

AIR TRAILS

Pictorial

A STREET & SMITH PUBLICATION

JULY
1943

20c

25 CENTS IN CANADA

REG. U. S. PAT. OFF.

HAWKER TYPHOON DETAILS!

THE NEW LUFTWAFFE

FULL-COLOR SPREAD—BREWSTER BUCCANEER
100-M. P. H. RACING GAS-POWERED MODEL

FOR VICTORY
BUY WAR BONDS
AND STAMPS



DOUGLAS DAUNTLESS

Announcing the **SPARTAN** College of Aeronautical Engineering



Train now for your aeronautical engineering career in aviation—at the Spartan School of Aeronautical Engineering. NEXT SEMESTERS START JUNE 21st and SEPTEMBER 20th.

NOW . . . SPARTAN is a greater "University of Aviation" than ever! This school's department of aeronautical engineering—already acclaimed for its fine equipment and technical training—has been given full recognition as a COLLEGE OF AERONAUTICAL ENGINEERING.

- The College of Aeronautical Engineering is:—*
- ★ Recognized and accredited by the Oklahoma State Regents for Higher Education.
 - ★ Affiliated with Oklahoma State System of Higher Education.
 - ★ Intensified war-time scheduling enables students to earn 133 credit hours in 16 months.
 - ★ Graduates of the Aeronautical Engineering Course receive the degree of Associate in Arts in Aeronautical Engineering.

Aeronautical Engineering offers one of the greatest opportunity fields in aviation—now and in the future. Aeronautical engineers are urgently needed. The success of America's air power in the war, and her continued supremacy of the air after

victory, depends largely upon an adequate supply of trained aeronautical engineers.

Just think! . . . in 20 months you can earn your degree at Spartan's College of Aeronautical Engineering—under the most advantageous conditions available at any aviation school in America! This degree will make you a valuable man to your country—will put you in line for higher grades and ratings when called to military service. As an experienced aeronautical engineer after the war, you'll be ready for an important lifetime career in the greatest "Age of Flight" the world has ever known.

The attractive Engineering Building (above) prominently located on the Spartan campus is designed especially for training aeronautical engineers and is one of the most modern to be found at any aviation school in the U. S. At Spartan all technical subjects are taught by thoroughly skilled and highly educated engineers who have had practical experience in the industry. The entire course is planned with a conception of maximum usefulness to the student in making his career a success.

Whatever type of aviation career you choose—Aeronautical Engineering or Airline Maintenance Engineering, Commercial or Airline Pilot, Aircraft or Engine Mechanic, Weather Forecasting, Airline Communications, Instrument Technician—Spartan offers you advantages obtainable at no other school of its kind.

SPARTAN SCHOOL OF AERONAUTICS DIVISION OF SPARTAN AIRCRAFT COMPANY and COLLEGE OF AERONAUTICAL ENGINEERING DIVISION OF SPARTAN SCHOOL OF AERONAUTICS

SPARTAN SCHOOL OF AERONAUTICS—Capt. Maxwell W. Balfour, Director. Address Dept. AT-73, 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**
- | | |
|--|--|
| <input type="checkbox"/> Aeronautical Engineering | <input type="checkbox"/> Aircraft or Engine Mechanic |
| <input type="checkbox"/> Airline Maintenance Engineering | <input type="checkbox"/> Airline Communications |
| <input type="checkbox"/> Commercial Pilot | <input type="checkbox"/> Private Pilot Course |
| <input type="checkbox"/> Airline Pilot | <input type="checkbox"/> Weather Forecasting |
| <input type="checkbox"/> Commercial Flight Instructor | <input type="checkbox"/> Instrument Technician |
| <input type="checkbox"/> Airline Service (A&E) Mechanic | <input type="checkbox"/> Women's Instrument Technician |

NOW
Is the Time to
ACT



If You Want to Prepare to Serve Yourself
 and Your Country Best, Enroll for
PARKS LEADERSHIP TRAINING

The War Manpower Commission has recommended deferment of students engaged in such specialized fields as Aeronautical Engineering, Meteorology, and Transportation Engineering for Air — who will complete their training by July 1, 1945.

This means that if you enter Parks Air College *now*, for the Summer Term, you may finish your education and complete the training that equips you to serve your country best in wartime, and at the same time acquire a background for leadership in the great postwar aviation industry.

Parks, too, is looking to the future and is constantly broadening and expanding its courses so as to be of the greatest possible value to every Parks student. In the years to come, you will take more pride than ever before in being a graduate of Parks Air College.

Hundreds of Parks graduates are today serving their country as trained specialists. They are engaged in various activities with the Armed Forces, in air transport, aircraft engineering, designing, and production, and in training activities.

The recommendation of the WMC is definite evidence that your government realizes the dominating importance of the trained man in wartime aviation. Every branch of aviation is important to the country today. As a special wartime measure, Parks is now admitting students who have completed only 3½ years of their high school courses, providing they meet certain other entrance requirements.

But now is the time to act. To make the most of your next two years, equip yourself with the specialized aviation training offered by Parks Air College. The coupon or a post card request will bring you the new 64-page Parks catalog with complete information. You are urged to send for it today.

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 for enrollment of 300 commercial aviation students, also detachments 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-7

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

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

Address.....

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

AIR TRAILS

Pictorial

JULY, 1943 — VOLUME XX NO. 4

CONTENTS

25 YEARS THIS MONTH	By Dave Cooke	8
BOOK REVIEWS		10
"STALIN'S FALCONS"	By Major Vassily Kolibelnikov	15
YOU'LL STILL FLY A "PUTT-PUTT"	By William T. Piper	18
THE NEW LUFTWAFFE	By James L. H. Peck	19
SHANGRI-LA		24
THE TYPHOON	By Alexis Dawydoff	26
YOUTH IN AVIATION		
Give the Schools a Break! By Congressman Jennings Randolph		28
"Boypower"		29
METEORITE	By Claude D. McCullough	30
THE FORTRESS	By Earl Stahl	34
THE BREWSTER BUCCANEER IN COLOR		36
PINE'S NO PROBLEM	By Ed Yulke	38
WE FLY BY NIGHT	By Dr. H. B. Newlin & Paul Enstad	39
MODEL MATTERS		40
AIR TRAILS PLANBOOK NO. 5	By Thomas A. Naylor	41
I'VE BUILT EVERY LOCKHEED	By Al Bridges	42
WHIZZ	By Austin Rinaldi	44
BALSA BUTCH		69

WILLIAM WINTER Editor
W. F. TYLER Associate Editor
ETHEL KERESZTES Associate Editor
ALEX D. SNIFFEN Art Editor
ALEXANDER CAÑEDO Assoc. Art Editor

STREET & SMITH PUBLICATIONS, INC.

ALLEN GRAMMER President
GERALD H. SMITH Vice President and Treasurer
HENRY W. RALSTON Vice President and Secretary
C. W. FULLER, Advertising Director, 79 Seventh Avenue, New York.
S. C. Smart, Mid-Western Adv. Mgr., 230 N. Michigan Ave., Chicago.

Monthly publication issued by Street & Smith Publications, Incorporated, 78 Seventh Avenue, New York City. Copyright, 1943, in U. S. A. and Great Britain by Street & Smith Publications, Inc. Registered as Second class Matter, June 27, 1942, at the Post Office at New York, N. Y., under Act of Congress of March 3, 1879. 20 cents per copy—\$2.00 per year. Subscriptions in 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.



There is a definite need and a place for women in Aviation. Hundreds who have trained at our school now hold responsible positions—Link Trainer Operators, Flight Instructors, Radio Technicians, Sheet Metal Workers, Welders, and Riveters. Their courage and foresight in training will hasten our Victory and enable them to share equally in the peacetime development and expansion of this great industry.

DALLAS AVIATION SCHOOL AND AIR COLLEGE

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 7-43



17

AGE
18

17, THE IMPORTANT STEP

If you want the AIR FORCE you must train for it..and before it is too late!

Never before in the history of our nation has reaching the age of 17 been so important. At that age, whether you realize it or not, you **MUST** make a vital decision . . . whether you will prepare yourself for maximum service to our war effort and for opportunities for rapid advancement or whether you will continue your normal routine and let fate run its course.

DON'T MAKE THE MISTAKE OF DELAYING. True patriotism is more than idly waiting to be called. If a man is able to make himself more valuable to our war effort, **IT IS HIS PATRIOTIC DUTY TO DO SO.** You at 17 are most fortunate and have the opportunity of a life-time. **YOU STILL HAVE TIME FOR TRAINING.**

Enlistments were closed so that each man can be placed in the particular branch of service for which he is best qualified. The regular army needs you badly even without technical training, but if you want The Air Force you must train for it . . . and before it is too late!

Established in 1929, Curtiss-Wright Technical Institute has trained thousands for aviation and since 1939 has been training Army Air Force Mechanics. **WE KNOW HOW!** But pre-induction plus broad career training is available to you only as a civilian. By obtaining this training you prepare yourself not only for maximum service to our war effort but also equip yourself for a fascinating and profitable lifetime

career in the most promising industry of the future..... American Aviation.

Curtiss-Wright Technical Institute, located in the very center of Southern California's giant aircraft industry, is one of the oldest, best known, largest and most distinguished aeronautical schools in the nation. Its high standing in the Aircraft Industry is sharply indicated by the fact that Mr. Donald Douglas, President of the great Douglas Aircraft Company, chose this school for his own son's training. Our thousands of successful graduates have proven that Curtiss-Wright Technical Institute Training gets results. **IT CAN DO THE SAME FOR YOU.**

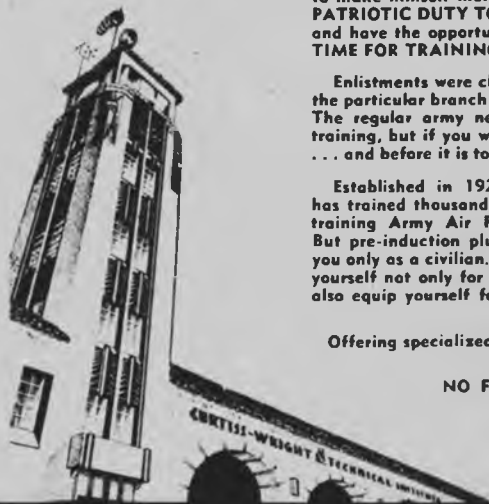
THE FUTURE FOR ONE TRAINED IN AVIATION CAN BE ALMOST WITHOUT LIMIT. BUT REMEMBER . . . get this training before you are 18. Time is often all too short. IT WILL NOT WAIT.

SEND COUPON NOW . . . including your birthdate.

NOTE TO PARENTS . . . If your son is approaching the selective service age he's probably more eager to "get into the scrap" than you realize. Give him a chance to get this finest pre-induction training. It may be important to him; and to you!

Offering specialized and proven training in **AERONAUTICAL ENGINEERING AND MASTER AVIATION 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 MAJOR G. C. MURSELEY, OWNER, SINCE ITS ESTABLISHMENT IN 1929

Contractor to the U. S. Army Air Corps

JOIN THE U. S. AIR FORCES

BE WISE—PROTECT YOUR FUTURE

MAIL TODAY • DON'T DELAY

WITHOUT COST OR OBLIGATION SEND US THIS INFORMATION AND ATTACH TO THE COUPON CHECKED BELOW

- AERONAUTICAL ENGINEERING COURSE
- MASTER AVIATION MECHANIC COURSE
- SPECIALIZED ENGINE COURSE
- SPECIALIZED AIRPLANE COURSE
- POST GRADUATE AERONAUTICAL ENGINEERING COURSE
- SPECIALIZED AIRCRAFT SHEET METAL COURSE
- AERONAUTICAL DRAFTING COURSE, HOME STUDY
- AIRCRAFT BLUE PRINT READING COURSE, HOME STUDY

NAME _____ AT-7

ADDRESS _____

CITY _____ STATE _____ DATE OF BIRTH _____

for the bombers of today . . .



NAVIGATORS WANTED



for the airliners of tomorrow . . .

Here is your opportunity to begin a career that's interesting—essential and profitable—a line of endeavor necessary to the war effort—something that's not a "duration" job, but a lifetime career as well.

Today navigators are guiding our bombers and transports to all of the fighting fronts. It is these men who, when the war is won, will guide our giant commercial airliners over the world wide air lanes we are now establishing.

You may avail yourself of the Weems System either through our home study course or through our individual or class instruction which is now provided in the following cities: Annapolis, Baltimore, Boston, Denver, Los Angeles, Miami, New Orleans, New York, Philadelphia, San Diego, Seattle, Washington, D. C.

You who wish to further your present knowledge of navigation will find many of the texts and instruments used in the Weems System invaluable and may purchase these separately without necessarily taking the full air navigation course.

WEEMS SYSTEM OF NAVIGATION

navigation equipment

AIR NAVIGATION OUTLINE, Prof. F. W. Keator	.....\$2.50
STUDENT PILOTS' TRAINING PRIMER, Col. Hugh J. Koerr	..... 2.00
SIMPLIFIED THEORY OF FLIGHT, Gillmer & Nietzsch	..... 2.00
PILOTS' METEOROLOGY, Halpine	..... 2.50
LYON COMPUTER, F. S. Lyon & Gertrude Hursey Type	..... 2.00
SPEED-TIME-DISTANCE CALCULATOR	..... 1.00
AIR NAVIGATION, Weems	..... 3.50
INSTRUMENT FLYING, Weems & Zenz	..... 4.00
RULES OF ACTION OF AIRCRAFT, Tornich	..... 3.00
SIMPLIFIED CELESTIAL NAVIGATION, Weems & Lieb	..... 3.00
LINE OF POSITION BOOK, Weems	..... 1.50
STAR ALTITUDE CURVES, Weems, per 10° Lat. Band	..... 5.00
NAVIGATION NOTE BOOK & PLATTER, Weems	..... 3.00
AIRCRAFT PLOTTER, MARK II	..... 2.00
WARNER PLOTTER	..... 2.50
ILLYNE STAR CHART, with booklet	..... 1.00
BROWNELL-WEEMS STAR FINDER	..... 5.00
WYN COURSE AND DISTANCE PROTRACTOR	..... 2.00
DALTON COMPUTERS, MARK VII OR E-1A	..... 7.50
SEA AND AIR RESIDENCE AND HOME STUDY COURSES	..... Various
GILLMER COMPUTER	..... 2.00
LEARNING TO NAVIGATE	..... 2.00

WEEMS SYSTEM OF NAVIGATION AT-7, ANNAPOLIS, MARYLAND

Please send me descriptive literature on navigation course. I am interested in Marine Navigation ; in Air Navigation . Enclosed find \$..... for which please send to me the following Books or Equipment

NAME

ADDRESS

CITY..... STATE.....



"THIS IS IT!"

Yea, men . . . in that zero-hour phrase of fighting souls —
this is it . . . indeed!

Graceful . . . sturdy . . . maneuverable . . .

with the climbing characteristics of a homesick angel . . .

here's one trainer that students fly with confidence,

and which turns out better pilots . . . fast!

Built by the creators of the famous Aeronca Grasshopper,

here's one more example of "First and Finest."

It's Aeronca's version of the PT-23.

Get this vivid, dramatic, colorful Walt Disney book now! Just send 10c in stamps to Dept. T, Aeronca Aircraft Corp., Middletown, Ohio.



AERONCA

FIRST *Grasshopper* FINEST



*If he could only see me
Now!*

There's one guy back in Florida who would get just as big a bang out of this as I do—my first instructor. And in a way, he got the Zero, not me. I wouldn't have been up there in the sun when they came over this morning if he hadn't had the confidence and patience during those first hours. Sometimes I think the primary instructors are the guys that are really winning the War.

INSTRUCTORS NEEDED IMMEDIATELY!

Flight instructors, ground school instructors, engine, sheet metal, aircraft instructors—we need you to help us carry on the vital job of training U. S. Army Cadets. Wire or write us today for full details.

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

A-T. 743

Name _____

Address _____

City _____ State _____

Contractors to
 UNITED STATES ARMY AIR FORCES
 CIVIL AERONAUTICS ADMINISTRATION
 ROYAL AIR FORCE

25 YEARS THIS MONTH

JUNE, 1918

June 1—Singlehanded, Lieutenant Edward Rickenbacker brought down one German Albatros fighter and rescued Lieutenant James A. Meissner. Five German planes had attacked Meissner and he was boxed in when Rickenbacker dived to his assistance. After Rickenbacker had fired a hundred rounds into one of the biplanes it fell crashing to the ground. He then turned and attacked another, which sought safety in flight. Meanwhile the remaining German machines descended too low for Rickenbacker to engage in combat.

June 2—Lieutenant Douglas Campbell brought down his fifth Boche plane in a flight back of the Allied lines, thus making him the first American-trained ace. The only other American aces at the time were William Thaw and Captain D. M. K. Peterson, but both Thaw and Peterson had received their training with the Lafayette Escadrille.

June 3—In an article entitled "Carry the War Into Germany," the *Army and Navy Journal* urged that Allied airmen be ordered to bomb German cities continuously, and that in carrying out these raids the part of the United States should be to "back them with all the force we can bring to bear in men, machines and ammunition."

June 5—Finding that at night it was easy to distinguish Fifth Avenue, Broadway, and certain New York City cross streets because of their exceptional brightness, army aviators who flew over the city advised reducing the light in those thoroughfares so as to produce a more uniform illumination which would prevent German aircraft from raiding the city from the air.

June 5—While on a combat patrol British fliers observed a Halberstadt machine flying alone, as a decoy. When the R. A. F. planes drew close, the Halberstadt was joined by six enemy scouts. At once, six more Huns dived out of the sun and attacked their comrade fliers. The Germans,

unable to make out markings, fought one another, and the British joined in the melee and helped first one side and then the other. The fight eventually broke off when the Germans had lost so many machines that they were forced to retire.

June 6—According to a communique from the British War Office, the Allies were stated to have gained aerial superiority on the Western front. It was claimed that Allied aircraft were able to operate virtually without opposition from the Central Powers.

June 6—The first air-mail flight between New York City and Boston was made in a plane piloted by Lieutenant Torrey H. Webb. On the trip the ship carried more than 4,000 letters and covered the 250 miles in three hours and twenty-two minutes.

June 7—It was announced that during raids on Paris the Germans had "made use of an illuminating device which is a combination of a rocket and a clock movement. The bomb is dropped, and when it explodes it releases a linen parachute provided with a magnesium base." This was probably the first use of magnesium flares by aircraft.

June 10—Lieutenant Culver landed at Belmont Park, Queens, Long Island, after completing the first air-mail flight from Washington and Philadelphia. On the flight he reached an altitude of nearly 18,000 feet, carrying about eighty-five pounds of mail. He said that he could have gone higher but "found that it was cold enough" where he was.

June 13—British bombers attacked the German cities of Treves, Dillingen, and Briery, dropping eighty bombs. Albatros scouts attacked, but the Americans fought them off and returned to their base without loss of either men or machines.

June 14—Sergeant David E. Putnam downed five German aircraft, three official and the others under investigation. This (*Turn to page 48*)



Flight delivery of Handley-Page four-engined bombers from American plants for the bombing of Germany was being planned. Thought 10,000 could end war in 60 days.

The light in a pilot's eyes

THERE'S something about a perfectly performing aircraft engine that makes a pilot's eyes shine. Unconsciously he is probably reflecting the confidence he places in it.

He undoubtedly does not think of its marvelously ingenious construction, the vital roles played by hundreds of precision parts each with its own specific job to do. No, to him it's one single mechanical marvel, with a distinct personality, which he has learned to know and respect because he has found it dependable in situations involving life or death.

The Champion Spark Plugs we manufacture for use in aircraft engines of every size are built with this in mind. Ours is just one component with one vital job to do in any engine it goes into. But it is a vital product—vital because it must not fail. We never want that light in a pilot's eyes which bespeaks his silent trust in us to be suddenly extinguished by the bitter disillusionment which failure of our product would mean.

That's the kind of responsibility we honestly feel for every Champion Spark Plug made by us—that is the trust we have undertaken and will not fail to meet.



**Model Builders
Attention!**

	V	V-2	V-3
Hex	1/2"	3/8"	5/16"
Thread	3/8"-24	1/4"-32	1/4"-32
Thread Length	7/32"	7/32"	7/32"
Weight, Grams	8	3 1/2	2 1/2

Actual Size V-Plug

Champion spark plugs for model gas engines give the same dependable performance as regular Champions. Silliment sealed. Sillimanite insulator. Alloy needlepoint electrodes for easy starting. One-piece construction.



C26—Unshielded

CHAMPION SPARK PLUGS



USE CHAMPIONS AND FLY WITH CONFIDENCE

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



Ideal introduction to aviation for High School Boys and Girls

- 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

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

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

SEND NO MONEY

Tear out, sign, and mail to

FUNK & WAGNALLS COMPANY
Dept. 566, 354 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.....

Enc. Postage FREE if payment enclosed. Same return privilege.

BOOK REVIEWS

ELEMENTARY AVIGATION By L. E. Moore. (D. C. Heath & Co., Boston, Mass. \$1.60.) Prepared as a textbook for use in preflight training in high schools, there is no denying that this book is both instructive and authoritative. However, it is by no means as simple and as elementary as it is blurred to be; this, of course, is probably because aviation is neither a simple nor elementary study, and it's the subject's fault and not the author's. The book is most comprehensive and deals in detail with dead reckoning, celestial navigation, and contact flying.

Printed on durable paper and bound with heavy cloth, it is designed to take all the abuse to which textbooks are usually subjected.

FLYING MEN AND MEDICINE By E. Osmun Barr, M. D. (Funk & Wagnalls, New York, N. Y. \$2.50.) Like Malcolm C. Grow and Harry G. Armstrong, co-authors of "Fit to Fly," E. Osmun Barr has been connected with military matters for many years. He was a pilot during the first World War, when he acted as flying instructor on bombers.

As a rule, both military and civil pilots look upon health as something that should be present automatically, and as a rule they do little or nothing to preserve it. Then, when they are at last told, after a periodic check-up, that their flying days are over, they are at a loss to understand why. In this book the author explains not only the "why," but also the "how"—and, more important, he tells just what can be done to keep the human machine in flying condition for a longer period by caring for it properly.

Written in a nontechnical style that any layman can readily understand, the book makes interesting reading and presents worth-while lessons for all aviation personnel.

WARPLANES OF ALL NATIONS By William Winter. (T. Y. Crowell Co., New York, N. Y. \$3.00.) A "poor man's" *Jane's All the World's Aircraft*, this new reference work jams into its 420-odd pages action stories and design background, plus many three-view plans, photographs and complete descriptions of almost three hundred aircraft of all the major warring nations, including Holland and France. Tables of specifications follow each discussion.

Browsing through these descriptions, the reviewer noted many interesting sidelights not usually found in a work of this kind. For example, we learn that the Dewoitine 520 fighter, which figured in the battling between the French and ourselves in Africa,

looks like the Spitfire, does 340 miles an hour and is lighter than the Japanese Zero; that German-captured Vought-Sikorsky dive bombers raided Dover during the Battle of Britain. Then there is the inside dope on Axis record-setting flights which includes the story of the Italian bomber crew who, like the silk-covered airplane, were stripped for lightness—they flew in their underpants.

Titbits like these continually threaten to divert the reader's attention from the impressive facts and figures which distinguish the book as an essential reference for all the airplanes that have been in the war. In the reviewer's opinion, only the internationally famous and very expensive *Jane's* outranks *Warplanes of All Nations*. The latter book is worth much more than its asking price.

THE FIRST CENTURY OF FLIGHT IN AMERICA By Jeremiah Milbank, Jr. (Princeton University Press, Princeton, N. J. \$2.75.) One would assume from the title that this is a history of flight itself in America, but it is rather an historical account containing biographical sketches of the men who figured in early aeronautics. The author himself admits that it is only an "outline" and that a more comprehensive survey is needed; this makes it apparent that, realizing the need, he is probably at this time preparing a "more comprehensive" book. But until such time as that next book would be published this is the best yet on the subject.

As with the usual Princeton University Press book, this is bound with good cloth and has excellent typography on quality paper. For its price, it's a very good buy and deserves space in any and every aeronautical library.

THE WRIGHT BROTHERS By Fred C. Kelly. (Harcourt, Brace & Co., New York, N. Y. \$3.50.) Fate often plays strange tricks on men; a mechanical engineer may find himself employed in an entirely different capacity, the most unpromising of undertakings may prove to be the most successful—and Fred C. Kelly lived to see the day he would write a book such as this. He finds it particularly strange because as a newspaper reporter when Orville and Wilbur were undertaking their first experiments in flying he "did not take the Wrights seriously." And now, a little more than twenty-six years later, he has written the first and only comprehensive book dealing with the trials and tribulations, failures and successes of the fathers of aviation. The copy was thoroughly checked and approved by Orville Wright himself before publication.

(Turn to page 66)

TRUE STORIES ABOUT
Lockheed



**Captain Polifka's Lockheed Lightning . . .
THE EYES OF THE CORAL SEA BATTLE**

Aerial photography has become such an important part of modern warfare that some of our best planes and best pilots have been diverted from actual combat to take the pictures so necessary to victory. It's one sure way to locate the enemy, measure his strength and plan a strategy that

will beat him. Read the exciting story of Captain Polifka and the Lockheed Lightning that became the "eyes of the Coral Sea Battle" and you will understand why the air forces of our Army and Navy can no longer use slow, underpowered planes on jobs that may mean our Freedom.



1. Karl Polifka, U. S. Army Captain, was chosen to hunt out the Japs about to attack the U. S. Fleet in the Coral Sea—his duty, to get accurate information on the size and strength of the enemy forces as well as their location. Four powerful aerial cameras were installed in the nose of his Lockheed Lightning. All guns were removed because of their weight.



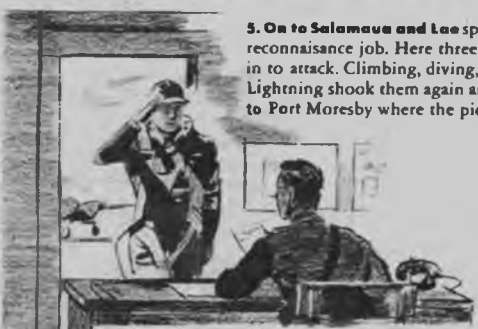
3. The Scene of the Coral Sea Battle is shown on this map. The lighter area within the circle was covered completely by Captain Polifka. Developed prints of this immense region, though taken from an altitude of 25,000 ft., were accurate to within 8 ft.



2. Over the Coral Sea, Capt. Polifka took pictures—pictures of land, water and ships that helped us plan victory. All four cameras were synchronized...one shooting forward...one to the back...and one on each side. With one "click" of the four shutters they accurately photographed an area of 2,500 square miles.



4. Polifka's Lockheed Lightning proved its superiority over pesky Japanese Zeros during this mission. Over Rabaul, ten of these fast enemy planes took up the chase. Jamming the throttle home, Polifka out-spied, and out-climbed them all, and did it with one engine functioning imperfectly.



5. On to Salamaua and Lae sped Polifka to finish his reconnaissance job. Here three more Zeros swooped in to attack. Climbing, diving, hiding in clouds, the Lightning shook them again and on one motor flew to Port Moresby where the pictures were delivered.

6. While he was reporting to Col. "Buzz" Wagner, the flying hero of the Philippines, Japanese planes attacked the airfield.



7. But Polifka, confident of his plane even on one engine—took off in the thick of it and flew to the safety of his home base hidden in the jungle 20 miles away.

This is one of a series of stories about Lockheed... its men... its accomplishments. Watch the pages of this magazine for another thrilling aviation adventure. Lockheed Aircraft Corporation, Vega Aircraft Corporation, Burbank, California.

**LOOK TO
Lockheed
FOR LEADERSHIP**



— than the Eye!

— and if it's quicker—and better—Ohlsson and Rice engineers will use it. The same methods that made Ohlssons marvels of miniature motor efficiency and stamina are now making precision tools for aircraft faster—and a little better—than they have ever been produced.

Just one illustration: The above pictures show the operation of countersinking a hole—so that the head of the rivet, which must be welded in later, will cause no obstruction but be absolutely flush. One shows the way it *had* been done, laboriously, requiring a battery of operators to secure any volume of production,

OHLSSON PRECISION MOTORS



OHLSSON AND RICE
MANUFACTURING COMPANY

P. O. BOX 2324 TERMINAL ANNEX • LOS ANGELES, CALIFORNIA



and involving constant adjustment by workers as the cutting tools gradually lost their edge.

The other is the method devised by Ohlsson and Rice engineering. With automatic cycling, this little machine countersinks two sides at a time. It trebles production, freeing labor for other jobs. Insures perfect uniformity of every part. And incidentally, compensates for wear on the cutting edges!

Just one illustration. Duplicate it fifty times and you'll see why these tools have been produced ahead of schedule—and "better than specifications called for." After the war, Ohlsson and Rice engineering will find the same "right way" for peacetime products including still finer Ohlsson Miniatures.

Every Alert American Urgently Needs This Authoritative New Aircraft Spotters' Handbook

Contains 2-Line FLASH IDENTIFICATION of 350 Foremost Bombers, Fighters and Other Aircraft of Warring Nations!

Over 1,300 Photos and 3-Position Silhouettes! Combines 4 Famous Best-Selling Spotters' Guides, PLUS NEW Material, in One Big Book!

THIS NEW COMPLETE HANDBOOK includes hundreds more fighting aircraft than any other similar manual. It is beyond comparison the biggest, finest, most comprehensive and up-to-the-minute Aircraft Spotters' Handbook available anywhere in America. It contains over 1300 photographs and silhouettes, with the amazing new 2-line FLASH IDENTIFICATION feature—practically a course in aircraft-spotting! Helps you to distinguish friendly and enemy planes at a glance!

No less than 350 military aircraft are described and illustrated, including nearly 100 American warplanes, over 50 British, 50 German, 35 Jap, 30 Italian, as well as planes of Russia, The Netherlands, Norway, Spain and France. Includes also Barrage Balloons, Blimps, Gliders, and Rotating Wing Aircraft.

You are shown authoritative photographs of all these aircraft, and given specifications, markings and physical characteristics to aid you in positive identification. Silhouette views show each plane from three angles so that you can identify a plane or group of planes simply by the outlines! Another interesting feature is the explanation of how planes get their designations, and such names as Helldivers, Spitfires, Zeros, etc.

You'll be able to identify all the famous planes you read about in the news dispatches from Africa, France, Britain, Russia, China, Burma, the East Indies, the South Pacific, and Alaska—American Flying Fortresses, Hudsons, and Airacobras; British Hurricanes and Spitfires; Russian Stormaviks and Moscas; German Stukas and Messerschmitts; Jap Zeros; and hundreds more!

Sturdy, flexible, water-repellent binding patterned on lines similar to the official U. S. Army Drill Manuals. THUMB INDEXING makes it a matter of an instant to turn to any of the 12 major types of military aircraft into which the book is divided. In contents, arrangements and format it is the most thoroughly practical book that could be devised—one that will give the maximum of service and quick information. Quantity limited. Rush your order on attached coupon. National Aeronautics Council, Inc., 37 West 47th St., New York, N. Y. (Copyright, 1943, by National Aeronautics Council, Inc.)

An authoritative, up-to-date guide for civilian defense workers and everyone interested in aviation, whether as a hobby or a study. Perhaps you like to build model planes. Perhaps you are looking forward to the coming opportunities in the airplane industry, as a mechanic, flyer, maintenance man. Perhaps you are now employed in aircraft production, or want to qualify for military aviation—this Guide will provide you with much up-to-date and useful information.

384 Pages!
A \$4.00 Value!

only \$1.00 with thumb notch index

Edited by
L. C. Guthman
Ensign, U.S. Naval Reserve

Size 5 1/2 x 7 in.
Flexible Covers
Rounded Corners

FRIEND OR FOE? *The two planes below look very much alike, although one's a Nazi and the other American. But even a child can instantly tell them apart with the new exclusive 2-line FLASH IDENTIFICATION illustrated by photographs and 3-position silhouettes.*



(Aeronautics Photo)



(Airpix, Toronto)



Long-Nosed Fuselage Suspended on Wings. Twin Tail Booms. Round Tail Plane.

The 2-line FLASH IDENTIFICATION identifies this plane instantly as the AMERICAN Lockheed P-38 Lightning.



Short-Nosed Fuselage Suspended on Wings. Twin Tail Booms. Square Tail Plane.

The 2-line FLASH IDENTIFICATION identifies this plane instantly as the GERMAN FOCKE-WULF Fw 189.

MAIL THIS COUPON

NATIONAL AERONAUTICS COUNCIL, Inc., Dept. 1017
37 West 47th Street, New York, N. Y.

YES, for the enclosed \$1, please rush me POSTPAID, for a week's FREE examination, the big 384-page AIRCRAFT SPOTTERS' HANDBOOK, in flexible binding with rounded corners and THUMB INDEXING. Over 1,300 photographs and 3-position silhouettes, descriptions and amazing exclusive 2-line FLASH IDENTIFICATION of 350 warplanes and other military aircraft of the world's warring nations. After 7 days, if not more than delighted, I may return the book and you will immediately refund my full \$1—making the trial absolutely FREE!

Name

Address

City & State

I also enclose \$..... for copies for friends, on same terms.

ACHIEVEMENT OF A SINGLE PURPOSE

A SINGLE purpose spurred the engineers who planned the Allison engine.

A single purpose moves the metallurgists who test and choose the fine materials that go into it.

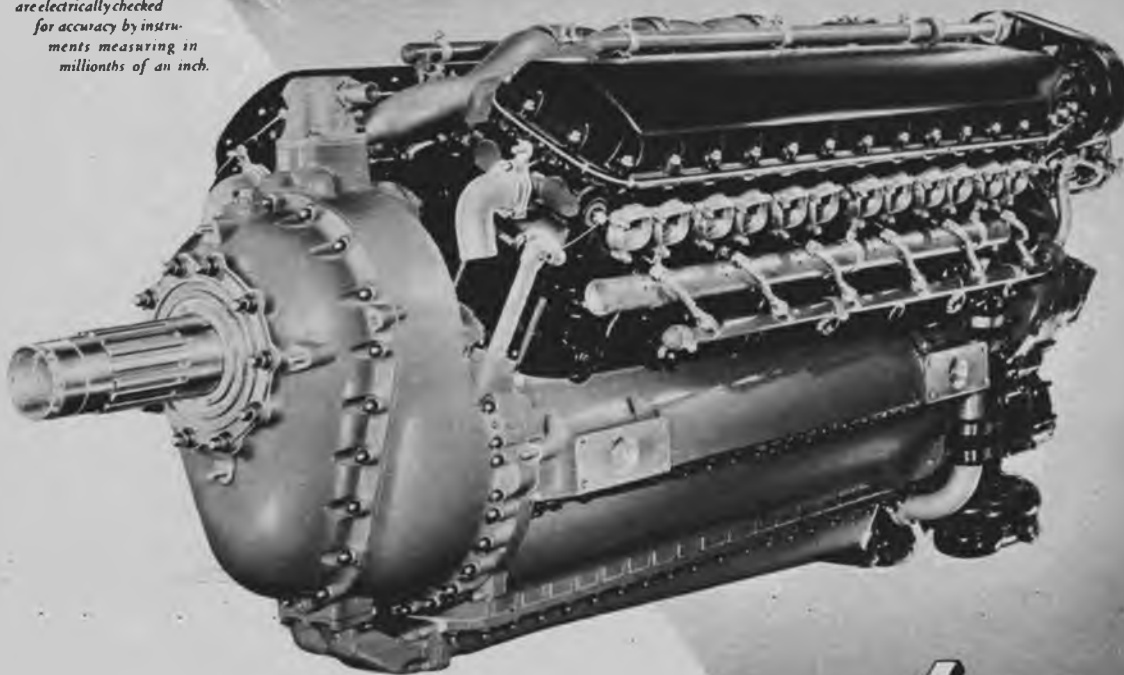
A single purpose guides the skilled hands of the craftsmen who machine and fit its gleaming parts with precision that finds few counterparts in volume production.

That purpose is to create the finest aircraft engine ever built.

How well that purpose is attained is being written in the records of the planes which the Allison powers — and in the standards it is establishing, at home and abroad, for sturdiness and dependability.

Employed in several types of American fighting planes, the Allison is proving before the world the ability of America to work to levels of quality and exactness never before approached.

Many Allison parts are electrically checked for accuracy by instruments measuring in millionths of an inch.



LIQUID-COOLED AIRCRAFT ENGINES

Allison



DIVISION OF

"STALIN'S FALCONS,"

CRACK RUSSIAN FIGHTER

SQUADRON USING AIRACOBRA'S EXCLUSIVELY, HAS WON OUTSTANDING VICTORIES OVER MESSERSCHMITTS AND EVEN FOCKE-WULF 190'S.

By Major
Vassily Kolibelnikov

IN his speech on March 11, 1943, at a breakfast given by Mr. Stettinius on the occasion of the second anniversary of the Lend-Lease Act, Soviet Ambassador Maxim Litvinov said that one Soviet air force guards group using Airacobra fighter craft during the past three months' action on the Voronezh front and later in the Demyansk region, had downed thirty-three enemy planes, losing only three aircraft themselves.

