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by COL. JOHN H. JOUETT



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Production Articles

are usually formal and boring. But on page 2 we've got one that will keep you interested from beginning to end. Colonel Jouett explains fully how America is forging ahead.



A close-up of the trailing edge camber-changing Fowler flaps at full extension on a Lockheed 14

FLYING ACES

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A WARPLANE EVERY EIGHT MINUTES!

If our aircraft industry is to produce the 60,000 machines scheduled for 1942, a ship must leave the lines every eight minutes during the year's 525,600 minutes!

by Col. John H. Jouett

President, Aeronautical Chamber of Commerce of America



Col. John H. Jouett

THE GHASTLY STORY of what happens to a nation that cannot fight fire with fire has been the most tragic lesson of this second World War since it first set Europe aflame. And since Pearl Harbor brought the fear of bombs and poison gas to all our western seaboard cities, there has been among us much self-reproach for not having been more extensively prepared in the air. It is obvious that Japan would not

have risked war with us if we had possessed our total potential air strength. And it is obvious that even Hitler and Mussolini would not have dared to start war *anywhere* if the United States and Britain had been thoroughly armed in the air and had agreed to use that air power for the maintenance of international law and order.

As far back as the first World War the Germans were busily developing

planes to be carried across the Atlantic by submarine, ready to be launched against New York from points only a few miles offshore. It must be realized, of course, that raids by submarine-based airplanes would be only a "token" nature—but with Pearl Harbor to remember we should not be surprised at anything they do. It is entirely possible for them to slip past our most efficient and far-flung guardians of the sky,

because the seas of the air are three-dimensional and the advantage lies with the intruder.

Axis air power is at present the greatest threat to our success in this war and our security here. And it will remain so until we gain supremacy and turn the tables. It places an additional burden on us, because while supplying equipment to our own air services and those of our allies on all fronts, we must at the same time supply enough good planes to guard more than 3,000 miles of coastlines. But when the American war production spigot is turned on full force, we will see a flow of munitions of all kinds that will even amaze us here.

I hardly need mention what the plan is today. The President of the United States gave the aircraft manufacturing companies their orders in his historic message to Congress early this year. The plan calls for 60,000 planes this year and 125,000 in 1943. It has been pointed out that this means one warplane every eight minutes during the next twelve months and one every four minutes next year. It means that this year we must approximately triple last year's production and then double that output in 1943. But it means even much more than that.

You, of course, understand that in any war everything possible must be done to prevent the enemy having knowledge of what is being prepared for him. In this war the elements of secrecy and surprise are particularly vital, because on one side we have an enemy that is very ingenious and clever, and on the other side another enemy is clever at copying the inventions of others. Still, you have a right to know how we are getting on with this venture. Our Army and Navy want you to know. They cannot say much about what they are doing, but they are accomplishing wonders with what they have. They long have planned for mass use of aircraft equipment and they realize their huge responsibility.

But, after all, they can use only what the nation gives them. For example, it became our Government policy to send planes to England and



American long-range patrol bombers, like this Martin PBM-1, are classed as the finest to be found. Our Navy has long been interested in machines of this type.

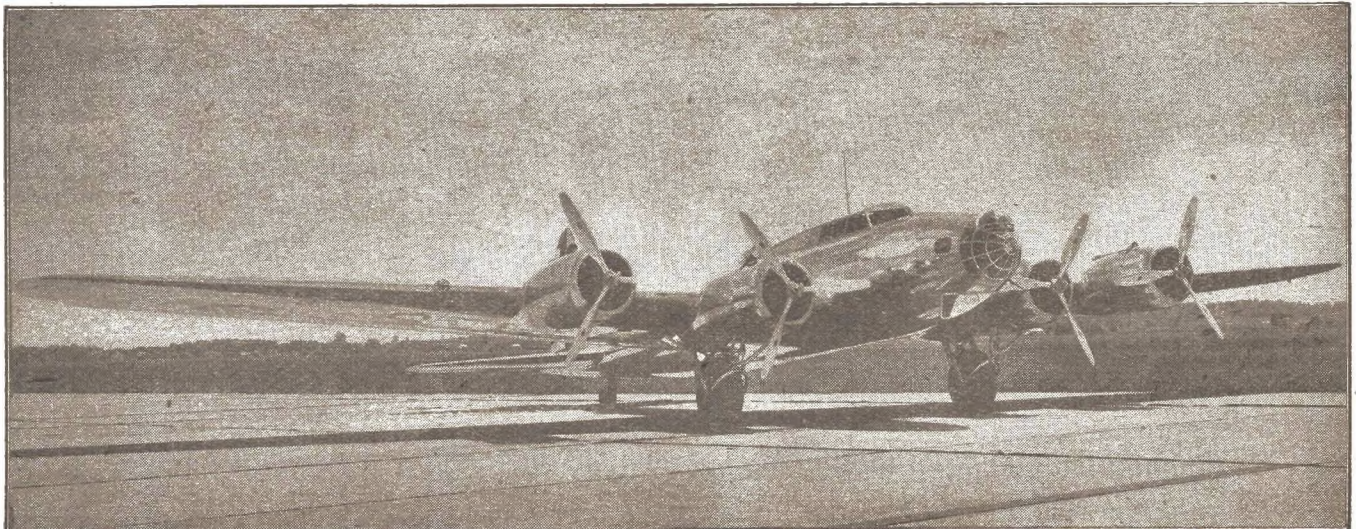
France at the start of this war. This was at a time when our own air services were being authorized to expand. As the tempo of war made still greater demands, we sent increasing numbers of planes abroad—not only to England but to Africa, Singapore, the Dutch East Indies, and to China. Then we sent planes to Russia. I have not the slightest criticism to offer. The point I am trying to make is that our air services to date have received only a very small percentage of what we have produced. I suggest that you take this into consideration when the question is raised as to why Americans are not here or there over the front in force.

THE REASON our President felt confident in setting up the gigantic aircraft program for this year and next is found in the performance of the recent past. Some months prior to the outbreak of war in Europe, Brit-

ain and France placed orders here and indicated that still larger purchases would follow. That gave most of our larger companies an opportunity to develop quantity production methods, educate sub-contractors and purveyors in providing large quantities of planes, train labor by the thousands instead of a few score as in the past, and, finally, it paved the way toward standardization of parts and gadgets and in some cases whole models, especially trainers.

You will recall that when the President in May, 1940, told Congress that he wanted the industry to gear up to a capacity of 50,000 planes a year, most people thought it impossible. We then were producing at an annual rate of less than 6,000 planes. Well, under that old program we would have reached the yearly rate of 50,000 planes before next December. So you will understand that the President was justified in raising the

Colonel Jouett says that we are underway toward a tenfold increase in our output of four-engine bombers. The Boeing B-17's are very symbols of destruction.



requirements as he did.

All this, of course, has created radical changes in the economy of the aircraft industry, as well as other industries. Under the impact of the defense program we have been going through continuous reorganization of the plants. But the rapid expansion has forced the creation of new departments and in many cases entirely new auxiliary plants in other locations. As a result, management and trained supervisory personnel have been spread rather thin. These conditions have prevailed to a greater or lesser degree throughout the industry and in the subcontracting field where the pressure of sudden and unprecedented demand has caught thousands of firms unprepared and in most cases unfamiliar with the exacting requirements of airplane manufacture. That it did not plunge us into confusion and chaos during 1940 and the early months of 1941 is part of the industrial miracle that has been accomplished.

The United States has been turning out good airplanes and many of our types are the best in the world. In the effort to speed up production, there has been no relaxation of constant improvement in performance as dictated by the lessons of the war. You undoubtedly know this, but I cannot resist repeating that every plane, every type and model must be designed for a specific kind of operation in warfare. It must also perform to specifications. Second best is not good enough in aerial warfare. Armor once was kept off planes to save weight. With more guns and high speed it became easier to shoot down unarmored machines. With fast bombers flying far beyond the range of protective escort fighters there came a need for armor protection. All air forces have it now. Fire-power has increased to tremendous proportions. Our relatively small pursuit planes carry 37mm. cannon and whole batteries of heavy caliber machine guns. Our dive-bombers make those used in Europe only a year ago appear like relics of the past. We are not at all amazed when we read of the havoc wrought by our combat planes. The only trouble at present is that we do not have enough of them.

WITHOUT TRESPASSING on the censor's forbidden ground, I may also say that the aviation which we have heard about this far during this war is nothing when compared to what we should see in the near future. We have heard it said that no new inventions have appeared in the war to date. I will not debate the point, but I do know there are some technical developments of great magnitude. I know that we are not lagging in that respect. There are better airplanes even now going into mass production. There are many new devices of destruction, not for some problematical date in the distant future, but now! They are being produced in quantity now. The Germans and the Japs have some frightful surprises in store for them.

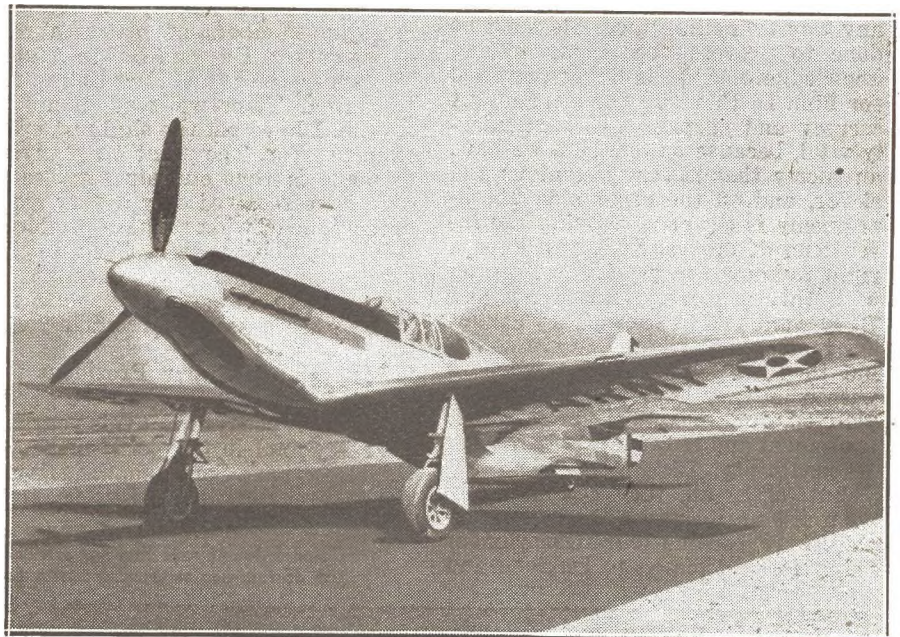
There is every urge for us to accomplish these objectives as quickly as possible, because while we are preparing surprises for them it is not too much of an assumption to consider the possibility of their finding some surprises for us.

In order to speed up production our industry is accomplishing much in the way of standardization of parts and installations. There once were thousands of parts of different

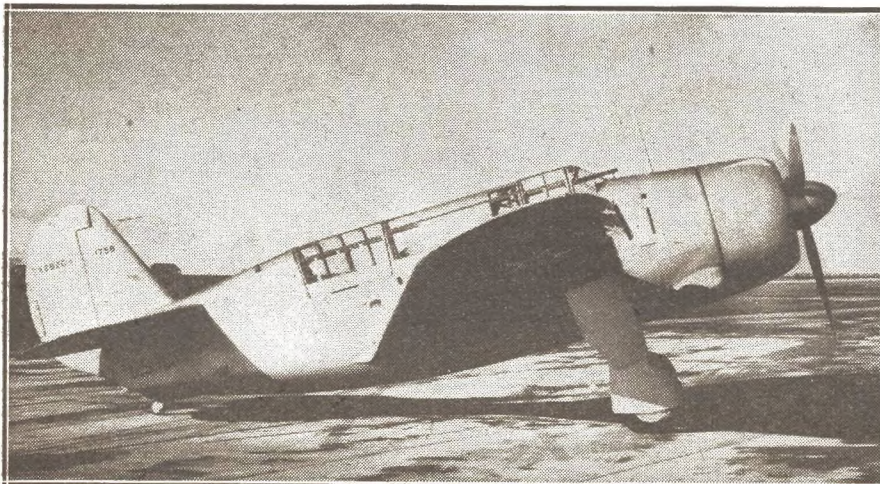
shape and size for every model of plane. That required more time, more plant space, and vastly more labor in every shop that handled a part, from the place it was made to the factory where it went into the plane or engine. The industry had been at work on standardization for some years. Now it is aiding materially in speeding up production.

