of any other merchandise)

FREE POSTAGE ON ALL U.S. ORDERS

SHIPPING INSTRUCTIONS: Add 2c for insurance to orders safe delivery. Packing cost on all orders 10c. 5¢ or 5 ft. 20¢. If outside 48 States also add 15¢ postage when order is over \$1 and 15¢ if under \$1. Minimum order—50¢. No C.O.D. orders.

PLANES—SHIPS—JEEPS

Wide selection all famous standard kits: PLANES—BOATS—TANKS—JEEPS. 25c to \$15

Rogers '29' \$14.95 P.P.

GAS MODEL ACCESSORIES

Champion Spark Plugs 4 or 1/2 50c
Spark Plug Wrenches, Universal 35c
Sockets, Jags, Set of 2, 35c val., 25c
Condensers, Best steel, 20c; Metal 35c
Terminal Clips 1/2 10c val., 3c—5c
Gas Funnel, with copper strainer 30c
Sparkplug Tubing 1/8" 3 ft.—10c
Toggle Switch 25c Lightweight 15c
SAE 7/8 Oil—1/2 pl. 25c Pint 45c
12" High Tension Leads—Best—15c
Best quality M. Y. lead wire 3 ft. 10c
Booster Leads—25c val.—Pair 50c
Masking Tape 1/2x36"—Instructions 5c
Alligator Clips—Solderless—10c
Jiffy Switches, stops power dives 30c
Neoprene tubing 1/2" 20 ft.—20c ft.
Dural Angle 1/2x1/2 20c ft.—3x1/2 30c

AVIATORS TRAINING COCKPIT

COMPLETE PRE-FLIGHT TRAINING COURSE. Complete kit contains full size instrument panel with movable dials, full size 'jay' stick for control manipulates; 30 pages, 50 illustrated instructions book and instructions for plane identification.

CAMOUFLAGE KITS

7 bottles various camouflage colors with instructions booklet. \$2 NOTE: above 3 items MUST be accompanied by postage to purchaser's zone!

ALUM. FOIL 6" ROLL 15c

Perfect for covering metal surface planes, etc. LIBERAL ALLOWANCE for OLD MOTORS (overhaul purchase of any other merchandise)

FREE POSTAGE ON ALL U.S. ORDERS

SHIPPING INSTRUCTIONS: Add 2c for insurance to orders safe delivery. Packing cost on all orders 10c. 5¢ or 5 ft. 20¢. If outside 48 States also add 15¢ postage when order is over \$1 and 15¢ if under \$1. Minimum order—50¢. No C.O.D. orders.

SKYWAY MODEL AIRCRAFT SUPPLY CO. 426 SIXTH AVE., DEPT. A, BROOKLYN, N.Y.

NOW YOU CAN BUY LUMINOUS "THEY SHOW UP IN THE DARK" AUTHENTIC AIRCRAFT INSIGNIA DECALS

Heralded as the most sensational improvement in decals in the past 40 years, they are the exclusive, fully protected product of F. R. Smith Decalcomania Products—the original compilers of authentic U.S. & foreign aircraft insignias for the model trade!

SHOW UP DAY OR NIGHT!

Nothing Else Like Them in the Decalcomania Field! Complete selection—individual sheets—American, British, Russian, Chinese, German, Jap & many others!

U. S. ARMY-NAVY SQUADRON INSIGNIA (35 pair)—Each Decal Approx. 1" diameter.

Sheet size 5"x12" Luminous, \$.100 Laquer, .50c
Same sheet but 12 1/2"x18"—each decal being approx. 1 1/2" diameter—Luminous, \$.150—Laquer, .75c

All Smith Decals are made of finest raw materials. No Smith Decal will ever crack or fade!

F. R. SMITH DECALCOMANIA PRODUCTS, P. O. Box 367, CHICAGO, ILL.

THE U. S. ARMY & NAVY have given Smith written permission to make authentic insignia decals for model airplane!

LARGE 8 1/2" x 12" SHEET Contains 10 pairs from 1/2" to 1 1/2" any nation. 50c
Same sheet in Laquer (not lum.) only. 20c (not lum.)

SMALL SHEET 6 1/2" x 9" Contains pairs from 3/8" to 5/8" any nation. 10c
Same sheet in Laquer (not lum.) only. 5c (not lum.)

70 U. S. ARMY-NAVY SQUADRON INSIGNIA (35 pair)—Each Decal Approx. 1" diameter.

NEWEST SOLIDS

100

Everything specified is right in the kit. No extras to buy! Your choice of LOCKHEED P-28 (TY Lightning—17" span); GRUMMAN 16" SKY ROCKET; DOUGLAS 19" B-19 BOMBER; MESSERSCHMITT 17" No. 119. In ordering, be sure to specify 1st choice and 2nd choice.

TOP VALUE 50c SOLIDS

4" scale kits complete with shaped bodies and wings of liquid, prop, printed cockpit-transparencies, etc.