Since June 22, 1941, the group has seen intense action in defending Leningrad against the German Nazi and Finnish invaders. Equipped with I-15 aircraft the fighter pilots successfully repulsed attacks by superior enemy forces, downing thirty-five planes in the air and destroying twenty-nine on the ground.

In June, 1942, the group was outfitted with new material—Airacobra fighters—and was ordered to the Voronezh front. On the first day that they piloted Airacobras, June 29, 1942, they opposed superior German forces and shot down fourteen enemy planes. One Airacobra was hit, but the Soviet pilot escaped safely.

The next day another seven enemy craft were downed: one Heinkel III, three Junkers 88s, and three Messerschmitt Me-109F's. The Soviet pilots suffered no casualties. Altogether, during the period of action at the Voronezh front from June until August, 1942, the fliers in this aircraft group piloting Airacobras shot down sixty-four enemy planes, of which fifteen were Junkers 88s. Two Soviet fliers perished in these engagements, one of them being killed ramming an Me-109F. At that period the group was

EDITOR'S NOTE

THE "EXPERTS" WHO, LESS THAN A YEAR AGO, STILL NOISILY CRITICIZED AMERICAN FIGHTER PLANES, WERE PARTIALLY QUIETED BY THE BRILLIANT RECORD OF THESE SAME SHIPS IN THE SOUTHWEST PACIFIC. THEY WILL BE SILENCED PERMANENTLY BY THIS STRIKING RUSSIAN TESTIMONIAL TO THE PROWESS OF ONE OF THESE TYPES IN SOME OF THE HEAVIEST FIGHTING ALONG THE RUSSIAN FRONT. WRITTEN IN MOSCOW FOR AIR TRAILS EXCLUSIVELY, THIS COMPLETE RECORD OF AN AIRACOBRA SQUADRON DETAILS ITS SEVEN-TO-ONE RECORD OVER THE LUFTWAFFE. THIS WILL NOT SURPRISE THE MEN AND WOMEN ON AMERICAN PRODUCTION LINES FOR, DESPITE THE CRITICS, THEY NEVER FOR A MOMENT LOST FAITH IN THE PLANES THEY PRODUCED.



commanded by Hero of the Soviet Union Colonel Sergei Mironov. He himself led fighter craft into the attack, teaching the pilots to utilize all the advantages offered by an Airacobra as compared with an Me-109F, and deliver crushing blows to the enemy craft. Colonel Mironov shot down five German planes singlehanded.

During this period of fighting on the Voronezh front the Airacobras showed splendid fighting qualities, and in the able and experienced hands of the "Stalin Falcons" they were dreaded by the German fliers. As testified by most of the Soviet fliers in action in this region, whenever the Germans encountered Airacobra fighters, they would not enter battle unless they had numerical superiority. It was only in individual cases that arrogant German fliers would attack Airacobras—unexpectedly, and even then, only from behind clouds or from the direction of the sun.

Here is one episode, told to me by Hero of the Soviet Union Senior Lieutenant of the Guards Ivan Grachev, who took part in an air battle on July 16th of last year. Sixteen Airacobras under the general command of Group Commander Colonel Sergei Mironov took off to accompany bombers heading to strafe the enemy. Returning to their airdrome post, having accomplished the task set, the fliers encountered twenty Me-109F aircraft proceeding in small groups of six or eight planes each. The German fighters tried to attack the Soviet bombers, but by a bold maneuver the Russian fighter pilots cut off the enemy fighters and, tying them in isolated groups, opened battle.

The engagement lasted over thirty minutes. As a result of this battle, six enemy craft and also one Junkers 88 bomber which happened to be passing, were downed by the Soviet fighter craft. Mironov's aircraft suffered no losses. The battle was waged with vertical banked turns. Incidentally, the vertical was a favorite stunt of the German fighters, but the Airacobra was fully equal to the German fighter in this figure.

"In the banked turn," says Ivan Grachev, "the Airacobra has great advantages over the German fighter. Of this I became convinced myself."

Soviet fliers employed an original tactical method in another air battle over Voronezh on July 7, 1942. At the alert signal, thirteen Airacobras took off. At an altitude of 8,000 feet, Soviet fighters encountered fifty enemy bombers and twenty fighters. The

group, commanded by Hero of the Soviet Union Major Makarenko, boldly attacked the bombers, breaking up the latter's battle formation, and then allotted a group of fighter craft to tackle the Messerschmitts, while a second group was ordered to open fire on the enemy bombers. The commander's plan was brilliantly effected. In this engagement, Soviet pilots downed seven enemy planes, Major Makarenko shooting down two single-handed. He was badly wounded in this battle, but despite this he brought his machine back safely to the airdrome.

In August, 1942, a number of Airacobras were allocated from this aircraft group, under the command of Major Oleg Rodionov, to a sector of the front near Rzhev. Here, within a short period of time, Rodionov's aircraft engaged in several successful air fights. Altogether, in the battles at Rzhev, there were sixty-eight planes on our side and 116 on the enemy's. Notwithstanding this ratio of forces, Soviet fliers downed thirteen enemy planes: nine Junkers 88s and four Me-109F's, losing only two machines themselves.

During September and October, 1942, the aircraft group was held in reserve by the army command.

In November, 1942, a whole group was transferred to the northwest front, in the region of Demyansk. Winter set in early that year. The group personnel had had no experience in flying Airacobras under winter conditions. Despite this the ground crews, headed by Group Engineer Major Fedor Krasnovsky, did everything possible to maintain normal battle activities for the fliers. Airacobras are adapted for service on cement or asphalt runways, but the latter were not available at all front-line airdromes. At Major Krasnovsky's suggestion, the fuselage leg nodes were reinforced, and after this there were no more cases of these nodes snapping. Winter battle experience with American fighter craft showed that oil radiator thermostats became distorted and fairly often were put out of commission. In order to avoid this and keep the material in constant readiness for battle, special covers were made which kept the oil at a normal temperature.

Other difficulties were also encountered. For instance, at low temperatures the hydro mixture employed for guns became viscid; this could cause the gun to jam. The aircraft group then decided to use Soviet "MVI" oil, which has a low temperature. The results were good.



A typical Soviet pilot, Lieut. V. Kamenshchikov, has twenty enemy airplanes to his credit. Bell-equipped Falcons downed 142 planes in about nine months.



Chess on the Karelian front as fighter pilots await the alert. Russian pilots take great pride in their personal airplanes, often give them pet names.

Major events were ripening on the northwest front. Conditions of battle here turned out to be exceedingly complicated. Woody, swampy terrain made it very difficult for fliers to keep their bearings, and the limited landing fields forced the fliers, in case of emergency, to land wheelless, with landing-gear retracted. But the pilots in this Guards aircraft unit paid small heed to such inconveniences.

Trying to retain at all costs their tactically advantageous positions in the region of Lychkovo Zaluchye and Lake Seliger, the Germans were painstakingly reinforcing strong points, primarily with artillery. The 53rd German fighter squadron, in action in this sector of the front, was hastily reserviced with Focke-Wulf 190 aircraft. And it was with these aircraft that a Soviet Guards air unit engaged in battle during February and March, 1943. The very first engagements showed the Soviet fliers that both the Me-109 and the Focke-Wulf 190 are suited mainly for engaging in battle on the vertical, showing inferiority to the Airacobra, which simultaneously possesses good vertical and horizontal maneuverability. The Germans then employed the tactics of combined groupings of Focke-Wulf and ME fighters for use against the Airacobras. But this combination had no success.

On February 17, 1943, a formation of four Soviet pilots engaged a numerically superior enemy in an air battle at an altitude not exceeding 400 feet. The Airacobras encountered four Messerschmitts and two Focke-Wulfs in head-on parallel courses. The Messerschmitts proceeded in pairs on the right, with the two Focke-Wulfs bringing up the rear. As soon as the Germans discerned the outlines of the Airacobras—only too familiar to them—two of the Messerschmitts immediately sneaked off into the clouds. Formation leader, Senior Lieutenant of the Guards Alexei Smirnov, deployed his group to the left, and with his leader, Junior Lieutenant of the Guards Ouglyansky, circled behind the tails of the enemy craft bringing up the rear. Meanwhile our second pair, Senior Lieutenant of the Guards Vassily Savin and Junior Lieutenant of the Guards Kryukov, described a smaller circle, heading to attack the second pair of Messerschmitts. All four Messerschmitts straightway made for the clouds, with both Focke-Wulfs following suit, to elude the four Soviet fliers. The battle initiative was instantly taken by Smirnov's quartet. One Messerschmitt



The Airacobras replaced these maneuverable I-15s. Pilots found that the Airacobras outmaneuvered Focke-Wulfs in verticals; turned inside the 190s.

which had darted out from the clouds was quickly caught up with by Senior Lieutenant Savin. To avoid colliding, Savin had to step on the gas. Choosing an opportune moment, Savin opened point-blank fire on the German plane, which (Turn to page 50)



Getting acquainted with newly received Douglas Havocs, these flight commanders examine controls and instrument panels. In the case of the Airacobras, ruddy fields on the northwest front were used during the winter; woody, swampy terrain led to many forced belly landings. Total loss was twenty Airacobras.

YOU'LL STILL FLY A "PUTT-PUTT"

IMPROVED LIGHT PLANES—NOT HELICOPTERS OR ROADABLE
GYROS—PLUS SUCH THINGS AS LANDING STRIPS AND LOWER
HANGAR FEES WILL HELP POOR-MAN FLIER AFTER THE WAR.

By William T. Piper

PRESIDENT, PIPER AIRCRAFT CORPORATION, AS TOLD TO GEORGE R. REISS



Sixty-one, the head of the Piper clan practices what he preaches. He and his three sons are pilots.

WHEN the war is over and the shooting is all done, you will be flying— Wrong, guess again! Not helicopters or roadable airplanes or 400-mile-an-hour private jobs, but the same good old pre-war light planes; the putt-putts, as you may choose to call them.

Some of them may be improved light planes—"cleaned up" with better streamlining; equipped with retractable landing gear and flaps; and powered with even better engines that will make them cheaper to operate, more dependable, and give them an even better spread between landing speed and top speed. But they will still be the same old light planes, the good, safe, long-lived and inexpensive ships that so many thousands of pilots have learned to fly in the last decade.

But they will open a new era of flying. Light planes represent the most flexible system of transportation the world has ever known—and we haven't even begun to use our imagination to get the best possible use out of them, either in war or in peace. But that must certainly come after the war.

There is already a tremendous pent-up demand for flying that will be released the day the war closes; the demand from the pre-war private owners who want new ships, the war-trained pilots, and the public which has been made air-minded by the war. And the light-plane makers should do very nicely with their present models, just as the auto firms will with their 1942 models.

The supply of light planes already is pretty well shot to pieces, and the war will complete the job. The War Training Program and the Civil Air Patrol and the rest of the war activities will see to that.

Yes, even the military pilots, the boys trained in the high-powered ships, will accept them and like them. My boy, Pug, had plenty of hours on Cubs before he got the itch for high-powered ships and joined the navy. Now he sometimes flies his high-powered ship home to Cub Haven for a visit.

And as for all this talk about the new convertible auto-airplane which you can land at your airport and then fold the wings and motor home; or the high-speed private ship which can zip you from New York to Chicago in two hours, and at a price any owner can afford—all poppycock! They make good reading, but they're not near; at least not in the post-war picture.

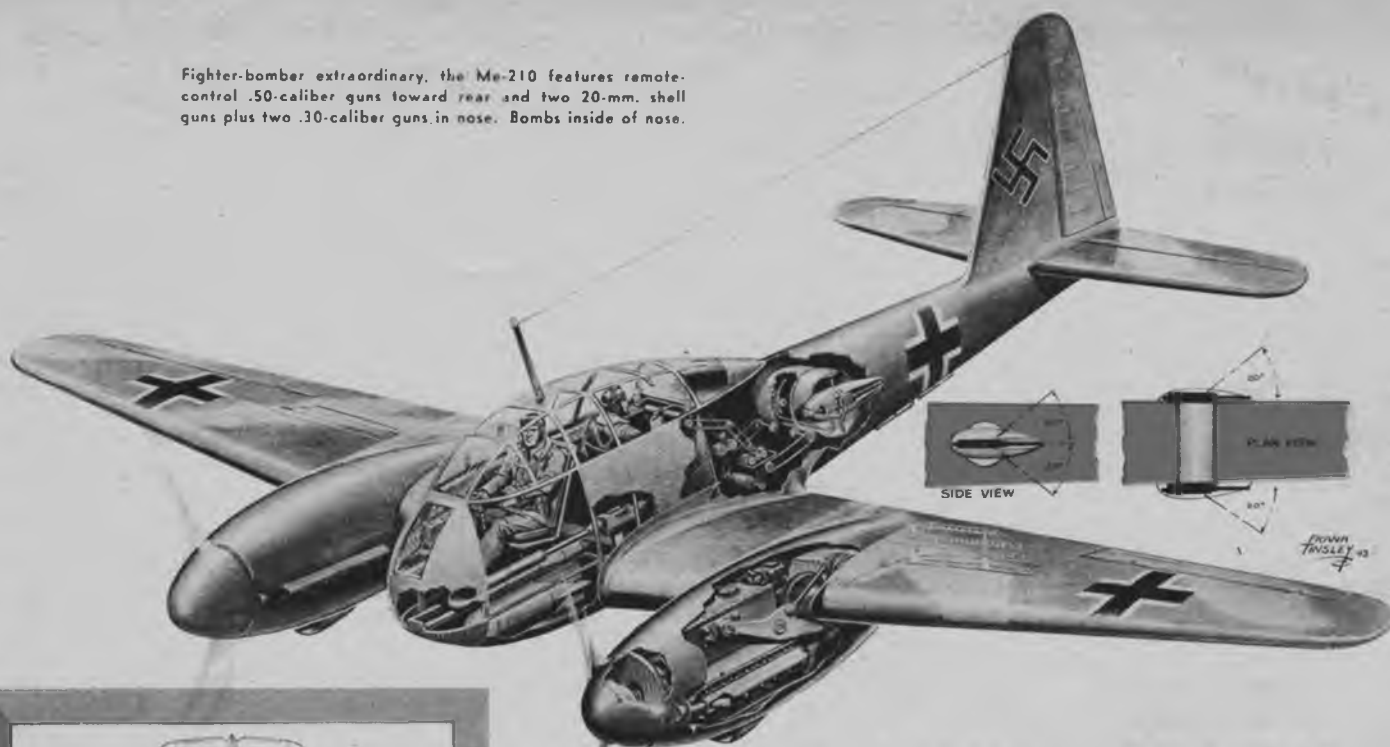
The helicopter has its advantages—but also its disadvantages and its weaknesses. It may cost a lot of money to build a helicopter with its revolving vanes; time alone will tell. Pilots accustomed to fixed-wing airplanes aren't going to feel so much at home with that big revolving fan overhead. And if anything does happen to the vanes—well, he'll need his 'chute, and need it desperately. I question seriously that the demand for the helicopter ever will become big enough to bring down the cost so that the poor-man flier can afford it.

(Turn to page 61)



Light planes have gone to war. Like the auto industry, light-plane people anticipate post-war orders for current models. Liaison Cub on maneuvers in England.

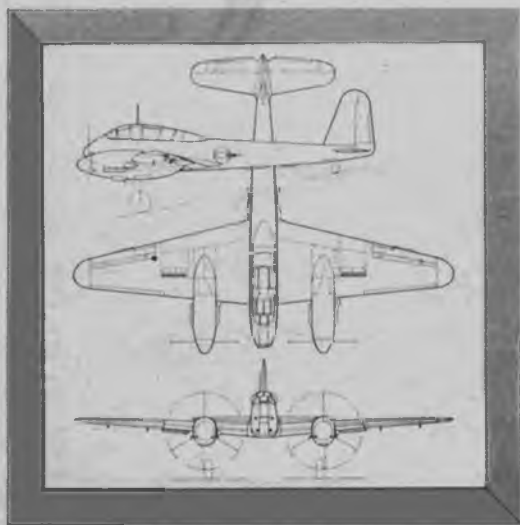
Fighter-bomber extraordinary, the Me-210 features remote-control .50-caliber guns toward rear and two 20-mm. shell guns plus two .30-caliber guns in nose. Bombs inside of nose.



THE NEW LUFTWAFFE

NEW DESIGNS, PLUS MODIFICATIONS OF MANY OF THE OLD ONES, ENABLE THE DWINDLING LUFTWAFFE TO FIGHT BACK.

By James L. H. Peck



MESSERSCHMITT Me-210

STRUNG out thinly from the Arctic to the coast of Tunisia, from Spain to the Ukraine, the Nazi air arm has been forced to adopt the strategic defensive and to depart from the offensive philosophy on which Goering, Milch, Udet and the late General Werver organized, trained, and equipped the Luftwaffe. Allied air tacticians are generally of the opinion that the German eagle will be able to fly forth on few, if any, offensive missions this summer, but will be forced to battle fiercely in defense of his nest.

The new brood of combat planes with which the Luftwaffe is contesting Allied air superiority in its desperate last-ditch stand boasts good performance and armament. The brightest star in the German firmament is the now widely used Messerschmitt Me-109G-2 fighter-bomber, which is reported to be in larger scale production than any other fighter. Powered by a 1,500-horsepower Daimler-Benz engine, this single-seater has a top speed of 395 miles per hour at 22,000 feet and has a ceiling of almost 40,000 feet. The wing span is 32 feet 7 inches; length, 29 feet 4 inches; and height, 9 feet, with an all-up weight of 7,600 pounds. Some models have a hub-mounted 20-mm. Mauser cannon and two .30-caliber guns (7.9 mm.) in the cowl; others have two wing-mounted 20-mm. cannon and the two small guns; still others have wing-mounted and hub cannon, three in all, along with the two machine guns. A maximum bomb load of 550 pounds may be carried, and the maximum range is about 700 miles.

This ship, along with the Messerschmitt Me-109G and Focke-Wulf Fw-190A-3, has been in service for some time both in Tunisia and over the homeland. The newer Focke-Wulf Fw-290 and Messerschmitt Me-210 have been reported active, recently, in both theaters of war. The former is a slightly larger version of the Fw-190, powered by a 2,100-horsepower BMW twin-row radial engine having 18 cylinders. Somewhat faster than its stablemate, it carries the same four-cannon, two-gun armament combination, but the ammunition load of each gun is doubled, giving the ship considerable staying power. The new Messerschmitt is a two-seater fighter that doubles nicely as a dive bomber or attack bomber. It is powered by two 1,270 h. p. Daimler-Benz engines that afford a top speed of 370 miles per hour at 18,000 feet and a 30,000-foot ceiling. The Me-210 has a wing span of 53 feet 9 inches and is 40 feet 3 inches long, with a gross weight of 21,350 pounds. Four fixed guns are carried in the side of the ship's nose, two 20-mm. Mausers and two .30-caliber guns. The unusual feature of the craft is the waist armament. This consists of two remote-control .50-caliber (13-mm.) machine guns mounted in side blisters. Some 900 pounds of armor and bullet-proof glass are used for crew protection.

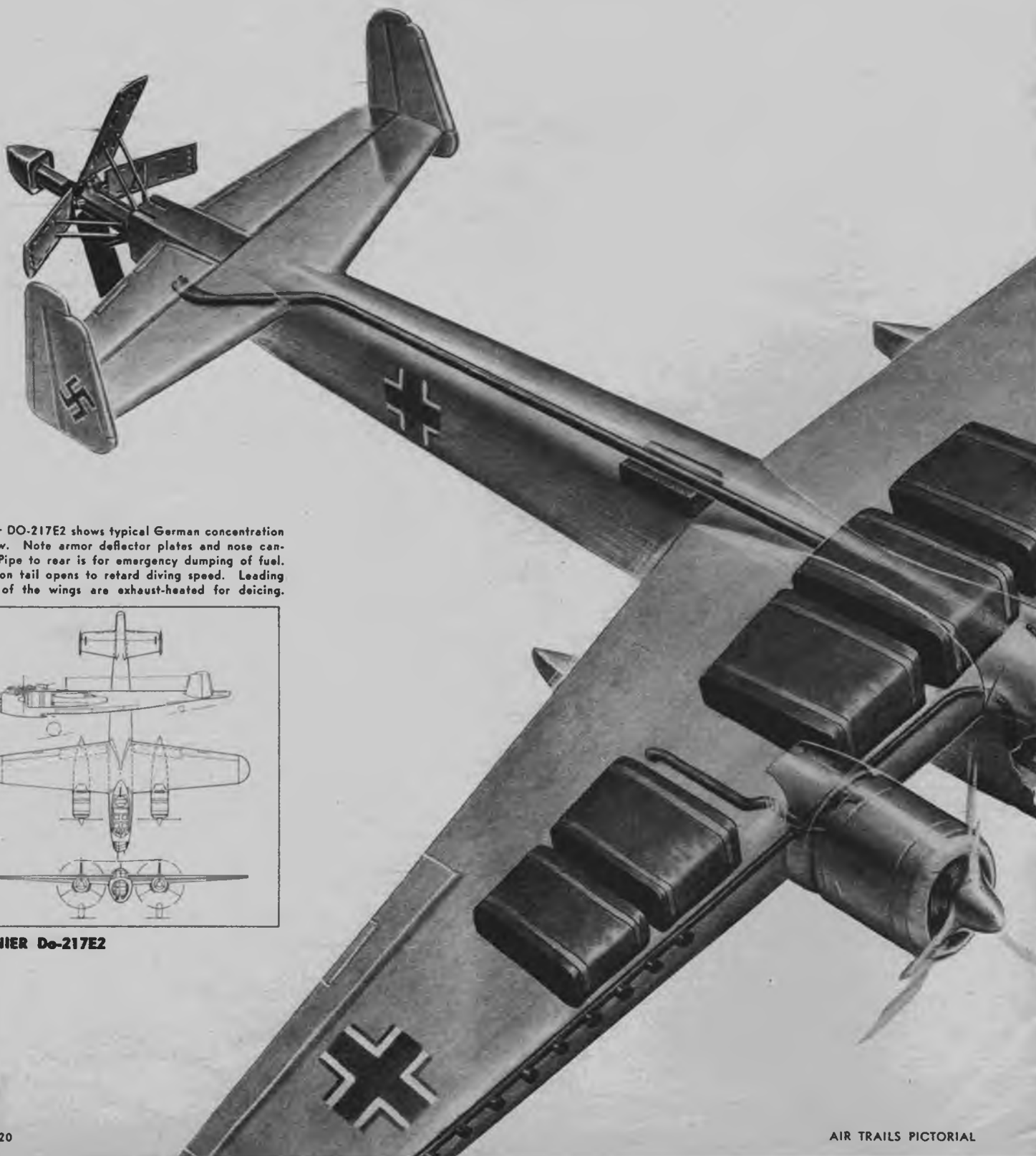
In the new Stuka department, we find the Me-210 reappearing, and it is reported to be a better dive bomber than fighter. A maximum bomb load of 2,200 pounds is carried under the nose and the plane is equipped with Venetian-blind diving brakes. A

new model Junkers Stuka, the Ju-87D, has appeared over Tunisia. It differs from former versions by having a larger engine and two fixed, forward-firing wing guns; it also carries some 200 pounds more bombs. A modification of what was once a bomber-trainer made its appearance over Russia some time ago as the Henschel Hs-129 fighter-attack plane. A twin-engine single-seater, it has a 44 ft. 6 in. span, is 38 feet long and weighs approximately 9,000 pounds. Armament is reported as being a 7.9-mm. machine gun and a 15-mm. cannon on each side of the fuselage. A 30-mm. cannon under the fuselage is interchangeable with a bomb. Power plants are now 650 h. p. Gnome-Rhones giving a top speed of 285

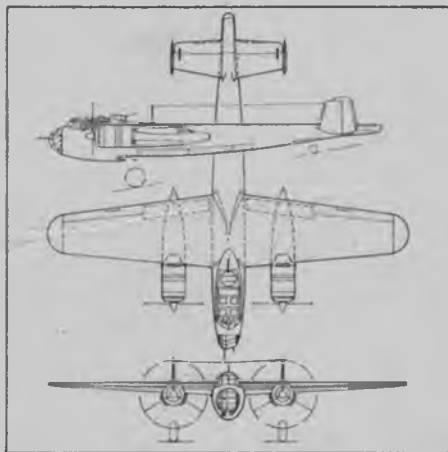
m. p. h. The revamped model of the highly successful Junkers Ju-88 dive-level bomber has appeared as the Ju-288. Powered by two 2,000-h.p. Junkers Jumo engines, it has a speed of about 300 miles per hour at 20,000 feet and carries a four-man crew.

Still in production are the better-known Dornier Do-217E-2 dive-level bomber, the four-engined long-range bombers Heinkel He-117P and He-177, the Junkers Ju-86P-1 and Ju-86P-2 high-altitude reconnaissance bombers, the asymmetrical single-engined Blohm & Voss Bv-141B reconnaissance plane, and the Junkers Ju-290 transport.

The largest of Germany's new tactical types are the six-engined



Dornier DO-217E2 shows typical German concentration of crew. Note armor deflector plates and nose cannon. Pipe to rear is for emergency dumping of fuel. Brake on tail opens to retard diving speed. Leading edges of the wings are exhaust-heated for deicing.



DORNIER Do-217E2

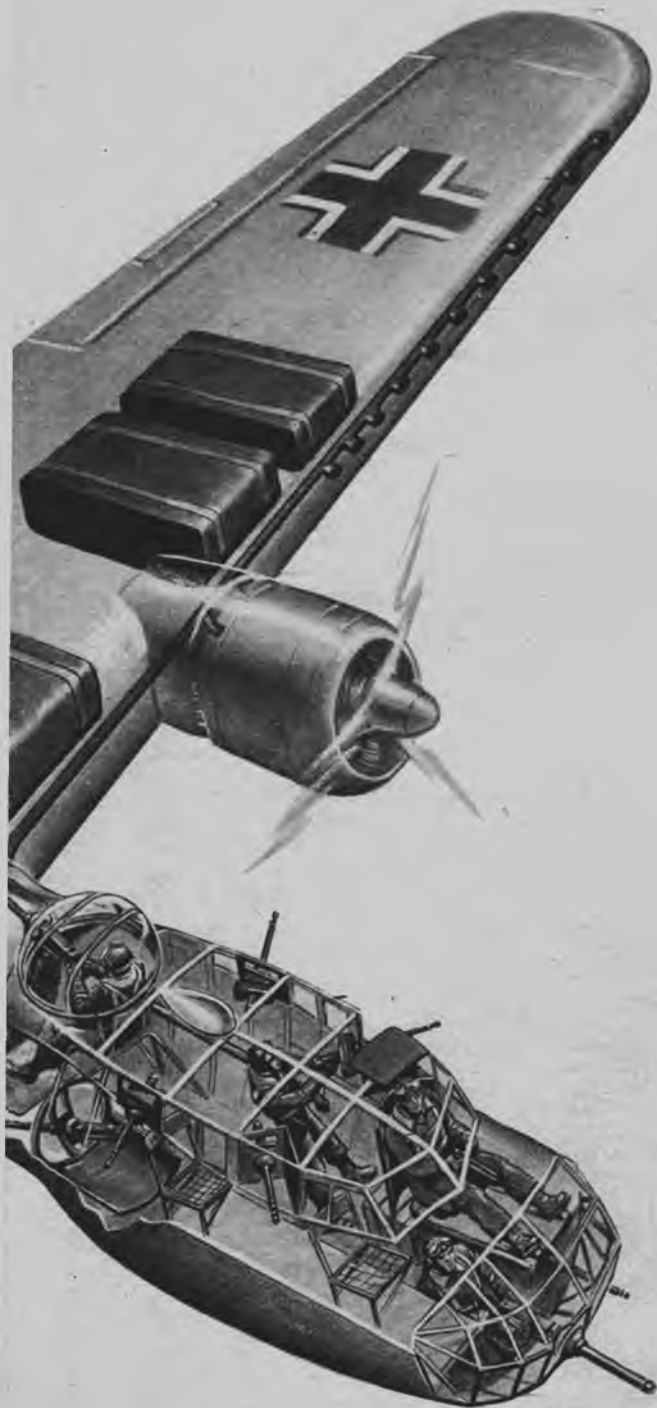
Blohm & Voss Bv-222 flying boat and Messerschmitt Me-323; the latter much in the news of late as the easy victim of Allied fighters over the Mediterranean. The Me-323 is said to have been developed from a huge glider, and it is Adolf's best troop carrier with a capacity of from 120 to 140 fully equipped men. Having a wing span of 180 feet, it is the world's biggest service warplane. The span is 180 feet and the motive power includes six radial air-cooled engines. A ten-wheeled landing gear perches the craft on level keel on the ground and the front of the fuselage opens to permit entrance and exit of a light tank or three scout cars. It is equipped for assisted take-off and has a 450-mile range. The Bv-



A new version of the Focke-Wulf 190, known as the 290, has been reported. Armament is the same as on 190; ammunition is doubled.



Weirdest ship of the war, the Messerschmitt 323 started life as a powered glider. With six Gnome-Rhones, it now carries 140 troops.



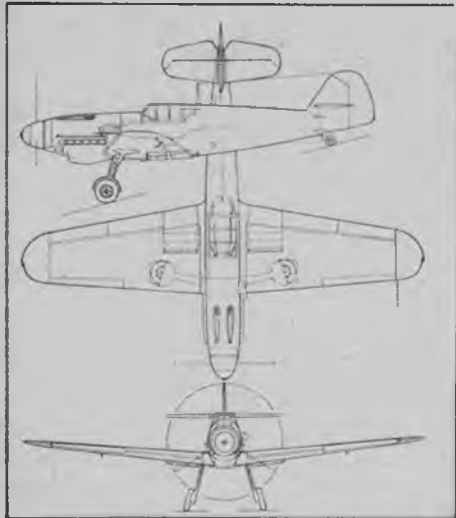
222 is a transport patrol bomber, but this flying boat is not believed to be in production as yet. A recent liaison plane, the Messerschmitt 208, featuring the first-known German tricycle landing gear is believed to be in service in Russia.

Six new experimental craft are reported in the works in the Reich; some may be in production, but no reliable information is available for confirmation. These include the Dornier Do-29 twin-engine fighter, Heinkel He-121 (modified He-113) fighter, Messerschmitt Me-119 fighter, Heinkel He-119 twin-engine escort fighter, Henschel Hs-133 twin-engine fighter-bomber, and the Gotha Go-155 long-range bomber. All are powered with either 1,375 h. p. or 1,500 h. p. Daimler-Benz engines. The biggest news is that concerning an undesignated plane that features a reaction-type motor, a jet-propulsion model. The British captured one of these ships about three months ago in the Middle East.

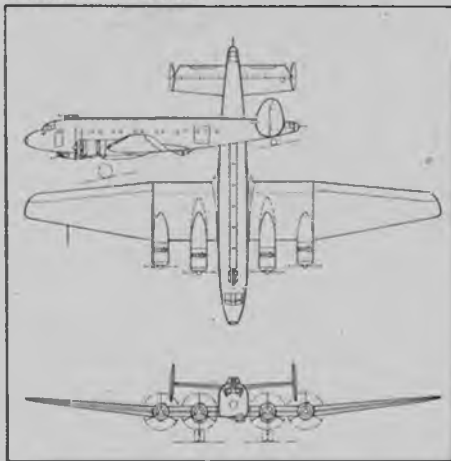
Allied strategy seeks to reduce the times and places at which the Luftwaffe will be able to resist effectively with these new aircraft our round-the-clock operations. The restriction of such operations is made somewhat difficult, despite Allied air superiority in the European theaters, by the extreme strategical and tactical mobility of certain key German Air Force units. The ability to move complete air corps, including reserves and maintenance equipment very rapidly from one theater to another has been demonstrated both in Russia and in the west. One instance was that in which Gen. von Richthofen's *Nahkampf Fliegerkorps*, a close-support air corps numbering some 800 airplanes, principally dive bombers and fighter-reconnaissance craft (used with great effectiveness during the month-long siege of Sevastopol last July) was moved more than 500 miles to the Voronezh sector and was in operation after quitting Sevastopol on July 2nd. Because of this flexible organization, Hitler's air arm has been able to concentrate considerable strength—fighter, bomber, or transport, as the tactical situation demanded—at certain decisive theaters of war.

Against the ever-growing Allied might, however, this shifting of air strength becomes less effective and only dilutes the Luftwaffe's defensive powers. For example, during April, the Nazis allocated great numbers of Junkers Ju-52/RMK transports and quite a few new Messerschmitt Me-323 transports to the Tunisian thea-

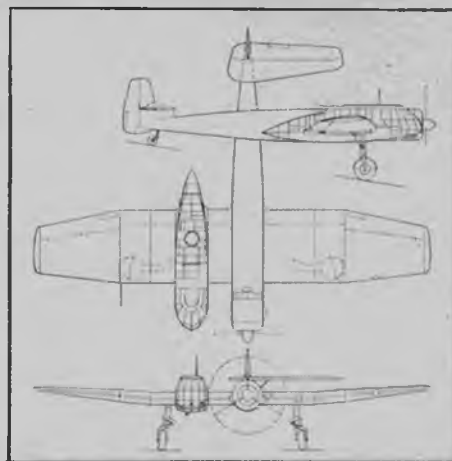
MESSERSCHMITT Me-109F



JUNKERS Ju-190K



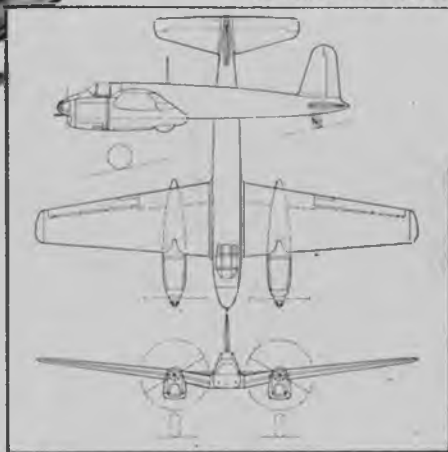
BLOHM AND VOSS Bv-141



Henschel one-man attack bomber now has 650 h. p. Gnome-Rhones; heavy armor under engines and about nose as indicated by shading.



HENSCHEL Hs-129

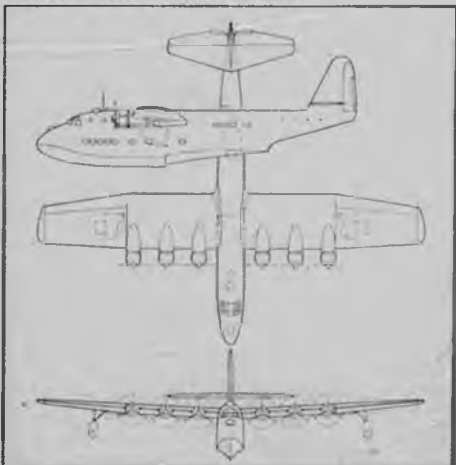


ter. But as Easter week began, the RAF and AAF knocked down 68 of these craft within two days. The month's losses in transports will probably run close to the 200 figure. The Germans also concentrated considerable transport strength during the Stalingrad debacle, in an effort to reinforce and supply the encircled armies before that historic city. The Red Air Force downed 132 of these Junkers during one week and destroyed many more on the ground. These concentrations have, of late, resulted only in terrific losses to the Nazis. During Easter week, also, they increased fighter strength over occupied France and are making Allied raids more costly than at any time in several months, but the German losses in fighters are also high and the heavy raids are seriously impairing the Reich's war effort.

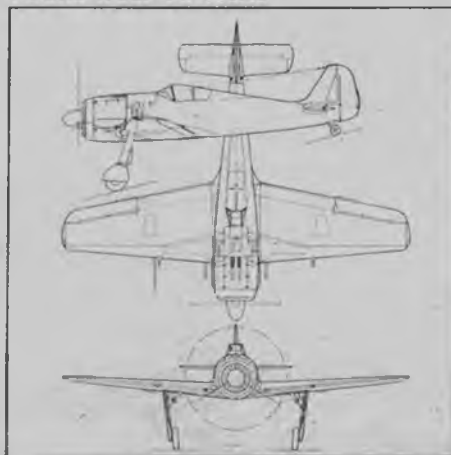
Early in April, the disposition of the Luftwaffe was reported as forty percent in the west, thirty-five percent in Russia and twenty-five percent in Tunisia and the Mediterranean. Terrific losses in all three theaters must have necessitated some reallocation, however. Allied intelligence has sources from which it is able to obtain accurate daily information concerning this disposition, squadron by squadron, and we are making excellent use of this data.