It is most gratifying to know that past planning has resulted in a well-balanced use of the aircraft industry. All our plants, large and small, are producing to the limit of their facilities and the supplies obtainable. In 1939, when increased production appeared essential, Lieut.-Gen. H. H. Arnold, then Chief of the Air Corps and now Chief of the Army Air Forces, succeeded in changing procurement procedures so that practically all existing manufacturing units would share in the expansion, to the end that the whole industry would be ready for the full-out effort when that time arrived.

Another fact is of importance. We hear at intervals that the nation was unprepared and had no plan for industrial mobilization at war. That is not the case. The aircraft industry, as well as the other key defense in-



One of the latest pursuits to be ordered in quantity by the AAF is the North American P-51. However, it is outclassed by new types.



Left: Our dive-bombers make those used in Europe only a year ago appear like relics of the past. Curtiss' SB2C-1 is the last word.

dustries, have been the subject of considerable planning by the War and Navy Departments for about 20 years. The principle of not forcing the established aircraft companies to undertake all war production has been part of the Government's war mobilization plan for at least two decades. It is a very sound policy.

You remember what happened to our aircraft industry after the last



We sent increasing numbers of planes abroad as the tempo of war made greater demands. This is one reason why American aircraft are not more prevalent over the many far-flung fronts.

war. It was characteristic of the American way of doing things that we should plan for a maximum effort, as we are doing today. In 1917, our aircraft companies were given a program of 2,500 planes. Then the Allied missions arrived and convinced us that not 2,500 but 25,000 planes would be needed from the United States. The industry had to expand tenfold. The program was again expanded, this time to 20,000 combat and 9,000 training planes.

At the time of the Armistice in November, 1918, the aircraft industry, including war baby plants and some companies in the motor car industry, were producing at the rate of 21,000 planes a year. Within three days after the Armistice the war contracts were cancelled and nearly all the employees laid off. Within three months the industry had been liquidated to within 10 percent of its wartime size. That stifled the development of aviation for years. Most of the companies went out of business and the others had no money for the promotion of flying or anything new. As late as 1924, the entire aviation plant of this country had a net worth of less than \$7,000,000. The few companies that remained struggled along on a hand-to-mouth basis with precariously small orders from the air services. Fortunately, the Government now agrees that there shall be no unnecessary expansion.

TRANSITION to full-out effort has been accomplished as quickly as it has because long-range thinking has been the rule. Aircraft experts

have been training automobile artisans and supervisory personnel for many months and have been able to assist materially in converting the motor car plants into adequate factories for aircraft parts. The result of more than a score of years of design, engineering research and development, as well as manufacturing "know-how," without reservation, are being turned over to the motor car and allied industries for their use. This will continue to be the practice of the aircraft industry throughout the war period.

Another factor which has placed the aircraft industry far ahead of the point which all industries occupied when we entered the first World War in 1917 has been the training programs which our companies have been carrying on since the first orders arrived from Europe. While Government educational projects have done much in pre-employment training of mechanics our companies have trained tens of thousands at their own expense, paying new employees during the learning period. This has lightened the burden of expansion as much as any one thing.

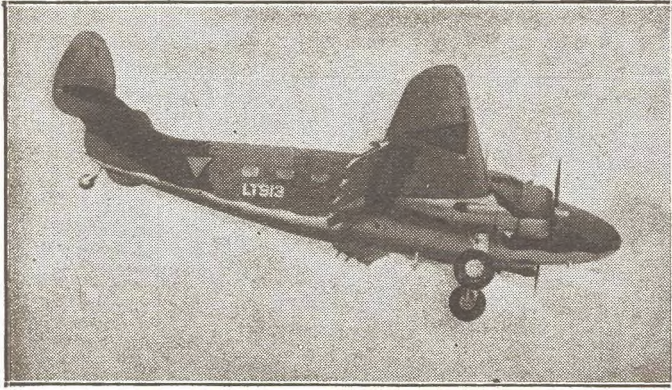
There are manifold problems of the present which we must solve before being satisfied with our production progress. In fact, they are far too many for me to dwell upon here. You are familiar with shortages of rubber and tin. We also must deal with limited supplies of aluminum, copper, magnesium, and steel. There is the question of machine tools and dies and there is a very long list of essential materials now critical. It is

not a question of there being enough for the aircraft industry for other defense industries need the same things in quantity. Their needs, like ours, grow with the expansion of the program in ordnance, shipping—everything, as a matter of fact. It becomes a question of priorities, a question which only the Government can answer, whether aircraft will be allocated certain quantities or tanks or ships will get the materials. Decision in each case will probably rest on what is considered the most urgent at the time.

Here are some of our present problems in meeting the President's program for 60,000 planes this year and 125,000 next. We must find means of increasing factory floor space from the present 50,000,000 to more than 80,000,000 square feet this year and then boost it to more than 180,000,000 square feet for the next year's program. A material increase in factory space will result when the subcontractors start operating new plants now nearing completion, when our companies get into production with the new assembly plants for which the subcontractors in the motor car industry are making parts, and, finally, when the motor car manufacturers themselves achieve full production in the plants built for this purpose.

Labor is another item. It must be trained to work in aircraft plants. From about 400,000 at present in our own industry, the entire program demands an increase to more than 700,000 within the next few months

(Continued on page 79)

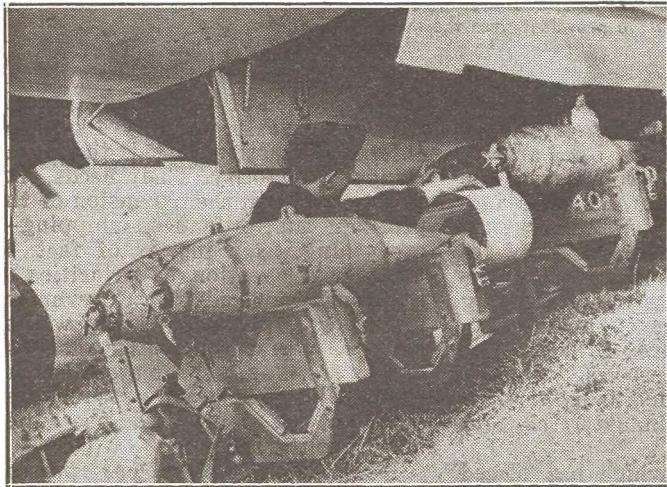


This militarized version of the Lockheed Lodestar is in service with the Netherlands Indies as a bomber and troop transport. Note camouflage and wing and fuselage markings.

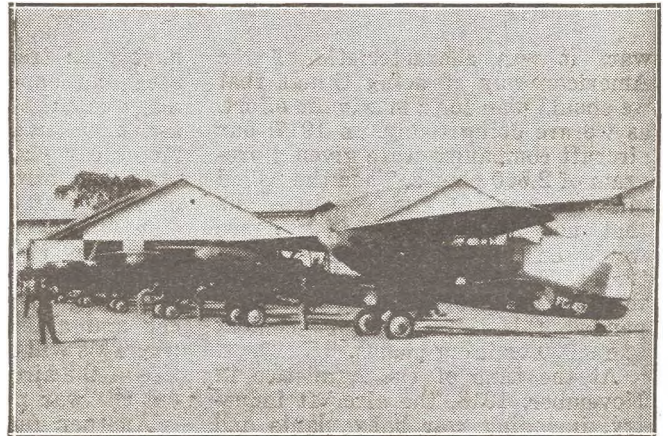
Flying Into Focus



English paratroops now use head gears made completely of sponge rubber. These picked troops are exceptionally fit and go through rigorous training for their dangerous work.

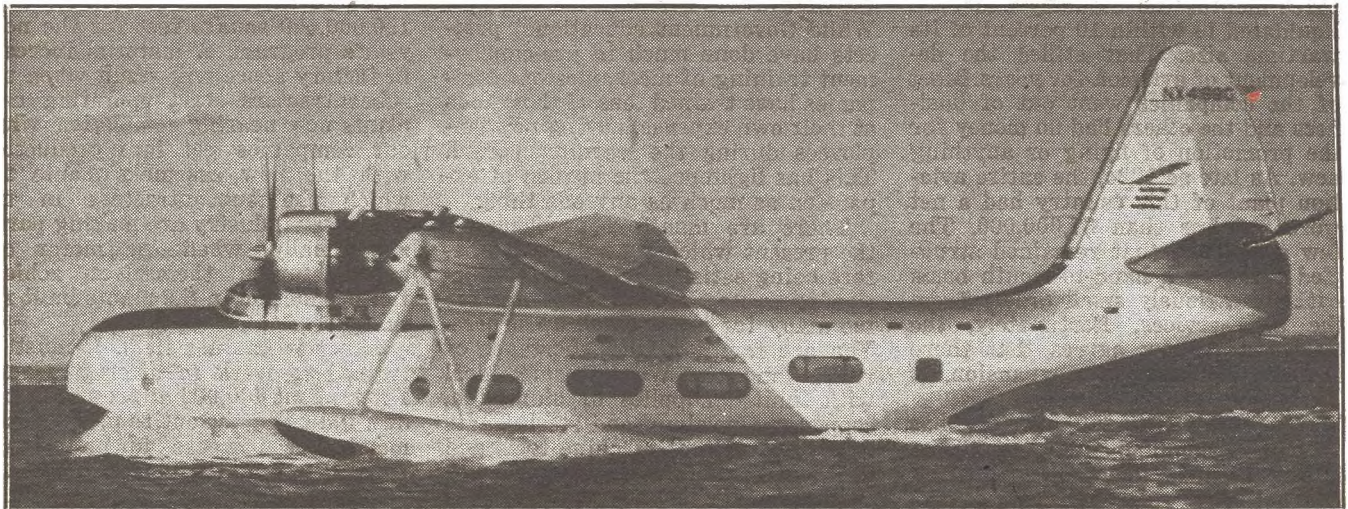


"Somewhere in England," armorers load a bomber with eggs before a flight to "paste" Nazi or Italian industrial areas.



Although sadly out-dated, these Fokker reconnaissance jobs in service with the Netherlands Indies are pounding Japs.

Here is one of the three trans-Atlantic Vought-Sikorsky Excalibur flying boats built for American Export Airlines. This particular ship is called "Flying Ace."