4" scale kits: BUNDA'S STORMOVIC, S. A. MISTANG; Grumman SKYROCKET; also WILDCAT, LOCKHEED P-28, Republic THUNDERBOLT and YOUNG-SIKORSKY. (Specify kit desired).

SUPER JEEP ONLY

Here's the "only to ever" direct POPULAR PRICED Jeep Kit, why pay more? Accurate 1/2" scale, assembled by full size hand. Kit contains transparency for windshield, 3 turned wheels, leatherette car seats, covers, movable wheels & windshield. Easily the outstanding value of its kind!

5 DESIGNS

Full size plans, prices included in kit with cut-out outline-shape bodies. Choice of 5: Spitfire, Curtiss P-40, Yutee, VANGUARD, Hawk, Panther, Red Arrow or Lightning. Full Detail. (Specify kit.)

BY MAIL INCLUDE POSTAGE

When ordering by mail, be sure to include 10c for each kit (25c for 31 models) to cover packing and postage. No C.O.D.

MASTER MODELRAFT

DEPT. 727 Westchester Av., N.Y.

MASTER MODELRAFT

DEPT. 727 Westchester Av., N.Y.

WAR OR PEACE BERKELEY GIVES YOU THE BEST IN QUALITY AND DESIGN



Every war has found a need for a change in design. These changes have always meant improvements for peace time. We believe that the Berkeley kits now being produced are far superior to the models we were producing several years ago. Constant effort to substitute materials that are not vitally needed in the war effort have resulted in better kits that build better models.

INTERSTATE CADET WITH DIE-CUT "AIR-TEX" PARTS 35" WINGSPAN

Immediately after the Interstate Cadet won the last National Championship Meet, Berkeley Engineers with the helpful assistance of the Interstate Aircraft and Engineering Corporation, began to produce America's most advanced model kit. No expense was spared. Many of the details were reproduced from the full size plane by photo-reduction. Unparalleled as a flying model, it has turned in flights of over four minutes duration. Kit is complete with formed metal parts, decal stripping, wheels, special propeller, cement, and Silkspan. \$1.50 p.p.



\$1.50
P.P.

THESE GREAT KITS NOW EQUIPPED WITH "AIR-TEX" DIE CUT PARTS

Air-Tex is a composition board made from wood pulp. It is extremely light, durable and strong. Air-Tex may be sandpapered in the same manner as wood and because of its superior strength it can be used in smaller sizes leaving a model often lighter than balsa wood.

SINBAD THE SAILER 50" WINGSPAN

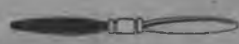


\$1.00
plus 10c postage

Another Henry STRUCK design. This towline launched glider equipped with Spiral Control is capable of unbelievable accomplishments. The simplicity with which you can launch makes Sinbad a real contest winner! The ease with which you can build the ship will amaze even the most experienced builders. Complete kit.

RUBBER POWERED FLYING MODELS NOW EQUIPPED WITH THE NEW "ADJUST-O-PITCH" PROPELLER

Assembled in a few minutes an "Adjust-O-Pitch" propeller is more efficient than former machine cut propellers. In a few seconds any desired pitch can be obtained and the maximum performance of the model can be easily determined.



BELL AIRACOBRA P-39



$\frac{3}{4}$ " Scale—27" Wingspan
With new Phantom Drawings simplifying construction. Complete kit with insignia, die-cut "Air-Tex" parts, cement, etc. \$1.00 p.p.

CURTISS "CLEVELAND" DIVE BOMBER



With Automatic Bomb Release
24" Wingspan
This sensational model carries a dummy demolition bomb which is dropped in flight. A complete kit with detailed plans, die-cut "Air-Tex" parts, cement, etc. \$1.50 p.p.

AMERICAN ACE "54"

Henry STRUCK Design



54" Wingspan
\$3.95
P.P.

Designed for you by the National Champion. Thousands of these great ships have been built and flown, proving its stability and performance. An official A.M.A. Record Holder on land and sea! Kit includes finished propeller, rubber wheels, formed landing gear and liquids.

REPUBLIC THUNDERBOLT P-47B



$\frac{1}{2}$ " Scale—41" Wingspan
The first authentic model of America's Newest Fighter. Complete kit with phantom drawings, insignia, die-cut "Air-Tex" parts, cement, etc. \$1.00 p.p.

CURTISS P-40



$\frac{1}{2}$ " Scale—38" Wingspan
Kit is complete with insignia, die-cut "Air-Tex" parts, cement, etc. \$1.00 p.p.

BUCCANEER "B" SPECIAL



Featuring Stall-Proof Slotted Wing and Spin-Arresting Tail
54" Wingspan
\$3.95
P.P.