The organization of the Luftwaffe has, on the whole, not changed in character during the recent months. It comprises five *Luftflotten* (air fleet) commands whose tactical units are called *Flieg-divisionen* (air divisions) and *Fliegerkorps* (air corps). Very flexible command echelons permit the use of the Luftwaffe in purely aerial operations, for support of naval operations, or for ground support with the army co-operation organization. Units of the *Nachtjagddivisionen* (night fighter division) and *Fallschirm-divisionen* (parachute division) and Richthofen's outfit may operate with a certain amount of autonomy. Air-borne infantry is

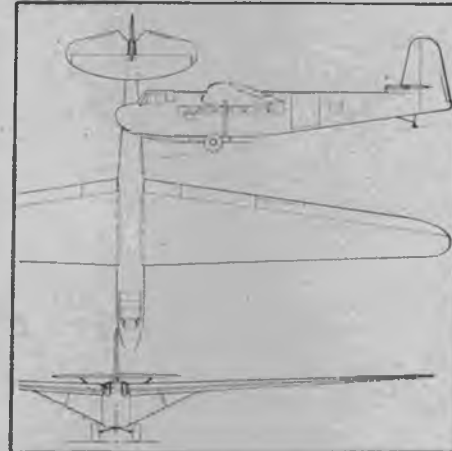
BLOHM AND VOSS Bv-222

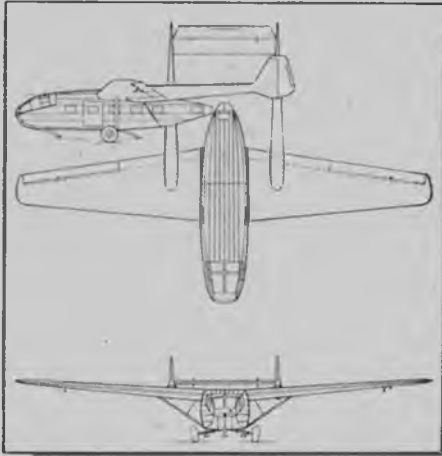
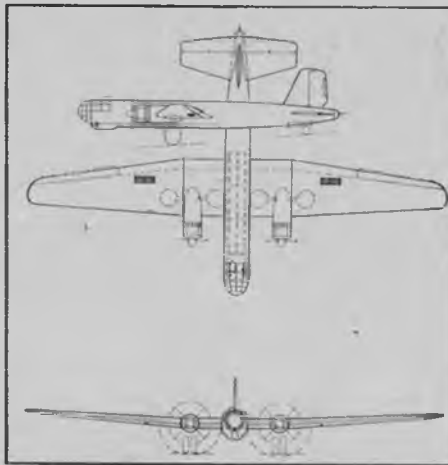
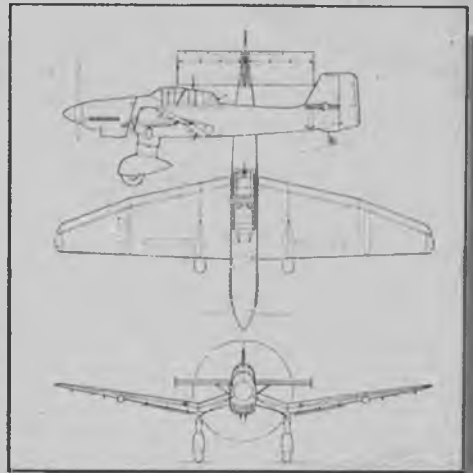


FOCKE-WULF Fw-190A3



DFS-230A1



GOTHA 242**HEINKEL He-177****JUNKERS Ju-87D**

placed under air force command for certain missions, and a number of Luftwaffe troops are given training for glider duties. The anti-aircraft defenses, consisting of radio locators, guns, balloons, searchlights, and fire-control apparatus and known collectively as *Flak (Flieger Abwehr Kanonen)*, are under control of the air ministry.

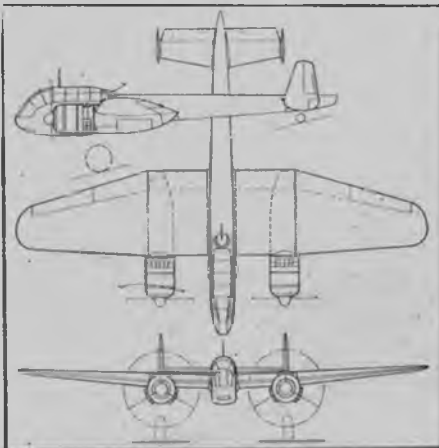
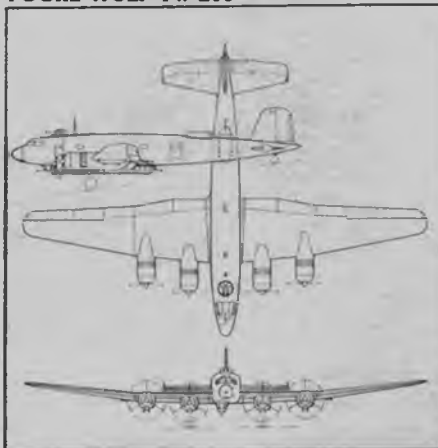
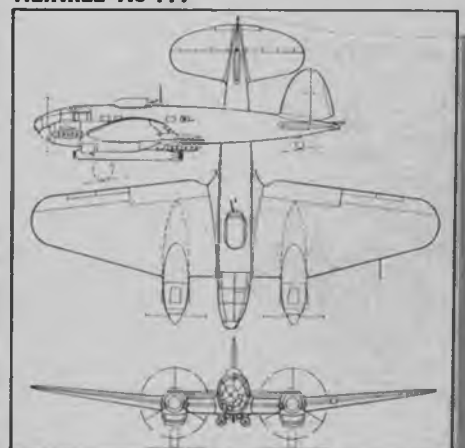
Until recently, there had been no indication of any lowering of standards within the Luftwaffe; the newer crop of pilots and air crews seemed as well trained as ever when they appeared over Russia or in the west. This is no longer the case. The equipment, on the other hand, although reaching the fronts in smaller quantities, is better than ever. The Messerschmitt Me-210 and the Focke-Wulf 190 are certainly formidable aircraft.

On June 22, 1941, the Luftwaffe flew into Russia on what in all probability is its last offensive. With five *Luftflotten* commands of 1,300 planes and von Richthofen's corps of 800, the German Air Force was at its peak with a daily operating strength of about 6,000 first-line combat planes. (This figure does not include transports or trainers.) Undergoing overhaul, lying in storage, or otherwise held in reserve were approximately 16,000 fighters and bombers in what is called "main base reserve." As the year drew to a close, some 7,800 of Hitler's best warplanes and 11,000 fliers and air-crew members had been destroyed. Even a greater number were lost through operational difficulties and wear and tear, bringing total casualties of an estimated 18,000 craft. Meanwhile in September the four Nazi air-fleet commands had been consolidated into just three in an effort to close up the ranks. Even with fewer craft in action their losses averaged 1,000 per month through the first three months of 1942. But more than a million and a half German soldiers had, meanwhile, been fur-

loughed to work in factories back home; about one third of these were engaged in aircraft building.

This extra production gave the Luftwaffe, by spring, almost 5,500 planes for a daily operating force. With the German eagle again in healthy flying shape, they launched a revised form of blitz that the generals called *mot pulk*—heavy and light tanks backed in depth by huge concentrations of motorized infantry, over and in front of which a thick umbrella of bombers and fighters ran interference. This battle scheme gained ground and brought the Nazis almost to the Volga and well into the Caucasus, but throughout the summer it cost them 3,000 planes a month—more than half of these in the Stalingrad sector. As winter again set in, their day-to-day operational strength was down to less than 4,000 planes, with about 13,300 craft held in "main base reserve." However, they had no real chance to recoup the losses this winter as they did during that of 1941-42. The RAF had been hard at work in the west and great labor shortages had forced the drafting of much slave personnel from the occupied countries. The two factors, principally the latter, have production down to what is reliably credited as only 2,000 planes per month. More important, the pilots and air crews cannot be trained fast enough to compensate for the terrific casualties. Many observers are of the opinion that, despite the slowing Nazi production, Goering has at his disposal this spring fewer pilots than planes.

Since the Allies gained air superiority over Tunisia and the Mediterranean in December, Goering has been forced to shift larger and larger numbers of aircraft to plug the holes we have been shooting in his aerial umbrella. His new planes are proving good, and it is, for the most part, these additions that will enable the Luftwaffe to fly fast and well until it is torn apart.

JUNKERS Ju-288**FOCKE-WULF Fw-200****HEINKEL He-111**

SHANGRI-LA



SHANGRI-LA FIELD, perhaps the strangest army air force field in the nation, was opened recently at Curtiss-Wright Technical Institute, Glendale, Calif. Created at the request of the Army Air Forces Technical Training Command, the new base provides the final phase of training for army mechanics and technicians under instruction at Curtiss-Wright Tech.

Shangri-La Field reproduces all the features of a combat zone operating base. Here, under actual field conditions, the graduating technicians in effect pass their final examinations by demonstrating their ability to do under war conditions what they have learned in classrooms and shops. Airplanes are serviced and engines changed under combat conditions. Dispersal of ships and camouflaging of aircraft are practiced. The men learn to taxi and park airplanes along a 600-foot runway, and even to conceal themselves in camouflage fashion. Parachute handling under field conditions is another of many duties practiced at Shangri-La Field, which even has operations offices, shops and other administrative headquarters duplicating those hastily set up in remote operating areas.

Coming at the end of their training as mechanics and technicians, the period at Shangri-La Field is designed to send the graduates off to their work with combat crews fully cognizant of all phases of their duties, even to previous experience in working under the conditions they will find in the remote combat zones.



Duplicating the procedure practiced at the advanced bases, status of each ship under repair is indicated on board at this camouflaged operations hut.



Mechanics must be able to taxi ships quickly from one point to another. At end of the runway this student may have to remove wings or overhaul engine.



A ship under repair is a sitting duck to the enemy. Camouflaging ships adds to mechanics' headaches. These students practice on an ancient Martin.



Now you see it, now you don't. Beneath netting and boughs, the Martin disappears completely from aerial eyes. Quick work reduces time on ground.



Hasty repairs are made on training plane at edge of runway. Even for servicing plane is camouflaged. At Shangri-La no plane is too old for practice.



Jap Zeros respect nothing that moves. Each man learns to make a vest of heavy cord, to which he may tie grass or shrubs when he is in the open.



This Douglas O-38 retired years ago, but with its noisy Conqueror helps teach a new generation of mechanics to keep modern planes and engines in repair.



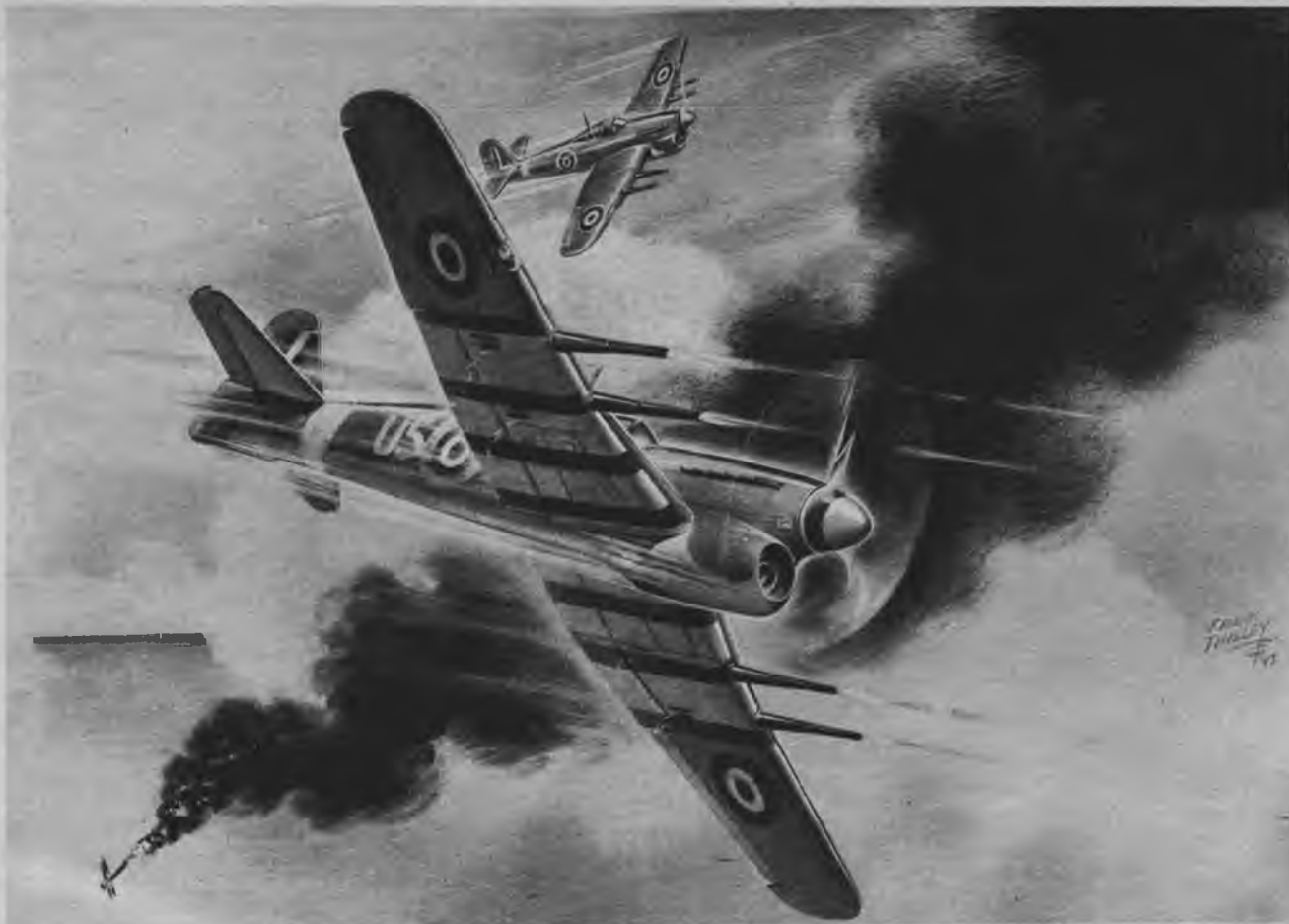
Maintenance inspection and other records are invaluable to efficient operation of planes and engines. At a glance, students know repairs to be made.



Since mechanics also fly, they are taught the feel of a parachute in order to land safely in an emergency. Mechs may be dropped over an advance base.



Whether at Shangri-La or under the noses of Jap bombers, the air forces mechanics always turn out a very reliable job. Orderliness marks their work.



THE TYPHOON

By Alexis Dawydoff

**DETAILS OF GREAT BRITAIN'S MYSTERY FIGHTER,
THE NAPIER SABRE-POWERED HAWKER TYPHOON.**

IN September, 1942, a flight of Messerschmitt 210s, returning from a small-scale raid on England was rudely jarred from its complacent smugness when three large, deep-chested fighters bearing the insignia of the R. A. F. dived on it from out of the sun. Before the Messerschmitts had a chance to break formation, two of them literally disintegrated under the impact of shells fired from the wing cannon of the mysterious fighters. The first attack having carried the British machines past the Nazis, they executed a lightning chandelle and pounced anew on the scattered foe, sending three more Messerschmitts to their graves. The remaining four, although badly shot up, managed to escape.

The fighters which so swiftly dealt out punishment to the German flight are no longer unknown to Nazi airmen. German identification books list them as Hawker Typhoons. Although for two years considered the most hush-hush of planes, the Typhoons, nevertheless, have seen considerable action in connection with which can be listed their participation in the Dieppe commando raid on August 19, 1942, and sorties into France and Holland, during

which railroad trains were strafed and ground installations demolished.

The Typhoon was designed in 1938 by Sydney Camm of Hawker Hurricane fame. Its engine was the 24-cylinder H-type liquid-cooled sleeve-valve Napier-Halford Sabre, developing 2,350 h p. at take-off. The Napier firm, one of the oldest engine-manufacturing concerns in Great Britain, built engines for Schneider Cup racing planes, Junker Diesels and the Halford series power plants, including the H-type air-cooled 16-cylinder Rapier and the 24-cylinder Dagger. For the more powerful Sabre, its designer, Major Halford, turned to liquid cooling. The Typhoon is, without doubt, England's largest fighter. The ship is as large as our own Republic P-47 Thunderbolt, having a span of 41 ft. 7 in. and an over-all length of 31 ft. 11 in. British publications credit it with excellent maneuverability, comparable to that of the Spitfire, and a speed of "400 plus." British fighter-plane designers are staunch believers in light wing loading, preferring often to sacrifice speed for a high rate of climb and good maneuverability, the latter

achieved by virtue of generous wing area. Taking into consideration the horsepower of the engine, the speed of "400 plus" does not seem to be an exaggerated claim, even though "400" has been an extremely abused figure. Some day people will realize that the human body cannot stand violent maneuvering at that speed.

The deep-bosomed appearance of the Typhoon is another interesting feature. Here an attempt was made to incorporate liquid-cooling radiator, oil radiator, and air intake for the engine and possibly supercharger intercooler into one large air scoop, instead of having a number of smaller scoops, as on the Spitfire and the Hurricane. This improves the aerodynamic form of the airplane, with resultant improvement in performance—especially at top speed.

The wing of the Typhoon has a cranked appearance due to the thickening of the center section toward the wing root, similar to the Miles Master. This gives extra strength in the center-section spar, necessary for a ship of this size and performance. The four Hispano-Suiza cannons appear to be of 20-mm. caliber, although British publications hint that the Typhoon has been only temporarily armed with these guns until such time as something really "hefty" should come along; 40-mm. cannons may be a possibility. The guns shown are fairly far out on the wing, probably because their bulk cannot be completely accommodated in the outer panels without having the breech section of the guns sticking out the top side of the wing. It is impossible to place them in the center section because of the retractable gear housing and mechanism. Another possibility is that the guns have longer barrels in order to achieve higher muzzle velocity, and larger flat trajectory and to minimize recoil effect. There are two versions: Typhoon 1A with twelve .303 Browning machine guns and Typhoon 1B with the four 20-mm. Hispano cannon.

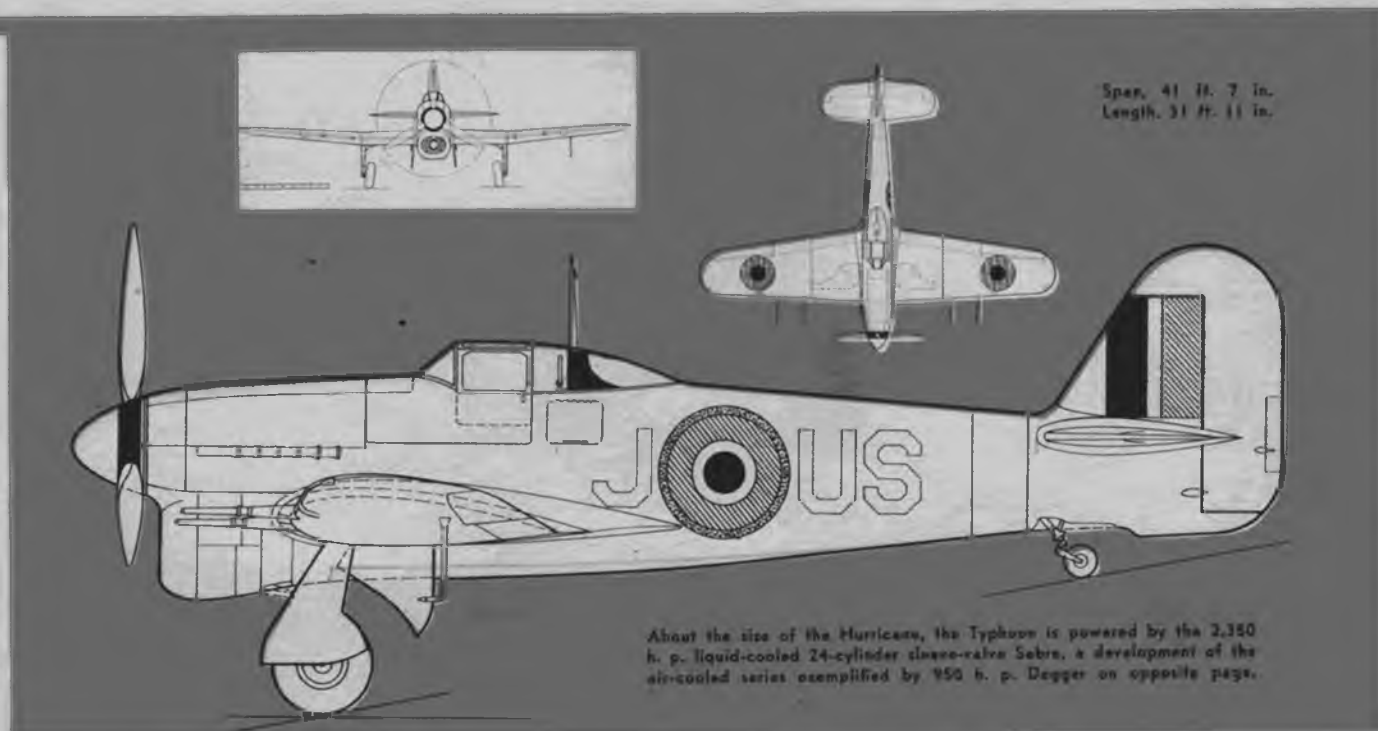
Structurally, the Typhoon differs considerably from the Hurricane and more extensive use has been made of stressed-skin fabrication. The fact that the ship has been reported several times to have accompanied the Westland Whirlwinds on their strafing sorties indicates that it has a long operational range, probably in the 1,500-mile class. The idea behind the Typhoon is undoubtedly the desire to have a really all-round versatile machine able to act as a long-range bomber escort, interceptor, fighter, low-level attack ship and possible dive bomber and tank destroyer, a sort of a de-luxe Stormovik. In the light of available information it is possible that the British "really have something."



Servicing one Typhoon between flights, mechanics involuntarily watch as a sister ship roars by. With Whirlwinds, Typhoons raid Europe.



Huge air scoop houses engine air intake, cooling for both oil and liquid radiators. Four long-barreled 20-mm. guns may be high velocity.



About the size of the Hurricane, the Typhoon is powered by the 2,350 h. p. liquid-cooled 24-cylinder sleeve-valve Sabre, a development of the air-cooled series exemplified by 950 h. p. Dagger on opposite page.

GIVE THE SCHOOLS A BREAK!

By Congressman Jennings Randolph

SUCCESSFUL PREFLIGHT PROGRAM IN DISTRICT OF COLUMBIA SCHOOLS PROVES NEED FOR ESTABLISHING A DIVISION OF AVIATION WITHIN THE UNITED STATES OFFICE OF EDUCATION.

Congressman Jennings Randolph's record qualifies him as aviation's leading legislator. During his ten years in Congress he has spoken on the floor of the House one hundred and sixty-two times on aviation subjects. In 1940, Al Williams said, "Congressman Randolph is American Air Power's most able and competent champion in Congress." 1943 finds him still leading the way.

MORE than ten years in Congress with an intimate contact with national affairs have convinced me of the vital need of youth in aviation. The Axis nations, especially the Nazis, in devious and sundry ways, so impressed the aviation motive on their youth that they developed the most amazing air armada ever conceived since World War I. Even while this was going on, our own country, the land that gave birth to the man-carrying, power-driven airplane, allowed aviation education to drift along as it would, with no other impetus save that derived from the aviation industries and aviation enthusiasts.

Early in 1940, and not until then, the British established the Air Training Corps, a voluntary aviation organization for boys between the ages of sixteen and eighteen. The prime purpose of this organization consists of developing, on a pre-Royal Air Force basis, a background of aviation education. A recent report shows that one boy in three between the ages of sixteen and eighteen in Great Britain is today enrolled in the A. T. C. This is significant because only recently Air Chief Marshal Sir Arthur Tedder stated in his farewell speech before leaving Cairo on January 9th:

"Air supremacy will win the war. Empire Air Forces have now grown to equal status with the land and sea forces and are commanded by men who have specialized in air work for *over a quarter of a century*. The essential lesson learned in the Middle East is that an air force is a separate offensive (Turn to page 56)



Student works out a typical problem with the aid of instructor. Courses were set up by aviation experts, conducted by teachers with practical experience.



Senator Kilgore, Undersecretary of War Patterson, and Congressman Randolph (from left to right), view model contest held by Carl Hopkins, model instructor.



Boy works four weeks—attends school four; or combines both daily. Here, T. A. Baker, supervisor of major and final assemblies, gives instruction.



Left to right, trio of Pasadena Junior College students: Lawrence Bennett, Gilbert Anderson, John Bunting, with R. A. Von Hake, a vice president.

DURING the month of February, 1943, all of the company's previous production records were broken at the Vega Aircraft Corp. plant in Burbank, California.

The only thing at Vega during the twenty-four working days of February that was different from what had been there in previous months was a group of nearly one hundred sixteen- and seventeen-year-old high-school boys who attacked the production line like a championship high-school football team moving down the field with all the relentless drive and enthusiasm of teen-age youth. The high-school boys were not entirely responsible for the record output, of course, but they certainly did their share.

Meanwhile, a mile away at the Lockheed plant, a similar group of about 350 had department heads yelling, "Give us more of those buzz-saw kids!"

Some of the boys work full time—forty-eight hours a week—for four weeks, and then return to school for four weeks while another set of boys take their places in the factories. Others divide an eight-hour day equally between school and work. Those who are under the former plan alternate four weeks on the job and four weeks off throughout the year. They are paid hourly wages equal to the wages earned by other workers doing equivalent work.

At Lockheed the boys assemble and mate fuselages and center sections of Lightning P-38 fighters and Hudson bombers; they also work in the machine shops. At Vega, all were placed in an "induction and orientation" department to be trained for specific jobs—training which required only a few hours in some cases, perhaps two or three days in others. Some are drill press operators, others riveter buckers, armament installers, airplane plumbers, pickup men, skin fitters, frame builders, general installers, spar builders or detail assembly workers.

All boys now employed under the plan are over sixteen and under the draft eligibility age of eighteen. It is anticipated that more than 1,000 will be employed by this summer. No girls are employed under the plan, it still being required that girls be eighteen years of age.

The idea originated with Norman Hayhurst, principal of Hoover High in Glendale, who approached Svend Pedersen, director of education for Lockheed and Vega, on the subject. It had been a company policy not to hire anyone under eighteen because it was felt that boys should finish high school and receive a diploma. But the four weeks at work and the four weeks at school plan, as suggested by Hayhurst, sounded good.

It was agreed that under either the four-week or four-hour plan the boys would graduate at the normal time with their classes. Teachers would be available throughout the summer to carry on the program. The schools provided supervisors for the boys in the plants, and each school system has a co-ordinator—a teacher who is provided with a regular visitor's pass so that he may be right with the boys in any department at any time. The co-ordinator, who is on the school pay roll, consults with (Turn to page 48)

"BOYPOWER"

LOCKHEED AND VEGA TEACHES, USES BOYS OF 16-17 AT MEN'S WAGES. BOOSTS PRODUCTION WITHOUT INTERFERING WITH SCHOOL.



Bomber builders of Burbank High, Elwood Chew, left, and Robert Clow, work on B-17 leading edges at Vega. Foremen are demanding still more "kids."

METEORITE



By Claude McCullough

THIS RUGGED, SPEEDY SPORTSTER IS IDEAL FOR THE CONTROLINE BEGINNER. FEATURES NEW TYPE OF WING CONSTRUCTION REQUIRING NO RIBS. CAN BE USED WITH ANY OF THE CLASS A, B, OR C ENGINES.

ONCE you've given this little number a twirl you'll understand exactly how a whirling dervish feels after a hard day's work. For when opened full blast, the Meteorite will twist out of all but the stoutest grip and do a ballet pirouette as it races around its orbit. The original basswood Meteorite, without a scrap of balsa, weighed two and a half pounds (quite a contrast to the Cleveland 4½ pound, 24" jobs) which isn't much more than the usual balsa controliner weighs.

When the teardrop outlines first took a design form, I wasn't intending to use hardwood, but with the "no more balsa" order I found myself up against the decision that every modeler must face

sooner or later. (Perhaps the Balsa Butchers will change their name to Hardwood Hagglers.)

I approached the task with little enthusiasm, but soon found myself actually enjoying the problems engendered by hardwood. Working with hardwood certainly isn't child's play, nevertheless you'll be surprised at the ease with which you can adapt yourself to it. Basswood is four times heavier than balsa, but in many ways easier to work with—though requiring a greater variety of sharp tools. You will appreciate basswood's enduring qualities when you see it weather crack-ups successfully. One of the members of our club built a U-control of similar design, using balsa; it is already near the junk heap, while the Meteorite, veteran of dozens of flights, has hardly had the paint nicked.

Its specialty is speed, but it more than holds its own in the stunt field, its acrobatics being of the Stuka-Spitfire type. If you prefer the precise aero-antics of Tex Rankin, use a Class A or B engine, or increase the wing span if using a Tiger. It's a good idea to get your hand in on the ship with a small engine before using more power. At any rate, it's plenty fast with any engine.

Now for the construction of a hardwood model. (Basswood is best, but white pine will suffice.) The fuselage should be turned on a lathe. If you don't have a lathe, try to borrow one, for its use will save you a lot of bother. High-school shop instructors, teachers of industrial arts, neighborhood Mr. Fixit's, Y. M. C. A. craft instructors or members of your modeling club are all potential sources for borrowing. Failing these, however, wood-working shops permit use of lathes during slack hours for a nominal fee. And as a last resort, the fuselage may be hand carved with a sharp draw knife and a padded vise.

The 3" x 3" fuselage block is made by gluing two 1½" x 3" basswood blocks together. Let dry twenty-four hours and place in lathe. After the block is turned down to a round, mark the stations on the rotating block and with calipers check (Turn to page 62)



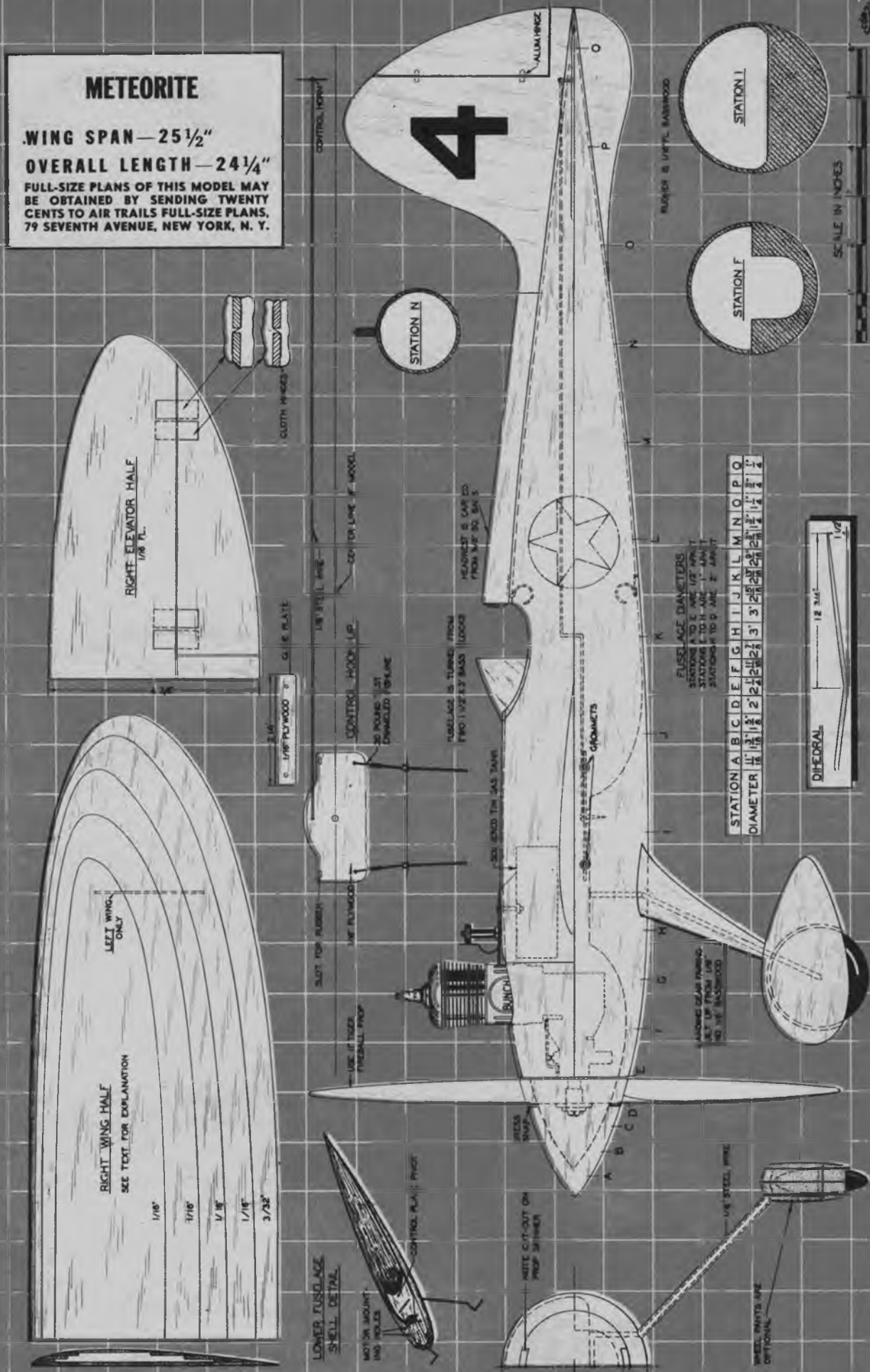
Upper left: Clean treatment of engine mounting greatly improves performance. Below: Side view shows ample tail surface for good stability, but not so much as to detract from realism. Pants are added after test flying.



METEORITE

WING SPAN—25 1/2"
OVERALL LENGTH—24 1/4"

FULL-SIZE PLANS OF THIS MODEL MAY BE OBTAINED BY SENDING TWENTY CENTS TO AIR TRAILS FULL-SIZE PLANS, 79 SEVENTH AVENUE, NEW YORK, N. Y.



EACH SQUARE EQUALS ONE INCH

4

FUSelage DIAMETERS

STATION	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
DIAMETER	1 1/8"	1 1/8"	1 1/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"

STATIONS A TO L ARE 1/2" APART
STATIONS L TO N ARE 1" APART
STATIONS N TO Q ARE 2" APART

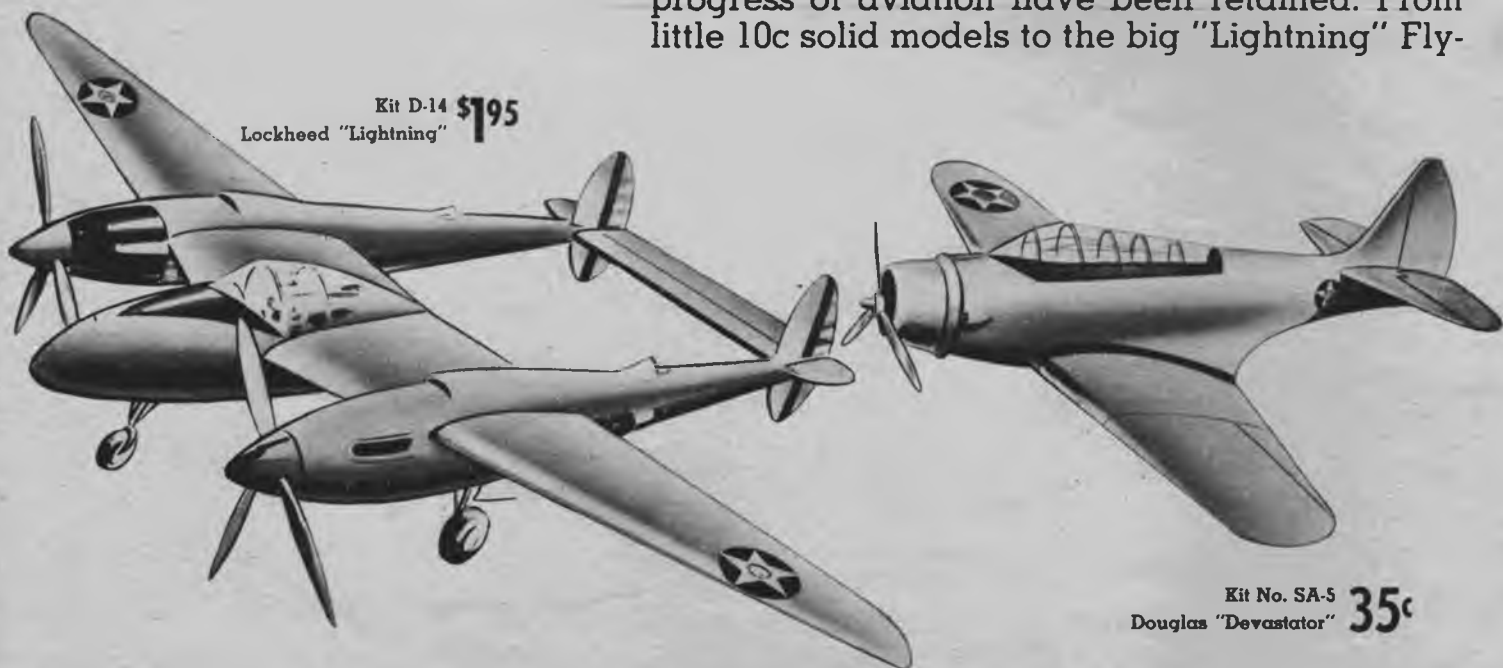


SCALE IN INCHES

THE STORY OF WAR AVIATION

It is a long way from the flimsy little crates of the first World War to the CORSAIRS, WILDCATS and LIGHTNINGS of today, and the development of aviation in these few short years presents one of the most interesting stories in all history. Only by the use of models can the story be fully understood.