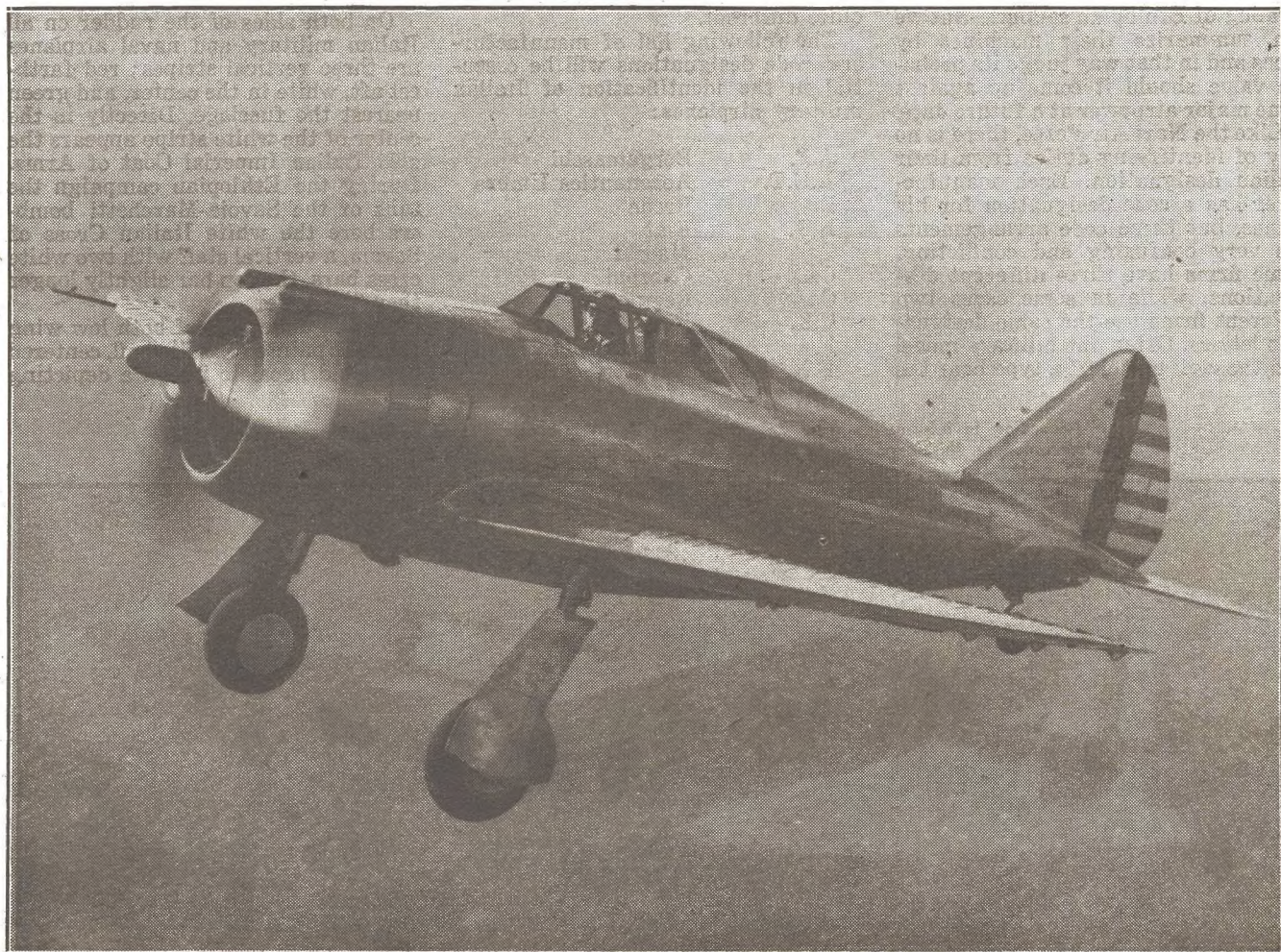


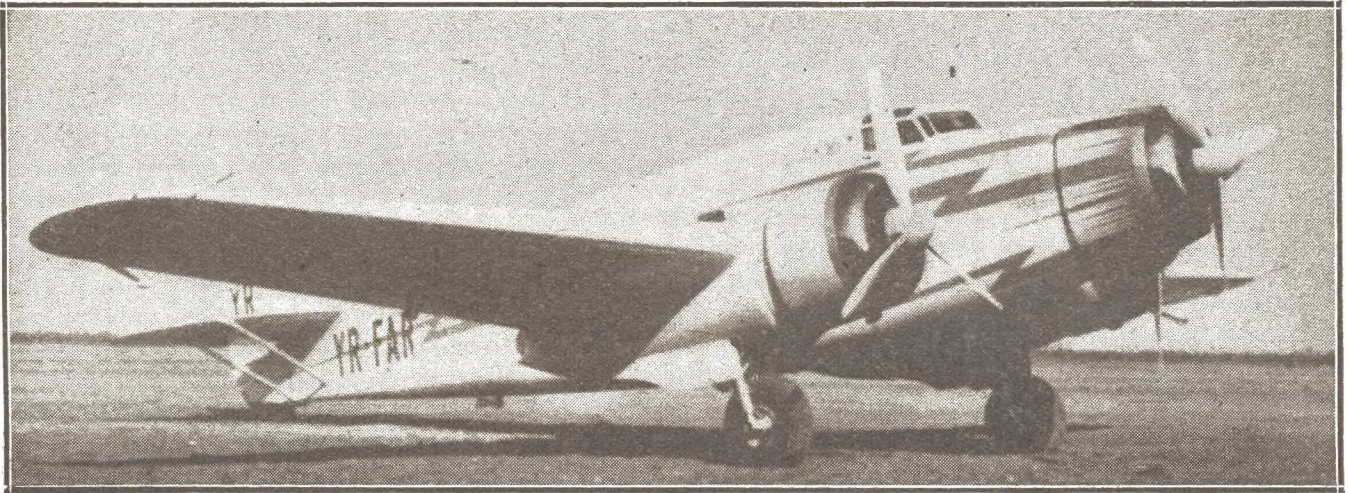
Not a moment of precious time is lost as second-shift men at Douglas wait for first shift to finish their day. When the whistle blows the night workers take up the work immediately to keep 'em rolling!

Right: An RCAF pilot-instructor jots down notes for a student air-gunner at target practice overhead. From sunrise to sunset, young Canadians are training for the big job that awaits them "on the other side."



Designed especially as a high-altitude fighter with supercharger installation, the Republic P-43 Lancer has .30 and .50 caliber wing and synchronized machine guns. Powered by a 1,100-h.p. Pratt & Whitney Twin Wasp engine, the ship is said to cruise at well over 350 m.p.h. More powerful still is Republic's P-47 Thunderbolt.





Designed originally as a commercial transport, the Savoia-Marchetti Sm. 83 is now used for troop carrying and reconnaissance. Power is supplied by three Alfa Romeo engines of 750 h.p.

Review of Italian Warplanes

by
William H. Randall

THERE IS very little in the way of past performance by which to judge the temper of the *Regia Aeronautica* as a general unit, since the Italians have yet to meet a major air opponent. Their bombers encountered very little resistance in the Ethiopian conquest, and their fighter planes were used solely in ground-strafting of Ethiopian soldiers. But we can summarize their machines by types and in that way judge its probable value should it come up against some major airpower at a future date.

Like the Nazi Air Force, there is no way of identifying duties from their Italian designation. Each manufacturer has a code designation for his planes, but these code arrangements are very confusing and conflicting. Some firms have three different designations, while in some cases two different firms use the same designation letters. Often the military model and the civil model of a type bear the

same identifications, although the power plants and specifications are quite different.

The following list of manufacturers' code designations will be essential in the identification of Italian military airplanes:

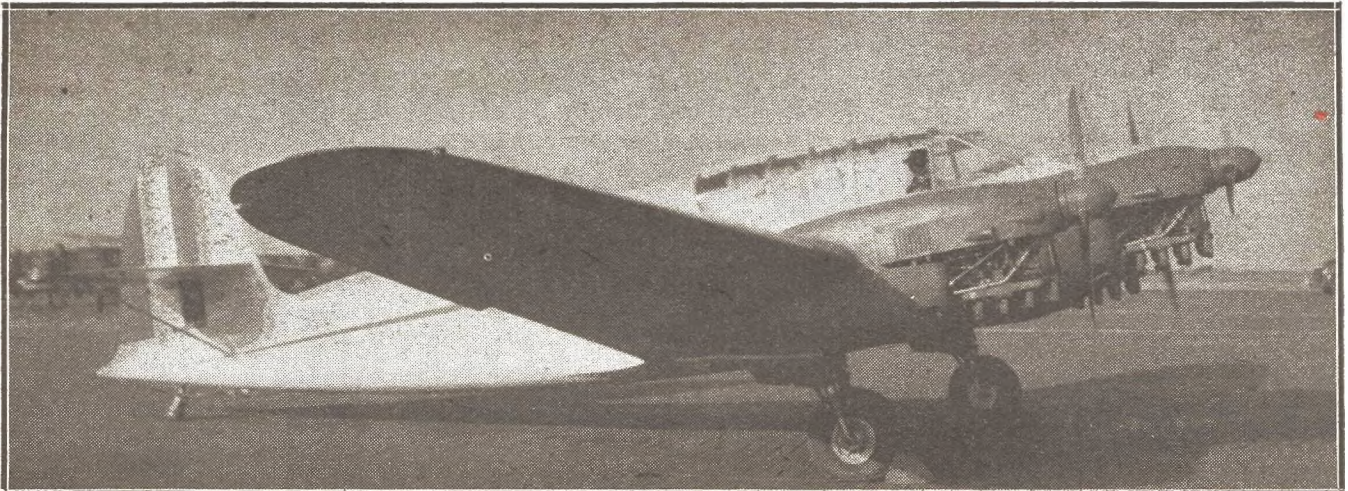
A.P.	Bergamaschi
A.U.T.	Aeronautica Umbra
Ba.	Breda
B.R.	Fiat
C.	Macchi
Ca.	Caproni
Ca.	Reggiane
C.R.	Fiat
F.	Caproni-Vizzola
F.N.	Nardi

G.	Fiat
J.	Jona
M.F.	C.M.A.S.A.
P.	Piaggio
P.M.	Magni
Ro.	Meridionali
Sm.	Savoia-Marchetti
Z.	Cant

On both sides of the rudder on all Italian military and naval airplanes are three vertical stripes; red farthest aft, white in the center, and green nearest the fuselage. Directly in the center of the white stripe appears the gold Italian Imperial Coat of Arms. During the Ethiopian campaign the tails of the Savoia-Marchetti bombers bore the white Italian Cross of Savoia, a vertical staff with two white cross bars, the top bar slightly longer than the lower.

On the underside of both low wing panels is painted a white ball, centered by a gold heraldic insignia depicting

According to information from Italy, this Cant Z. 1012 is now classed as a communications machine. In this capacity, it is used for transporting ranking officers to various points.



the medieval hatchet of the Italian Knights. On many of the Italian planes this ball is centered by three of these heraldic designs.

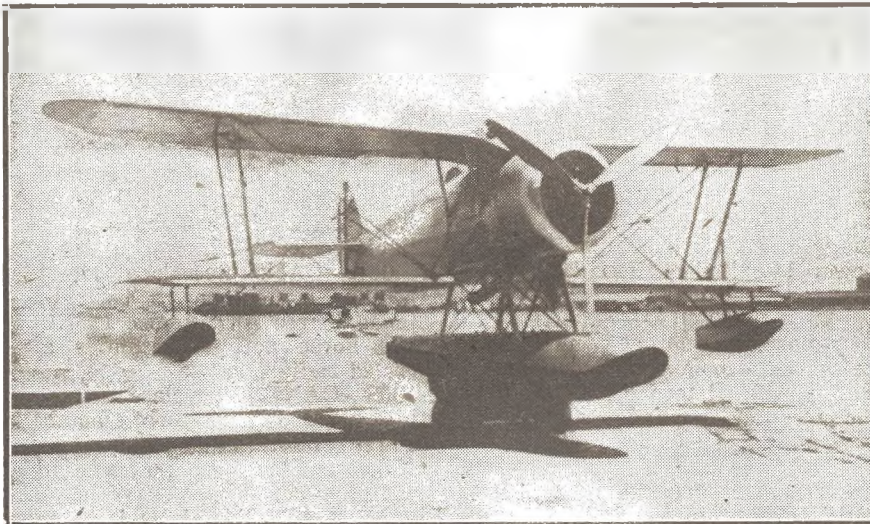
Squadron and plane identification of Italian military and naval aircraft appears on both sides of the fuselage midway between the cockpit and the tail group. Numbers are used for this identification, the first number indicating the squadron, followed by a hyphen, then the plane's individual number in the squadron. These markings appear in bold black numbers.