This newest BUCCANEER gives you the ultimate in safe, stable super-performance. The ideas incorporated in this ship are the result of the latest N.A.C.A. Wind Tunnel Tests. No more whipping or spins due to improper adjustments with the BUCCANEER "B" Special, the only gas model with wing slots and spin arresting tail. Power it with any Class "B" or small Class "C" engine. Kit includes finished propeller, rubber wheels, formed landing gear. \$3.95 p.p.

BANNER SPORTSMAN



30 Inch Wingspan

A beautiful and easily built model with the appearance of today's most popular sportplanes. Flights of 1000 feet or more are not uncommon. Complete kit with die-cut "Air-Tex" parts.

50c
Plus 10c Postage

THE BERKELEY CATALOG

Only a limited quantity still available. 48 pages of the finest models in America. At your dealer or postpaid.

10c



BERKELEY MODELS INC. 230 STEUBEN ST. DEPT. AT-3 BROOKLYN, N. Y.

WHAT WILL COMET DO IN 1943?



BEHIND THIS DOOR



—the Comet Designing Staff has been busy for over a year on projects to aid the war effort. Naturally, that has made it impossible to introduce new kits for the model-building public with the usual Comet regularity and frequency. But... Comet hasn't let you down! There will be Comet surprises in 1943... plenty of them... watch—and wait! In the meantime, Comet expresses its sincere gratitude for the loyalty of its many friends... model builders, dealers and distributors... who have cooperated with us so splendidly during the past year... and wishes them all a Happy New Year!

COMET MODEL AIRPLANE & SUPPLY CO.

★ ★ ★ CHICAGO ★ ★ ★ NEW YORK ★ ★ ★

Be an
Aircraft
Instructor
*
TRAIN
NOW

Thousands of
instructors needed
to teach mechanics to service the
airplanes of our
fighting forces



"To build and service more planes
faster--and keep them flying--
we must have trained instructors"
...says the aircraft industry

Qualify with AERO TECH'S Special Course in Aircraft Instruction

Today with America's vast plane production program operating at top speed, the demand for skillfully trained AIRCRAFT INSTRUCTORS is the greatest in history.

Thousands—scores of thousands of civilians—are needed AT ONCE to fill these important positions. Business and professional men—salesmen—mechanics—and many others, both men and women—should take immediate advantage of this new and unusual employment opportunity that has arisen almost over night. If you are not eligible for military service and are not now engaged in the war industries YOU can serve your country and fill a responsible position by fitting yourself QUICKLY as a specialized instructor of others in the Aircraft Industry. Prepare for the present as well as the future. Be an Aircraft Instructor whose duties are enjoyable, interesting, profitable. Train now to train others later.

OPPORTUNITIES NOT LACKING FOR THE QUALIFIED

To handle the increasing demand for Instructors qualified to teach in civilian operated mechanics schools, and at military bases and depots as Civil Service Aircraft Instructors, AERO TECH has expanded its facilities to include a specialized department for this new training activity—a department of vital importance in the war program. Most any earnest, alert, ambitious man or woman, of average education can qualify as an Aircraft Instructor, IN ONE of several branches, if they possess the essential experience. This experience can be readily obtained if you are willing to devote only a few weeks of your time to an intensive, specialized training program,

now offered by one of America's Largest Aeronautical Schools.

ENTER THE AIRCRAFT INDUSTRY NOW AS A TRAINED INSTRUCTOR

On the completion of AERO TECH'S course in Aircraft Instruction YOU can be teaching others how to SERVICE and MAINTAIN the airplanes being built today.

Your previous experience or past vocation should not affect your progress. Your age is unimportant. Recognized from Coast to Coast as one of the leading Aeronautical Training Schools—offering courses in Aeronautical Engineering and C. A. A. approved Mechanics Courses the Aircraft Instructor training combines the years of accumulated experience of both the industry and AERO TECH.

At AERO TECH you specialize in the field best suited to your experience. Modern, practical methods of teaching are directed by a large staff of specialists. You "learn by doing." You train right in the huge AERO TECH Engine Shops, on the big, powerful engines. It's intensive, thorough, practical training that prepares you to step right into a war-time job with a peace-time future. Write NOW for complete details... there is no obligation.

BUS FARE PAID TO LOS ANGELES—

from your present place of residence, or amount of bus fare allowed for application on cost of any other form of transportation.

Contractor to U.S. Army Air Forces
Technical Training Command

AIR MAIL THIS COUPON NOW

Aero Industries Technical Institute, 5257 W. San Fernando Rd., Los Angeles, Calif.
Please send complete information on the AeroTech Aircraft Instructor's Course.
(If interested in Aeronautical Engineering courses instead, check here)

Name _____ Age _____

Address _____

City _____ State _____ A-63-T



6 Career Courses in AIRCRAFT MECHANICS, AIRCRAFT ENGINES, and AERONAUTICAL ENGINEERING—including CAA-approved 12 Month Aircraft and Engine Mechanics Course



AERO INDUSTRIES TECHNICAL INSTITUTE

5257 WEST SAN FERNANDO ROAD, LOS ANGELES, CALIFORNIA