Of the hundreds of Megow Models that have been produced, those marking the year-by-year progress of aviation have been retained. From little 10c solid models to the big "Lightning" Fly-



Kit D-14 \$7.95
Lockheed "Lightning"

Kit No. SA-5 35c
Douglas "Devastator"

Kit No. C-3
SOPWITH (World War) **29c**



Kit No. C-2
SPAD (World War) **29c**



Kit No. C-4
NIEUPORT (World War) **29c**



... Can be Pictured with MEGOW Models

ing Model selling at \$1.95 shown here, you can find practically any type you want... and for those wanting to answer America's call for Identification Models, there are some forty types of "Spotters' Specials" drawn according to Navy requirements.

Building model warplanes helps in the war effort, trains hand and eye, and may lead to a career in the great industry of the future.

See Megow Models at your dealer's, or write direct to us for information.



Kit No. SB-9
Lockheed "Lodestar" **50c**

Kit No. X-5
Vought "Corsair" **95c**



Kit No. X-7
Grumman "Wildcat" **95c**



Megow

PHILADELPHIA, PA.

BOEING B-17E, THE FLYING FORTRESS

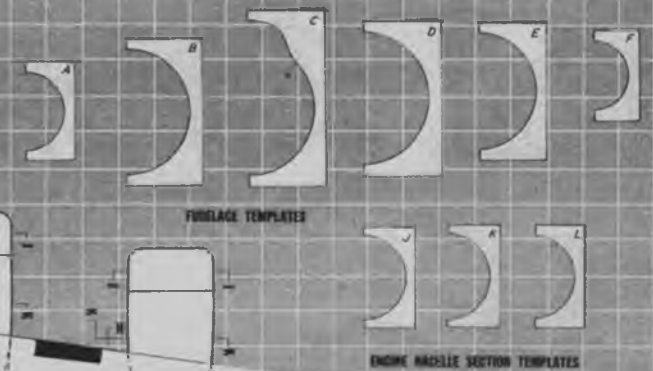
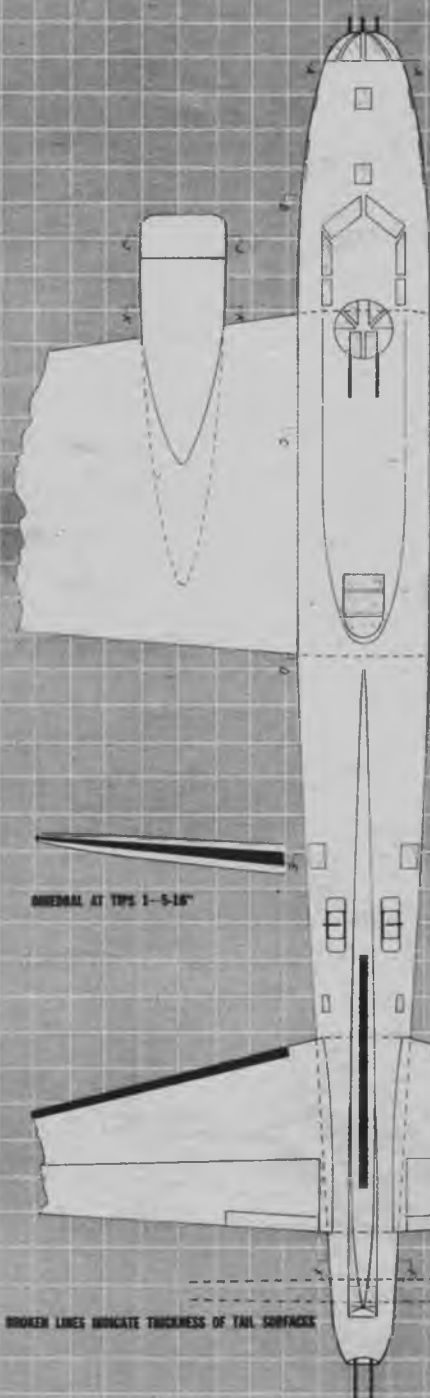
EACH SQUARE EQUALS 1/2 INCH



SOFT WHITE PINE OR BASS WOOD USED THROUGHOUT

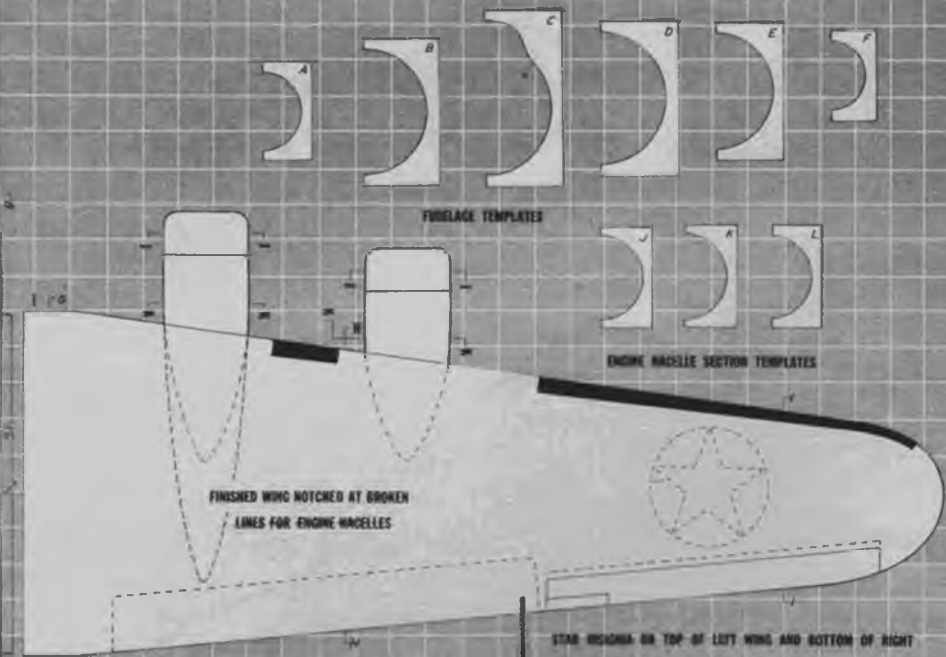
SECTION OF FUSELAGE CUT OUT TO ADJUST WING, THEN REFITTED

PLANE IS CAMOUFLAGED IN THE USUAL ARMY MANNER—OLIVE DRAB ON TOP AND GRAY BELOW. WINDOWS ARE SILVER OR BLACK



FUSELAGE TEMPLATES

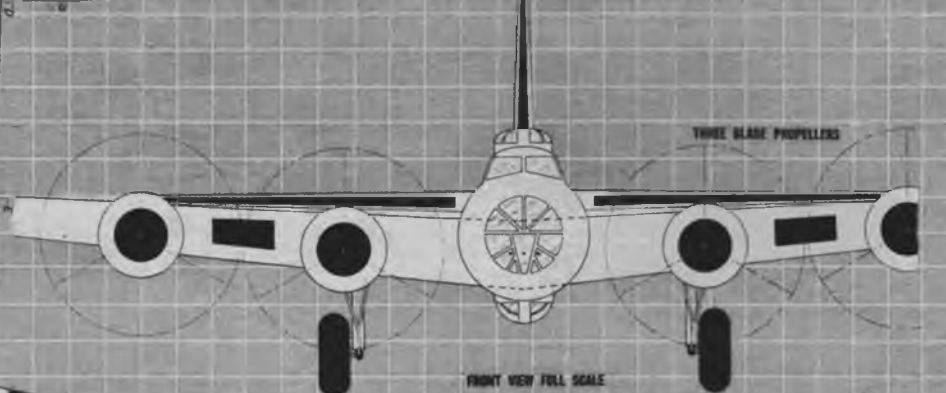
ENGINE NACELLE SECTION TEMPLATES



FINISHED WING NOTCHED AT BROKEN LINES FOR ENGINE NACELLES

STAR INSIGNIA ON TOP OF LEFT WING AND BOTTOM OF RIGHT

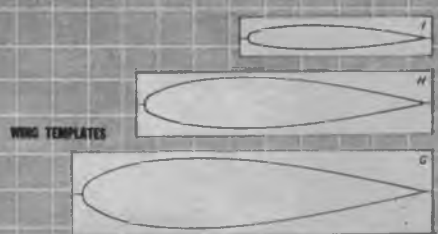
DIHEDRAL AT TOPS 1-5-18"



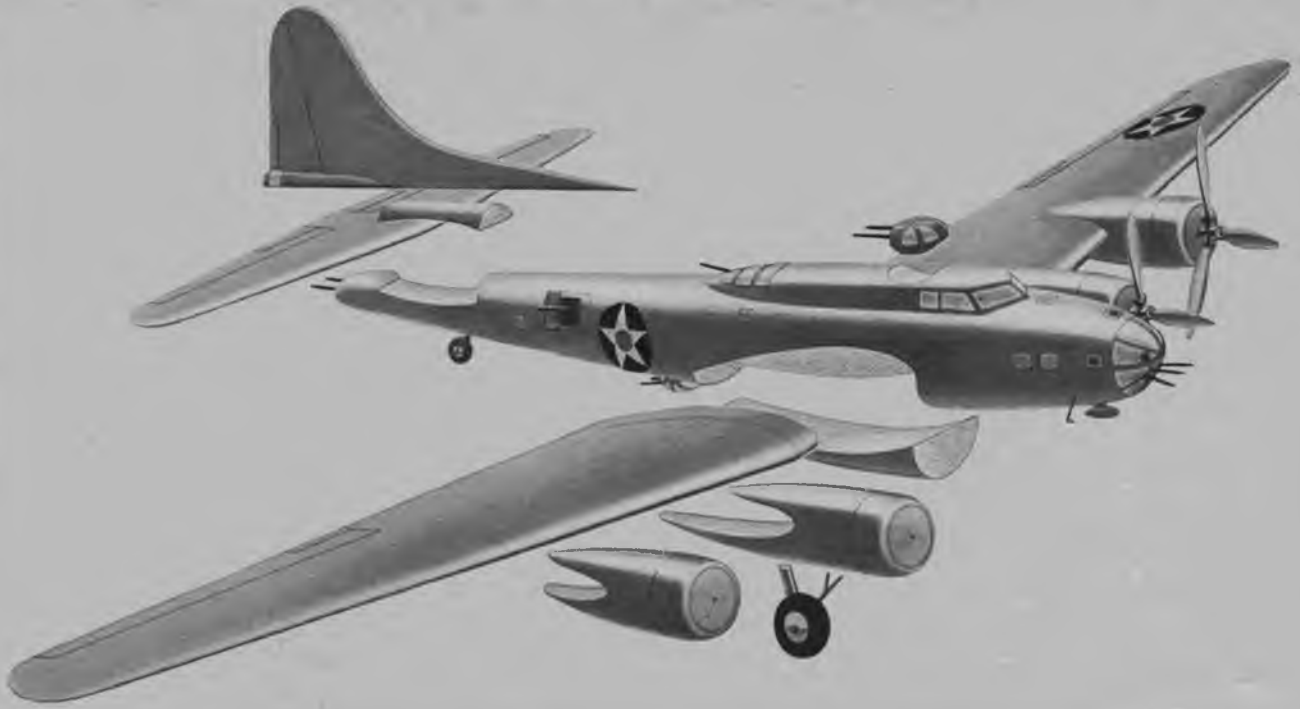
THREE BLADE PROPELLERS

FRONT VIEW FULL SCALE

BROKEN LINES INDICATE THICKNESS OF TAIL SURFACES



WING TEMPLATES



THE FORTRESS

By Earl Stahl

NO SCALE COLLECTION IS COMPLETE WITHOUT THIS
MODEL B-17E, AMERICA'S MOST POPULAR BOMBER.

OUTSTANDING daylight bombing plane of the war is the sensational Boeing Flying Fortress. In action on the far-flung battle fronts of the world, the B-17E's are credited with being capable of flying farther, faster and higher with greater defensive firepower than comparable bombers of our allies or enemies.

Since its inception in 1935 the Flying Fortress series has undergone no less than half a dozen major design changes for additional utility and effectiveness. While no official figures are available on the B-17E's performance, it is logical to assume that it exceeds that of the prototype Boeing B-299. This plane had a maximum speed of 325 m. p. h. and a normal cruising range of more than 3,000 miles. It had a pursuit plane rate of climb, for it could ascend at the rate of 2,300 feet per minute. Service ceiling was more than 36,000 feet. The latest Flying Fortress is powered by four turbo-supercharged Wright Cyclone engines totaling nearly 5,000 h. p.

The Boeing B-17E affords a most attractive subject for the solid-model fan, and in spite of the sleek, graceful lines and wealth of detail, it is not difficult to make.

Soft sugar pine is, in the opinion of the author, the best wood for solid-model work, although bass or similar soft wood will prove satisfactory. Pine is available at neighborhood lumber yards, and the cost is about the same as that of balsa.

To obtain the correct sizes of blocks for the various parts, measure directly on the plan. Begin by making cardboard templates of the top and side view of the fuselage, the wing and tail surfaces. Trace the fuselage outlines on a block of sufficient size and then, if available, use a jig saw to blank the fuselage to shape. When cutting the side view, it is best to cut out the indicated section into which the wing fits; this piece is recemented to the fuselage block and is not removed again until the whole unit is smoothly shaped. Once the blank is sawed to shape, center (*Turn to page 58*)





BREWSTER BUCCANEER

THIS SWIFT DIVE BOMBER HAS LONG

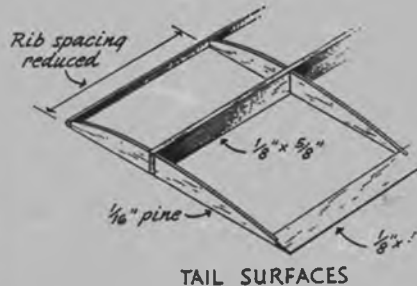
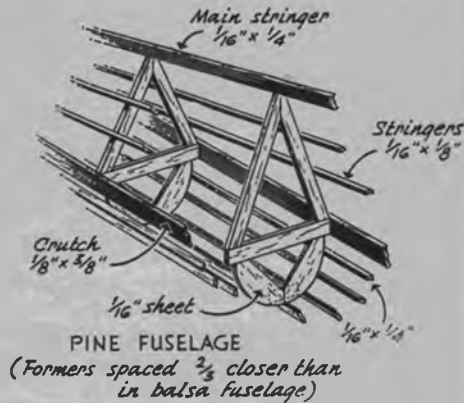
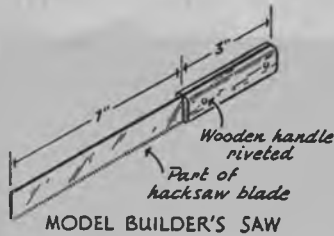


U. S. NAVY PHOTO

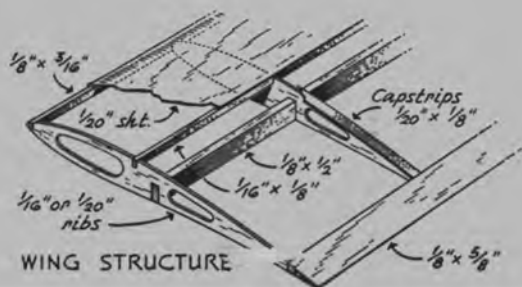
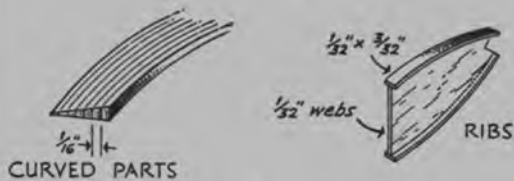
ANGE, GOOD BOMB CAPACITY. ENGINE IS WRIGHT 1700 h. p. CYCLONE.

PINE'S NO PROBLEM

By Ed Yulke



PINE SPAR CONSTRUCTION



AS CAREFUL STRUCTURAL DESIGN RESULTS IN STRONGER MODELS STILL WITHIN WEIGHT-RULE LIMITS, PLUS BETTER PERFORMANCE.

ALTHOUGH the navy has declared that model builders can carry on their educational hobby without the benefit of balsa, the very mention of pine as a substitute seems to horrify some builders. What's wrong with pine or bass? The main objection so far has been weight—snap judgment having immediately condemned hardwood models to the 12 or 14-ounce-per-square-foot class. This snap judgment can do nothing but retard the development of model craft until the model builders forget this first impression and investigate hardwood possibilities more carefully.

Let's take a conventional crutch type of fuselage for example. The crutch calls for $\frac{3}{16}'' \times \frac{5}{8}''$ balsa; why not use $\frac{1}{8}'' \times \frac{3}{8}''$ pine or bass? In general, if the size of balsa called for is reduced to the equivalent size in pine the stringers would sag under the pull of the dope covering, so put the bulkheads closer together to support the stringers at closer intervals (at this point the boys in the back room are chanting, "Weight! Weight!"). But the bulkheads need not be heavy to obtain the required strength. Where $\frac{1}{16}''$, $\frac{3}{32}''$, or even $\frac{1}{8}''$ sheet balsa was formerly used for bulkheads, $\frac{1}{20}''$ or $\frac{1}{16}''$ thick pine can be used. The elimination of edge grain and the proportional spacing that seems to work out best for bulkheads and stringers are shown in the illustration. Where $\frac{1}{8}'' \times \frac{1}{4}''$ stringers were formerly used on comparatively widely spaced bulkheads, $\frac{1}{16}'' \times \frac{1}{4}''$ stringers of pine will do the job on the closer spaced bulkheads. If the thickness is decreased on a stringer, and not the depth, the "beam action" or tendency to resist sagging is not impaired. The tendency for a thinner, pine stringer to move sideways under load is resisted by the slots in the closer-spaced bulkheads and the restraining action of the doped covering.

Engine mounts, firewall, and methods of attaching landing gears need not be changed. Landing gears no longer seem to worry the average modeler since the A. M. A. rules eliminated the necessity of take-offs in contest competition. Some fellows will say that engine mounts also will soon be unnecessary, since production of engines has been curtailed, but let's not get "down in the dumps."

Stabilizers and rudders are not any more difficult to convert to pine or bass than the fuselage. For the stabilizer on a popular type of plane, where the spar calls for $\frac{1}{4}'' \times \frac{1}{4}''$ balsa, $\frac{1}{8}'' \times \frac{3}{4}''$ will do the trick, if the ribs (formerly $\frac{1}{8}''$ thick balsa, and now $\frac{1}{16}''$ thick pine) are spaced the same as before. This maintains the same general type of construction, but there can be variations. Instead of a spar, the full depth of the airfoil section, smaller spars, one on top and one on bottom, directly above and below each other, can be used with practically the same effect as that obtained with a single, solid spar. Leading edges can be reduced in size, too. A leading edge of balsa that was $\frac{1}{4}'' \times \frac{3}{8}''$ can be cut down to $\frac{1}{8}'' \times \frac{1}{4}''$, set vertically and will still hold the contour without pulling out of shape, due to the increased stiffness of the harder wood. If trailing edges of $\frac{1}{4}'' \times 1''$ balsa is called for, a pine section $\frac{1}{8}'' \times \frac{5}{8}''$ will be plenty. There again, the higher fiber strength of the harder wood will prevent the $\frac{1}{8}''$ (Turn to page 60)

WE FLY BY NIGHT

By Dr. H. B. Newlin and Paul Enstad



Underview of fuselage shows landing-light installation. This is operated from contacting switch attached to engine timer.

WE used to be conventional gas-model fliers. Some of our models were bad, some good, but our greatest difficulty was the lack of adequate take-off space. The country-club fairways and two baseball diamonds were good to fly on, but we were always getting lost among golfers yelling "Fore!" and miscellaneous baseball teams. By the time space was available, darkness was coming on and there were always some left without turns.

When we were converted to controlled flight, someone had the bright idea of putting lights on the ships. One of our members hung lights over his Scientific Flagship; it was so successful that he made the navigating and landing lights more permanent by building in the lights and taping down the wires. This prompted another member to install lights on his Modelcraft Spook 72 which had been gathering dust.

The battery arrangements on the two ships differ. The Flagship batteries are fixed on the center of gravity; those of the Spook are arranged on a vertical sliding plywood panel in the belly of the fuselage. The latter arrangement corrects the balance when necessary. Both ships carry eight batteries: four penicells for navigating lights of one and one-half volts; and four medium cells, two for a three-volt landing light and two for a three-volt ignition. Small-gauge enameled wire was used for solid wiring and

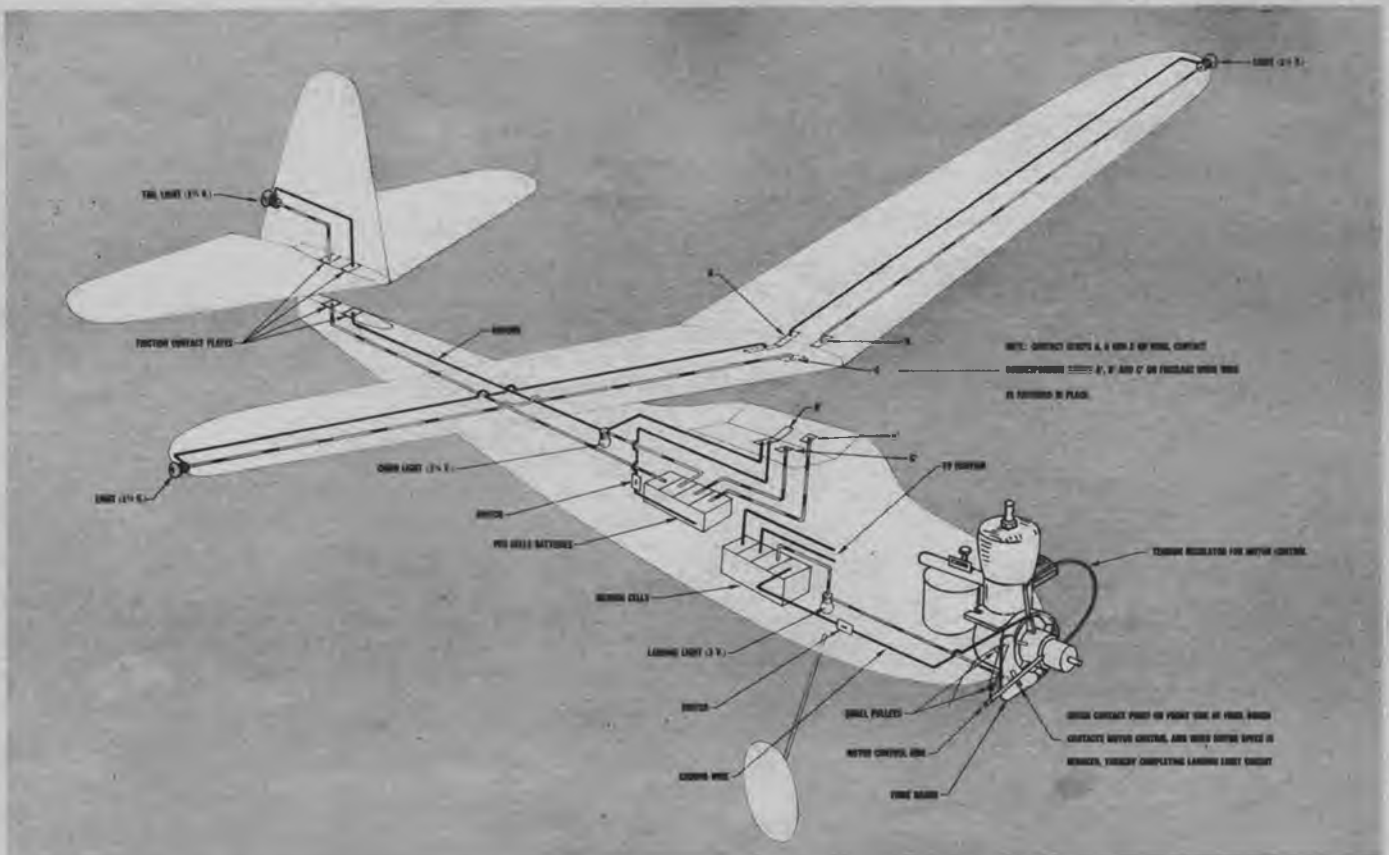
IS YOUR USUAL FLYING FIELD UNAVAILABLE DAYS? TRY NIGHT FLYING CONTROL LINE MODELS—HERE'S THE DOPE!

cotton-covered radio antenna wire for movable wiring. The wings of both ships are wired for contacts so that the ships can be dismantled without having to disconnect the wiring. The navigating lights stay on all the time, but the landing light is subject to an automatic switch on the motor arm; both lights are controlled by off-on switches.

Dark nights are naturally better for flying with lights. Baseball diamonds are ideal for flying space because there is nothing on which the lines can snag and the scraped dirt reflects white to the landing spot. We found the late evening was best for control-line flying.

One idea for these two six-foot jobs was a reverse motor control: if a flying cable or control line should break in flight, the reverse control slows the motor and your outfit has a chance to recover. Another advantage is that no one has to hold your model while you run out to the handle.

An average night's flying will cost about fifty (Turn to page 65)





Designer Paul MacCready calls this one an autogyro. What would be your idea?



Shades of Buck Rogers! But it really flies, sez builder, Jack Shinn, Tacoma.



A detailed B-17 built from Air Trails plans by South American Jorge Chavez.



Robert Winsor got the inspiration for this towline from Russian model photo.



Here's how they mount them in the navy! Spitfire and stand by Charley Armstrong.

Model Matters

THE DOPE CAN

A recent "original design" contest by a club in the East had interesting results: out of ten entries, nine were pylon jobs. As a result, points awarded for originality were few—very few. In the course of the "hangar flying" that followed the announcement of the winners, several of the contestants contended that pylon jobs were the only type of design that could take full advantage of the power loading allowed by existing A. M. A. rules—80 oz. per cu. in. displacement. Most modelers have the same opinion: why build anything else? Inasmuch as other designs cannot absorb the full power allowed for a given weight, thereby automatically handicapping themselves in contests, this trend is logical.

What is not logical is the power-loading rule. If 80 oz. per cu. in. causes a condition where everything we fly must have a pylon—let's change the rule. Unless we do this, some bright manufacturer will start making standard sizes of pylons and offer them for sale along with batteries, timers, coils, et cetera. While that may sound ridiculous, the idea of model designs being frozen is not amusing. In a letter to Gordon Light recently I suggested a power loading of 100 oz. per cu. in. Since then, further research has proven that 120 oz. per cu. in. is closer to being the figure that will take the advantage away from pylon designs and allow the wing to be lowered to a respectable distance above the C. G. This idea of increasing the power loading has also proven to be the answer for a method for making models less sensitive to adjustment. Most really efficient contest jobs today are so sensitive the sun can tighten the covering a little more between flights, causing a negligible change of warps or "adjustment" which usually results in a smashing finish that entertains the spectators, but does nothing to win contests or advance modeling.

Using a power loading of 120 oz. per cu. in., and wing loadings suggested recently, models will not increase much in size. By using a step-up arrangement for wing loadings and creating an AA class for engines of less than .10 cu. in. displacement, club contests can be run with all classes in one event and the larger planes will not have the definite advantage that now exists under a blanket 8 oz. per sq. ft. wing loading for all classes.

This could be worked out as follows:

Class AA	less than .10 cu. in. displ.	8 oz./sq. ft.
Class A	.10 to .20 cu. in. displ.	9 oz./sq. ft.
Class B	.20 to .30 cu. in. displ.	10 oz./sq. ft.
Class C	over .30 cu. in. displ.	12 oz./sq. ft.

Thus the larger the model, and the higher the aerodynamic efficiency attained through size, the higher the wing loading.

Models designed to these suggested changes in the

rules would not be larger or unwieldy. The following list is an indication of how models would change:

Class	Engine & Displ.	Min. Weight	WING Area (sq. ins.)	(Aspect Ratio 7) Span (ins.)	Chord (ins.)
	Atom				
AA	.095	11.4	203	40.0	5.7
	Bantam				
A	.199	22.8	365	50.5	7.25
	Forster				
B	.299	34.8	500	59.25	8.45
	Ohlsson				
C	.60	72.0	865	78.00	11.10

While the above changes are not offered as a cure-all for what is wrong with the rules and contest competition, the study of planes now flying and research into the possibilities of models flown with these loadings have shown that the changes would again leave the field open for new designs. With the increased power loadings the engine run could be increased to 25 or even 30 seconds due to the slower climbing speed these models would have.

The duration time method of recording flights is still a matter of controversy—some want (Turn to page 68)

CLUB CHATTER

Judging from the announcements, it's going to be "business as usual" as far as many of the annual contests are concerned. Already many have been scheduled for this summer, and one will have been run off before this gets into print.

Unfortunately the announcement of the Syracuse Model Airplane Club's Seventh Annual Outdoor Meet arrived at this office too late to be included in last month's issue as a coming event. Perhaps the club will let us know who won the prizes. Announcements of contests should arrive at this office a minimum of two months prior to the date of the event in order to appear in the desired issue of the magazine.

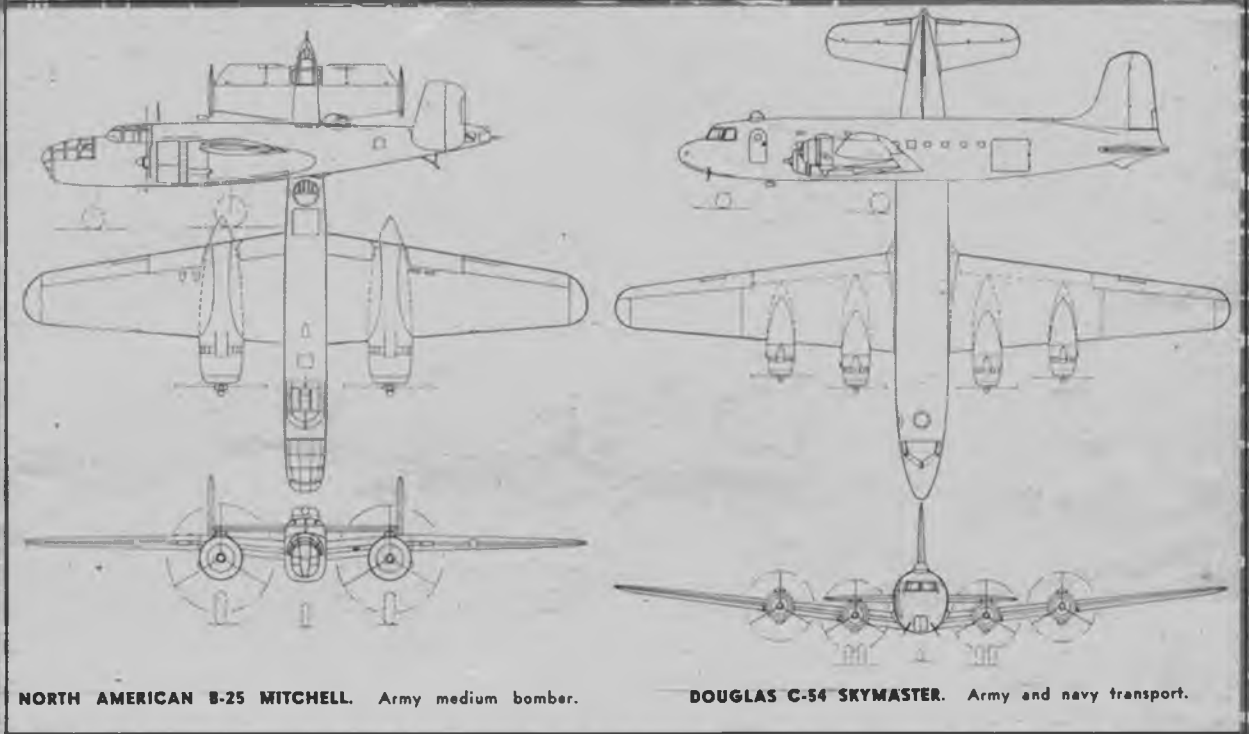
The Birmingham Aeromodelers will hold their State Miniature Air Meet on June 27th. If previous years' meets are an indication, this should be rather a large event. Sponsored by the Alabama Exchange Clubs, it will be a contest fellows in that area won't want to miss. This group, incidentally, has the largest number of members in the armed forces that we have heard of to date—fifteen fellows with all branches represented.

In line with members being on the inactive list due to war duties which take them out of the vicinity, we have noticed that many clubs are publishing monthly mimeographed bulletins, which serve to keep those absent members informed of what's going on in modeling back home. Such publications serve to "include them" in the club's modeling activities and will make it easier for them to fit back into their place in the club again. It's an idea that many clubs could copy; no club is too small. Hectograph is a cheap (Turn to page 68)

CONTESTS—CLUB CHATTER—DISCUSSION. WHAT'S NEW? LET'S HEAR WHAT YOU'RE DOING!

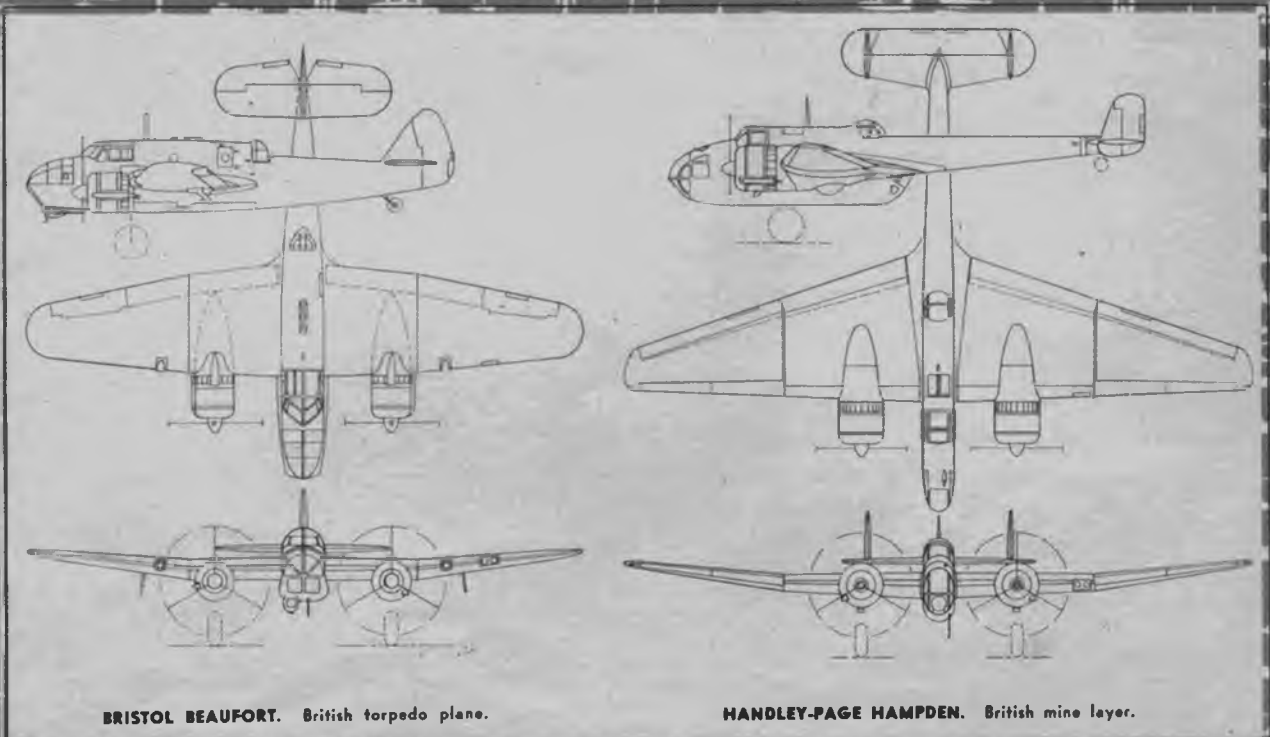
AIR TRAILS PLANBOOK NO. 5

DRAWINGS BY THOMAS A. NAYLER



NORTH AMERICAN B-25 MITCHELL. Army medium bomber.

DOUGLAS C-54 SKYMASTER. Army and navy transport.



BRISTOL BEAUFORT. British torpedo plane.

HANDLEY-PAGE HAMPDEN. British mine layer.



"WINNIE MAE"—Vega Model 5-C. Flown by the immortal Wiley Post.



"AIR EXPRESS"—Lockheed Model 3, made famous by late Frank Hawks.



"SERIUS"—used by Charles Lindbergh on flights to plot airline routes.



"ALTAIR"—The "Lady Southern Cross," flown by noted Kingsford Smith



"ORION"—One of early transport planes used by Varney "Speed Lines."

I'VE BUILT EVERY LOCKHEED

By Al Bridges

SCALE-MODEL BUILDER FOR LOCKHEED HAS BUILT ENTIRE HISTORIC SERIES FROM THE EARLY VEGA TO THE MODERN LIGHTNING.

FOUR years of making scale miniatures of the many fine types produced by the Lockheed Aircraft Corp. has kept me hopping all the time. With me in this work have been two marvelous modelers, Robert Wiehle and John Park.

Our models have found their way all over the world, wherever Lockheeds are flown, and are put to a variety of uses; in sales promotion, advertising, publicity, art work, educational demonstrations, by the production illustration department and the air corps, to name but a few.