The following summary of aircraft comprising the Fascist Air Force includes all of the first-line and reserve planes.

TRAINING AIRCRAFT

ITALIAN military training aircraft are light, two-place planes, powered with single engines. The following listed planes are the types currently used for instruction:

- Ba. 25—BREDA two-place biplane. Alfa Romeo D2C30 240 horse power 7-cylinder air-cooled radial.
- Ba. 25—BREDA. Same as above,



- with twin pontoons. Sea-plane.
- Ba. 28—BREDA two-place aerobatic biplane. Piaggio Stella VII-Z 370 horse power 7-cylinder air-cooled radial.
- Ca. 113—CAPRONI two-place advanced biplane. Piaggio Stella VIIC/35 370 horse power 7-cylinder air-cooled radial.
- Ca. 164—CAPRONI two-place biplane. Alfa Romeo 115-I 185 horse power air-cooled inverted 6-in-line.
- F.N. 305—NARDI two-place advanced low-wing monoplane. Alfa Romeo 115-I 185 horse power air-cooled inverted 6-in-line.
- J-6—JONA two-place biplane. Fiat A-54 140 horse power air-cooled radial.
- J-6s—JONA two-place biplane. Alfa Romeo D2C30 240 horse power 7-cylinder air-cooled radial.
- P.M. 4.1—MAGNI single-seat aerobatic monoplane. Fiat A-54 140 horse power (take-off rating) 7-cylinder air-cooled radial.



Classified as a trainer, the Jona J-6 seems advanced for that type work. Visibility from front pit, because of struts, is very poor.

Below: Meridionali's Ro. 44 is a single-seat fighter for cooperation with the fleet. Top speed with 700-h.p. engine is close to 250.

- F. 5 — CAPRONI-VIZZOLA single-seat low-wing monoplane. Fiat A74RC38 870 horse power 14-cylinder air-cooled twin-row radial.
- CR. 32—FIAT single-seat biplane. Fiat A30RA 550 horse power liquid-cooled V-12.
- CR. 42—FIAT single-seat biplane. Fiat A74R1C38 840 horse power 14-cylinder twin-row radial.
- G. 50 "Falco"—FIAT single-seat low-wing monoplane. Fiat A74RC38 840 horse power 14-cylinder air-cooled twin-row radial.
- C. 200—MACCHI single-seat low-wing monoplane. Fiat A74RC38 840 horse power 14-cylinder air-cooled twin-row radial.
- Ro. 41—MERIDIONALI single-seat biplane. Piaggio PVIIC45 390 horse power 7-cylinder air-cooled radial.
- Ro. 51—MERIDIONALI single-seat low-wing monoplane. Fiat A74RC38 840 horse power 14-cylinder air-cooled twin-row radial.
- F.N. 500—NARDI single-seat low-wing attack fighter monoplane. No data released on engine.
- Ca. 2000—REGGIANE single-seat interceptor - fighter. Piaggio PXIRC40 1,000 horse power 14-cylinder air-cooled twin-row radial.

FIGHTING MACHINES

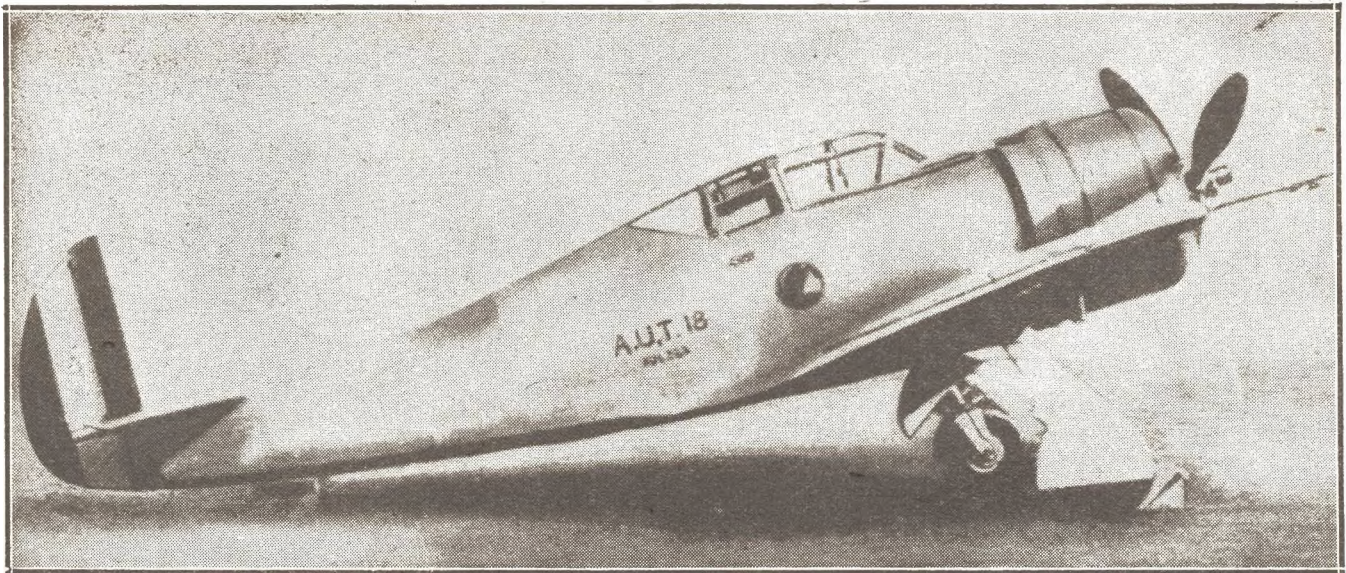
ALL OF Italy's fighters are single seat, single engine planes, with one exception. The design of twin-engine, two-place fighters is only just coming into being, with the Ba. 88 the solitary model.

- A.U.T. 18—AERONAUTICA UMBRA single-seat low-wing monoplane. Fiat A80RC41 840 horse power 14-cylinder air-cooled twin-row radial.
- A.P. 1—BERGAMASCHI single-seat low-wing monoplane. Alfa Romeo 125RC35 650 horse power 9-cylinder air-cooled radial.
- Ba. 88—BREDA two-place high-wing monoplane. Two Piaggio PXIRC40 1,000 horse power 14-cylinder air-cooled twin-row radials.
- Ca. 165—CAPRONI single-seat biplane. Isotta Fraschini L121RC40 900 horse power liquid-cooled V-12's.

BOMBING TYPES

ITALIAN bombardment aircraft fall generally into the medium bomber classification, there being only one four-engine type and one dive-bombing type.

- Ba. 82—BREDA five-place low-wing monoplane. Two Fiat A80RC41 1,000 horse power 18-cylinder air-cooled twin-row radials.
- Z. 1007—CANT four-place mid-wing monoplane. Two Piaggio PXIRC40 1,000 horse power 14-cylinder air-cooled twin-row radials.
- Z. 1011—CANT four-place low-wing monoplane. Two Isotta Fraschini Asso XIRC45 820 horse power liquid-cooled V-12's.
- Ca. 111—CAPRONI single-engine high-wing monoplane. Isotta Fraschini Asso 750RC35 870 horse power liquid-cooled V-12.
- Ca. 135—CAPRONI four-place twin-engine mid-wing monoplane. Two



Of all-metal construction, the Aeronautica Umbra A.U.T. 18 uses a Fiat engine of 840 h.p. and has a top speed of near 300. With all its modern lines, only two cowl guns are fitted.

Isotta Fraschini Asso XIRC40 900 horse power liquid-cooled V-12's.
 Ca. 135 bis—CAPRONI four-place mid-wing monoplane. Two Piaggio PXIRC40 1,000 horse power 14-cylinder air-cooled twin-row radials.
 Br. 20M—FIAT six-place low-wing monoplane. Two A80RC41 1,000 horse power 18-cylinder air-cooled twin-row radials.
 P. 50—PIAGGIO low-wing heavy monoplane. Four Piaggio PXIRC40 1,000 horse power 14-cylinder air-cooled radials.
 P. 108—PIAGGIO low-wing long-range heavy monoplane. Four Piaggio PXIIRC35 1,500 horse power 18-cylinder air-cooled twin-row radials.
 Ca. 405—REGGIANE four- or five-place mid-wing monoplane. Two Isotta Fraschini Asso XIRC40 836 horse power liquid-cooled V-12's.
 Sm. 85 — SAVOIA-MARCHETTI single-seat mid-wing monoplane dive-bomber. Two Piaggio PXC35 625 horse power 9-cylinder air-cooled radials.
 Sm. 86 — SAVOIA-MARCHETTI. Improved version of the Sm. 85, with considerably improved performance.

RECONNAISSANCE CRAFT

THE RECONNAISSANCE division of the Italian Air Force has but a single type designed solely for that work. All other aircraft assigned to this duty have a secondary mission, and some models have a third mission. Only those aircraft for reconnaissance and secondary missions are covered in this section. Triple-purpose planes fall under the heading of General Purpose Aircraft and are listed in that category.

Ca. 134—CAPRONI two-place biplane. Isotta Fraschini Asso XIRC40 836 horse power liquid-cooled V-12.
 Ca. 310—CAPRONI three-place low-wing reconnaissance-bomber mono-

plane. Two Piaggio PVIIC35 460 horse power 7-cylinder air-cooled radials.
 Ca. 311—CAPRONI three-place low-wing reconnaissance-bomber monoplane. Two Piaggio PXVI 630 horse power 9-cylinder air-cooled radials.
 Ro. 37 — MERIDIONALI two-place reconnaissance - fighter biplane. Piaggio PXR 700 horse power 9-cylinder air-cooled radial.
 P. 32 bis—PIAGGIO mid-wing reconnaissance-bomber monoplane. Two Piaggio PXVIRC40 1,000 horse power 14-cylinder air-cooled twin-row radials.
 Sm. 79 — SAVOIA-MARCHETTI four-place trimotor low-wing reconnaissance - bomber monoplane. Three Alfa Romeo 126RC34 750 horse power 9-cylinder air-cooled radials.

GENERAL PURPOSE AIRCRAFT

MISSIONS of planes in this category are so general that the purpose of each is listed with the individual type.

Ghibli — BERGAMASCHI low-wing general-purpose monoplane. Two Alfa Romeo 115-I 200 horse power air-cooled inverted 6-in-line engines.
 Ba. 64—BREDA single-seat low-wing monoplane. Duty as reconnaissance, fighter, or light-bomber. Piaggio PIXRC40 610 horse power 9-cylinder air-cooled radial.
 Ba. 65—BREDA one- or two-place low-wing monoplane. Duty as reconnaissance, fighter, or light-bomber. Fiat A80RC41 1,000 horse power 18-cylinder air-cooled twin-row radial.
 Ca. 101—CAPRONI two-crew high-wing trimotor military transport monoplane. Two Alfa Romeo D1 270 horse power 7-cylinder air-cooled radials.
 Ca. 133—CAPRONI two-crew trimotor high-wing military transport monoplane. Three Piaggio Stella

PVIIC/16 460 horse power 7-cylinder air-cooled radials.

NAVAL COOPERATIVE TYPES
AIRCRAFT designed for duty with the Italian fleet, and those intended for general over-water duty, are listed below.