One thirty-second scale, or three eighths of an inch equal one foot, was selected because a reasonable amount of detail can be incorporated in a model of this convenient size. A good basic material to use is a good grade of well-dried (*Turn to page 54*)



"ELECTRA"—Model 10-A, granddaddy of the famous twin-engine series.



MODEL 12-A—Used by the Brazilian Air Force. Popular also as transport.



XC-35—First successful pressure cabin job used by U. S. army air corps.



British version of the "Lightning" differs but slightly from U. S. model.



MODEL 14—Popular as light transport: is now the "Hudson" with R. A. F.



MODEL 18—The "Lodestar," used prior to the war as light transport.



"HUDSON"—First a transport, now made famous by R. A. F. on patrol.



"VENTURA"—Militarized version of "Lodestar," popular as light bomber.



MODEL 212—Flown by Dick Merrill on record-breaking N. Y.-London trip.



"STARLINER," featured 2 Menasco engines geared to only one propeller.



P-38—The famous "Lightning," has established itself as a fighter de luxe.



MODEL 14—The plane that Howard Hughes flew on his round-world trip.



WHIZZ

By Austin Rinaldi

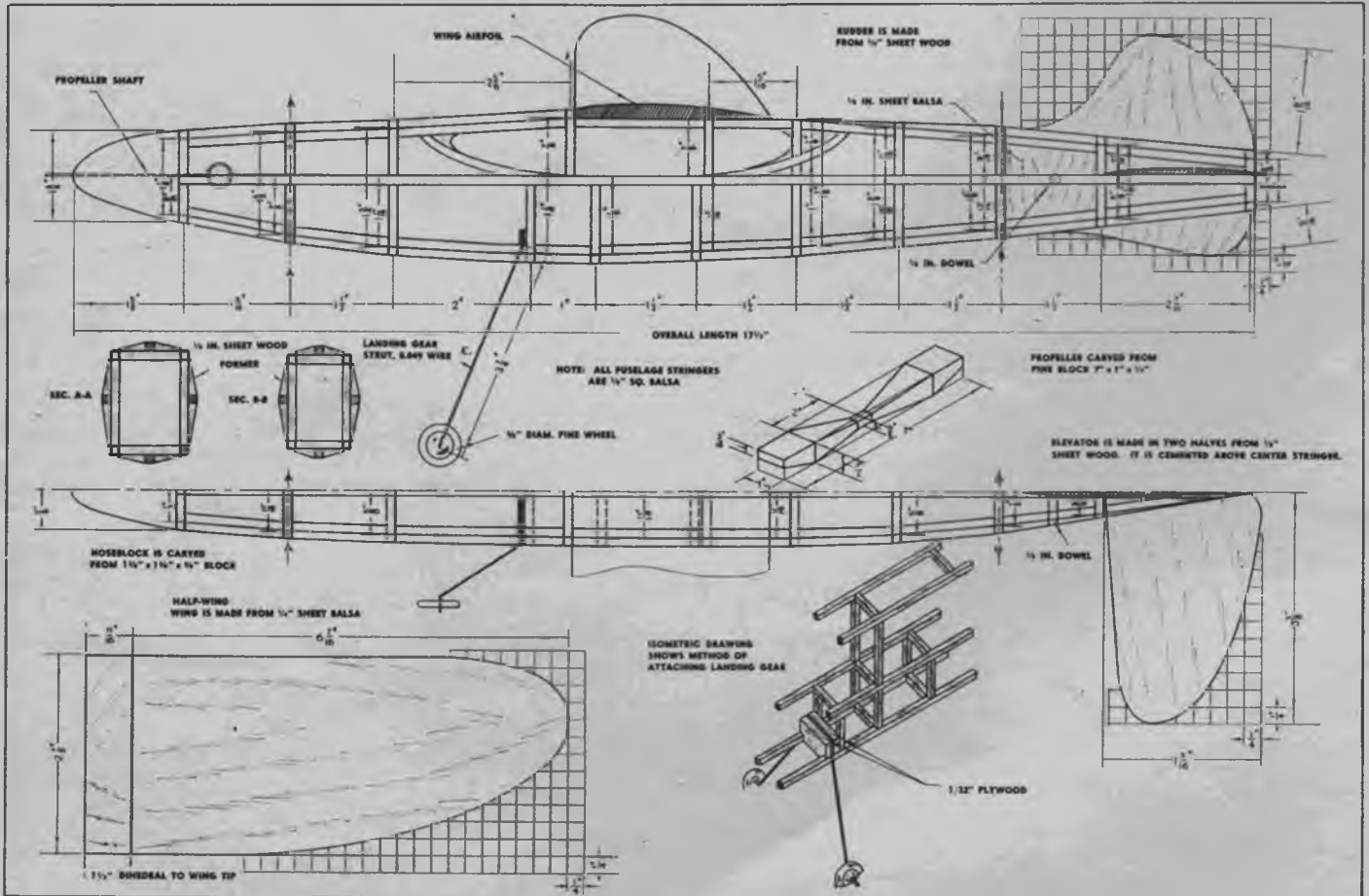
IN these modern times an airplane's efficiency is estimated by its speed. Therefore, after studying many real planes, we have perfected a model which I know will thrill the hearts of all model builders. It is a sleek, streamlined job whose looks catch the eye and whose performance is exceptional. The prop on this ship turns so fast it has to be carved from hardwood because a balsa prop would be thrown apart. In designing any speed job, the designer must find the ship which has the least minimum drag, for at the speed these ships travel, a terrific wind resistance is set up. The ship must, therefore, be as sleek and streamlined as possible, as you will notice on the pictures.

On the first test flight I found that the ship had too much wing area, for it glided, and a speed model should not glide. After cutting the wing area down I found that toward the end of each flight the ship had a tendency to oscillate, but by increasing the rudder area this was corrected. When test-flying this ship I let it fly parallel to the ground because I flew it in the meadows where the weeds were very high, thus preventing any damage to the ship.

But when there is no such place available, test-fly the ship straight up into the sky. If the ship goes straight up it is thoroughly adjusted and can be flown parallel to the ground, for it will go straight out until the power is exhausted and then drop to the ground. If the ship has a tendency to dive and has not been tested in this manner it will hit the ground under full power and crack up; but if flown up into the air first, the power will have been exhausted and it will not hit the ground hard, thus preventing a wreck.

CONSTRUCTION

To start the construction, scale up plans and lay out the side view of the body. Build up two sides out of hard $\frac{1}{8}$ " x $\frac{1}{8}$ " balsa. When dry, take up from plans and glue cross pieces in, as in top view on plans. Next bend a landing gear from .049 wire and glue to body as indicated on plans, and carve a nose plug, putting a small piece of $\frac{1}{32}$ " plywood at the front and back of the plug. This keeps the prop steady. Then put sheet sec- (Turn to page 65)





IT'S a vital role the Piper HE-1 Ambulance Plane is playing . . . a role that is saving many American lives! Landing in small fields where most planes could not operate, the "Air Ambulance" picks up a casualty and carries him, comfortably enclosed under the plane's hinged turtle deck, to a base hospital. It transports him with speed that often means the difference between life and death.

Built especially for the Navy, it adds another page to the story of services rendered our Armed Forces by Piper Cub planes. The important parts played by this "Air Ambulance" and the famous Piper L-4 "Grasshopper" daily bring victory nearer!



And, when peace comes, the lessons learned and the developments made during this war will combine to bring you a superb peacetime Piper Cub plane. In it, you'll fly to your favorite vacation spots and streamline your business trips. Then small airports and highway landing strips will dot the country. And, light airplanes will dominate the air just as popular-priced automobiles dominate the road!

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. Piper Aircraft Corporation, Dept. T73, Lock Haven, Penna.

16mm. SOUND FILM—"The Construction of a Light Airplane" now available. For point of nearest distribution, write the producer: Supervisor, Audio-Visual Aids, Extension Services, Pennsylvania State College, State College, Pennsylvania.

PIPER *Cub* **POINTS THE WAY TO WINGS FOR ALL AMERICANS**

America's Biggest Dollar's Worth!

**BIG 40 INCH WING SPAN KITS
ALL SIMPLIFIED OTT-O-FORMER CONSTRUCTION
AT YOUR DEALERS NOW!**

Build the Planes That are Making War History With the Sensational History-Making Construction Method Developed by Joe Ott

Go to your dealer today and see the fine line of Ott-O-Former Kits he has waiting for you. If there is no dealer carrying these models near you send your order to address below. Minimum order accepted \$1.00. Add 15 cents for packing and postage.



Curtiss O-52
ONE DOLLAR



The Vengeance
ONE DOLLAR



**BUILD WITH OTT-O-FORMERS AND
GET 'EM FLYING QUICKER**

Ott-O-Former Kits have ready-cut wing ribs, ready-cut nose block parts, ready-cut propellers, and the sensational time-saving OTT-O-FORMERS.

**OTT-O-FORMER
CONSTRUCTION KITS**

are Patented in U. S. Patent Office and Made Only By

**JOE OTT MANUFACTURING CO.
Dept. 27. 415 West Superior St.
CHICAGO**

Joe Ott

WITH SIMPLIFIED OTT-O-FORMER



**30 Kits
for you
to choose
from**

- Airabonita**
22" Wing Span....15c
- Airacobra**
32" Wing Span....50c
- Boeing Flying Fortress**
32" Wing Span....50c
- Brewster Dive Bomber**
38" Wing Span....75c
- Consolidated Catalina**
22" Wing Span....15c
- Curtiss Pursuit**
22" Wing Span....15c
27" Wing Span....29c
40" Wing Span...\$1.00
- Douglas Dauntless**
27" Wing Span....29c
- Grumman**
27" Wing Span....29c
32" Wing Span....50c
40" Wing Span...\$1.00
(*Avenger" Torpedo Bomber)
- Hurricane**
22" Wing Span....15c
- Lockheed Lightning**
32" Wing Span....50c
45" Wing Span...\$1.39
- Martin Maryland**
38" Wing Span....75c
- Messerschmitt**
22" Wing Span....15c
- Mustang**
27" Wing Span....29c
40" Wing Span...\$1.00
- North American B-25**
22" Wing Span....15c
- Spittire**
22" Wing Span....15c
27" Wing Span....29c
32" Wing Span....50c
45" Wing Span...\$1.39
- Stuka Dive Bomber**
22" Wing Span....15c
32" Wing Span....50c
- Vought Sikorsky**
22" Wing Span....15c
32" Wing Span....50c
38" Wing Span....75c
27" Wing Span....29c
(*Kingfisher")
- Vultee Vengeance**
40" Wing Span...\$1.00

**THE MUSTANG . . . Two-Fisted
Army Air Corps Fighter**

This is a new Joe Ott model of North America's famous XP-51 pursuit ship, the "Flying Mustang," which is a single seat, single engine job and one of the world's fastest ships. Big 40-inch kit, at your dealer \$1.00

If no Ott-O-Former dealer in your neighborhood mail your order to address below. Enclose \$1.15 (stamps or money order) for prepaid delivery to your home.

**CURTISS 0-52 . . . The Army's
Crack Observation Plane**

One of the most talked-about U. S. Army Air Corps planes is the Curtiss Observation-0-52. It is built especially for "peeking" duty and has been pronounced remarkably effective. Big 40-inch kit at your dealer \$1.00

If no Ott-O-Former dealer in your neighborhood send \$1.15 (stamps or money order) to address below for prepaid delivery to your home.

**Vultee VENGEANCE . . . Combina-
tion Dive Bomber and Pursuit**

Another fine model now ready. A terrific fighter and a combination pursuit and dive bomber. Uses a 1700 to 2000 H.P. twin row engine. Big 40-inch kit, at your dealer. \$1.00

If no Ott-O-Former dealer in your neighborhood mail your order to address below. Enclose \$1.15 (stamps or money order) for prepaid delivery to your home.

**AIRPLANE
CONSTRUCTION KITS**



Joe Ott

WHEN YOU SEE
THIS NAME..YOU
KNOW ITS GOOD!

**AIRPLANE
DOPES AND
CEMENT**

The finest quality you ever used in Red, White and Blue Tubes and Jars. Dope in seven colors, clear and tissue cement.

5c AND 10c



JOE OTT MANUFACTURING CO.
415 W. Superior St. CHICAGO

COMBAT PLANES OF ALL NATIONS

64 Official Photos of WAR PLANES 50¢

U. S. ARMY & NAVY · BRITISH · RUSSIAN · GERMAN · JAPANESE · ITALIAN
Fighters · Dive Bombers · Torpedo Bombers · Paratroop Transports · Light and Heavy Bombers



BEAUTIFUL REPRODUCTIONS 5 1/4 X 8 1/2 READY FOR FRAMING

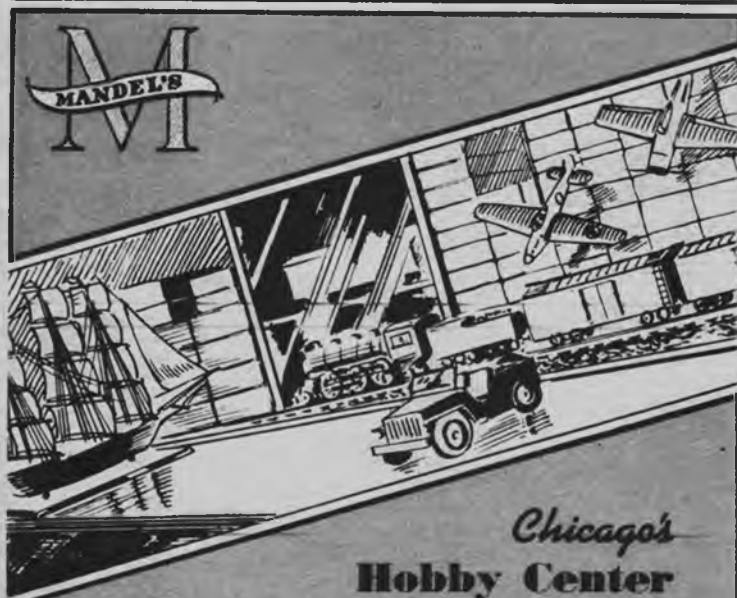
Send for your collection today!

SEND MONEY ORDER OR COIN TO BOX NO. 89, STATION O, N. Y. C.

(Write Name and Address Clearly)

Name _____

Address _____



Chicago's Hobby Center

Probably the best known 6th floor in all Chicago—in the opinion of many midwest modelers—is the one right at Mandel's.

It houses the Hobby Center which, in turn, houses all the necessary and accessory items for completing model planes, trains and ship model projects.

As this was written, a shell inventory reveals kits from Berkeley, Capitol, Cleveland, Consolidated, Megow, Ideal, Joe Ott, Rogers, and all the other leading manufacturers.

Is it any wonder our 6th floor HOBBY Center is so popular?

Mandel Brothers
6th floor

25 Years Ago

(Continued from page 8)

gave him a total of thirteen and the honor previously held by Lieutenant Frank Baylies as the American ace of aces.

June 19—The first escadrille of American airmen trained in Italian aviation fields started for the Italian front, accompanied by Congressman LaGuardia. It was reported that the group would see immediate action.

June 20—A German Albatros landed in a suburb of Copenhagen. The two men on board wore civilian dress and straw hats, but in the machine were officers' uniforms and arms. They said a lack of "benzine" had forced them to come down.

June 21—Major General William Brancker, of the R. A. F., proposed that test flights be made across the Atlantic Ocean, so that American-built bombers could be delivered directly to France without finding it necessary to wait several weeks for shipment by surface vessel. He brought along with him three pilots who were prepared to attempt the first test flights.

June 24—Captain LaGuardia announced that the American fliers in Italy had gone into action and had acquitted themselves marvelously against the Austrians.

June 25—A "huge" air raid siren was tested in New York City, and its blast was heard for several miles. New Yorkers felt convinced that the Germans would undertake to bomb the city from the air, and all precautions were taken.

June 29—W. H. Workman, of Handley-Page, proposed a plan to build 10,000 bombers in America and fly them to Europe with crews, equipment, and bombs. Mr. Workman said that 10,000 big American-made planes bombing Germany in 1919 would win the war.—By Dave Cooke.

"Boy Power"

(Continued from page 29)

supervisors and boys on the job to handle any problem that may arise.

These boys' school programs are now co-ordinated with their plant work to provide the necessary technical training. In the classroom the boys are getting more technical subjects such as blueprint reading, trade mathematics, drafting, technology, metallurgy, et cetera, and less Latin, art appreciation, poetry and literature. But the usual required high-school subjects are not neglected. The boys receive credits in their vocational high-school subjects for work done in the plant.

The boys were chosen as a result of I. Q. tests, scientific block tests, and other aptitude tests, together with their high-school records. Like all other employees, they had to pass physical examinations and investigation. In addition, they had to secure work permits signed by their board of education, and the written approval of their parents. If they don't keep up in their school grades, they must drop out of the program.



Important Announcement New ZWENG SEXTANT

This new Sextant is "Bubble Type" with improved averaging device. The bubble is "adjustable". An improved index glass for direct reading of scale is center pivot design. A single rheostat control operates lighting system. Comes packed in handsome carrying case. Price complete \$450.00.

NAVIGATION NOTE BOOK

This handsome book, containing the Navigation Plotter (Weems) should be in every navigator's kit. Price \$4.00 complete.

PAN AMERICAN NAVIGATION SERVICE
12021 Ventura Blvd., North Hollywood, California.

WITTEK AVIATION HOSE CLAMPS

Standard Equipment on

BELL P-39 AIRACOBRA



Since the beginning of modern aviation Wittek Hose Clamps have been known as the standard of the industry. Today they are being used by the nation's leading military aircraft and engine builders.

WITTEK Aviation HOSE CLAMPS

"BUY

WAR

BONDS"

OUR 11TH YEAR

BRONCO HOBBY CENTER
Bronco Hobbycraft Co.
132-34 West 21st St.
New York City

Distributors of

MODEL AIRPLANES
RAILROADS
BOATS, ETC.

Wholesalers to the Trade Only

You CAN'T zoom into an AVIATION CAREER!



Yes! Aircraft builders need trained men. . . .

Yes! Aviation demands skill and knowledge and trained intelligence.

But! U. S. aircraft manufacturers want, and want badly, key-men—not “bolters and nutters,” who have to ask “where does this little bolt go, Bill?”—the type of men who, in the words of Svend Peder- sen, Director of Education and Public Relations of the Lockheed Aircraft Cor- poration, “make up the backbone of such an organization”!

By what yardstick are these key-men measured at Lockheed? Four years’ ap- prenticeship! There isn’t any “zooming” into aircraft careers at Lockheed, or any other important aircraft plant!

There is just as much skill and knowl- edge and intelligence demanded of “air- craftsmen”—those men on whom rests one of the greatest responsibilities ever handed to industrial workers—as on the men who make up the backbone of any other industry.

There has been too much loose talk about “Aircraft Production Training Courses,” and “Aircraftsmen Trained in Four Weeks,” and “Zooming into an Avi- ation Career.” We’ve got to be honest about this matter.

“Aircraftsmanship,” the knowledge and skill that must predominate among aircraft workers, is not something to be obtained “overnight,” or by reading a few short articles.

It is unfortunate that only those connected with the aircraft industry

appreciate the absolute necessity of spe- cial training of all aircraft personnel.

And here’s how I. C. S. handles the problem:

I. C. S. has paid to specialists in the past three years \$34,740 for the data only, from which training for Aircraft Me- chanics and Aviators is provided . . . \$6244 for one subject only—“The Avia- tion Engine”; \$2552 for “Sheet Metal Work”; \$2843 for “Measuring Instru- ments”; \$1536 for “Aviation Engine Ignition.”

That gives you an idea as to how “Specialists” do the job.

If you’re looking for a “career” in aviation, if you’re aiming to become a key-man in the aircraft industry, if your objective is more than to be a “cog” in the machine or a “number” on the

assembly line, don’t be mistaken: You’ve got your work cut out for you. You can’t reach these objectives by any quicker process than have those select few who are the “backbone” of the industry to- day. They worked, they studied, and they studied from authoritative instructional data, and under the guidance of a com- petent faculty.

I. C. S. Training is designed and con- ducted to make these objectives possible. It is not an educational Irish stew . . . a conglomeration of unrelated facts. It is real . . . thorough . . . practical and ap- proved by unquestionable acceptance.

If you’re a man with a definite objec- tive in the Aviation Industry, we will be glad to send you the truth about a Career in Aviation. A letter or a post-card will bring information . . . or use the coupon.

INTERNATIONAL CORRESPONDENCE SCHOOLS

BOX 4928-E, SCRANTON, PENNA.

Please send my free copy of “AVIATION OPPORTUNITIES,” and complete infor- mation on the course marked.

<input type="checkbox"/> AIR PILOT <input type="checkbox"/> AVIATION MECHANIC <input type="checkbox"/> AIRPLANE MAINTENANCE <input type="checkbox"/> AVIATION ENGINES	<input type="checkbox"/> AVIATOR <input type="checkbox"/> AIRPLANE DRAFTING <input type="checkbox"/> FUNDAMENTALS OF AERONAUTICAL ENGINEERING
--	---

Name _____ Age _____

Address _____

City _____ State _____



ABSOLUTELY ESSENTIAL!

Without exception, every man now training or hoping to train for the air services, needs the instruction in these two "must" subjects.



BASIC MATH FOR PILOTS AND FLIGHT CREWS

By C. V. NEWSOM AND H. D. LARSEN

Here is a boiled-down, easily-mastered home study course in precisely the mathematics a pre-flight cadet must be able to use, the identical problems he must face and solve, the practical applications he will encounter in action. This is the only book that follows the outlines of the Civil Aeronautics Administration. Includes answers to the problems so that accuracy and progress can be checked, errors spotted and quickly corrected.

FREE CIRCULAR SLIDE RULE. Not only is this the only book containing full instruction in the use of the circular slide rule, but each book comes with the circular slide rule itself, conveniently pocketed for handy reference. Experience in the use of the circular slide rule is absolutely required of cadets.

PRICE: \$2.00



BASIC PHYSICS FOR PILOTS AND FLIGHT CREWS

By E. J. KNAPP

This book gives you the principles and realistic applications of the physics which every flyer must master—and then use constantly. Follows the official CAA outline, giving you quickly, yet as thoroughly as possible, the fundamental physics required by all aviation training branches of the armed services. Fascinating exercises show you how to determine bomb energy, velocity of a parachute jump, action of air currents, the lift of a plane, bomb load capacity, etc. Nothing is taken for granted; everything is explained in easy-to-understand terms that eliminate confusion and difficulty. Book includes 97 supplementary exercises which give you a thorough self-examination which shows how completely you have mastered the course.

PRICE: \$1.65

PRENTICE-HALL, Inc.
Dept. BP-1, 70 Fifth Ave., New York City

Please send at once.

copies of BASIC MATHEMATICS @ \$2.00

copies of BASIC PHYSICS @ \$1.65

I enclose \$.....

SEND C.O.D., plus few cents charges

NAME

ADDRESS

No Time To Lose!

Time is of the essence! The sooner you master Basic Mathematics and Basic Physics, the sooner you qualify for the unprecedented opportunities now open to trainees. Rush coupon now!

MODERN HOBBYCRAFT PRODUCTS AIRCRAFT PLAN SERVICE • P. O. BOX 9 • NEW BEDFORD, MASS.

Pilot your Own!

SPITFIRE IV or FOCKE-WULF 190A3

Be a fighter pilot! Have all the thrills of diving your own Spitfire on the tail of a Focke-Wulf. It's now possible with control-line flying. Build these famous fighters from full size 1"=1" plans drawn by expert draftsmen exclusively for MODERN HOBBYCRAFT PRODUCTS. All latest, up-to-the-minute changes have been incorporated from authentic sources. Supplementary photos and drawings give complete scale detail, even to guns and rivet lines. Both models have approximately a 36" span and may be built from balsa or non-priority materials. Any Class II or small Class C engine may be used. Speeds up to 60 m.p.h. have been clocked on the original test models. Act now, the increasing paper shortage limits the quantity of these accurate plans. Prompt service!



MODERN HOBBYCRAFT PRODUCTS
Aircraft Plan Service • P.O. Box 9 • New Bedford, Mass.

Print clearly. Money order, if possible. Tape coins to card that fits envelope, thanks!

NAME

STREET

CITY

STATE

SPITFIRE IV

FOCKE-WULF
Fw. 190 A3

25¢
EA.



IMMEDIATE SERVICE

ALL PLANS POSTPAID

"Stalin's Falcons"

(Continued from page 17)

crashed to earth. The Germans then tried launching a sudden attack on the Soviet fliers, but all their efforts were in vain.

Knowing that Airacobras possess good horizontal maneuverability, Smirnov decided to lead his quartet at a low altitude, banking sharply; and it was here that he gave the Germans battle. This headlong but remarkable air duel between the four Airacobras, and four Messerschmitts and two Focke-Wulfs ended in complete victory for the Soviet fliers. Three Messerschmitts were shot down and one Focke-Wulf also failed to return to its airbase.

German propaganda shouts from the rooftops that Focke-Wulfs are "invulnerable," but if you walk through the hills and woods of the Ilmen region you will find the debris of these planes everywhere. Our pilots quickly learned both the strong and the weak points of this new German machine, and soon learned the knack of downing Focke-Wulfs.

During an air fight, Senior Lieutenant of the Guards Alexei Smirnov encountered a Focke-Wulf under equal conditions, at halfway bank. Smirnov reduced the radius of his bank to the uttermost limit. His Airacobra banked at a lower speed, and yet did not fall into a spin. Controlling his machine with consummate skill, at its maximum possible speed, and keeping his craft from falling into a tailspin by means of foot controls, Smirnov maneuvered his machine behind the Focke-Wulf's tail and shot down his opponent.

Piloting Airacobras, Soviet fliers force the Germans to fight in conditions unfavorable to the latter, and crack them on vertical figures, dragging them down to low altitudes, where the Focke-Wulfs lose their fighting powers.

The Germans were particularly anxious to put into effect their practice of combined groupings of fighters at the moment when our troops of the northwest front were liquidating the last enemy strong points in the region of the "Ramushevsky Corridor."

A formation of Soviet dive bombers headed off to bomb enemy artillery and trench-mortar positions in the region south of Lake Ilmen. Two groups of four Airacobras each were detailed to escort these bombers. The leaders were Hero of the Soviet Union Senior Lieutenant of the Guards Ivan Grachev, and Senior Lieutenant Vladimir Bezrodny. German anti-aircraft guns raised a solid barrage of fire in front of our bombers and fighters, but this did not help the enemy. German fighters then appeared from the direction of Lake Ilmen—more than thirty of them. The Messerschmitts proceeded in pairs, higher up, while the Focke-Wulfs flew at about five to six thousand feet in echeloned pairs. This German tactical method was nothing new to Soviet fighter pilots. The Germans thought to entice the Airacobras into a pincer, disarrange the firing interrelationship

of our fliers, and settle with them singly.

Taking due account of this maneuver, the leader of the right-hand shock group, Bezrodny, was the first to force battle on the Germans and, darting ahead, he attacked the Focke-Wulf pair bringing up the rear. Flying in pairs, during the whole of this engagement, the Messerschmitts resorted to waiting tactics and pursuit of our three planes which had broken from formation. But the Germans' hopes were futile. Acting in co-ordination, the Guards' fighter pilots scattered the Focke-Wulfs and Messerschmitts all over the skies, and what is more, shot down three without losing a single machine of their own.

Nazi pilots show particular zeal in hunting for our landing fields, trying to spot and block them. Soviet Guards' pilots gave them such a hot lesson that the enemy for a long time lost all desire to attempt to block this aircraft group's airbase.

On December 30, 1942, the German command equipped a special group of "Freehunter Aces" to block this unit's airbase. This enemy group was headed by Major Heinrich Bruno. Eight German aces were intercepted en route by a formation of five of our Airacobras under command of Guards Captain Anatoly Kislyakov. The Germans, as usual, proceeded in groups of twos in echelon. Our pilots, who were the first to spot the enemy, made use of the unexpectedness of the attack. Before the Germans even knew what had hit them, two of their craft were downed by Captain Kislyakov, one in passing and the other on a banking turn. The third enemy plane was bagged by Kislyakov's leader plane—piloted by Junior Lieutenant of the Guards Pasko—while the fourth Messerschmitt was set aflame by Guards Sergeant Lorents. From passive defense, the four remaining Messerschmitts soon turned tail and scurried off.

In this engagement three German aces who had bailed out—Paul Grothoff, Emil Koppelberg, and Heinrich Bruno—were taken prisoner. During the interrogation all three declared they were powerless to stand up against the onslaught of the Soviet pilots and the heavy fire and high maneuverability of the Airacobras. Their testimony is worth quoting:

"How were you shot down?" N. C. O. Paul Grothoff was asked.

"I didn't see the Soviet fighter. He had evidently come up so cunningly behind my tail that in this case my experience proved inadequate. He was apparently a good marksman; he downed me with his first volley. But I can't tell you very much because I recovered consciousness only when I was already at the war prisoners' transit station."

Sergeant-Major Emil Koppelberg stated, "I didn't see the Soviet fighter. He attacked me when I was escaping the anti-aircraft fire, and when I caught sight of him it was already too late; my machine was hit

(Turn to page 52)

3 WAYS TO GET IN THIS LINE-UP

If you are 18 to 26 years old, inclusive:

(1) If *not yet called* for induction under Selective Service, apply now at the nearest Aviation Cadet Examining Board. No school or college credits required. If you pass physical and mental examinations you'll be instructed on further procedure.

(2) If you *have been called* for induction, you can't apply direct. But after induction in the Army, you may apply for Aviation Cadet training after you're in the ranks.

If you are 17 but not yet 18:

(3) You can go now to your Aviation Cadet Examining

Board and volunteer in the Air Corps Enlisted Reserve. If you pass physical and mental examinations, after you become 18 you'll be assigned for preparatory training leading to appointment as an Aviation Cadet. Enlistment under 18 requires parents' or guardian's consent.

If accepted for Aviation Cadet instruction, you will not be able to choose your school, but we hope you may be with us at Ryan. Wherever you are sent, be assured that you will receive the world's finest flight training.

RYAN SCHOOL OF AERONAUTICS
Headquarters, San Diego, Cal.
Hemet, Calif. Tucson, Arizona

Ryan
SCHOOL
OF AERONAUTICS



Be an AIRCRAFT INSTRUMENT TECHNICIAN TODAY ... and get ready for your after-the-war FUTURE

AS AN AIRCRAFT INSTRUMENT TECHNICIAN, you are needed NOW . . . AND TOMORROW! No matter what you're doing today . . . whether you're in the Army or Navy . . . in a war production plant . . . or in non-essential work . . . you can start now to prepare for your TOMORROW. If you haven't found your war job here's golden advice. If you're doing your bit you will nevertheless find this booklet helpful in planning your future, as well as improving your present opportunities. Remember, a man's judgment is only as good as his information. Read this advice from America's oldest instrument school.

Send for this 24-page book TODAY

Contractors to
U. S. Army Air Forces
Technical Training
Command



Send Coupon for this 24 Page Book

AMERICAN SCHOOL OF AIRCRAFT INSTRUMENTS
DEPT. AT-7, 3903 SAN FERNANDO ROAD, GLENDALE, CALIFORNIA

Please send me your 24-page book on Aircraft Instrument Opportunities:

Name _____ Age _____
Address _____
City _____ State _____ AT-7

(Continued from page 50)
and hurtling to the ground. Seeing that I've spent about five thousand hours in the air, it can be said that I was downed by a big Soviet ace."

Only N. C. O. Heinrich Bruno had time to see how Captain Kislyakov shot him down.

"I found myself up against an opponent with whom I couldn't do anything, although I attacked him twice. When I've been shot down it means that the Soviet flier surpassed me in fighting skill and piloting. So far I've been in over seventy air battles."

Grothoff, the youngest, had eight hundred hours on his flying record

The interpreter asked Koppelberg, "You arrived on the eastern front a long time ago?"

"December 29th I reported for duty at the airdrome. December 30th I was shot down."

Koppelberg had been flying since 1935, and in action since September, 1939. In Holland, RAF pilots had fractured his skull and broken his jaw. His fingers are mangled. He spent a long time in different hospitals and was away on a long furlough. He was a semi-invalid flier, and after being wounded piloted transport planes. Then he was appointed a flying-school instructor, and now had been reposted with the active army. He is typical of the scrapings that Goering is today obliged to send into battle.

"Have you received letters from your comrades with whom you started when the war began?" Koppelberg was asked.

"No. Nobody else but me is left alive, excepting those who have been taken prisoner."

During their eight months of piloting Airacobras, remarkable advances have been made by fighter pilots in this unit; the fliers have superb command of their machines. Among these men the first to be named is Senior Lieutenant of the Guards Alexei Smirnov. Smirnov shot down eight German fighters and two bombers singlehanded. He is a rank-and-file Russian fighter pilot of which the red Army numbers thousands.

Before being called to the Red Army he worked in Paltsevo Collective Farm in the Kalinin region. This Airacobra pilot has been awarded the Order of Lenin.

Junior Lieutenant of the Guards Nikolai Pasko, born in Kharkov, is twenty-one. Before the war against the German invaders, Pasko was engaged as a flying club instructor. He has been piloting an Airacobra since January, 1943, and has brought down six Nazi planes singlehanded. On the glorious anniversary of the Red Army, February 23rd, he shot down two German planes. Pasko wreaks vengeance on the Nazis for the torment and sufferings of his native Ukraine and his birthplace, Kharkov.

Since the war started, Hero of the Soviet Union Ivan Grachev has advanced from a rank-and-file pilot to assistant squadron commander. He is a real Soviet ace. Coming from a family of workers of several generations' standing, Grachev brought with him to the army his inherent determination,

(Turn to page 54)

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 after-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

Easier Starting—Top Performance With Merco IGNITION KIT

With engine production curtailed for the "Duration" the MERCO 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 Merco condenser
 - 5' coil super ignition wire
 - 1 doz. copper terminal lugs
 - 1 Merco Hi-Tension lead
- FREE repair booklet with every kit ordered.



ALL FOR
\$3.00
P.P.

MERCURY MODEL AIRPLANE CO.
1592-Y7 Lincoln Place, Brooklyn, N. Y.

BUILD "EAGLE" SOLIDS



BUY WAR BONDS
AND
STAMPS

★ A GREAT LINE OF HISTORY-MAKERS:—

- ★ Grumman "AVENGER," CURTISS P40F, North Amer. "MUS-
- ★ TANG," Republic "THUNDERBOLT" (Pictured), Grum-
- ★ man "WILDCAT," Jap "ZERO," British "SPITFIRE" **35c**
- ★ 2"—2½"—3½" STREAMLITES STILL AVAILABLE ● See Your Dealer

H & F Model Airplane Co. 273-A2 Van Sinderen Ave.,
BROOKLYN, N. Y.

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 much faster. Carves intricate concave or convex surfaces with ease. Note toughness and simplicity of construction.



At your local Hobby Shop, Hardware or Department Store or order direct.
X-ACTO CASSETT PRODUCTS CO.
449 FORTH AVE., NEW YORK, N. Y.



GIVE YOUR MODELS WARTIME CAMOUFLAGE



WITH

CAMOUFLAGE FINISHES



Now! Try your hand at wartime camouflage! Here's practical experience and valuable training that will add new pleasure to your craftsmanship. Testor's Camouflage Finishes... in 8 official U. S.

Army Air Corps colors, together with thinner... are waterproof, quick-drying, easy-to-apply with brush or spray, lusterless to diffuse light reflection.

They can be used on solid model planes, as well as over the doped surfaces of flying and scale models; also for model ships, tanks, guns, trucks, and trains. Buy them in this handy \$1.00 kit... or in individual bottles at 10c each. At all leading hobby shops, department stores, 5-and-10c stores, hardware and sporting goods stores.



TESTOR CHEMICAL COMPANY, ROCKFORD, ILLINOIS, U.S.A.



**Engines
for
Modellers!**



A SNAP

to Start!

**ANOTHER DAY NEARER
VICTORY . . .**

. . . each passing day brings us all closer to final and complete victory! The path has been difficult — the sacrifices immeasurable — but the price for freedom has ever been high!

Soon—*very soon!*—model airports all over the world will re-echo to the 'OK-let 'er go' signals of model flyers! Then, as before, 'OK' engines will fly for the foremost modellers!

'KEEP 'EM FLYING'

Herkimer Tool and Model Works
HERKIMER NEW YORK



**SQUADRON LEADERS
WANTED!**

**"Enroll now in the Pre-Flight Glider
Training Program that is coming to
your High School."**

Learn Glider Construction and Maintenance in a short time. Be prepared to actually fly and get your pilots license later.

Build a Glider and learn flying this new approved easy way. Any school shop will do.



We Want YOU! Help organize your school's Penguin Club. Club Charters are now offered to High Schools and Junior Colleges.

FREE! Receive full Club benefits . . . membership cards, awards and each issue of "Glider Progress."

WRITE for full particulars about the Penguin Glider and Penguin Club. Give name of School and grade. Send letter to



CLUB HEADQUARTERS

Dept. AT-7 1829 W. 62nd St., Los Angeles, Calif.

(Continued from page 52)

persistence and tenacity of purpose. He skillfully pilots all classes of Soviet fighter craft. He learned to pilot an Airacobra in two days. Grachev has accounted for thirteen enemy aircraft singlehanded, plus eight more shot down in group engagements.

Group Commander Lieutenant Colonel of the Guards Oleg Rodionov has been decorated with three orders of the Soviet Union. He has downed five enemy craft singlehanded; four while piloting his Airacobra.

Since June, 1942, when this aircraft group was equipped with Airacobras, and up to March 27, 1943, this unit has shot down 142 enemy planes in air battles. Of these there were twenty-nine Junkers 88s; two Heinkel 111s; one Dornier 217; eight Focke-

Wulf 198s; one Messerschmitt 210; seventy-two Messerschmitt 109Fs; twenty-one Focke-Wulf 190s; four Macchi 200s; four Heinkel 126s. Besides this, nineteen more enemy planes were hit. The group's losses were twenty Airacobras.

Altogether, forty members of the air crews and forty-six members of the ground crews of this group have been awarded orders of the Soviet Union.

Such are the deeds and such are the men of this aircraft group—men who know no mercy for the foe. Into each battle flight, into each fight with the Nazis, these men carry their unquenchable hatred, their deep faith in the triumph of our righteous cause and in the inevitable defeat of Nazi Germany.

I've Built Every Lockheed

(Continued from page 42)

white pine; in some instances, where resistance to warping is necessary, as in the models for production illustration work, mahogany is more suitable; and small removable parts such as rudders, elevators, and ailerons as well as the extremely thin trailing edges, are best made of maple. However, pine or basswood is unbeatable for most display models. Keep that pine model out of the sun, though, or the pitch will raise and spoil the finish.

Quite normal construction methods are used—carving is done mainly with block planes, draw knives and spoke shaves, chisels, and gouges. Most important is a good carving knife. The part to be shaped is first hand sawed to outline shape, then screwed to a block, which is in turn held in a vise or fastened to the workbench. This greatly facilitates carving, provided the screw heads are countersunk deeply to obviate nicks in tool blades. Half cross-section templates are used to obtain the proper contours in the following manner: lay out the center line around the blanked-out part; also a locating mark for each template to be used. Then with gouge and rat-tail file, set in each template by the cut-and-try method, using blue chalk on the template to indicate high spots, till the template meets the center line. Rough carve to indicated cross sections, finish with sanding blocks. A spline and blue chalk will show up the high spots longitudinally. Any part to be hollowed, as for a cockpit of cabin, is blanked out in halves, spot glued together, carved on the outside, split apart and gouged to required wall thickness by feel or the template method again.

Finished parts are assembled in jigs wherever possible—casein or hot glue, and screws, will give you a pretty permanent joint. Locating and alignment jigs are extremely helpful in fitting for assembly such parts as nacelles to wing, wing and tail to fuselage, landing gears, et cetera.

Wood sealer should be applied to the bare wood, followed by six or eight spray coats of lacquer primer and surfacer, sanding every couple

coats. The last coat should be sanded with #100 Wetordry paper and water or gasoline, thus providing a good base for the finish color coats, from two to four of which should suffice. Final polish is obtained with rubbing compound—then a wax job.

Lettering and insignia, to be well done, require practice and the proper materials. Fine brushes, a crow-quill pen for the extremely minute work, and stripping enamel, which dries very slowly (plenty of time to rub out mistakes and start over again) will do just about any job well. The work to be done can be laid out on the model with a soft #1 pencil, then brushed or panned by hand; but wherever possible, such as on a long straight stripe, scotch cellulose tape should be used.

Reproducing in miniature the molded transparent plastic parts such as bomber noses, turrets and cockpit inclosures has always been a bit of a problem. The method we use is simple but requires a little time and tooling—justified by the results obtained. Sheet cellulose acetate, about one thirty-second of an inch thick for models built to the three-eighths-inch-to-the-foot scale, is formed in a hot-oil bath, at about 275 degrees F., in hardwood or lead dies. You will find a generously sized sheet, several times larger than the part to be formed, is necessary, to allow for plenty of stretch and creep between the dies. (This process is not recommended for the average model builder.—The Editor.)

Different types of aircraft models require varying techniques. For a simple example, in the case of a parasol, such as the Lockheed "Air Express," the wing must be completely finished and painted before being attached to the completed fuselage and center section strut structure. Practically every model presents specific new problems—ample opportunities for the model builder to call his ingenuity into play. And the development of that skill and ingenuity is, after all, one of the greatest benefits acquired from a very fine hobby.

"Without My C-D Model Experience, I Would Be Lost"

writes R. B. S., Naval Air Station, Jacksonville, Florida

Read What He Says: "I am learning to be an Aviation Machinist's Mate, and Aircraft Recognition is a vital part of our Course here. Without my pre-war experience with C-D models I would be lost in this class. It has given me an edge on my classmates, and as I intend to be a Naval Air Gunner, it is twice as important, as my life and the lives of my shipmates will depend on it. We have a Model Builders Club here at the NAS, so I would like the Brewster 'Buffalo' Kit."

Big 3-Foot Wingspan WARPLANE SERIES

- Kit T74: Messerschmitt ME-109
- Kit T-76: Bell "Airacobra"
- Kit T77: Curtiss P-40 "Warhawk" (shown)
- Kit T78: Hawker "Hurricane"
- Kit T85: Lockheed P-38 "Lightning"
- Kit T91: P-51 "Mustang"

Each Kit, only \$1.50

Gramman "SKYROCKET"
Navy's "Terror of the Skies." Reputed 450 m.p.h. speed. Span 31 1/2". C-D Master Kit SF-75 \$3.50

Curtiss "HELL-DIVER"
Navy scout bomber, also dive bomber. Span, 25 1/2". C-D Master Kit SF-80..... \$3.50

Gramman F4F "WILDCAT"
An excellent U. S. Navy Shipboard and Marine fighter. Lives up to its name. Very maneuverable. Has a speed of 325 m. p. h. Span is 26 1/2". C-D Master Kit SF-83 \$3.00

British "SPITFIRE"
Pride of the RAF. Fast, maneuverable and deadly interceptor-fighter. Span is 27 1/2". C-D Master Kit SF-73... \$3.00

Curtiss P-40
Making history everywhere it takes to the air. Span 28 1/2". C-D Master Kit SF-77 \$3.00

MESSERSCHMITT ME-109
Germany's mass production fighter. In action wherever Nazis are fighting. Span, 24 1/2". C-D Master Kit SF-74..... \$3.00

BELL "AIRACOBRA"
The swift flying "Peanut Special" that's doing great work in the Solomons and England. Span 25 1/2". C-D Master Kit SF-76 \$3.00

ORDERING INSTRUCTIONS:

See your dealer first. If he can't supply you, send check or m.o. (cash at own risk). No C.O.D.'s. Postal restrictions now prohibit shipment outside U. S. except to Canada and Mexico (to which 10% must be added). For service men still stationed in U. S.: restrictions prevent shipments to A. P. O. or Fleet P. O. box numbers—so use a local nearby address if possible. Special Delivery 25c extra (U. S. only). Ohio residents add 3% sales tax.

Cleveland Model & Supply Company

World's Largest Makers of Quality Model Aircraft—Since 1919
4508C61 Lorain Ave. ★ ★ Cleveland, Ohio, U. S. A.



Catalog No. 40
5c (none free)

Vought Sikorsky "CORSAIR"
A Navy fighter in the 500 m.p.h. class. Span 30 1/2". C-D Master Kit SF-78 \$3.50

Hawker "HURRICANE"
Build the famous "Hero" plane of the "Battle of Britain." Span 30". C-D Master Kit SF-78 \$3.00

BIGGEST \$1.00 PLANE IN U.S.



New Super CONDOR Soarer
You can't get a better design for learning principles of advanced soaring flight. Easier to build than ever. Hours for hours. Kit VE-5019 \$1.00

BIGGEST 50c PLANE IN U.S.



Redesignated EAGLET GLIDER
Unusually good model of a secondary type glider. Patterned after "Baby" Bousin. Easily made. Big 4 ft. span. Kit VE-5018 50c

Lockheed "HUDSON" Bomber

Used with terrific effect on the Japs in the Solomons. Used for bombing, fighting and reconnaissance. Called "Old Boomerang" by British, for it usually comes back. Big "49 1/2" span. C-D Master Kit SF-95..... \$7.50

"Cleveland Models Win More Prizes, More Honors, More Compliments Than Any Other Line of Models in the World."

Lockheed P-38 "LIGHTNING"

"Fastest thing on wings." A perfect interceptor for bombers because of its high ceiling and terrific diving power. Span 31 1/2". C-D Master Kit SF-35 \$4.00

Republic P-47 "THUNDERBOLT"

The "Flying Battleship" with tremendous fire power. A speed of over 425 m.p.h. and a 40,000 foot ceiling. One of our greatest fighters. Span is 30 1/2". C-D Master Kit SF-81..... \$4.00

Nazi Ju-87B "STUKA"

The dive bomber used so widely by the Nazi Germans all over Europe, at Crete and now in Africa. Span, 30 1/2". C-D "Master" Kit SF-84... \$3.50

Doeg. SBD "DAUNTLESS"
World's hardest hitting dive bomber. Span 30". C-D Master Kit SF-89 \$3.50

Brewster "BUFFALO"
Highly maneuverable. Climbs 4,000 ft. per minute. Speeds around 350 m.p.h. Also used by British and Dutch. Former nick named it "Peanut Special." Span 26 1/2". C-D Master Kit SF-87..... \$3.00



North American "MUSTANGS" Skimming Close to the Ground in a "Rhubarb Flight"

In attacking Nazi-controlled objectives in France and the Netherlands, "Mustangs" have sprung many surprise attacks, due to their ability to hug the ground, so low at times that their propellers cut swaths through the rhubarb fields. The Mustang

(P-51) was designed for perfect control on ground-hugging flights. A tough, vicious fighter with a speed of 350 m.p.h. Span 27 1/2". C-D Master Kit SF-91..... \$3.00

★ ★ ★ ★ ★ CLEVELAND MODELS ★ ★ ★ ★ ★

When You Build

You're Building Models

that Pilots, Bombardiers, Instructors, Cadets-in-Training and Mechanics of all classes in the Air Forces Build

(Continued from page 28)

Complete Realism and Detail

THESE TWO C-Z FIGHTERS

A NEW TECHNIQUE . . . MORE FUN . . . NEW MATERIAL



Actual photo of Model Curtiss P-40F

Actual photo of Model Republic Thunderbolt

Pictured here are just two of the new series of scale jobs designed by C-Z. This new material and startling realism has caused a sensation in scale model building circles . . . all the detail to satisfy the most critical along these lines and due to C-Z's expert designing these jobs are simpler than ever to construct . . . all hollow construction, ribs, formers, etc. and yet a tougher finished job than solid balsa. No paint is necessary because the authentic color is right on the new material and all parts are clearly printed for quick and accurate assembly. Each detail is numbered and full size plans make it easy to follow and fun to complete. Your dealer should have the new series in stock right now. Watch the list grow. If by chance he is not yet supplied send direct to us and send 15c for postage and packing.

- 2 Navy Planes Grumman Avenger .85c
Curtiss Hell Diver .75c
2 Army Planes Curtiss P-40-F .50c
Republic Thunderbolt .50c

STILL AVAILABLE. Many of these C-Z dealers still have on hand the original C-Z metal covered scale model kits. If you are lucky and if you hurry you can still build one of these famous kits . . . the last you will get for the duration.

C-Z Model Airplane Co. Dept. AT, 5056 Archer Ave. CHICAGO, ILLINOIS

SKYWAY Model Airplane Supply Co. advertisement featuring Balsa, Metal, and Rubber products, along with a 'Photo Credit List' and 'Photo Credit List'.

entity striking at the enemy in co-operation with the army. "Today, because of that lesson, Britain . . . can look to a striking force in the air unshackled and untrammelled by parochialism and preconceived ideas, free from glib phrases like 'air support' and 'fighter assistance'—an air force which commands the air."

This statement by Sir Arthur Tedder, who now is in London as vice chief of the air staff, reflects British foresight in setting up the A. T. C. two years ago to do something tangible for youth preliminary to entering the air forces.

For a long time I have been convinced that this nation must take vigorous action to supply our youth, both boys and girls, with the fullest information and facilities, not only for "aero-conditioning," so called, but to insure for the future an adequate group of well-grounded personnel for the air services and for air transportation in general.

Since coming to Congress, I have made many speeches and statements on aviation in the House of Representatives. These remarks are in the Congressional Record. But sometimes I wonder if it is possible to put through Congress any bill providing for aviation education on a national basis. Those bills on this subject which have been presented since the Second Session of the 73rd Congress in 1934 have all died in committee, except one which passed the Senate but did not reach the floor of the House.

On October 21, 1941, however, by direction of the House of Representatives' Committee on the District of Columbia, of which I am chairman, I called up on the floor of the House, H. R. 5478, a bill "to provide aviation education in the senior high schools of the District of Columbia and other purposes," for though general national legislation might be impossible, it was thought that a start could be made by securing legislation for aviation courses at Washington, D. C., the seat of our government. This bill passed the House unanimously and later the Senate, on December 9, 1941. It is now Public Law 348—Second Session—76th Congress.

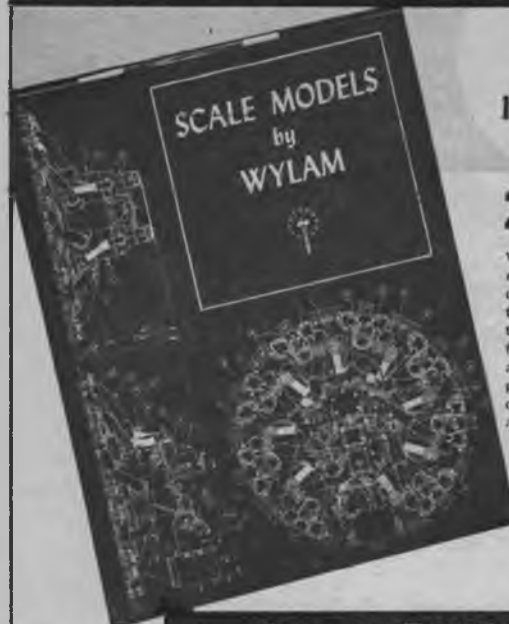
The act provides funds for instructors, textbooks, maps, and other necessary educational supplies for conducting credit-giving courses in the Washington, D. C., senior high schools, and allows the school board to set up such educational courses in aeronautics as are deemed desirable. This Act of Congress gave aviation education in high schools a good start. So far as I know, the schools of Washington, D. C., represent the first in the United States to have aeronautical subjects taught, according to law. There is no doubt that the significant action by Congress has done much to create interest in other sections of the country in making courses in aviation a recognized part of high-school programs.

Then came some other detailed questions to answer, such as how long the courses of study should be, what subjects should be taught, how they should be taught, what textbooks could and should be purchased and, last but not least, where to secure teachers. In order to settle the most important of these questions, Dr. Chester W. Holmes, assistant superintendent of D. C. schools, requested the U. S. Office of Education to call a conference of individuals from various sections of the country. For two days the group talked back and forth until conclusions were reached as to what would be the best policies and the most satisfactory solutions to setting up an aviation education program. Had it been merely to provide ground-school training for those contemplating flight, the school board would have been required but to adopt the Civil Pilot Training course of study and employ Civil Aeronautics Administration licensed instructors. Since, however, the aims of the program were decided as—1. to acquaint high-school students with an overall picture of aviation; 2. to offer pre-induction information in aviation as a basis for the air forces, the course of study could not be limited to ground-school work nor the instructors circumscribed by merely meeting the requirements of the Civil Aeronautics Administration.

Following the major conference carried out under the direction of the Office of Education, in which the most important objectives took form, the aviation teachers and two supervisors met from week to week to discuss with Dr. Robert W. Hambrook, long-time aviation specialist of the Office of Education, progress achieved and suggested procedures. By the end of the school year there had been developed a well-rounded aviation course meeting the objectives and requirements decided upon earlier. Now that aviation education is a reality in the District of Columbia school system (and the Federal Act on which the program is based has proven sound), I hope it proves a springboard for nation-wide high-school aviation education.

Photo Credit List

- The following list shows the sources from which credited photos were obtained: Abbreviations: Top—T, Center—C, Bottom—B, Left—L, Right—R. Page 15—L, Bell Aircraft. Page 16-17—Sovfoto. Page 18—H, British Combine. Page 19-24—A. W. Roone. Page 25—C. L. D. Napier & Son, Ltd. Page 27—British Combine. Page 28—C. L. U. S. Office of Education; R. W. Va. Works Project Administration. Page 29—Lackhead. Page 30—T. H. Harold Kulk. Page 42-43—Lackhead. Cover photo—T. S. navy



Ready for IMMEDIATE DELIVERY This ONE Volume Contains ALL The Plans Of W. A. WYLAM World's Foremost Model Draftsman 25 PLANES and 3 ENGINES

WYLAM'S Plans are established as the finest of their kind in the model building and publishing field! They contain every detail—drawn to precise scale!—as in the original plan! Every characteristic incorporated! Clean, sharp lines—clear dimensions and lettering, easy to follow! You can't help but build better working from a 'WYLAM' plan! This single volume contains all the 3 view and plan layout drawings by this scale-model artist! Page after page of planes reproduced as only this master craftsman can! A distinguished collection—a rich treasure for individual or club at an amazingly low price!



'DRAWN BY WYLAM!'

is widely recognized as a trademark of excellence. Publishers of foremost model aviation publications eagerly seek the plans of this master craftsman!

\$1.50
POST PAID

DATA & TEXT INSTRUCTIONS CYCLONE, WHIRLWING, TWIN WASP, JR.

This 'all-in-one' volume features 14 detailed 3 views and 7 layout plans of 21 famous planes, representative of foremost in each class: From Fokker D-16, Winnie Mae (Wiley Post's round-the-world pioneer!) up to present day spectacular performers such as U. S. NAVY'S Grumman F3F-2, English

Supermarine Spitfire, Germany's Messerschmitt, Douglas O-46A, Hawk 111-C and Grumman F3F-1. In addition, precision plans with detailed text instructions for constructing miniatures of the three famous engines listed above. The ONLY book of plans containing all this rich material!

Authentic BOOKS to help you Build BETTER MODELS

MODEL AIRPLANE DESIGN BY C. H. GRANT

Editor, Model Airplane News
Major 'Al' Williams said: "I know it will richly serve through the years in guiding and training the air-minded youth of our country!"



AERODYNAMICS For Model Builders IN NON TECHNICAL LANGUAGE

This book is a personalized, RAPID ADVANCE COURSE in aerodynamics, the principles of which govern ALL flight! Written in easy-to-understand, non-technical language by one of America's best known modellers! It's a real help in preparing yourself to become a proud, prize-winning modeller!

\$3.00

OVER 259 PAGES—300 ILLUSTRATIONS

24 fascinating chapters: Covers every subject in this field! Drag of Bodies in Motion; Lift of Wing Forces; Airfoil Characteristics; Calculation of Lift & Drag Forces; Aerodynamics of Prop; Balancing a Model for Flight; Calculating Center of Gravity; Nomenclature of Aeronautics and 15 other profusely illustrated chapters. Zier's complete book is the modeller's complete theoretic ground course!



SHIP MODELS ILLUSTRATED

The best 'picture-book' ship model ever published! An assembly of best group of photos, sketches and drawings ever organized! Real Ships; Ship Models; Masts, Rigging and Deck Gear, 60 full color pages, 430 detailed drawings. Many features including nautical glossary.

\$2.00

SHIP MODELS Not just another model construction guide. Step by step instructions for 'kit-model' building. 12 Complete working plans, rated one of the best books of its kind 7 1/2" x 10" pages. \$6.00

"IRON HORSES," by E. P. Alexander

For the first time, a detailed, explanatory book on 'old locomotives' in representative collection of authentic prints and lithographs with case histories. 98 plates including a double-page in full color! This is really a splendid addition for collectors of 'Americana' as well as railroad enthusiast.

\$5.00



MODEL RAILROADS

Standard, comprehensive work on scale-model railroading. Covers every phase of this fascinating hobby: Planning the system, Construction of Layout, Scenic Backgrounds, Rolling Stock, Operation (Passenger and Freight), Signals, etc. The author is considered the outstanding MODEL TRAIN personality in the country and he writes in a most interesting manner! This standard guide, profusely illustrated!

\$4.00

LATEST SHIP MODEL AND RAILROAD CATALOGS

POLK'S SHIPYARD: 128 page, illustrated building guide and catalog for ship modellers. 25c (Coin or stamps). POLK'S HO-00 TRAINS for scale railroaders. 128 pages, fully illustrated. 25c (Each contains 25c cash value coupon). Be sure to specify which catalog you desire!

BASIC TRAINING FOR AN AVIATION CAREER

The new, revised 2nd edition! Presents a thorough training in the basic rules governing all flight, both model and large planes—the required 1st step in an aviation career! Schools, libraries, men in Army & Navy air force, aviation industrial plants are using MODEL AIRPLANE DESIGN as a handbook and reference volume! It teaches how to design your plane scientifically—correctly! Explains how to (1) Prevent Spiral Dives (2) Make planes fly straight (3) Prevent Stalls (4) Prop size to use (5) How to calculate blade area (6) What makes gas engines run and a hundred other every-day questions! 528 pages, 205 diagrams and plans.

\$3.75

BUILDING MODEL WAR PLANES FOR ARMY and NAVY

OFFICIAL PLANS for 60 Army-Navy Planes
PACKET OF TEMPLATES

BOOK OF 60 1/72" SCALE MODELS and PACKET OF BUILDING TEMPLATES (Each can be purchased separately!)

\$3.75

At last! A comprehensive, detailed instruction guide for the construction of accurate scale models for Army & Navy identification use. More than 60 models—United Nations and enemy types—are included. Official scaled plan (1/72") and clear photographs of the original planes to speed the modeller's completion for acceptance! Aviation glossary and identification data. This volume of plans (if purchased separately) \$2.50. PACKET OF TEMPLATES which simplifies and speeds the construction of the models described in the book, if purchased separately, \$1.50.

POLK'S Model Craft HOBBIES

"The Nation's Leading Hobby House"

[DEPT. BT-7] 429 7th Ave., New York, N. Y.

SPECIAL OFFER! 200 Autographed COPIES



'Bill' WINTER Editor 'AIR TRAILS PICTORIAL' WAR PLANES OF ALL NATIONS

"War planes of all nations" by William Winter, Ed., Air Trails. Full specifications, a photo, plus a three view plan on every important warplane of U. S., England, USSR, France, Holland, Germany, Italy, Japan. 215 illustrations, 452 pages. A big encyclopedia of warplanes \$3.00 right up to the minute.

\$3.00

MODEL CRAFT Handbook

The 3rd edition of this sensationally successful handbook contains helpful suggestions showing HOW TO GET AROUND MATERIAL SHORTAGES, SUBSTITUTES FOR BALSA, RUBBER, etc. The author tells all you need know to design, build and fly a model airplane! Tells it in simple, interesting manner so that novice can understand! Over 300 pages and more than 100 illustrations.

\$2.00

Complete Model Aircraft Manual by HAMILTON

Revised-to-date, 570 pages of the most interesting and helpful instructional guidance in model aircraft work. Covers every type of model aircraft: gliders, stick models, solids, and flying scales. 77 full page photographs, 85 working plans with 'airplane alphabet' showing position and name of each part in a model plane. 10 pages showing 120 insignia types.

\$3.50

FLYING MODELS and TOM'S BOOK

Compact, comprehensive description of building methods and short cuts. 30c: TOM'S BOOK, a simplified guide for model-building and flying. Includes construction and assembly hints. 116c. 15c

POLK'S MODEL CRAFT HOBBIES, 429 7th Ave., N. Y. (BT-7)

- Please send the book(s) checked below. I enclose
- Check Money-Order Cash
- for amount of the order. (NO C.O.D. for duration.)
- WYLAM'S PLAN BOOK \$1.50
 - BUILDING WAR PLANES 2.50
 - ZIER'S AERODYNAMICS 3.00
 - HAMILTON'S AIRCRAFT 3.50
 - IRON HORSES 'Trains' 5.00
 - FLYING MODELS .25
 - MODEL AIRPLANE DESIGN \$3.75
 - WAR PLANES TEMPLATES 1.25
 - WINTER'S WAR PLANES 3.00
 - WINTER'S MODEL HANDBOOK 2.00
 - MODEL RAILROADS 4.00
 - TOM'S BOOK .15

NAME _____

ADDRESS _____

CITY _____ STATE _____ BT-7

Send check or money order for books desired! WE PAY DELIVERY CHARGES! (Cash at own risk unless registered.) No C.O.D.'s!

TWO INSTRUCTION MANUALS FOR BUILDERS OF FLYING MODELS

TOM'S BOOK OF FLYING MODELS

AT YOUR DEALER **10c** 15c POSTPAID

FLYING MODELS HOW TO BUILD THEM

AT YOUR DEALER **25c** 35c POSTPAID

MOST GUILLOW FLYING MODEL KITS HAVE FULL SIZE PLANS, FULL SIZE TISSUE PATTERNS AND COMPLETE INSTRUCTIONS FOR BUILDING THE FRAMES, COVERING THE FRAMES AND ASSEMBLING THE MODEL.

PAUL K. GUILLOW • WAKEFIELD, MASS.

WHY NOT BUILD THEM RIGHT?

As Light as **BALSA** and **Twice** as **Strong!**

Build Them Lighter and **STRONGER** with

PAULOWNIA WING RIBS

Ready Made Ribs for Gas and Other Models; Build Complete Wings Perfectly Tapered as to Both Chord and Thickness. Fill a long-felt need, save endless time. Precision construction guarantees a smooth, unbroken wing surface. Cut out center section to reduce weight. Graduated sizes as listed below.

CLARK "V" OR GOETTINGER Per Set of 10 Ribs of 1 Size		TAPERED WING RIBS SETS OF 27 RIBS	
Size	Price	Size	Price
3 1/2"	10c	9"	30c
4"	11c	10"	40c
4 1/2"	12c	11"	45c
5"	13c	12"	50c
5 1/2"	14c	13"	55c
6"	15c	14"	60c
6 1/2"	16c	15"	65c
7"	17c	16"	70c
7 1/2"	18c	17"	75c
8"	19c	18"	80c
8 1/2"	20c	19"	85c
9"	21c	20"	90c
9 1/2"	22c	21"	95c
10"	23c	22"	1.00
10 1/2"	24c	23"	1.05
11"	25c	24"	1.10
11 1/2"	26c	25"	1.15
12"	27c		

RIBS-BY-MAIL
Add 5c to Each Order to cover Packing and Postage.

NOW! Another Selection of SPECIALTIES!

NUTS IN-TECHNICOLOR

The popular "PEN-RO" Spinner which does double duty on your flying model! Enhances the modern, streamlined appearance of your plane with its color (choice of many!) and acts as shock absorber in "nose" landings.

20c

HOO-K-UP WIRE 20 ft. 50c

Oil, Gas & Fireproof, each 15c

FUNNELS, 2 sizes, 10c & 15c

HAND MADE CHERRYWOOD PROP

The famous "G-B" prop with 'much copied but never equalled' section. 8" 20c; 10" and 11", ea. **25c**

HILLCREST TIMERS \$1.25

HILLCREST Medium Battery Box 45c

HILLCREST Pen Lite Bat. Box 45c

HILLCREST DETHERMALIZER 75c

BOOSTER Connector Unit, with wire, 45c

MAIL ORDER FOR \$1.00 or more, accompanied by cash, check or money-order (plus postage) promptly filled. NO C. O. D.

W.P.B. Said "OK"

BALSA SOLIDS

ARMY-NAVY — 1/4" SCALE PLANES
EACH KIT CONTAINS A **DIE CAST CHROME** **3 BLADE PROP 50c**

The WAR PRODUCTION BOARD has authorized the use of certain BALSA WOODS for model airplane construction. Here is a complete selection of famous ARMY-NAVY models, in that good-old, easy-to-work with wood: ARMY: Curtiss P-40-F, North American Mustang, Republic Thunderbolt. NAVY: Grumman Wildcat or Avenger. BRITISH: Supermarine Spitfire. **Package 5**, each kit is partially finished & carved. Sealed, die cast chromed prop in each! Be sure to state model desired!

INTERNATIONAL Models 254 WEST 55th ST. (AT-7) NEW YORK, N. Y.

The Fortress

(Continued from page 35)

lines are drawn on all sides for reference points when using the templates. To obtain the correct cross section, templates are cut from cardboard; these are used frequently as the sides are rounded. Best tool for removing the excess wood is a small, sharp block plane, although a sharp pen-knife will prove satisfactory. A small rasp and rough sandpaper will prove valuable in removing the bumps and roughness. Once the body is reduced to exact cross section, finish with fine sandpaper to produce a smooth surface.

Stabilizer and rudder are made next. Because of the huge size of the rudder, it is best to make it in two parts—the grain of the forward section being parallel to the fuselage and the rear section being vertical. The tapered inclosure for the "stinger" gunners head is made separate from the rudder. Cut the tail surfaces to outline shape and then taper the thickness as shown by the broken lines. Roughly shave the tail surfaces to streamline cross section, using a small block plane. Finish with rough and then finer grades of sandpaper. Shape the gunner's inclosure from a small piece of pine and cement it to the rudder.

A soft, straight-grained piece of sugar pine is needed for the wing. It is easiest to make the entire wing in one piece, although it can be worked in two sections, as it will be necessary to cut it later for dihedral. Mark the amount of taper on the front edge of the wing wood and then use a draw knife or plane to shave away the excess. Using a template, draw the wing's plan view and then saw to shape. Next, by using the plane or draw knife, the airfoil section is shaped. For accuracy, check frequently with the templates. Once the wing is roughly shaped, it is thoroughly worked over with rough and then finer grades of sandpaper. Cut the wing in the center, if it was made in one piece; bevel the edges carefully and recement with 15/16" dihedral at each tip.

Form the four engine nacelles by sawing out the blanks and completing in the same manner as the fuselage by using templates to assure the correct cross section. Cement each motor unit to its correct position on the wing, carefully checking for proper alignment.

The first task in assembling the various parts is to remove the section of fuselage where the wing fits in. Make some trial fits to assure a neat junction before cementing the wing fast. Next cut away as much of the fuselage bottom as necessary to make the part fit exactly to the wing and fuselage. The manner of attaching the stabilizer is the same except that the fuselage has not been cut to receive it, so this will have to be done at this time. Align the stabilizer with the wing, fit the fuselage part to place and then cement the rudder fast. To make the engine nacelles flow into the wings, the wings and tail surface to the fuselage, et cetera, make a mixture of fine sawdust and

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, Boasting, 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 Defense 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. H556, Draxel at 58 St., Chicago, Ill.

American Technical Society, Dept. H556
Ventennial Publishers since 1888
Draxel 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 owe you nothing, but if I decide to keep them I will send \$2.00 after ten days, then only \$1.00 a month until \$18.00, 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.

ELECTRICITY Learn at Home

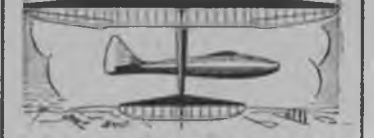
Prepare for War Work, Big Future, with New...
AMAZING 3 VOLUME ELECTRICAL ENCYCLOPEDIA
FREE 7 DAY TRIAL
Includes Radio, Electronics as well as motors, generators, and other electrical equipment. Based on 44 years of experience.

FREE WITH SET!
Big extra book of 150 Coyne Shop hints, wiring diagrams, tests, book-etc. Also a FREE Consulting Service by mail from Coyne staff.

FREE TRIAL COUPON
Send me the low 7-day **FREE TRIAL** of **COYNE'S** Electrical Encyclopaedia and 150 hints book. I will pay the delivery charges only after receiving the books. If I return them, then I will pay \$1.00 and then \$2 a month until the total price of \$12.00 is paid.

NAME.....
ADDRESS.....
CITY..... STATE.....
SAVE 10% Send cash price \$12.00 with order if preferred.

"Thermic 50"



With soaring weather on its way, better get ready by building this outstanding glider of the year. A pleasure to build, Topped Blaine (rust colored) and Diamond construction. The problem solved. Flights to tingie your spine.

Price \$1.00 By Mail Add 15c

Kit includes cement. Add 35c for 2 oz. of clear dope, red trim dope, sealing tape and balance clay. Plans alone 50c. P.P.

JASCO's famous all balsa gliders,

"Thermic 10" (20c plus 5c P.P.) and "Thermic 20" (35c plus 10c P.P.) now again available. These kits are subject to cancellation without notice because of low stock. Plans require a tremendous amount of work before it is usable, is very often placed on the restriction list. No order promptly.

1943 JASCO PRICE LIST
Lists basic supplies. Yours for the asking.

JUNIOR AERONAUTICAL SUPPLY CO.
263 East 15th Street New York City

regular model cement and apply it freely to all junctions. This, when carefully sanded down, will make a very neat job; if necessary, apply this material several times to build up the fillet as required.

Some builders will want their model to be set on the extended undercarriage while others will prefer the wheels in the retracted position and the model mounted on a pedestal; either way the plane looks swell. To duplicate the landing gear on the original model study the plans and it will be noted that the gear simply consists of several rounded struts. The model pictured has wire axles for the wheels; these axles are concealed within the large rear struts which were split and notched to receive the wire. Drill holes of the proper diameter through the nacelle and into the wing and simply slip the strut into place—of course, care should be exercised to drill the holes at the correct angles. The small forward struts are white pine dowels or rounded splints of bamboo. Cement the whole landing gear assembly securely. Wheels likewise are cut from white pine. Saw them round and then use a razor blade and sandpaper to finish the job.

For a "wheels up" job two half wheels are needed and they are cemented to the bottom of the inner nacelles. Details of the pedestal for such a model are left to the builder.

Without a doubt the most important single item for any fine exhibition model is the finish, so extreme care should be exercised at this stage of construction. First work over the entire model with fine-grade sandpaper removing every flaw. Then apply several coats of filler with light sanding between each coat; clear dope or shellac is suitable for this. Camouflage dope available at many model supply shops is the best finish the author has found, since it works as well as the familiar model dope yet dries with a dull, smooth finish. Different color combinations are used, depending on where the planes are used, but the model builder cannot go wrong by using the familiar olive-drab top and gray bottom of many of the army ships. Apply numerous thinned coats of the color rather than one or two thick applications for the best job. Lightly sand the paint with the finest grade paper on all but the last coat. Masking tape will make easy the job of keeping the color line neat.

The other more minor details are added next. Dummy turrets are shaped from small pieces of pine. They should be painted before being cemented fast. Windows in the fuselage and turrets may be painted silver or black. Before applying any color, mask the various outlines with scotch tape; tape should be pulled off just before the paint has hardened. Numerous details found on pictures of the real plane such as the wheel wells, deicers, motor fronts, et cetera, are effectively represented by black paint or dope. Such items as guns, tail wheel, antenna, et cetera, are made from scraps of wood and wire. Control surface outlines are represented by india ink lines applied with a ruling pen. The regulation stars and U. S. ARMY are painted on or



Old friends in new dress and name. Individually, these model-aircraft names represent the top in dollar-for-dollar value! Collectively (now all are consolidated in one modern plant) added efficiencies and economies make it possible to maintain the quality you know and want at the same low prices—despite market advances! Whether you use the former name—or the new—it's the same G.L.D. friend-making kit!



CONSOLIDATED

New-DE LUXE KITS

Grumman No. Amer. Grumman Republic Focke-Wulf Vought
Avenger Mustang Wildcat Thunderbolt FW190 Corsair

TO MAKE BEAUTIFUL "LIFETIME" MODELS!
FULLY Carved FUSELAGE



GIANT SIZE—UP TO

22 1/2 INCH WINGSPAN

All Ready for SANDING!
SAVES YOU 4 to 6 hours WORK!

FULL SIZE PHOTOGRAPHIC PLANS in each kit!

CHOICE OF 23 POPULAR AIRPLANES \$2.50 EACH For most models in DE LUXE KITS!