Z. 501—CANT four-place high-wing flying boat monoplane reconnaissance-bomber. Isotta Fraschini Asso XIR2C15 880 horse power liquid-cooled V-12.
 Z. 506B—CANT five-place trimotor bomber monoplane on twin pontoons. Three Alfa Romeo 126RC34 750 horse power 9-cylinder air-cooled radials.
 Z. 508—CANT four-place trimotor high-wing flying boat bomber. Three Isotta Fraschini Asso XIRC40 865 horse power liquid-cooled V-12's.
 Ca. 111—CAPRONI high-wing bomber monoplane on twin pontoons. Isotta Fraschini Asso 750RC35 870 horse power liquid-cooled V-12.
 Ca. 124—CAPRONI mid-wing reconnaissance-bomber on twin pontoons. Isotta Fraschini Asso XIRC15 900 horse power liquid-cooled V-12.
 Ca. 310—CAPRONI three-place low-wing reconnaissance-bomber monoplane. Two Piaggio PVIIC16 460 horse power 7-cylinder air-cooled radials.
 Ca. 312 bis—CAPRONI three-place low-wing reconnaissance-bombing monoplane. Two Piaggio PXVI 630 horse power 9-cylinder air-cooled radials.
 Ca. 312 I.S.—CAPRONI two-place low-wing torpedo plane on twin pontoons. Two Piaggio PXVI 630 horse power 9-cylinder air-cooled radials.
 M.F. 6—C.M.A.S.A. two-place catapult reconnaissance-fighter on single pontoon, equipped with wing tip floats. Bristol Jupiter VI 415
 (Continued on page 78)



The General Aviation mail and express plane of 1934 was designed to carry a crew of one and six passengers. It used a Wright Cyclone engine of 710 h.p. and was of all-metal construction. Note fuselage baggage compartment and fixed landing gear legs.

Down Memory's Runway



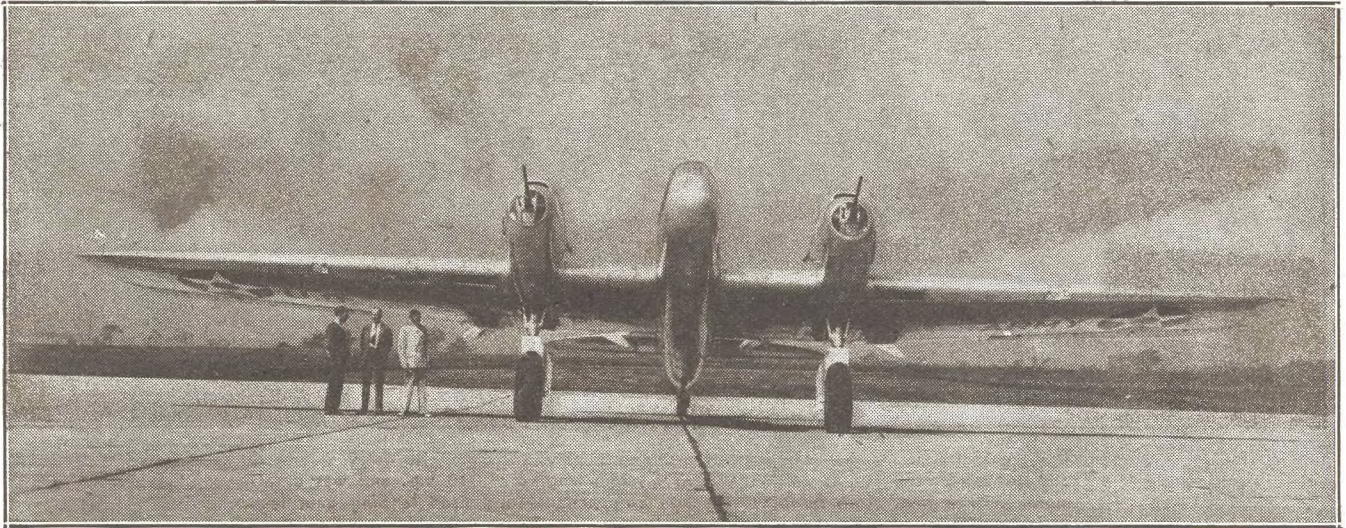
First flight of Western Air Express on April 17, 1926. "Pop" Hanshue, first president of WAE, and the Los Angeles postmaster load letter to Mayor Walker aboard ship.



"Mass" production in 1921. Of all-wood construction, this Douglas DT was used by Naval Air Service for torpedo duties. Power plant was a 400-h.p. Liberty on spruce engine mounts.

World-famous globe-girdler Wiley Post and his Lockheed Winnie Mae. With this machine Post in 1933 flew solo around the world in seven days, 18 hours, and 49 minutes. In '31 Post made the same hop in the same plane in eight days, 15 hours, and 51 minutes.





"Fighter planes of tomorrow, patterned greatly around the basic idea of the Bell multi-place fighter, are on the boards of our engineers right now," Maj. Hoyt Vandenberg stated.

Fighters of the Future

According to this writer, aerial combat in years to come will take on aspects of a gigantic naval battle.

by Raymond Heron

EVEN THOUGH the single-seat fighter is today, as in the last great war, *the garde du corps*—the top man—recent developments make it apparent that the future of this type fighting machine is somewhat shaky and that it might possibly drop out entirely, except for interception purposes. This is a some-

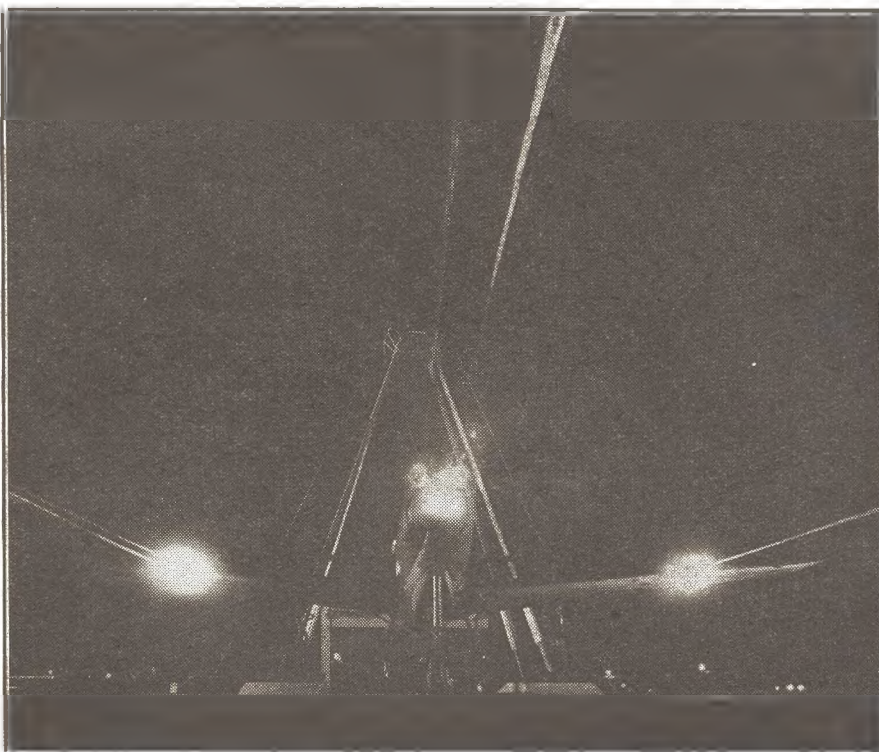
what startling statement, especially when one considers the role that single-seat fighters are playing in this current war, and there will undoubtedly be plenty of contradiction—but, just for the record, let's look at cases:

With advancement in aeronautical design, bomber performance was

stepped-up to such a degree that the Martin B-10 of 1932 could out-run and out-fight any Army Air Corps single-seat job of that time. To counter this situation, fighters were made faster—but in doing so they were made larger and heavier through the necessity of more powerful engines.

The fighters are on top at the present, with the Republic P-47B being the last word in the single-seat category, but that ship is heavier for its size than a battleship, and carries almost a ton of guns and ammunition! From this, we see that in order to keep fighters modern and in pace with bombers, it has been necessary to greatly increase their weight and put them in the same category as bombers of a few years ago. To even top this off, we are now being told that the not-too-distant future holds promise of 5,000-h.p. fighters weighing up to 30,000 pounds and carrying 75mm. cannon!

Power plant ratings did not advance fast enough, so many other innovations were put into effect to increase the speed of single-seaters. But with heavier ships and higher speeds came much higher landing speeds. The Boeing P-26A, for instance, was said to have a landing



Author Heron says that fire-power is the most important feature of a fighter. This P-39 is firing its six m.g.'s and cannon.

Flaps were added to decrease landing speeds. But if fighters become much faster, set-down speeds will once again go up the graph.

speed of 84.5 m.p.h., which is plenty hot—more so for a job with such a short landing gear tread. Then flaps were installed in more advanced fighters. But there is a limit to protective apparatus which can be added, and if speeds continue to increase and weights continue to mount, landing speeds will most certainly reach a tremendous high. And as landing speeds increase up the graph's arc, so landing fields will necessarily become larger to make possible longer take-off runs and landing approaches. This actually defeats the main purpose of a fighter, for primarily the type is for operations from comparatively small, make-shift fields close to actual scenes of combat.

TO MAKE it even more apparent that the future of single-seat fighters is very uncertain, take the case of the Boulton Paul Defiant. The plane is actually a fighter but is so different from ships previously seen in that category that it is really a type in itself. For in the Defiant, which was designed in the first place for night operations, all armament is concentrated in the rear power-operated machine gun turret and no guns are provided for the pilot. In this case, then, we see that the pilot is actually nothing more than an aerial chauffeur—and the British state that the Defiant is one of the most effective fighting machines they have in service.

The Douglas Havoc and the Consolidated Liberator clinch the argu-



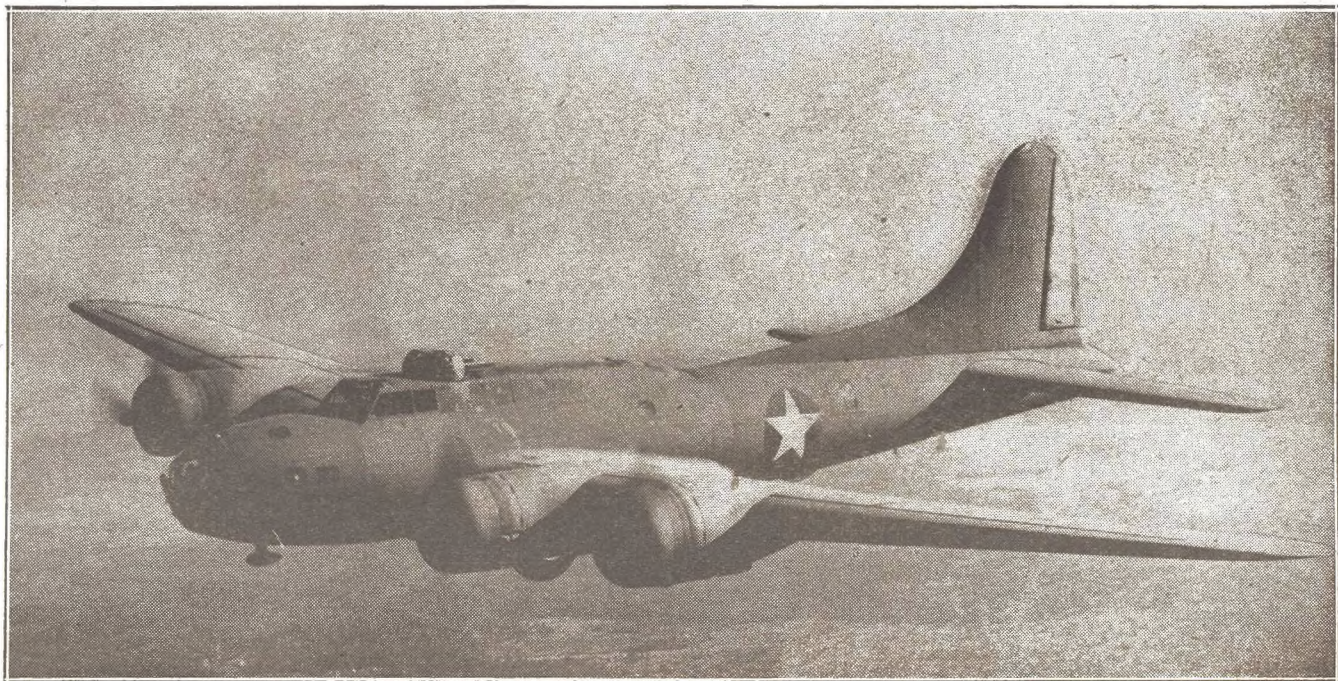
ment. The American version of the Havoc, the A-20A, is used for light bombardment and ground attack and the original British model, the Boston, was employed in similar duties. Then the potentialities of the craft were realized by our British allies, and it was rechristened Havoc and made into a multi-place night fighter. And as far as the Liberator is concerned, you remember that in the March, 1942, issue of FLYING ACES, Maj.-Gen. H. H. Arnold (now Lieut.-Gen.), Chief of the Army Air Forces, stated: "The B-24 is so maneuverable, in spite of its size, that the (British) Coastal Command has stuck four cannon in the nose,

equipped it with anti-submarine charges, and used it as a fighter."