Modern FIGHTERS—BOMBERS		Standard	DeLuxe
★ Grumman "AVENGER"	20 1/2"	\$2.00	\$3.00
★ N. American "MUSTANG"	17"	\$2.00	\$2.50
★ Grumman "WILDCAT"	16"	\$2.00	\$2.50
★ Republic "THUNDERBOLT"	16"	\$2.00	\$2.50
★ Focke-Wulf "FW190"	18"	\$2.00	\$2.50
★ Vought S. "CORSAIR"	19 1/2"	\$2.00	\$3.00
WESTLAND "WHIRLWIND" 22 1/2" \$2.00 \$3.00 (Complete with Carved Fuselage & Nacelles)			
LOCKHEED "P-38" LIGHTNING 20" 2.00 3.00 (Complete with Carved Wings and Fuselage)			
★ STUKA "DIVE BOMBER"	22 1/2"	2.00	3.00
★ LOCKHEED-MOODON	19 1/2"	1.50	2.50
★ MESSERSCHMITT "ME109"	18"	1.50	2.50
★ CURTIS "HAWK"	18"	1.50	2.50
★ SUPERMARINE "SPITFIRE"	18"	1.50	2.50
★ BOULTON PAUL "DEFIANT"	20"	1.50	2.50
★ NORTH AMERICAN "OTIA"	20"	1.50	2.50
★ HAWKER "HURRICANE"	17 1/2"	1.50	2.50
★ GROMMAN FIGHTER "F4U"	15"	1.50	2.50
★ GLOSTER "SAUNTLET"	17 1/2"	1.50	2.50
★ BREWSTER "BERMUDA"	17 1/2"	1.50	2.50
★ RYAN "STB-2"	17"	1.50	2.50
For Carved Floats for Ryan, add \$1.00.			
★ CURTIS "P40"	19 1/2"	1.50	2.50
★ BELL "AIRACOBRA P.39"	17"	1.50	2.50

Can Easily Be Converted Into "Movable-Control" MODEL

Airmen (in U. S. Aviation) as well as civilian modellers join as one in singing the praises of these magnificent kits! They're "ENGINEERED"—precision production methods and care for details makes them the outstanding solids today! We take particular pains in their making, to make sure they will make you a friend and booster! BUILD A CONSOLIDATED—YOU WILL BE PROUD OF THE RESULTS!

Each kit contains cut-to-outline shape fuselage, wings (tapered leading and trailing edges where necessary), nacelles, stabilizers and rudder. Material to make propeller, wheel gears where required, Turned wheels; Insignia, Cement, base paint, celluloid and felt paper for cockpit enclosure. Aluminum rivets where specified on plans. FOR CONVERSION INTO "MOVABLE CONTROL" MODEL, you need merely hinge rudder and stabilizers at hinge lines!

BAY RIDGE PACER 'C' The Nationals Champion

Gas Model time is PACER FLYING SEASON! PACER—the reigning Nationals Champion! 'C' is a 60" span gas flier (B or C) and is 45" long. 4 sq. ft. area. Kit is complete (except engine).

Nothing else to buy and the price is exactly the same as last year — no increase!

\$4.95



PACER 'B' The original model, from which 'C' was developed. 55" span, 37 1/2" length, 432 sq. in. area, \$3.95. DIAMOND DEMON has "A" and "B" flight. 44" span, \$1.49. TOPPER 'A' Skyscraper wings for 'A' or small 'B' engines, streamline wheels included. \$3.50. MIKE, 1st small plane in gas model history. Originally \$4.95 when introduced. Quantity production has made it possible to retail for \$1.49.

ACCESSORY KIT

Includes FOIL, COLORS, CEMENT, INSIGNIAS **\$1.00**

The original Accessory and Camouflage Kit! Perfect for doing either of these realistic jobs, in a jiffy! Everything needed is in the kit: Contains felt paper (for covering to simulate metal finish), brush, insigalia, colors, cement, sandpaper, detailed instructions and camouflage tips as well as the stylus for reconstructing the rivet detail. (By mail: Add 15c to cover packing, post-see, etc.)

36 PAGE ILLUS. CATALOG

LOTS of HELPFUL BUILDING DATA

Complete, convenient-pocket size, profusely illustrated with lots of authentic, model-making tips. FREE in each kit, by itself, 3c coin or stamp.

CONSOLIDATED MODEL ENGINEERING CO.

(DEPT. AT-7) 3079 Third Ave., New York

Mail orders filled if accompanied by cash, check or money order INCLUDING postage. Sorry, No C.O.D.'s.

BOEING B-17 FLYING FORTRESS BOMBER



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

Set has all parts printed, four 2" finished motor fronts, four 4" carved props, celluloid wheels, set of paints, glue, and full size drawing. The most exclusive sensational bomber 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, 4" turned motor front, 3 on. grey dope, 1/2 oz. yellow, 2 oz. glue, etc. All parts printed, 10" propeller, wheels, rubber motor, full size drawing, and all parts. Set, postpaid. **\$3.75**

READY BUILT SOLID MODEL CURTISS P40F WARHAWK



14" Span. Length 11 1/2"
Ready Built Curtiss P40F Warhawk Model postpaid **\$17.00**

BELL P-39



U. S. Army Fighter set with paints, etc. Flying time. Postpaid. **\$3.50**

SEVERSKY P-35 ARMY PURSUIT



32" Span. Length 25". 1" Scale. Color, silver
Set has 4" turned motor front, 10" carved prop, balsa wheels, tall 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 postpaid. **\$3.25**

CURTISS F11C4 NAVY PURSUIT



32" Span. Length 25". 1" Scale
Finest equipped model in the world. Set has 3 1/2" scale celluloid motor, aluminum cowling, prop, down, alum. step plates and wing walk, insignia, rubber, complete set of four colored paints, full size drawings, wheels, and parts printed on balsa. Post. set, postpaid. **\$4.50**

CATALOG, 10c

MINIATURE AIRCRAFT CORP.

83 Low Terrace • Dept. A-7 • Staten Island, N. Y.

they may be obtained at a model shop in decal form. The four three-blade propellers may be assembled from scraps or they can be purchased. Propellers on the Fortress are colored dull black.

Pine's No Problem

(Continued from page 38)

deep rib at the joint to the trailing edge from crumbling, as would happen if that depth of balsa were used.

The necessity of keeping the wings light in order to maintain a low center of gravity is a favorite argument against pine. Weight-saving tricks that were hitherto unnecessary with balsa come into their own with harder woods. Fellows will say, "We can't cover the leading edge one third back on the top with pine." Maybe yes, maybe no. With 1/20" sheet pine available in at least 9" widths, our contention is that the size of the spar can be greatly reduced. 1/20" sheet pine is also considerably stronger than 1/16" or 3/32" balsa when curved to an airfoil contour. Since the top of the wing takes a compression load in flight, the sheet wood covering on top of the leading edge, when curved, acts as a beam. The lower surface, being in tension, need not have a spar of very large cross section—the tension load will tend to keep it straight. Thus in a wing of the "B Pacer" type the sheet covering feature can be retained and the spar reduced to 1/8" x 1/2" in pine. Ribs that were 1/16" balsa can be 1/20" sheet pine and capstripped with 1/20" x 1/8" strip pine. Ribs can also be lightened by punching holes in them with sharpened metal tubes of various sizes, or by cutting out the center, leaving 1/8" all around the contour and adding some pieces of 1/20" square as braces.

Leading and trailing-edge sizes can be cut in half as mentioned for stabilizers. The above wing construction will prove slightly heavy for Atom ships, but here we can use 1/20" x 1/8" stringers set edgewise in the leading edge instead of sheet covering. This has proven the most popular means of construction for small crates in the past.

As far as tools are concerned, despite popular conception, 1/20" and 1/16" sheet pine curved parts need not be cut out on a power saw. A razor blade works just as well as on balsa. For 1/8" sheet pine, it is advisable to use a jig saw, but the hand variety does not require any undue amount of elbow grease. A saw for cutting the 1/8" thick crutch members, longerons, or spars can be purchased in some hobby shops, or one can be made from a back-saw blade.

The author is building a B job of pine to prove to the skeptics that it need weigh no more than balsa. So far the fuselage has been finished, and it weighs exactly the same as the balsa one. Other standard designs that have been built in pine have picked up as little as an ounce and a half in the conversion, which proves that with a little thought and a will to do it, gas models can be built for the duration of the war, until balsa is again released to the model industry.



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 ★ ★

LEADING SUPPLY HOUSE—VALUE—QUALITY—QUANTITY

FREE choice of any one on orders of 1 dollar or over. (1) 2 plans, (2) 4 sheets AA tissue. **MINIMUM ORDER 50c.**

- Light weight victory pins—6 x 1/16" sizes, prices same as below.
- 1/16x1/16 30, 5c
- 1/16x1/8 12, 8c
- 3/32x3/32 15, 8c
- 3/32x1/8 19, 5c
- 3/16x3/16 15, 5c
- 3/16x1/8 14, 5c
- 1/32x1/8 14, 10c
- 1/16x1/8 14, 10c
- 3/32x1/8 14, 10c
- 3/32x1/4 2, 10c
- 3/32x1/2 7, 10c
- SKEETS 12"x2" 1/16 5, 10c
- 1/8 2, 10c
- 1/4 1, 5c

FREE POSTAGE Shipping Instructions: Add 15% packing on orders over \$1.00; under \$1.00 add 15c. No stamps, No C.O.D.

- DOWELS**
1/16x1/8 .5c doz.
1/16 dia. 3 ft. 10c
3/32 dia. 3 ft. 25c
1/8 dia. 5 ft. 35c
- TRUST BEARINGS, dz.**
1/16 dia. 10c
1/8 dia. 15c
- PURSUITS GUNS**
1/2" or 3/4" ea. 5c
1 1/2" or 1" ea. 20c
- WIRE**
8-8-10 2 ft. 1c
1/16 dia. 3 ft. 10c
3/32 dia. 3 ft. 25c
1/8 dia. 5 ft. 35c
- BRUSHES**
Small 5c, large 10c
Extra large 15c
- PROP SHAFTS**
12 for 15c
- REAR HOOKS**
Plain 8 to 11" 15c
Polished 15c
- CELLULOID**
5x7 ea. 5c
Red, green, blue, yellow
- INSIGNIA**
24 and stripes 5c
- WHEELS per pr.**
Brch Bits Celu 1 1/2 to 2 1/2" .70c
2 1/2 Gas 1.00
2 Gas 1.10
2 1/2 Flyweight 5c
1 1/2 94 .05 .07
1 1/2 95 .08 .10
1 1/2 97 .10 .16
3 .15 .15 .20
- HOBBY**
1/4" Tubing ft. 7c
Free Wheeling 10c
Silk .yd. 75c
AustTimer 1.50
Model Knife 10c
2 extra blades 10c
Spark Plugs 50c
Condensers 15c
U. S. Coll. 3.50
Rubber Lube 10c
- DECALS**
Army Navy 10c
10 & 15 ea.
WaterSprayer 10c
Sandpaper 50c
NOSE PLUGS
1/4" 6 for 2c
- M&M WHEELS**
1 1/2 to 2 1/2" .70c
2 1/2 Gas 1.00
2 Gas 1.10
2 1/2 Flyweight 5c
CEMENT, THINNERS, CLEAR DOPE
1 mc. 15c
Large bot. 30c
1/2 pt. 20c
COL. DOPE
1 mc. 15c
Large bot. 30c
1/2 pt. 20c
NOSE BLOCKS
12x21 2c
12x21 3c
12x21 4c
IGN. WIRE
1/16 (10) 1c
Hookup .75c
WASHERS
1 dot. 1/4 or 1/2
Ball Bearing 10c
Bushing 5c
Prop Nings 15c
AIRPLANE PHOTOS
22 U. S. Army & Navy
22 Foreign 25c
- Sponge Wheels**
2 1/2" 25c
3 1/2" 50c
PROPELLERS
Balsa Paulu
Winn
1 1/2" 4c
1 1/2" 5c
1 1/2" 6c
1 1/2" 7c
1 1/2" 8c
1 1/2" 9c
1 1/2" 10c
1 1/2" 11c
1 1/2" 12c
1 1/2" 13c
1 1/2" 14c
1 1/2" 15c
1 1/2" 16c
1 1/2" 17c
1 1/2" 18c
1 1/2" 19c
1 1/2" 20c
15" BAMBOO
1 1/2x3/4 .3 for 5c
Shredded 36 for 5c
PLASTIC Balsa
Large can .15c
PROP BLOCKS
1/2x1/2 4.5c
1/2x1/2 5c
1/2x1/2 5.5c
1/2x1/2 6c
1/2x1/2 6.5c
1/2x1/2 7c
1/2x1/2 7.5c

IMPERIAL MODEL SUPPLY CO.
345 Main St., Dept. A-7, Hackensack, N. J.

CONTROL LINE FANS!

If You're Looking for a Swell Model to Convert to Control Line Flying!!

TRY A \$1.50 CLEVELAND

HAWKER HURRICANE

CURTISS P40 TOMAHAWK

NORTH AMERICAN "P-51"

WITH A STRONGER SPAR & TWO PLYWOOD BULKHEADS IN THE NOSE YOU HAVE THE IDEAL SET UP FOR A SOLID MOTOR MOUNTING & A LANDING GEAR THAT CAN REALLY TAKE IT!!

BELL AIRACOBRA

MESSERSCHMITT ME 109

DEALERS: WRITE US FOR COMPLETE INFORMATION ABOUT OUR IMMENSE STOCKS OF MODEL SUPPLIES AVAILABLE FOR IMMEDIATE DELIVERY!!

A. J. MARINE
H. F. EXACTO
BURD WRIGHT
RITZ AUSTIN
COMET IDEAL
JASCO ROGERS

B. PAUL
5533 N. 5th STREET
PHILADELPHIA, PA.

OHLSOON WESTCRAFT JACO INC. CLEVELAND FLO TORQUE CONSOLIDATED PYLON PRODUCTS

NOW - Atlantic AVIATION INSTITUTE INC. OFFERS A Practical HOME STUDY COURSE IN AIRCRAFT ENGINE MECHANICS

Includes Aircraft Engine Mechanics—Aircraft Engine Principles—Maintenance—Repairs—Inspection—Ignition—Fuel and Fuel Systems—Lubricants and Lubrication Systems—Cable—Ignition—Sparchangers—Propellers—Trouble Shooting

20 really understandable lesson assignments based upon many years of experience in practical aircraft training. Each assignment has an examination sheet which you complete and return to us; it is corrected by our government licensed instructors and mailed back to you with comments.

Here is a real opportunity to learn Aircraft Engine Mechanics. Fill in the enrollment coupon and return today.

Enroll me in your Aircraft Engine Home Study Course. \$2.00 is credited to cover the cost of my first lesson assignment. You may also send me the additional 10 lessons C.O.D. at the rate of 1 lesson each week. I agree to pay \$2.00 plus postage for each additional lesson I receive. It is understood that I may discontinue my course at any time on 10 days notice.

NAME _____ AGE _____
STREET _____
CITY _____ STATE _____

ATLANTIC AVIATION INSTITUTE
61-66 Prospect St., Trenton, N. J.

Fly A "Putt-Putt"

(Continued from page 18)

As for the roadable airplane—well, it's neither fish nor fowl. It will make neither a satisfactory automobile nor a satisfactory airplane. Weight is and always will be a factor in the air. You just cannot build them heavy enough to be practical and stand the gaff on the highways, and still light enough to take to the air. A nice dream but no more than a dream.

The 400-mile-an-hour plane is definitely here, but not for the average private owner. He just can't afford to buy and operate that kind of craft, nor can he afford the risk. The poor-man flier just hasn't got the need or the money for that kind of speed. The average owner rarely ventures more than 200 or 300 or 400 miles from home on a single trip, and he can do that easily enough in his light plane.

Neither does he fly often and regularly enough so that he can safely fly the 400-mile-an-hour jobs. That's a job for the professional experts; and the poor-man pilot's place definitely is in the mistake-forgiving putt-putts.

This deluge of post-war flying is going to result in plenty of inexpensive and conveniently located landing strips instead of those municipal "white elephants," the big municipal airports.

Private flying has done a lot for Uncle Sam. Private flying furnished one of the best weapons the United States has had at the start of a war: a big reservoir of competent pilots who could step right out of the light planes into the bombers and transports with very little transition training or who could become instructors.

Instead of these big municipal airports with long, hard-surfaced runways and big, expensive—and often empty—hangars, we need a lot of landing strips, covering the nation like a blanket, so that flying can be made inexpensive and convenient.

These landing strips needn't be expensive. Just cleared, graded strips, say 100 feet wide and one third mile long, will do. They don't need over seven or eight acres for each, but there must be plenty of them. Each must have a windsock and a number. They will have to be located at intervals along every main road, near the center of every city or town. They won't require much maintenance.

If those landing strips were located only four miles apart, a cross-country flier, by staying up at 2,000 feet, would always be within gliding distance of a good safe airport in case he needed it.

And even such a blanket of them needn't be expensive. For four percent of what the nation spent for its highways, it could build such a blanket of landing strips. It costs about \$200,000 a mile to build four miles of good wide concrete highway. Four percent of that is \$8,000, and that ought to be plenty to build one of these landing strips, even where land is expensive.

There's a place for the big airports in the cities which get airline service. But the airlines never will come to



HEP! HEP!!
FLO-TORQUE
IS IN THE
ARMY NOW!

YES! FLO-TORQUE HAS GONE TO WAR. UNCLE SAM IS NOW USING THE KNOWLEDGE THAT HAS BEEN GAINED IN THE MODEL FIELD FOR ESSENTIAL WAR WORK. BUT YOU CAN STILL OBTAIN THE FOLLOWING PROPELLERS—

Flo-Torque
HI-BALLS 20s & 35s
9" to 13"
FLO-TORQUE
Finlabel 8" to 15" 35s
The new Flo-Torque
INVADER 20s
8" to 14" unsecured

CHOICE OF CHAMPIONS



1217 WEBSTER AVE. CHICAGO, ILL.

Know Your Planes!

12 BEAUTIFUL AIRPLANE DRAWINGS

FROM ORIGINALS BY TED GROHS

Reproduced on Foto-Gloss Enlargement (5 1/2 x 15)

READY FOR FRAMING \$100

SUITABLE FOR HOME · OFFICE · BARRACKS only 1

Perfect for Airplane Spotters and Civilians



INCLUDED FREE AT NO EXTRA COST with the above enlargement is an additional set of individual 8 1/2 x 11 reproductions of the latest released Official Airplane photos. Ideal for a boy in the service.

SEND ORDERS TO M. S. LISMAN CO., Dept. 12
1240 So. Main St. Los Angeles, Calif.

SUPER "G" LINE FLYING ENTIRELY NEW & DIFFERENT



IT'S HERE. A Sensational New Directional Control System, SUPER "C" 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 Ohlsson "60"s, 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 balsa wood and hardwood, strips, sheets, blocks and printed parts. Cement, Dupe, 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.

KIT COMPLETE

\$3.95

POSTAGE 30c

REGULAR "G" LINE & FREE FLIGHT MODELS

SHARK P-60 "G" LINE MODELS



New Rubber Power & Gas Power Kits

Build and Fly one of these thrilling new ARMY TYPE PURSUIT "G" Line Speed Ships. All Kits are unusually complete throughout.

Complete Shark P-60 Kits

Rubber Power
KIT Complete

\$1.95

Postage 20c

For All Class C
1/5 H.P. Motors

\$2.98

Postage 30c

TIGER SHARK SPEED DEMON



The TIGER SHARK, Super Speed Demon, is designed for all 1/5 H.P. motors. It roars through the air at unbelievable speeds of from 60 to 90 M.P.H.

DELUXE
\$4.95
KIT
Postage 30c

INTERCEPTORS UP



Fly the Sensational New INTERCEPTOR, Class "B" Free-flight Model. Super Performance in climbing and gliding. Our kit is Unusually Complete.

Kit Complete

\$2.98

Postage 30c

BABY SHARK SUPER SPEEDSTER



The new BABY SHARK, Super Streamlined Speed Ship, is designed for all Class A and B motors. This snappy little job flies at tremendous speeds of from 50 to 75 M.P.H.

COMPLETE

\$1.98

KIT
Postage 20c

Illustrated Descriptive Literature 5c

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

★ COMET'S *New* ★
★ "SPEED-O-MATIC" ★
★ CONSTRUCTION ★



IT'S REVOLUTIONARY!

Another Comet achievement
 — an entirely new way of building
 flying models that saves
 hours of time, assures perfect
 alignment and better flyability!



**Kit No. E8—NORTH
 AMERICAN MUSTANG P-51**

**6 NEW 25c FLYING
 MODELS NOW READY**
 Authentic, accurate models
 of war planes that are in
 the news!



**MANY
 FEATURES!**

All finished parts:
 formers COMPLETELY
 cut out, finished
 wheels, thrust button
 and insignia. New-
 type plans—amaz-
 ingly detailed! Order
 from dealer, or add
 15c postage.

COMET MODEL AIRPLANE & SUPPLY CO.
 CHICAGO • NEW YORK

the small towns, just as the railroads often skirted the small towns.

I don't see much need for expensive radio navigation systems for the private fliers; that should be left for the airlines and the professionals. All the private flier will need is these landing strips, each designated with a route number and a landing-strip number, just as the highways are laid out. Thus, flying cross-country, he couldn't get badly lost if he wanted to. If he got off course, he would spot the next strip and get back on quickly enough.

And he wouldn't need an expensive radio and high-priced instruments and equipment. Cheap radios are all right, but I don't think we ought to be compelled to carry around that kind of stuff if we don't want to.

We shall need a lot of inexpensive small hangars, too; hangars that the average owner can afford, at a price of about five dollars or six dollars a month. Some big airports charge anywhere from fifteen dollars to twenty-five dollars a month for hangar space for a light ship; and that's more than the average owner can afford. The forty-dollar-a-week mechanic would hardly care to take out four dollars or six dollars a week for hangar rent when he pays two dollars a month for a garage for his car.

It's about as sensible to build a \$125,000 hangar to house a dozen light planes as it is to build a \$12,500 garage back of your \$6,000 home to shelter your \$850 Plymouth or Chevrolet or Ford. Yet it's being done at most of the larger airports. And those tactics are helping to discourage aviation instead of encouraging it, the very purpose for which most larger airports were built.

Another thing that is needed to help along this post-war flying boom is a string of good sleeping and eating places located conveniently near

these landing strips and airports. They will spring up like mushrooms once the flying public makes known its wants. Every airport manager right now ought to have an automobile available that he can rent out cheaply to a visiting airman who needs to get quickly into town. It avails a man very little to make good speed from one point to another if he loses all the time gained by flying in getting from the flying field to his final destination.

When I fly cross-country—and I get a lot of enjoyment out of delivering a ship occasionally, in spite of my sixty-one years—I like to get up early, travel a comfortable 200 miles or so when the air is smooth and the winds are quiet, before the rest of the world awakens. That means eating and sleeping near the airports. I usually pick those airports for my overnight stops where I know I can find a comfortable room and a good place to eat nearby.

Every ship we produce now is for the army and the navy—but they haven't begun to take full advantage of the light plane's possibilities as a war weapon. Of course, light planes are used in a limited way and they are being accepted by some military men, but they are not yet being received with the open-mindedness they deserve. The uses to which it could be put to help win the war stagger the imagination.

We're still hopeful that the try-out the army and navy are giving the Cubs that already have been purchased will prove to the army just what the light planes can do. While talk of post-war flying evokes a pleasant picture, we are hoping that now, before the war is over, the light planes will be given their rightful job to do—the big job of helping lick the enemy.

Meteorite

(Continued from page 30)

the dimensions continually as you take off wood. Sand the fuselage while still turning on the lathe, first with rough, then medium and finally fine sandpaper.

Cut the spinner off with a jig saw or coping saw and slit the fuselage in half at the glued joint. While the hollowing operation is most easily done with a router attachment for a drill press—you simply stand and let the machine do the work—it isn't much more difficult to chisel and gouge it out. While I had access to a drill press and router I preferred to do it by hand so that I might get the "feel" of the wood. It is at this operation that basswood's resistance to splitting will become apparent, and you'll soon see why this wood is so highly valued by wood carvers.

The most efficient tool for hollowing is the common cupped chisel, which may be used for the entire operation. The straight chisel isn't particularly desirable, especially when the shell gets thin. Clamp one half of the fuselage in a padded, long-jawed vise and begin removing the wood with smart smacks of the mallet at first and careful taps when the

shell gets thin. Work according to dotted lines on the plans. With a sharp chisel both fuselage halves can be completed in an hour, with an ease that will surprise even the most pessimistic.

The tail section is $1\frac{1}{16}$ " flat basswood, patterns for which may be obtained from the squared sections on the plan. Cement the rudder to the top fuselage half and add the headrest which tapers to a $1\frac{1}{16}$ " width to connect with the rudder. The elevator is cemented to the bottom half and the flippers hinged as shown on the plan. Cement the sub rudder to the bottom half.

The landing gear is $\frac{1}{16}$ " spring steel wire, installed as indicated on the plan and faired with basswood. If you don't like the idea of flying with pants (what will the neighbors think if you don't) they may be made removable. If the wheels rotate easily, I see no reason why flying can't be done with the pants on (the original used them), although it may be best to leave them off (and fairing, too) until after the ship is tested. Two

(Turn to page 64)

"Old Boomerang"
LOCKHEED HUDSON BOMBER
 IF YOU HAVEN'T GOT THIS ONE YOU'RE LACKING
 ONE OF THE WAR'S GREATEST FIGHTING BOMBERS

$\frac{1}{2}$ " Scale Kit with large clear plans. Cut out or stamped parts. In balance. Clearing star plate which many modelers are coming to prefer.

\$1.00 Add 15c Postage



NEW STANDARD SERIES 35A
Add 10c Postage



REPUBLIC P-47 "THUNDERBOLT"

The Army's newest favorite, com No. 1 U. S. Army fighter, 2000 h.p. engine. Dives at more than 200 m.p.h. Ceiling 18,000 ft. Known as the "Flying Battleship" because of its weight, armor, and outstanding fire power. In action in Africa and over Europe. $\frac{1}{2}$ " to ft.



VOUGHT SIKORSKY "CORSAIR"

Terrific Navy fighter that has been in action all over the Solomon, New Guinea, and the Pacific generally. Its 2000 h.p. should give a little trouble to Jap Zeos with 800 h.p. Said to be the world's fastest single engine fighter, with a dead level speed of 300 m.p.h. $\frac{1}{2}$ " to ft.

7306 SOUTH
 VERMONT AVE.

MODELGRAFT

LOS ANGELES
 CALIFORNIA

NEW LOCKHEED P-38

26" SPAN RUBBER-FLYER 65¢ Plus 15¢ P.P.

"Multi-Stringer" CONSTRUCTION

The famous LIGHTNING from a manufacturer famous for models of "Distinguished Design". Multi-Stringer construction (as illustrated above) assures true contour model, a faithful replica of the original plane in every detail! Stronger! Better buy and build 2 of these—1 to fly, 1 for proud display in den, office or club-room! Kit is complete including all necessary tissue covering, insignias, etc. (except rubber). (80¢ postpaid.)

CHOICE OF 7 MODELS

3 VIEW PHOTOGRAPHIC CONSTRUCTION PLANS

In addition to LIGHTNING illustrated above, you can have Supermarine SPITFIRE, Douglas DEVASTATOR, N. A. MUSTANG, Curtiss WARHAWK, Grumman WILDCAT, Vought-Sikorsky.

LARGE SIZE, CRYSTAL CLEAR PLANS

It's the care-in-details that makes these Capital Kits so popular! Unfold the full, extra-detailed step-by-step plans—a distinct feature by itself! BY MAIL: Add 15¢ per kit to cover packing, postage.

SHIP MODELS

Polk's SHIPYARD is one of the best-stocked in the land! Kits from every standard manufacturer. Plans, accessories, modeling tools, and ship fittings. Over 10,000!

128 PAGE Illustrated CATALOG YOURS PRACTICALLY A GIFT

Just published. Compact "pocket-book" size. Profusely illustrated. Send 25¢ coin or stamps for your copy! Each book contains a 25¢ CASH VALUE COUPON good for full amount in ship department.

Destroyer CAMPBELL

AIRCRAFT CARRIER WASP

P.T.10 BOAT

SAILBOAT

WAR BONDS!



Today's modeller is building as never before and dreaming of the wondrous aviation advances revealed by the battles in Tunisia, On The Continent, In Australia and in the Pacific! The dreamer of today is the leader of tomorrow! And, today, Aviation beckons more invitingly than ever! Start 'em Flying! KEEP 'EM FLYING!

WHEN THE FLIGHTS GO ON AGAIN ALL OVER THE MODEL-WORLD!

The 'engine-ear' of today will be that much ahead of the game tomorrow! There must be no idle engines gathering dust and cobwebs! The scarcity is too great! HAVE YOU AN IDLE ENGINE? Check and make sure! If required for some minor repair, bring it back into operating condition and loan, donate or sell it and do your part to 'KEEP 'EM FLYING!' If no facilities for exchange, repair or sale near you, send it to POLK'S! We'll make a generous allowance-offer! If acceptable, you can have cash-on-the-barralhead; Merchandise Credit or Priority Credit on 1st new engines to be available! Bring or send your engine—but do it NOW!

DECAL-TRANSFER SQUADRON INSIGNIAS SEND FOR FREE LIST

Authentic reproductions from original battle-insignias. ALL UNITED NATIONS, also AXIS and many new, decorative decals. FOR COMPLETE LIST OF HUNDREDS AVAILABLE send stamped, self-addressed envelope. (No postage, please.)

HURLEMAN QUALITY PRODUCTS

CARBURETOR \$3.00

Made integral with 1/2" or 3/4" capacity metal tank. Easy to take apart for cleaning. Designed for large bore motors and midget racers. Increases R.P.M. up to 1500 r.p.m. Easily taken apart for cleaning.

HURLEMAN SPARK PLUG 50¢

Finest made. Fits all motors with 1/2" and 3/4" threads. Easily taken apart for cleaning. Painted electrode. Wt. 1/2 oz.

IDENT-O-PLANES 70¢

24 silhouette models of Allied and enemy planes. Ideal for spotting recognition study, use by converted to gliders.

DYNA FLASH COIL \$1.75

For all A, B or C motors. Quick start, low draw, lightweight 1 1/2" dia. Unconditionally guaranteed.

INBOARD MECHANICAL MOTOR \$3.50

Compressed power for boats from this strong, spring motor. Easily wound. Complete with winding crank. Though they show the signs of storage and disuse, we guarantee each to be new & unused! Cleaning and all applications will do wonders! Only a limited quantity.

JASCO "THERMIC" GLIDERS 18" and 20" BOTH POST PAID 60¢

PLAN PACKET

Identification plans and templates identical with those issued by U. S. Office of Education and Navy Department. (Series 'A' or 'B') 20 PLANS & TEMPLATES 75¢ (Series 'C' or 'D') 10 PLANS & TEMPLATES 40¢ (Wall chart included with each packet.) (By mail: Add 10¢ to cover packing & postage.)

POLK'S Model Craft Hobbies

"America's Leading Hobby House!"

429 7th Ave. (Dept. AT-7) N. Y. C.

(B-t, 33rd & 34th St.—Opposite Penn-Long Island RR)

Mail-orders are carefully filled! In ordering-by-mail, it would be wise to specify 2nd choice if your 1st selection should be out of stock! Allow a few extra days for delivery in view of transportation difficulties confronting carriers these days! Mail orders should be for \$1 minimum. Sorry, No COD orders.

A MAN'S SIZE MODEL!

M-4 "General Sherman!"

14" LONG — 7" WIDE
6 3/4" HIGH

782 Pre-Fabricated Parts \$2.95

A model-making project to test the skill of precision workers! The U. S. Army's "M-4"—General Sherman is the giant battering ram—a land battleship—that's in the African headlines daily! This is a GIANT-SIZE, SUPER-DETAILED MODEL! 782 precision-shaped parts, ready for interesting assembly work comprise the kit! Movable, revolving turrets, practical tread—large size construction plans! (BY MAIL: 30¢. west of the Mississippi 50¢.)

ARMY JEEPS—Scale Models

The war "limousine" used by the President at Casablanca! Scale model.

GIANT 1" SCALE \$1.25

STANDARD SIZE (1/2" Scale) 50¢

HEAVYWEIGHT PULPBOARD.....29¢

BY MAIL: 10¢ per kit for packing-postage.

ARMY TRUCK \$1.25

All parts cut and lettered to correspond to full size plans. Solid pine, kit includes wheels, tarpaulin, grille, bumper, windshield, etc. Accurate scale.

ARMY TRAILER 40¢

Accurately scaled miniature. Kit is complete. Goes with jeep and truck.

30" SPAN RUBBER POWER WAR PLANES U. S., British and German

DOUGLAS 8-A-5

Also Focke-Wulf "FW190" & Henschel HS-126.

SUPERMARINE SPITFIRE

Also: Blenheim Stua Fighter & Westland LYSANDER.

VOUGHT-SIKORSKY XF4U-1

Gullwing, shipboard fighter.

LOCKHEED INTERCEPTOR

(Also called Lightning) and FAIRCHILD M62 Trainer.

REPUBLIC GUARDSMAN

Also: Grumman's "MANT-LET" or "SKYCOCK" and FAIRCHILD M62 Trainer.

OFFICIAL PHOTOS

3 PACKETS (32 photos each)

(No. 1) 32 US Army-Navy Plane Photos (No. 2) 32 Foreign Aircraft Photos (No. 3) 32 All Types Tanks

Clear, sharp 5"x8" prints! Dive-Bombers, Targado Bombers, Light & Heavy Bombers; Paratrooper-Fighters; Fighters, etc. Each set includes latest-type used in actual combat! Suitable for framing. (BY MAIL: Specify group wanted and add 5¢ for packing-postage.)

SOLIDS PARTS CUT TO OUTLINE SHAPE

WINGS—FUSELAGE—TAIL SURFACES \$50 ea.

1/2" scale kits with cut-to-outline shape fuselage, wings, tail surfaces, turned wheels, simplified construction plans! Choice of Japanese ZERO, GRUMMAN MAN WILDCAT, CURTISS P-40, VOUGHT-SIKORSKY, LOCKHEED P-38 (By mail: 10¢ postage-packing per kit!)

35¢ BOEING P-26A, HAWKER FURY, HAWK PG-6, SEVRSKY P-35, BELL P-39, MESSERSCHMITT, HEINKEL, SPITFIRE, GRUMMAN WILDCAT, CO. BREWSTER BUFFALO, CURTISS KITTYHAWK.

By mail: 45¢ each or any 5 for \$2.00, postpaid.

3 ft. SPAN WARPLANE \$1.50

Lite VICTORY MODELS, each a realistic beauty. Choice: Messerschmitt; Aracabra; Warhawk; Hurricane; Lightening; Mustang.

A Super-Power Fuel that steps up R.P.M.

Model Planes Start Quicker, Fly Further with Phillips Model Motor Blend

Put new zip and power into your model plane... with Phillips Model Motor Blend. It's a scientific mixture of high quality gasoline and fine lubricating oil specially developed by the famous Phillips research laboratories to bring out the maximum power of your model plane motor.

Tests prove this great fuel gives greater climbing ability. And it contains special cleansing and metal-wetting agents that reduce carbon formation and prevent corrosion... actually clean out a dirty motor... keep it at peak efficiency for a longer period.

Why take chances mixing your own blends of gas and oil when you can depend on Phillips Model Motor Blend for unvarying high quality?

Special Note: Government regulations now require a non-highway gasoline ration coupon to purchase Phillips Model Motor Blend. Coupon may be obtained from your local ration board.



A Model Motor Blend of Gasoline and Oil

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!
Complete Catalogue 10c
IDEAL AEROPLANE & SUPPLY CO., INC. 24-26 WEST 19th ST. NEW YORK

"BUY WAR BONDS"

AUSTIN-CRAFT LIFE-LIKE MODEL

U. S. ARMY 2 1/2 TON TRUCK - \$1.50

First scale model of the U. S. Army's all-purpose "ten-wheeler"—used for both supplies and personnel. White pine parts cut to measure for precision fit! Facsimile detail and all accessories for a lifelike model including bumper, headlights, radiator grille material, ten wheels and a spare. 5 overhead shaped ribs with regulation O. D. covering. Keep up with the motorized war with Austin-Craft Motorized Vehicle Models. By mail, 10c postage.



AUSTIN-CRAFT official U. S. ARMY 2 1/2-TON TRUCK Scale 1/4 inch to foot

AUSTIN-CRAFT COMPANY
 431 South Victory Blvd. • Burbank, Calif.

Also—Austin-Craft Willys-Overland JEEP (60c—10c postage). In prep. 1 1/2 Ton Truck

(Continued from page 62)

wire hooks are cemented in the top and bottom halves as indicated on the plan. These are used to hold the top half on by means of a rubber band drawn through the cockpit and attached to both hooks.

The wing is built up from layers of 1/16" basswood (except the bottom, which is 3/32") which may be cut in a few minutes on a jig saw or coping saw. Patterns are obtained by completing the wing graph, the inside edge of the layers lapping the preceding layer by 1/4". (Note the end rib detail showing wing construction.) To prevent confusion, the inside lines are not shown on the plan. Build these pieces in "Dagwood sandwich" style and allow to dry thoroughly. With the fine side of a wood rasp form the wing roughly to airfoil shape and finish with a sandpaper block. Connect the two halves, blocking up to the required dihedral. When dry, cover the center section and dihedral joint with erimoline and coat with several heavy coats of cement. The guide plate for the control lines is cemented to the outer left panel. This type of wing construction is easy to build and is very strong.

The control plate, which is cut from 1/16" plywood, is fastened with a wood screw and several washers directly onto the model's center line; and a 1/16" control wire, bent midway to lift its line of action, extends from the plate to the wire control horn which is connected to both flippers. Small rubber bands are put through the little slots and given just enough tension to hold the plate in a neutral position so that if the control lines are slackened, the control will neutralize. Pins are stuck in the fuselage to dampen the action of the control plate, thus preventing the flippers from moving too much.