America's first real serious attempts to do something about the drawbacks of single-seat fighters, after the first World War, was with the Berliner-Joyce P-16 two-place gull-wing biplane. That machine, however, was none too successful and experiments were discontinued in the multi-seat line until Bell came along with the XFM-1. That plane, according to reports, is still under test but has not been ordered for actual service duties, even though preliminary orders have been let and filled for both the prototype XFM-1 and its more

(Continued on page 79)

Mr. Heron is firmly convinced that fighters of the future will be large planes, possibly even greater in size than the Boeing B-17, with gun turrets at all points of vantage.



Death Flies the Beam

CHAPTER I

THE MESSAGE

THE unseen plane was getting closer. Eric Trent peered across the dark flight-deck of the carrier *Lexatoga*, to where the machine-gunners squatted, waiting. Beyond them, the muzzles of anti-aircraft guns shone faintly under tropical stars. Trent turned to his perpetually sad-faced partner, Mortimer Crabb, who like himself had been commissioned in the Navy for special duty.

"Well, Mort, if it's a Jap trick, he'll get a hot reception. It's probably young Shelton, though it's a bit odd—"

"What happened?" interrupted Crabb. "I ate early and took a little nap—just woke up when I heard 'battle stations.'"

Trent grinned to himself in the darkness. "The way you were sawing wood, I thought it would take Gabriel's horn—that snore was probably what got the sound-rangers on their toes."

"Ha, ha!" Crabb said acidly. "About as funny as the time you slipped up and broke the admiral's

A Yank had died bringing that garbled message back to the "*Lexatoga*." But Eric Trent swore that he would work out the hellish puzzle, and he took-off into the night sky in search of—a cat!

by Donald E. Keyhoe

Illustrated by Alden McWilliams

watch, back at San Pedro."

"That was no slip," replied Trent. "The admiral had a weird notion a magician would make a good aide. I had other ideas—such as being the *Lexatoga's* air intelligence officer."

"Hot air's more like it," snorted Crabb. "What about Ensign Shelton?"

"He's an hour overdue. All the other patrols got in at dusk. We'd begun to think he was forced down when the detector-crew heard this ship heading toward us."

"Isn't Shelton's plane one of the three with my new radio-beam receivers?" demanded Crabb.

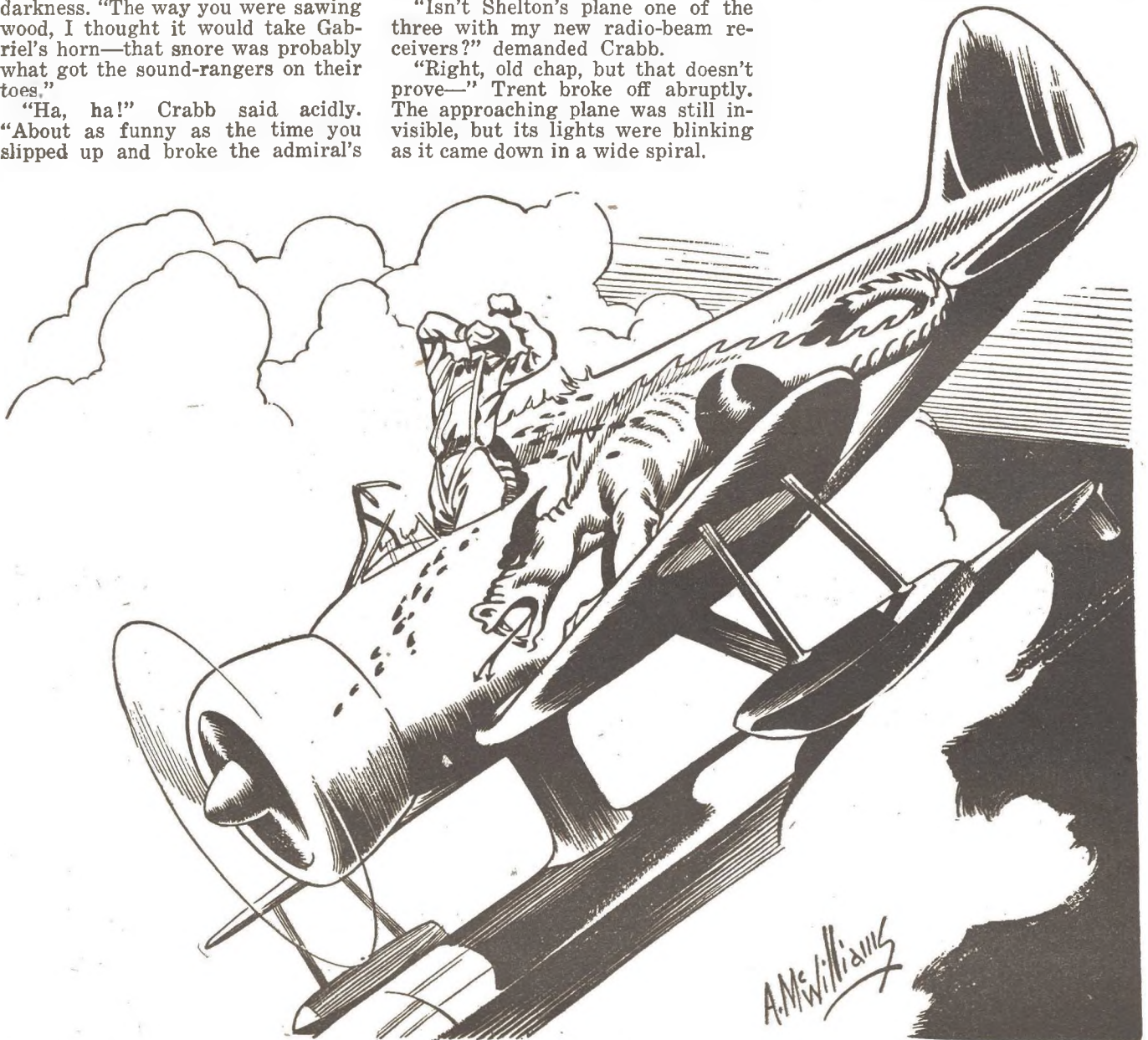
"Right, old chap, but that doesn't prove—" Trent broke off abruptly. The approaching plane was still invisible, but its lights were blinking as it came down in a wide spiral.

"That's his code-recognition number, all right," muttered Crabb. He jumped as a deep rumble sounded from somewhere above the carrier.

"Don't worry, Mort," said Trent. "The skipper sent off a flight of Brewsters—just in case. Oh-oh, what's this?"

The blinking lights slowly spelled out a word in plain Morse code, dragging out the last letter.

"D-a-n-g-e-r . . ." There was an interval in which the plane's engine



revved up, then fell to idling speed. The ship's navigation lights winked again, and a hush fell over the flight-deck crew.

"F-i-r-e a-t M-a-k-i . . . s-h-o-r-t l-i-n-e d-i-r-e-c-t-l-y w-e-s-t . . ."

Again the blinking signals ceased. The plane seemed to be circling aimlessly for a minute, its power now full on.

"Why don't they give him a light and let him land?" Mortimer Crabb said hoarsely.

"It still may be some trick," rapped Trent. "There go his code-signals again."

Slowly, with a hint of something almost painful, the words winked out. "W-r-e-c-k J-a-p-s . . . h-a-v-e h-i-d-d-e-n c-a-t . . ."

THE steady drone of the plane's engine broke sharply, and a second later a parachute flare blossomed about the dark sea. Anti-aircraft and machine-gun crews tensed as a plane

dipped into the glare. It was a Navy Grumman F4F-3 fighter, and it was swaying in toward the carrier, apparently almost out of control. Above it, the Brewsters swooped down, ready for swift action.

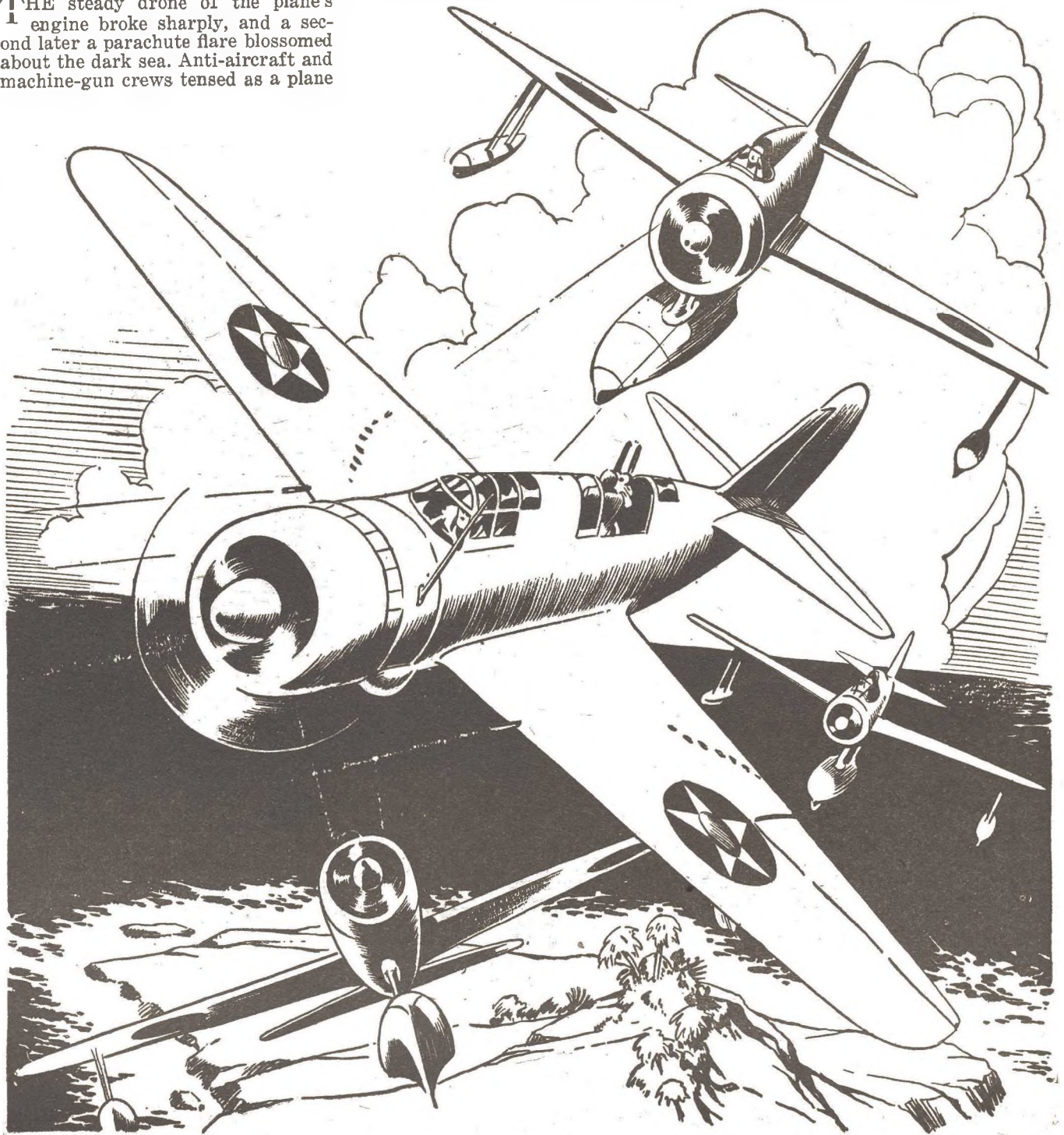
With a last muffled backfire, the engine went dead. The Grumman made a wide, skidding turn as the pilot attempted to correct his approach. For a second Trent thought the fighter would drop below the flight-deck and crash the side of the vessel. But with a crazy zoom, the Grumman moaned up above the deck, stalled, and struck with a resounding crash.