The motor is bolted in place and the ignition system is fastened into the top half of the fuselage. Cut the spinner out to fit over the prop and attach the dress snaps which hold it in place. When using the Tiger, a special gas tank must be made from tin salvaged from an old tobacco tin. Basswood takes dope excellently and a slick finish can be obtained with very few coats of dope. The original model was bright red with army stars and black tail numerals.

Hook a 30-pound enameled fish line to each side of the control plate and run through the eyelets and the guide plate on the wing and fasten to fishing tackle swivel joints. To the swivel are also attached the 50-foot control lines which are also 30-pound line. A double-sided reel should be made on which to keep the lines when not in use. If you have ever tried to pull unwound, or had to untangle, the double pretzel-kinks piano wire seems to get into regardless of swivels, you will understand why fish line is specified.

Balance the model by shifting the ignition unit. If you have never flown a controliner, test flights should be made with a small size engine so that you can get the feel of it. Having successful flights is more a matter of practice than anything else. One thing you should be sure of is

START YOUR MECHANIZED UNIT NOW!

BUILD THESE NEW U. S. ARMY SCALE MODELS



37mm ANTI-TANK GUN 40c

Accurate facsimile, complete with accessories, parts cut to measure for precision and sturdy construction. Here's a new model.

TRUCK 1 1/2 TON 1.25

TRAILER 40c

JEEP 60c

These kits are complete. All parts cut to measure. Deluxe pine and they include all accessories together with full sized plans.

DEALERS WRITE FOR INFORMATION.

REDY CUT

MANUFACTURING COMPANY

140 S. Brand Blvd., Glendale, Calif.

MAIL THIS COUPON TODAY

Enclosed find Send me postpaid
 TRAILER JEEP TRUCK 37mm ANTI-TANK GUN

NAME

ADDRESS

CITY STATE AT 7

10c POSTAGE EXTRA ON EACH.

SPEED YOUR GROUND TRAINING



GENERAL AERONAUTICS

A Complete Ground School Course in One Easy to Read Volume
 By HILTON F. LUSK
 Former Dean, Boring School of Aeronautics

This Popular Complete Up-to-date 330 page book clearly & thoroughly explains all subjects you

Need to Know to pass written Government C.A.B. exams for any pilot rating or for Aircraft Engine and Mechanic Certificates. Contains over 300 typical Exam Questions with answers. Meets need of Home Study & is used as Text at many Ground Schools, Junior Colleges & Technical Institutes.



Written in Easy to Understand Everyday Language so that even Beginners will have no difficulty in grasping every word from this experienced pilot.

EXAMINE IT LEISURELY FOR 5 DAYS

Covers Occupations in Industry, Principles of Flight, Theories of Lift, Aircraft Drag & Power Required, Methods & Types of Airplane Construction & Operation, Aircraft Balance, Stability, Control, Engine Construction, Theory & Operation, Types of Ignition Systems, Instruments, Landing Gear, Parachute, Night & Day Aerial Radio, Beacons, Air Navigation, The Automatic Pilot, Remote Reading Instruments, Applied Meteorology, etc. Tells How to Take Off and Land, Read Map, Special Aerial Charts, Codes, Dead Reckoning, Forecast Weather, Install, Maintain & Repair Propellers, Lubricate & Repair Engines, Operate & Install Magnetic Compass, Decode Fuel Gages, Safety Appliances, etc.

\$3.75

Contains 230 Illustrations & Diagrams describing various functions of Planes, Engines, Instruments, Mail Examination Coupon Today.

THE RONALD PRESS CO. (Estab. 1900)
 Dept. M702, 15 East 26th St., N. Y.

Send copy of GENERAL AERONAUTICS by H. F. Lusk. I agree to inspect book and either pay \$3.75 (plus a few cents postage) within 5 days or return it. (We pay postage when cash is sent with order. Name return privilege.)

Name
 Address
 Reference
 (PRINT OR COMPLETE WITH ADDRESS.)

Check here for catalog of publications on Aeronautics.

that the rudder is turned clear over to the right so that the ship will pull hard against the lines. Later, experience will show whether or not you have too much right rudder. Actually, it is impossible to get *too much* turn against the circle since a good firm pull against the lines is preferable to having the model flying over your head (for a very short interval) instead of around you.

The Meteorite is plenty fast enough with a Tiger to please the most rabid fan, but if you really like action (and "action" is the word!) a bigger engine will really make it whirl. It hits 65 and 70 with a Tiger and should do 85 or 90 with a large engine.

So brace your feet, take a deep breath and—whoosh!

Whizz

(Continued from page 44)

tion in body and put in a dowel for rubber.

The wings are cut from $\frac{1}{8}$ " medium-hard balsa and sanded to air-foil indicated on plan. We now glue in dihedral with a flat center section which is later to be fastened to body; then cut out stabilizer (which is in two pieces) and rudder out of $\frac{1}{16}$ " medium-hard balsa. Sand to streamline section and glue to body. Now cover body with tissue and cut out wheels. All you have left to do now is to carve the prop and dope the whole ship with clear or colored dope.

Now for the prop; cut this from a block of pine as indicated on plan, bend a wire shaft from $\frac{1}{16}$ " wire and put in rubber, which is 20 strands, $\frac{1}{4}$ " flat, well lubricated. Now we're all ready to fly, so take the ship to the best flying spot around and test-fly. From here on it's all yours, so good luck till next time.

We Fly By Night

(Continued from page 39)

cents' worth of batteries. Medium cells used one night for ignition are transferred to the landing-light battery box the next night. New pencils are good for about twenty minutes of flying if the time is broken into two ten-minute periods. We found that worn-out pencils, if left around for a couple of weeks, can sometimes be used again for a shorter period. Medium cells work for forty to fifty minutes of flying, depending on how quickly the flights follow one another. Remember that it is considerably cheaper to buy good batteries; you get more for your money.

Some of the trick gadgets we have put on the two ships have been a lot of fun and have won considerable applause from the crowd. The Spook, for instance, has a parachute release activated by an Austin timer. The Flagship has a smoke-screen-laying device, a bomb release and a parachute all operated by one Austin timer. We've put on everything but the kitchen sink—and that's next!

★★★★ 4-STAR HITS by SCIENTIFIC ★★★★★

Designed to give you more building enjoyment . . . more flying thrills . . . more beauty . . . more for your money!

Scientific's
NEW 30" MODELS

Only **50¢ Each**
Postpaid or at your dealer.



Whippet



Bullet



Yellowbird



Clarion

Scientific's
VICTORY SQUADRON

25" Wingspan

Just **50¢ Each**
Postpaid or at your dealer.



North American Apache P-51



New Bell Airacobra P-39



Curtis Warhawk P-40



Grumman Wildcat



Vultee Vengeance

Scientific's
DEFENSE SERIES

30" Wingspan

Only **50¢ Each**
Postpaid or at your dealer.



BREWSTER #340"



REPUBLIC P-47
"THUNDERBOLT"



CURTISS P-42



CURTISS SB2C-1

Sensational
GAS-TYPES

\$1.75 Each
*(Less rubber wheels)
Postpaid or at your dealer*



MISS AMERICA



FLEA

Scientific's Famous
ZENITH GLIDER

Double-purpose! . . . It's
a Glider and a Flyer!
Wingspan 33 $\frac{1}{4}$ " — Length 21 $\frac{1}{2}$ "
Class "B", A. M. A. Rules

50¢ *Postpaid or
at your dealer.*

2 Models by
DICK KORDA

32" Wingspan

Only **50¢ Each**
Postpaid or at your dealer.



GOLD STAR



VICTORY

"Gas Model Headquarters"

SCIENTIFIC MODEL AIRPLANE COMPANY

218-220 A-7 MARKET ST., NEWARK, N. J.

"BUY
WAR BONDS"

Prepare
Now For

YOUR LICENSE

Airplane mechanic's home-study course \$1.25. Engine mechanic's course \$1.25. Both courses \$2.00. Postpaid. Also sent C.O.D. Contains all license questions with answers and accurate diagrams. Helps you tremendously in mechanic's as well as Pilot's License Exams. 250,000 aircraft mechanics needed for U. S. Defense.

MEYER ENGINEERING

Box 8-J

Hempstead, N. Y.

HE Mailed This Coupon



...and Here's the Handsome Prize-Winning Body I Gave Him!

J. G. O'BRIEN of California mailed my coupon. Got my free book. Won my Atlas-Champion, Sterling Silver Cup. He says: "Look at me NOW! 'Dynamic Tension' WORKS! I'm proud of the natural, easy way you made me an 'Atlas Champion'!"



Let Me Prove I Can Make YOU a New Man!

Would you like greater development—a muscular body? Then listen: I was once a 97 lb. weakling. Afraid to fight, ashamed to be seen in a swimming suit. Then I discovered the secret that changed me into "World's Most Perfectly Developed Man." My secret is "Dynamic Tension." I'll prove it will give you powerful rippling muscles you'd like to see in your mirror. And for those with systems sluggish from lack of exercise—help them tone up their entire body, inside and out.

Only 15 Minutes a Day

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.

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. 1537, 115 E. 23rd St., New York, N. Y.

CHARLES ATLAS, Dept. 1537, 115 E. 23rd St., New York, N. Y.

I want proof "Dynamic Tension" will help make me a New Man—with healthy, bushy body, big muscle development. Send FREE book, "Everlasting Health and Strength."

Name.....
(Please print or write plainly)

Address.....

City..... State.....
 Check here if under 16 for Booklet A.

Book Reviews

(Continued from page 10)

SHELLS AND SHOOTING By Willy Ley. (The Viking Press, New York, N. Y. \$2.00.) If it's military science, tactics, or techniques you want to read about, Willy Ley is just about the best bet as the author for you. In his "Bombs and Bombings" of 1941 he gave some of the best material on bombs and bombing that this reviewer has ever seen. Likewise, in this latest book of his he presents down-to-earth and nontechnical information on the subject.

As far as we know, Ley does not write fiction, but if he doesn't he has certainly wasted years of valuable time; for "Shells and Shooting," which was written exclusively for the lay market, has absolutely the smoothest and most polished nontechnical style that has appeared in at least several months. The pages are so engrossing that once you pick up the little book you will find it difficult to put it down until you have read from endpaper to endpaper. And, at the same time, the lightly written pages are packed with vital information, usually found only in stereotyped engineering journals.

BUILDING MODEL WAR PLANES FOR THE ARMY AND NAVY By Emanuele Stieri. (Duell, Sloan & Pearce, New York, N. Y. \$2.50.) Duell, Sloan & Pearce has built up a name for itself as publishers of top-flight aviation books, "The Coming Battle of Germany," "Horizons Unlimited," and "Mitchell: Pioneer of Air Power" being more than worth-while reading. And because of this record it seems difficult to understand why this book by Emanuele Stieri.

The book is made up almost entirely of scale-model plans and instructions issued through official channels for the joint army-navy recognition program, which material is available to students of every school participating in the program. In addition to the plans, a photograph and descriptive material is given on each plane presented.

To be candid, the book without its supplement of sixty full-size plans (\$1.25) has little value, for the cuts in the book itself show nothing other than small three-view drawings and assembly perspectives. For the model builder who is not able to obtain plans of these models through school, the supplement is the better buy of the two.

WINGED MARS By John R. Cunco. (The Military Service Publishing Co., Harrisburgh, Pa. \$2.50.) According to the jacket and blurb, this book is supposed to be a history of the German air force between the years 1870 and 1914, but it actually covers the British and French air arms also.

Illustrated profusely with line-cut drawings by the author, the book contains much excellent historical information, even to the point of being a little too complete in many instances. While this might detract from the reading value, it certainly does not damage the book as far as information is concerned.

FREE!

Ten Beautiful 13 1/2 x 22 Color Pictures of Modern Planes!



The Lockheed P-38 Lightning

THESE large color-photographic reproductions, suitable for framing, are actually breathtaking. Depicted accurately, in brilliant colors, are the swift, streamlined beauties that are going to win the war for the Allies! They're printed on special stock, with plenty of white space so that you can frame them easily... makes and names of planes will appear under each picture. They come rolled in tubes so that they will stay uncreased.

The ten planes pictured are:

- 1—The Boeing B-17E Flying Fortress
- 2—The Lockheed P-38 Lightning
- 3—The Curtiss C-46 Commando
- 4—The Vought-Sikorsky OS2U-2 Kingfisher
- 5—The Lockheed A-29 Hudson
- 6—The Grumman TBF-1 Avenger
- 7—The Consolidated B-24 Liberator
- 8—The North American B-25 Mitchell
- 9—The Vought-Sikorsky F4U-2 Corsair
- 10—The Douglas A-20A Havoc

These ten pictures are not being sold... rather, they are being GIVEN away, as a means of introducing AIR TRAILS PICTORIAL, leading aviation magazine, to those who have not yet become regular readers.

Simply fill out the coupon on page 69 and send us your \$2.00. The ten color pictures will be sent to you WITHOUT ANY COST! (This offer good in U. S. only.)

AIR TRAILS

Pictorial

PUBLISHED BY STREET & SMITH

The Best Grade!

CLEAR DOPE

\$4 Per Gal.

MODEL AIRCRAFT CO.
418 N. CHARLES ST.
BALTIMORE, MD.



REAL ENGINE VALUE

Now Only \$15
The G.H.Q. is a miniature gasoline engine that really operates. Over 15,000 sold in the last year. 1/5 H.P. Complete with propeller (or flywheel), fuel, accessories and full instructions. Fully bench tested and ready to run. For boats, planes, mid-gut cars, etc. Send only \$1.00—Shipped Collect C.O.D. same day. Send 25c for catalog of hundreds of hobby items.

Rough castings set, including blueprints, only \$8.95

GHQ MOTORS
Dept. TT • 48 East 21 St., New York, N. Y.



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

This book will be a satisfactory addition to the libraries of those readers who care about aviation's early history.

WE THOUGHT WE HEARD THE ANGELS SING By Lieutenant James C. Whittaker. (E. P. Dutton, New York, N. Y. \$1.50.) If we are to believe all we read in the newspapers and magazines, stories similar to those told by Lieutenant Whittaker and Captain Rickenbacker about their Pacific ordeal will never again carry such a potent punch. The main difficulties experienced by these men, and the six along with them, were the lack of water and food. Now, according to reports, no less than 333,000 emergency kits—complete with fish hooks and line and directions on how to survive on an uninhabited island—have been installed in collapsible rubber life-boats. These kits should take much of the misery out of the experiences of fliers forced down at sea now or in the future.

But Whittaker and the other men on that trip did go thirsty and hungry, and that's what makes this book as interesting and as absorbing as it is.

Although this book has an aviation background, it is not pure aviation. But, by all means, if you want to get only a sample of what our soldiers and sailors and fliers in the war zones are experiencing daily, buy and read it.

FIGHTER FACTS AND FALLACIES By John G. Lee. (William Morrow, New York, N. Y. \$1.25.) This is really the first and only book of its kind. Small, with fifty-four simple but complete illustrations taking up much of its space, the copy is written to the point and without padding with extraneous material. As his main problem, the author takes two hypothetical planes of the same weight and horsepower, but with one having smaller wings, and he proceeds to show how and why each is superior for different purposes.

Aviation people speak highly of "Fighter Facts and Fallacies." It is one book you cannot afford to be without.

STUDENT PILOT HANDBOOK By Jack Hunt and Ray Fahringer. (Books, Inc., New York, N. Y., \$2.50.) If at any time in the future we in this department call a book "the best yet published" on the "dos" and "don'ts" of flying, just call it poor memory on our part—for this is so extremely good for the fledgling flier that it seems inconceivable that anything could surpass it.

Although this is definitely not a technical book, it does deal with the technicalities of flying in a lay fashion. It is not for the engineer or the pilot who plots a course with calculus and logarithms. Instead, it is a book written and illustrated so well and so simply that even an amateur could understand it with ease.

This pocket-size book deserves a place in your collection. If you haven't already earned your pilot's license, you're going to need the "Student Pilot Handbook" when you eventually set out for it—and don't say we didn't warn you.

The hit book **AMONG AIRPLANE MODELERS EVERYWHERE**

WILLIAM WINTER'S

Model Aircraft Handbook

OVER 300 PAGES... 100 ILLUSTRATIONS
By the Managing Editor of AIR TRAILS... Diagrams and plans by H. A. THOMAS and PAUL PLECAN

A NECESSITY today. Tells all the ways to build model aircraft without balsa, rubber, or other strategic materials you can't get today. Everything you need to know about this essential hobby, from tools and materials to aerodynamics, construction, and control. Only \$2.00



4th big printing!

NEW Plans! Photographs! Specifications!

U.S.A., England, U.S.S.R., Holland, France, Germany, Italy, Japan, completely represented

War Planes of All Nations

The new book by WILLIAM WINTER

NEVER so many airplanes completely described and pictured in a book for so little money—an "all the world's aircraft" within reach of every flying fan! There are close to 300 airplanes in all, 115 photos, 105 three-view plans, specifications of every plane. Text specially written, tells story of design, development, and performance of each type. The air armadas of the countries at war in a fascinating book for reading or reference, at an amazingly low price. 452 pages, \$3.

SEND NO MONEY!

Sign and mail coupon. Books returnable in 5 days for refund.

To: THOMAS Y. CROWELL COMPANY
432 Fourth Ave., New York, N. Y.

Send me the books checked below. I'll deposit price plus postal charges with mailman on delivery. I may return books in 5 days for refund if not completely satisfied.

- Model Aircraft Handbook, \$2.00
- War Planes of All Nations, \$3.00

Name _____
Address _____
City & State _____

"BUY WAR BONDS"

YOU'LL FLY HIGH WITH 30 FT. OF 3/16" BROWN RUBBER WITH EACH KIT



STRATOMETER
36" Span
31 MIN. 12 SEC.
AT LOS ANGELES

ALTIMETER
36" Span
37 MIN. AT
CORVALLIS, OREGON

SUPER SOARER
Towline Glider 44" Span
63 MIN. AT
CLEVELAND CONTEST

Finished ribs of balsa. Finished trailing edges. Fin, drilled nose block. Finest colored tissue. Cement. Music wire, etc. Stratometer has finished sides of choice stock. Super Soarer has fin, rudder and stab. of choice balsa. (No rubber with Super Soarer.) (NO CARDBOARD IN THESE KITS)

EACH KIT WITH RUBBER \$1.95
EACH KIT WITHOUT RUBBER . . \$1.50

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

MODEL BUILDERS

Grade "A" Balsa. 36" lengths. 1/32" 3 plywood; has 1000 uses. These and other exclusive items in our new price list. Send 5c. None free.

B. B. T. DETHERMALIZER
Save your precious plane and materials. Proven coast to coast. 25c p.p.

BEST BY TEST MODEL CO.
175 T-7 Main. Ridgfield Park, N. J.

Have you discovered BROOKLYN'S HOBBY CENTER?



The new Hobby Center at A & S is the rendezvous for Brooklyn and Long Island modellers. Model airplanes, scale railroads, ship models, kits, accessories—and helpful assistance in each specializing field. Plenty of elbow room, too. Come in soon; get acquainted!

A&S—SEVENTH, EAST

The Dope Can

(Continued from page 40)

total time, while others feel that ratio is the best indication of a model's efficiency.

Not requiring models to take off is eliminating one of the basic requirements of airplanes in general. Contest directors of the active type had always provided runways before the rule was washed out—why not now? Is the problem really one for a road-building contractor?

Cross section of the fuselage is a tough problem. The argument to date has been whether or not to include the area of a wing platform and pylon, or in other words, "where does the fuselage end and the wing begin?"

The problem of changing the rules is not an easy one; it's a matter that's going to require the concerted effort of everyone. Voicing opinions at your own club meeting is not enough—write to the A. M. A. This column would also like to hear from every active modeler and leader. Ideas and opinions written to this column will be forwarded to the A. M. A., if the writer desires.

If you have an opinion, send it—it's worth a three-cent stamp at least to avoid what happened the last time the rules were written. Let's hear your three cents' worth!—By Ed Yulke, pinch-hitting for Gordon Light.

Club Chatter

(Continued from page 40)

method of reproduction costing less than one dollar for the necessary equipment purchasable at most large stationers.

The model bugs in the area around New York City and Long Island will be glad to hear that the Prop Spinners will hold their Fourth Annual Gas Model Contest on August 8th. Details are not available at this time, except that the event will take place at either Holmes Airport in Queens or at Hicksville, L. I. More information should be available for the next issue of Model Matters.

Quite a few organizations have written in the past that they have movies of the group's activities; why not lend the films to other clubs? Seeing others in action should interest most active model fliers. This column could print the names and addresses of clubs offering to lend their films or clubs wanting to borrow films. List the size of the film, 16 mm., 8 mm., silent or sound.

The Baltimore Model Airplane Association starts off its club meeting bull sessions by having a member talk on some pre-arranged subject in model theory or design. This ought to prove to be the shot in the arm needed for those "what do we do now" club meetings when there is little business on hand and no program scheduled—for what will start a hot and heavy discussion faster than a fellow modeler standing up and expressing his theories and ideas? —By Ed Yulke.

Air Trails Pictorial Advertisers, July 1943

SCHOOLS

Aero Industries Technical Institute	Back Cover
American School of Aircraft Instruments	52
Atlantic Aviation Institute, Inc.	60
Coyne Electrical School	58
Curtiss-Wright Technical Institute, Inc.	5
Dallas Aviation School	4
Embry-Riddle School of Aviation	8
International Correspondence Schools	49
Meyer Engineering	65
Parks Air College	3
Ryan School of Aeronautics	51
Spartan School of Aeronautics	Second Cover
Weems System of Navigation	6

MODEL AIRPLANE KITS, MOTORS AND SUPPLIES

Abraham & Straus	68
Austin Craft Co.	64
Bantam Products Corp.	Third Cover
Berkeley Models, Inc.	70
Best By Test Model Co.	67
Bronco Hobbycraft Co.	48
Capitol Model Aircraft Co.	69
Cleveland Model & Supply Co.	55
Comet Model Co.	62
Consolidated Model Engineering Co.	59
C Z Model Airplane Co.	56
Flo-Torque Gas Model Propellers	61
C. H. Q. Motors, Inc.	67 & 69
Paul K. Guillow	58
H & F Model Airplane Co.	52
Herkimer Tool and Model Works	54
Ideal Aeroplane and Supply Co.	64
Imperial Model & Supply Co.	60
International Models	58
Junior Aeronautical Supplies	58
Mandel Brothers	48
Master Modelcraft Hobbies	69
Megow's	32 & 33
Mercury Model Supply Co.	52
Miniature Aircraft Corp.	60
Model Aircraft Co.	67
Modelcraft	62
Modern Hobbycraft Products	50
Ohlsson & Rice Mfg. Co.	12
Joe Ott Mfg. Co.	46 & 47
B. Paul	60
Phillips Petroleum Co.	64
Pulk's Modelcraft Hobbies	57 & 63
Radio Control Headquarters	67
Redycut Mfg. Co.	64
Rogers Motor Co.	68
Scientific Model & Supply Co.	65
Skyway Model Aircraft Co.	56
Victor Stanzel & Co.	61
Testor Chemical Co.	53
Charles C. Vandervort	68
X-acto Crescent Products Co.	52

GENERAL

Aerona Aircraft Corp.	7
Aeroplane Photo Supply	68
Allison Division of General Motors Corp.	14
American Technical Society	58
Artcraft Shop	69
Charles Atlas	66
Champion Spark Plug Co.	9
Thos. Y. Crowell Co.	67
Funk & Wagnalls Co.	10
Harley-Davidson Motor Co.	52
Indian Motorcycle Co.	60
M. B. Libman Co.	61
Lockheed Aircraft Corp.	11
National Aeronautics Council, Inc.	13
Nelson Co.	69
Pan American Navigation Service	48
Penguin Club Headquarters	54
Piper Aircraft Corp.	45
Prentice-Hall, Inc.	50
Ronald Press	64
W. R. Thompson & Co.	69
Witteck Mfg. Co.	48

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.

Build This Big M-4 Medium TANK



New Rogers Scale Model 34" to the Foot

Just what every scale model builder has wanted—a big tank model. This new kit contains everything you need to make a model that is handsome in appearance, unsurpassed in realism and detail. From the unretouched photo above you can see how closely the finished model resembles American Tanks now serving the United Nations in Africa and elsewhere.

Get the Kit at Your Dealer's Model Counter

Rogers Motor Co.

743 Beaubien, Detroit, Mich.



PHOTOS

PHOTOS OF ALL THE LATEST ALLIED AND ENEMY AIRCRAFT. (ALSO WORLD WAR I AND CRASHES)

REAL PHOTOS . . . NOT IMITATIONS

Set No. 4 . . . FIGHTERS . . . Price \$1.00
 Thunderbolt . . . No. 110
 Whirlwind . . . Lightning . . . Defiant
 Mustang . . . Aircraft . . . Zero
 Hurricane . . . Destroyer . . . Spitfire

Now 40-page stripless photo-etchalons (No. 15) with 175000 sets with sets. Catalogue only 10c.
 We buy photos and negatives of aircraft. Photos must be postcard size or larger. Negatives all sizes. Cash by return.

AEROPLANE PHOTO SUPPLY
P. O. BOX 195, TORONTO, CANADA



ATTENTION MODEL AIRPLANE BUILDERS!

Build a 34" to the foot model from our new selection of 40 instruction kits. Instructional and Educational.

We can still supply a limited number of 34" to the foot models. All Balsa Kits and Supplies. Write for FREE catalogue. State size of model you are interested in building. Send no money until advised what items are available.

CHARLES C. VANDERVORT
LACEVILLE, PENNSYLVANIA.



L. N. Z., Cleveland, Ohio.—Very sorry, Larry, but we don't know where you can get the plans you mentioned. But have you tried control-line flying? MODERN HOBBY-CRAFT PRODUCTS, Aircraft Plan Service, P. O. Box 9, New Bedford, Mass., has just printed full size 1"—1", authentic scale plans for constructing the latest Spitfire and Focke-Wulf 190 for control-line flying. These drawings give complete construction detail for making these models from either basswood or balsa. Supplementary photos and illustrations include complete authentic detail, even to showing rivet lines, guns, et cetera. Plans call for any Class B or small Class C engines. Butch, the guy who sets you straight, gives 'em his official stamp of approval. A buy for two bits each!

J. S., Spooner, Wis.—Landing flaps can and have been used successfully on control-line ships. They are usually controlled by a separate control line, although they might be controlled by some other device, for example by going into action when the motor cuts. You might work out something along this line.

J. S.—B. P., Langdon, N. D.—Apply silk wet. Dampen each piece in a pan of water, wring it out, then lay it over the surface and apply your cement to the silk, working it into the wood beneath with your fingertips. The cement will penetrate the silk and fasten it tightly. You'd better make your own 12" props. No such props are available on the market as far as we know. Don't spray dope. It will plug any dope or water gun. Brush it on. The finish will be better and the dope will go further. High finishes require lots of work. A coat of clear lacquer as a final step will produce a high-gloss finish if you want that. You could power the Whirlwind with two Class B motors. They should be of the same type, of course. The Messerschmitt 109F has a reported speed of around 390 m. p. h.

AIR TRAILS PICTORIAL
79 Seventh Avenue,
New York, N. Y.

Inclosed is \$2.00. (This offer good in U. S. only.) Kindly send me FREE the ten color pictures of aircraft; plus a full year's subscription to AIR TRAILS.

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

The INSIDE STORY

DISTINGUISHED DESIGN



RUBBER POWERED

65¢

UNRETOUCHED SKELETON PHOTOGRAPH OF CAPITOL'S LOCKHEED P-38

CHOICE OF 7 MODELS

Rubber Flying 65¢ KITS



Curtiss P-40F WARHAWK (30")



Grumman WILDCAT (27")

Also

Supermarine SPITFIRE (30")

Vought CORSAIR (30")

Douglas DEVASTATOR (30")

No. Amer. MUSTANG (30")

New LOCKHEED P-38 "LIGHTNING"

26" WING SPAN



CAPITOL has done it again! Achieved the peak with this superb model-interpretation of the famous LIGHTNING! Most modern available flying model of this spectacular airplane. It is the ONLY 'multi-stringer' CONTOUR-TRUE model in any phase of model projects: Gas, Rubber or Solid!

It dramatizes distinguished design, delivers that 'extra something' which has made CAPITOL kits most popular with modellers who take genuine pride in their accomplishments! Build CAPITOL and you build the best!

FULL SIZE—PROFUSELY ILLUSTRATED With actual photographs of models in various stages of construction to completion



'Multi-Stringer' construction imparts multiple strength! Fascinating in construction progress and makes it practical for 2 or more builders to cooperate! As usual in CAPITOL KITS, you work from FULL SIZE, PHOTOGRAPHIC PLANS—precise, clear, detailed! No guess work! Kit is complete including insignia, tissue and plenty of 'stringer' units!

CAPITOL
MODEL AIRCRAFT CO.
1613 E. New York Avenue (Dept. AT-7) Brooklyn, N. Y.
CAPITOL'S Distinguished Design KITS AT ALL DEALERS BY MAIL We have been able to provide all leading dealers with CAPITOL KITS, if none near you, send check or money order for factory service. Add 15¢ per kit to cover packing, postage. NO COD'S.

CLASSIFIED DIRECTORY

An opportunity to contact a large field on a small message. Rate 20¢ per word (Minimum 20 words). Cash with order. Address:

AIR TRAILS CLASSIFIED ADVERTISING
78 Seventh Avenue, New York City

AMERICAN AIRCRAFT PICTURES Post Card Size. Reproductions on heavyweight stock, high gloss surface equal to the best photo print. 5¢ all different themes 25¢. Satisfaction guaranteed or money refunded. Why pay more? Send currency, no stamps. W. H. Thompson & Co., Publishers, Richmond, Virginia.

G. H. Q. ENGINES WANTED: Will pay up to \$5 in cash or in trades for new Atom, Perky, Ohlsson, Rogers, Dreadnaught, etc. Send to G. H. Q., 10 E. 21st St., New York City.

CORRESPONDENCE COURSES and self-instruction books, slightly used. Sold, Rented, Exchanged. All Subjects. Satisfaction guaranteed. Cash paid for used courses. Complete details and 84-page illustrated bargain catalog free. Write Nelson Company, 321 South Wabash, Dept. G-244, Chicago.

24 MODEL PLANES: Squadron Insignia 25¢. Large U. S. Selection, also United Nations, Germany, Italy, Japan. New! High School Victory Corps, & designs 60¢. Aircraft Shop 714 AT, Addison, Chicago.

WANTED: TECHNICAL ILLUSTRATIONS, line or wash, capable of rendering model airplane designer's rough drawings and blueprints into perspective cut-away illustrations. Also, draftsmen with practical model-plane building experience to make inked plans suitable for reproduction. Free lance basis only. Send photographs or samples which will be returned. Air Trails, Dept. K, 79 7th Ave., N. Y. C.

"BUY WAR BONDS"

SUPER DETAIL 1/2" SCALE JEEP 29c

Most Popular MODEL PROJECTS in America Today!

19" SPAN "B19" DOUGLAS BOMBER

Here's the "easy-to-construct" Jeep Kit. Accurate scale, accompanied by full-size simplified plans. Includes transparency for windshield, 5 turned wheels, leatherette-type seat covering, movable wheels & windshield. Easily the outstanding value of its kind!

1/4" SCALE models with shaped bodies and wings, liquids, die-cut props, printed cockpit transparencies. Choice of Curtiss P-40, Grumman Wildcat, Spitfire, Vultee Vanguard, Grumman Skyrocket, Bell Airobra, Republic Thunderbolt, Jap Zero, N. A. Mustang, Heinkel Fighter, Lockheed P-38, Vought Sikorsky, Russian Stormovik, Boulton Paul Defiant. 50c

FULLY DETAILED \$1.00 EACH

BIG, DeLuxe, accurately scaled kits. No extras to buy! Your choice of LOCKHEED P-38 (The Lightning—17" span); GRUMMAN 16" SKYROCKET; DOUGLAS 19" B-19 BOMBER; MESSERSCHMITT 14" No. 110. In ordering, be sure to specify 1st choice and 2nd choice.

"SNAPED BODIES" 25c MODEL PLANES

8 PLANE TYPES. A new, improved line of scale models! Each kit contains shaped bodies, die cut full assemblies, turned wheels, die-cut propellers, wire, of steel insignia and full size, 3 view plans: Boulton Paul Defiant, Spad, Curtiss P-40, Spitfire, Fiat Fighter, Messerschmitt 109, Stuka, Hell-Diver.

BY MAIL: INCLUDE POSTAGE When ordering by mail, be sure to include 10¢ for each kit (20¢ for \$1 models) to cover packing and postage. NO COD service.

MASTER MODEL CRAFT 727 WESTCHESTER AVENUE [Dept. AT-7] NEW YORK, N. Y.

**ACCURATE,
AUTHENTIC,
"TACTICAL DEMONSTRATION"
SCALE MODEL
KITS**
by Berkeley

**EVERY *Berkeley* MODEL
— A SHOW-MASTER OR AIR-MASTER**

**2
OUTSTANDING
GAS MODELS**
that win
AIR-MASTERY

**NORTH AMERICAN
"MUSTANG" P-51**

Model S-10. Span 13 3/4"

The world's fastest low-altitude fighter. It is called by aviation authorities "the plane of the year." A plane that most pursuit pilots prefer to fly. Postpaid **50c**



**REPUBLIC
"THUNDERBOLT" P-47**

Model S-13. Span 15 1/2"

The "Thunderbolt" is the world's best fighter at high altitude. Powered by a 2800 Horse Power engine with a turbo-supercharger. It can outclimb, outfly and outdive any Axis opposition. Postpaid **\$1.00**



FOCKE-WULF 190

Model S-12. Span 13 3/4"

The German Luftwaffe's latest attempt to interest our high altitude Flying Fortress. The only German fighter powered by radial air-cooled engine. Complete markings and insignia. Postpaid **50c**



VEGA "VENTURA" B-34

Model S-15. Span 16 3/4"

The "Ventura" is one of the Army's newest and most deadly twin engine bombers. It carries a heavy bomb load for long range flight to the heart of the enemy. Postpaid **\$1.00**



**DOUGLAS
"BOSTON" A-20**

Model S-14. Span 15 1/2"

The "Boston" has been in the war since the start. It is used for long range flying and bombing. Postpaid **\$1.00**



ITALIAN "MACCHI"

Model S-11. Span 13 3/4"

Italy's best fighter plane of World War II. The ship that our Air Corps in Africa had to recognize and dog fight. Model has complete details with markings and insignia. Postpaid **50c**



**ALL NEW!
TO MEET FLIGHT TRAINING
DEMANDS**

AMERICAN ACE "54"



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. 54" wingspan. \$3.95 P. P.

BUCCANEER "B" SPECIAL



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 whipstall 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.



ONLY 10c — THIS SENSATIONAL NEW CATALOG. TELLS ALL ABOUT ALL MODELS, KITS, ACCESSORIES. AT YOUR DEALERS OR BY MAIL 10c.

Berkeley Models, inc., 230 STEUBEN ST., (HANGAR 7) BROOKLYN, N. Y.



5/1,000,000ths of an inch!



Bantam PRECISION is at War!

Precision machining of control instruments and firing mechanisms in America's planes, tanks and guns makes them dealers of death to the Axis!

BANTAM craftsmanship that once made championship miniature motors is now 100% in the service to help Uncle Sam *speed Victory!*

Achievements of tolerances of 5/1,000,000ths of an inch, surface finish, is your assurance that after the war BANTAM precision championship motors will continue to be the finest miniature motors in the world!



BANTAM MOTOR
National Champion Class A
1939 • 1940 • 1941
For Assured Postwar Laurels



BANTAM PRODUCTS CORPORATION

101 PARK AVENUE • NEW YORK
PLANT: NUTLEY, NEW JERSEY, U. S. A.



Your Place in Peace

Individuals, like nations, must make post-war plans if they hope to enjoy the return of peace. According to authorities, a career in the aviation industry holds more promise than any other. Of the thousands working in aircraft plants today, half or more are women who will go back to "woman's work" after the war. Many of the men will return to industries or professions now considered non-essential.

Yet aviation expansion will just begin when peace returns. War-accelerated development of flying makes all the world close neighbors . . . the farthest spot on the globe is only 60 hours away by airliner. There will be no dark continents. Every corner of the earth will have its airport, and every American village will have a landing field. All these airports will need ground crews, and factories will be hard-put to supply enough commercial and private planes. Many thousands of new aircrafters will be needed to design, build, service and fly the vast air fleets of tomorrow.

Training at Aero Tech will insure your place in peace. At this outstanding technical aviation institute, you will find complete equipment, and instructors with wide experience and understanding. Located in the midst of America's leading aircraft factories, you will have practical contacts with the industry that will be valuable, both during training and after graduation. Plan NOW to study at AERO TECH.

Make Post-war Training
a part of *your*
Post-war Plans

BUY
WAR
BONDS

**AERO
TECH**
LOS ANGELES

6 Career Courses in AIRCRAFT MECHANICS, AIRPLANE ENGINES, and AERONAUTICAL ENGINEERING—including CAA-approved 12-Month Aircraft and Engine Mechanics Course.

Contractor to U. S. Army Air Forces
Technical Training Command

AERO INDUSTRIES TECHNICAL INSTITUTE

5257 West San Fernando Road, Los Angeles, California