Even before it hit, the crash-squad was running toward the spot. Trent reached the group just as the pilot's limp body was lifted out. The blue-white glare of the parachute flare

shone with a ghastly light on the face of Ensign Shelton. There was a wide, dark stain across the front of his flying-suit, and another on his left sleeve. At least thirty bullets had drilled the Grumman's wing and fuselage.

A hospital-corpsman knelt beside the pilot's body. As he opened Shelton's flying-suit, two of the *Lextoga's* flight officers pushed through the throng. Trent recognized one, a two-striper, as Lieutenant Biff Jackson, a laconic, blunt-spoken Texan.

"Gangway for the Skipper!" said Jackson. The men stood aside for Captain Bradford, commanding officer of the *Lextoga*. Bradford was young for a four-striper, with an habitually grave expression that contrasted with his plump, ruddy face.



The hospital-corpsman stood up, shook his head in answer to Bradford's unspoken query. "It's a miracle he was ever able to fly back here, sir."

No one moved for a moment. Trent looked down at Shelton's ashen face, and a lump came into his throat. He was—he had been—only twenty-one. That afternoon, taking off, he had been as eager as a kid; it had been his first patrol in the Jap mandated area.

Captain Bradford looked up, and Trent saw the brief hint of tears in his eyes.

"Take Mr. Shelton below," he said. "Commander Trent, will you and Lieutenant Crabb come to my cabin, please?"

The drifting flare settled into the ocean as Trent turned to follow, but he had time for a quick glance skyward. Except for the circling Brewsters, there was no sign of planes. He saw the landing-officer signal with lighted wand to guide the first plane down.

BRADFORD had gone below. Trent glanced at Mortimer Crabb as they followed. The inventor's homely countenance had a grim look.

"I'm beginnin' to hate Japs," Crabb grated.

"I've a head start on you," Trent said. "I've hated them for six years—ever since I ran into some in China and found out what dirty butchers they are."

"What do you think Shelton meant by that message?" Crabb said.

Trent shook his head. "There's an island named Maki in the mandated area—but the last part of the message didn't make sense. The poor devil was probably out of his mind."

A Marine sentry let them into the captain's cabin. Bradford motioned them to seats, offered cigarettes. Trent sat back, absently fingering his clipped black mustache, waiting for the C.O. to speak. Bradford smoked for a minute, staring at a map on his desk, then he turned to Trent.

"Well, what do you make of it?"

"Not enough, captain," admitted Trent. "Maki's supposed to be deserted, from our latest reports. Obviously, Shelton discovered something and died trying to warn us to wreck it."

"What about 'short line west' and 'have hidden cat'?" asked Bradford.

"I don't know." Trent's dark eyes rested on the map. "But I've a suggestion. Let me fly to Maki tonight. I'll drop flares, see what's up—and get back before they can tag me."

"Wait a minute," growled Mortimer Crabb. "I've got a better idea. Make it a two-seater, and we'll take one of my K-type transmitters. We can flash back word the second we spot anything—I'll stake my life no Jap has a set that will receive those

frequencies. If Shelton had had one of my transmitters, he wouldn't have had to worry about radio silence and we'd know the truth."

"He probably tried to use his set, when he saw it was necessary," said Bradford. "I noticed the mike switch was on, but a bullet had gone through the set." He hesitated for a moment. "If we only had time to run tests on that new transmitter—remember, we're only part of a raiding force. If the Japs learned we were in these waters—"

Trent squashed out his cigarette. "They already know at least one carrier is in these waters. Seeing Shelton's fighter would tip them off to that. Why not let us go? We might be able to block some trick."

"Very well, I'll order a Curtiss prepared. You can take one of the ships that just landed. Of course, you realize it's a suicide mission, gentlemen?"

Trent looked at Crabb, and grinned. "How about it, Mort? Tired of life?"

"No Jap's going to knock me off," scoffed Crabb. "Let's go."

WHEN they reached the flight-deck, after donning flying-suits and getting their chutes, the K-type transmitter had been brought up from the radio-room. The *Lextoga*, in accordance with Task Force orders, was circling slowly in her assigned area before steaming to her dawn rendezvous with the rest of the raiding fleet. The destroyer escort was invisible in the darkness, but Trent knew the ocean greyhounds were tirelessly weaving back and forth, to protect the carrier from attack.

The special transmitter had been installed, with a temporary hook-up, and Trent was buckling on his chute when from off to starboard came the sudden roar of an airplane engine. Almost instantly, a searchlight flicked out from a destroyer. The rays fell on a seaplane that was bouncing from the waves in a hasty take-off.

"Jap plane!" shouted a mechanic. Pilots swarmed out of the "island" superstructure, but Trent was the first to reach his cockpit. A mechanic swung his prop, as Mortimer Crabb tumbled into the rear of the SB2C-1. Trent taxied out, and the mechs swung him into take-off position. As he got the signal, he sent the heavy dive-bomber thundering down the deck. The carrier had straightened into the wind, swiftly speeding up. The Curtiss hurtled off, and Trent banked toward the Jap seaplane. The destroyer's searchlight had swung to follow it, and he could tell that it was a Nakajima fighter on a pontoon.

The Nakajima whipped sharply back toward the destroyer, from

which a machine-gun began to blast. Tracers streaked from its guns, and the searchlight went out. Trent tripped his four forward guns just as the glow disappeared. For an instant there was pitch darkness, then three more searchlights came on simultaneously. The Jap plane was climbing steeply, but Trent reached its level with a full-power zoom. The Nakajima frantically reversed. Trent felt the throb of the guns in the power-turret behind him, but a searchlight momentarily blinded him.

"Look out, Eric!" shouted Crabb. Trent chandelled automatically, cast a hurried look to each side. The Nakajima raced by underneath him, heading West. Trent coolly ringed the seaplane in his sights, flicked a burst over the tip of the prop. The Jap pilot skidded, nosed down. Trent stabbed a blast past his left wing tip, herded him back toward the carrier. By now, the searchlight crews were with him. Dazzling light streamed across the seaplane's path, and for a moment the pilot seemed to be floundering, helpless.

Trent watched, on his guard. Without warning, the Nakajima shot into a tight loop, guns flaming back at the Curtiss. Trent rolled, and the Jap's tracers went into empty space. Before the seaplane was halfway into its dive Trent's tracers were clipping its tail. The flippers and rudder disintegrated like kindling under an axe, and the Nakajima plunged headlong.

THE pilot went tumbling out as the seaplane dived, and a few seconds later his parachute opened. Two searchlights followed him down, and Trent saw a boat being lowered from the carrier. He circled for a minute or two, looking for the exhaust flare glow of other enemy planes, but saw no sign of any.

"There's a signal for us to land," Crabb bawled from the rear cockpit. Trent made his approach, watching the lighted wands. The Curtiss landed, was quickly snubbed to a stop by the retarding-gear. As they climbed out, Lieutenant Jackson came alongside.

"Skipper's inside the island," he said brusquely. "Wants to see you."

"Trent, did you recognize any insignia on that plane?" Bradford asked, as they entered the superstructure. "Anything to help identify its squadron?"

"Not a thing, captain," Trent told him. "All it had was the rising sun emblem—and it's a pleasure to report that particular sun won't rise for some time."

"That was good work—I saw the last part." Bradford beckoned to Jackson. "When the boat's hoisted aboard, have the prisoner brought down to the ready-room."

Ten minutes later, Jackson and a bluejacket appeared with the Jap pilot. The prisoner wore dripping uniform of a shosa, or major. High, protruding cheekbones gave his dark face a brutal look. He moved sullenly into the ready-room at a prod from



Lieutenant Jackson's big .45.

"He's been searched, sir," reported Jackson. "We took a knife off of him—I guess he's got rid of everything else."

Captain Bradford sternly faced the Jap pilot.

"Where is your base?" he demanded.

The prisoner glared at him without answer.

"Speak up!" rasped Jackson.

"*Wakarimasen!*" the prisoner flung at him. Trent got up from the chair in which he had sat at one side, unnoticed by the Jap.

"He says he doesn't understand. I might add that he's a dirty yellow liar—and I don't refer to his outside color."

The Jap jumped back, his face suddenly a muddy gray.

"You! I thought you were—" he stopped, lips clamped tight. Trent eyed him with ironic amusement.

"Yes, I know—you thought you'd finished me that night in Shanghai."

"Then you know him?" Captain Bradford exclaimed.

"A little too well," said Trent. "He used to go by the name of Baron Igo Horuti. Don't let the 'baron' fool you. He's one of Japan's higher-class assassins, used by the Kimitsu Kyoku—their Army Intelligence Department. Combines espionage with blackmail and any other pretty little tricks that occur to him. I ran across him while I was learning the language in Tokio—and later, after I got mixed up with his gang of cutthroats in China."

"I refuse to be insulted in this manner!" Horuti burst out furiously. "I am an officer of the Imperial Japanese Army. I demand the treatment of a prisoner of war."

"Japanese style?" said Trent. "I seem to remember a Chinese prisoner whose tongue you cut out—because his screams annoyed your corporal who was practicing with a bayonet on him."

"You saw that, Trent?" Bradford said, with a sickened look.

"And a lot worse, captain. If the situation were reversed, the easiest we'd get would be a bullet through the back of the head."

Horuti gave him a sneering smile. "Fortunately, you decadent Americans still hold to your foolish ideas of chivalry. That's why we will win this war."

Jackson swore under his breath. "By Heaven, captain, I wish you'd put me in a stateroom with this man—just for three seconds."

"You can't bluff me," mocked Horuti. "I will betray no secrets."

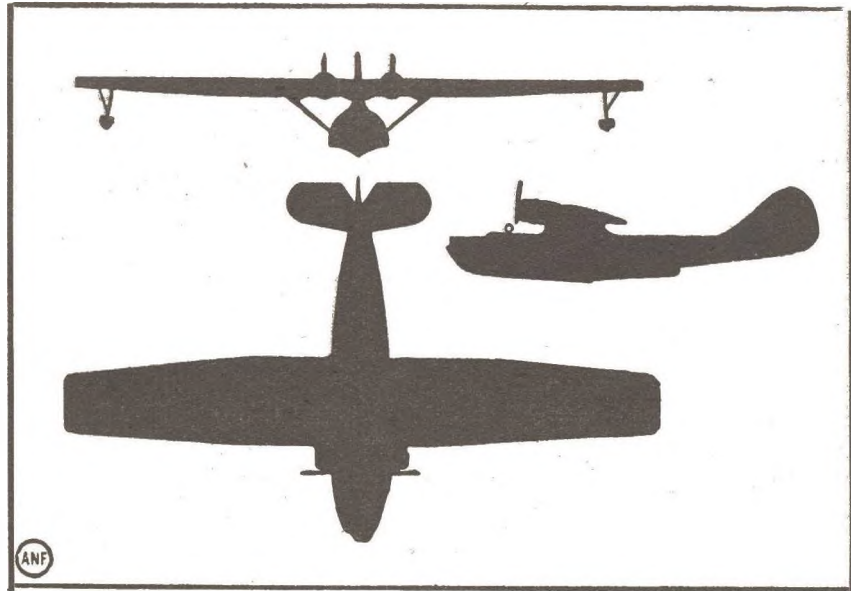
"You don't have to," said Trent. "The Grumman pilot told us about Maki before he died."

The Jap stiffened for a fraction of a second. Then his black slant eyes darted around the ready-room. He showed his teeth in another mirthless grin.

"So he flew to Maki, your pilot? He must have been disappointed—there is nothing at Maki but two or three nipa-roof huts. It is only a fueling

Know America's Planes

NUMBER FIFTEEN



INTRODUCING the "eyes of the Navy." Symbol of the strides made by the aircraft industry in meeting needs of hemisphere defense, the Consolidated Model 28 flying boat is a long-range patrol bomber capable of flying 4,000 miles or more non-stop. Our Navy, which designates the big ships as PBV-5's, already has more than 200 of these flying boats in service and many more in production.

Almost as soon as they were delivered to the U.S. Navy, planes of the PBV type established new massed flight records. These flights involved 147 PBV's and 1,022 men and crew members. The non-stop hops were from San Diego to Pearl Harbor (2,553 miles) and

from San Diego to Coco Solo in the Canal Zone (3,087 miles). The smallest group in these flights was 12 planes and the largest was 48, making hops concurrently. In only one occasion did any of the machines alight en route. On the flight of 48 to Coco Solo, three of the group, after battling adverse flying conditions for hours, descended a few miles short of their destination to take on additional fuel, simply as a precautionary measure. The flights were otherwise completed without incident, thus piling up an almost incredible record of consistent long-range performance; 422,283 airplane miles, or about 17 times around the globe!

station for planes in emergency."

"What were you doing there?" Bradford flung at him.

"My dear captain," smirked Horuti. "I have not seen Maki in three years."

"Then you wouldn't know," said Trent, "about the hidden cat?"

CHAPTER II

THE RIDDLE AT MAKI

FOR the second time since his entrance, Horuti's dark face lost color. But he recovered himself swiftly.

"Some American joke, Mr. Trent? I am afraid my poor sense of humor fails to grasp it."

Trent absently reached up, flicked his long fingers. A lighted cigarette materialized, seemingly from nowhere.

"Very clever," Horuti said, in an

edged voice. "I had forgotten you were a prestidigitator. But the joke—about the cat?"

"So that worries you?" said Trent. He exhaled lazily. "Don't give it a thought. We're going to take a little trip to Maki. We'll tell you all about it when we get back."

"Fool, you'll never get—" the Nipponese cut himself short, and his face became an inscrutable mask.

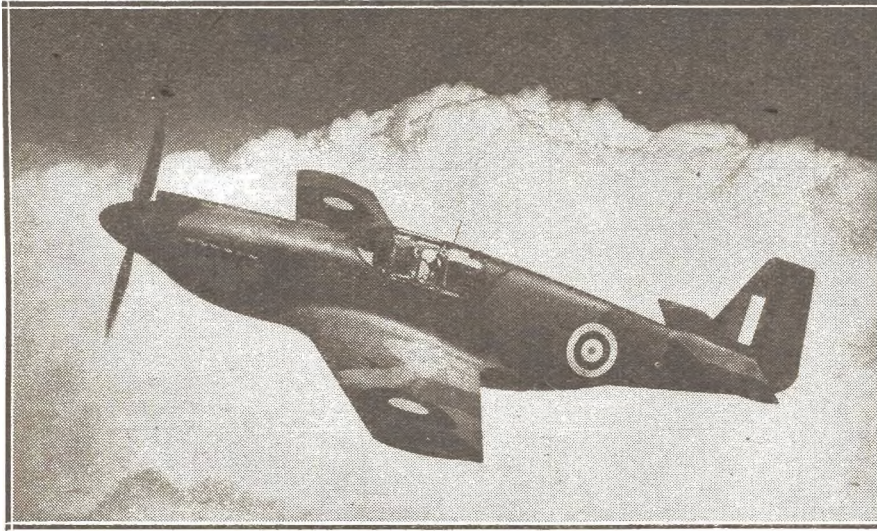
"I think that's all we'll need of Mr. Horuti right now," Trent told Bradford. "Of course, later he will stand trial for murder."

"Murder?" repeated the C.O. "But even if he was the one who killed Ensign Shelton, it was in battle—"

"Not Shelton—an American Marine Corps sergeant he murdered in Shanghai. The entire case is on file at Washington, and I have enough evidence to hang him. I happened to see the killing—it was the time when he

(Continued on page 64)

Modern Planes Album



NORTH AMERICAN MUSTANG

DRESSED in the camouflage of the British Royal Air Force, one of North American's new Mustang single-seat fighters is put through a routine test flight before delivery to England. The ship is also in service with the Army Air Forces, known as the P-51; the company name is Apache.

The fuselage is all-metal and is a monocoque structure with the usual

transverse frames and longitudinal stringers. Covering is stressed sheet metal Alclad flush-riveted in place. The pilot's pit is covered by a transparent canopy and has all instruments necessary for day and night flying. Armament consists of two fixed and synchronized machine guns mounted low on the nose sides and either two or four wing guns. Both .30 and .50 caliber weapons are used. The tail is cantilever and the movable

surfaces are covered with fabric.

The cantilever wing is attached in low position and is of all-metal construction. Structural details have not been released, but it is believed that two spars, as well as the usual ribs and auxiliary ribs, are used. Covering is flush-riveted metal sheet. The ailerons are of metal frame with fabric covering, and the flaps are all-metal and are of the split type. The landing gear legs retract up and in, being housed in wells in the wing undersection when in the "up" position. Retraction is by hydraulic pressure. The tail wheel retracts in unison with the main landing wheels.

Probably the most interesting external feature of the Mustang is the large bulge below and aft of the cockpit. This, of course, carries the radiator for cooling the Prestone engine solution.

Power is supplied by a liquid-cooled in-line Allison 12-cylinder engine of 1,150 h.p. Performance details are not available, but it is said that the top speed is well over 400 m.p.h.

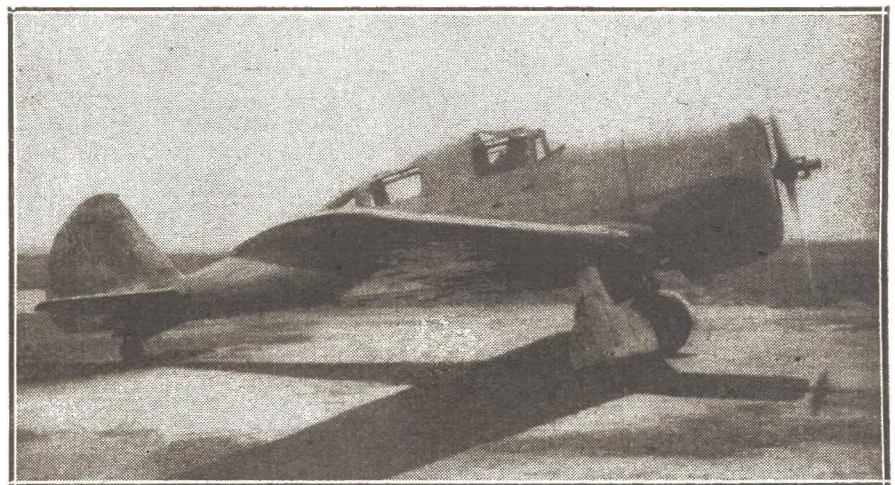
Other data: Span, 37 feet; length, 32 feet 2 inches; height, 11 feet 8 inches; wing area, 236 square feet; empty weight, 5,990 pounds; loaded weight, 7,724 pounds.

ALTHOUGH this plane is no longer in existence, according to the Curtiss company, our records show that it has not been presented previously in this department. Therefore, even though it is now "old news," we are sure that you fact fans and data collectors will want the story.

In the first place, the machine was developed in 1940 and was submitted to the Air Corps as a basic trainer. However, the Air Corps apparently didn't want the ship, for some reason, and the entire project was dropped.

The fuselage is of all-metal construction and is built-up of the usual transverse frames and longitudinal stringers. Covering is flush-riveted metal skin. A crew of two is carried, being housed-in by transparent canopies. The particularly unusual feature of the ship is that the movable tail surfaces, as well as the fixed surfaces, are metal covered. The usual style is to have fabric for rudder and elevators, of course. Heretofore, this former system has been seen mainly on larger aircraft, then only rarely.

The wing is attached in low posi-



CURTISS WRIGHT C-W 23

tion and is fully cantilever. Structure is metal and covering is smooth metal sheet. Ailerons are fabric covered and flaps are of the split type. The undercarriage is completely retractable, folding into wells in the wing undersection; retraction is by hydraulic pressure. The tail wheel is also retractable, folding forward into the fuselage tail cone.

Power is supplied by an air-cooled

radial Pratt & Whitney Wasp of 550 h.p., giving a top speed of 254 m.p.h. Cruising speed is 223 m.p.h. at 5,000 feet, and landing speed with flaps extended is 71 m.p.h.

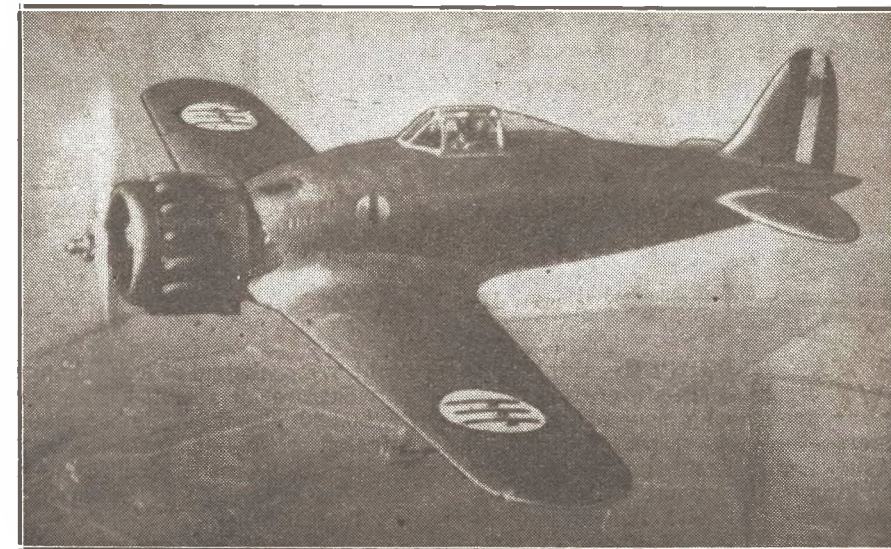
Other data: Span, 35 feet; length, 27 feet 2 inches; height, 8 feet 11½ inches; wing area, 174 square feet; empty weight, 3,158 pounds; loaded weight, 4,500 pounds; rate of climb, 1,860 feet per minute.

MACCHI C. 200

ONE of the most modern single-seat fighters in service with the Italian *Regia Aeronautica* is the C. 200. It is constructed by *Aeronautica Macchi*, at Varese, and is being turned out in large numbers. Although the plane was designed as a fighter in the first place, it actually has the lines of a racer rather than a military machine. Herein is probably the reason that *The Aeroplane*, authoritative British aviation weekly magazine, said in a recent issue that the plane "must be difficult to fly." And this can be traced to the fact that the ship was designed by Mario Castoldi, who was responsible for the M.C. 72 record-breaking seaplane. It did 440.6 m.p.h. on April 10, 1933.

The fuselage is a welded steel tube structure over which smooth metal "Super-Avional" skin is attached. The pilot's cockpit is located over the wing trailing edge and is canopied. A truss-type crash protector is used. Armament consists of two 12.7mm. Breda Safat machine guns mounted on the fuselage and synchronized to fire through the propeller arc. Additional guns, probably 7.7mm., may be installed in the wing panels.

The wing is cantilever and is placed in the low position. A two-spar construction principle is used, with spars and ribs of "Super-Avional" metal. The panels taper in chord and thickness and have rounded tips. Ailerons are fabric covered and flaps are split.



MACCHI C. 200

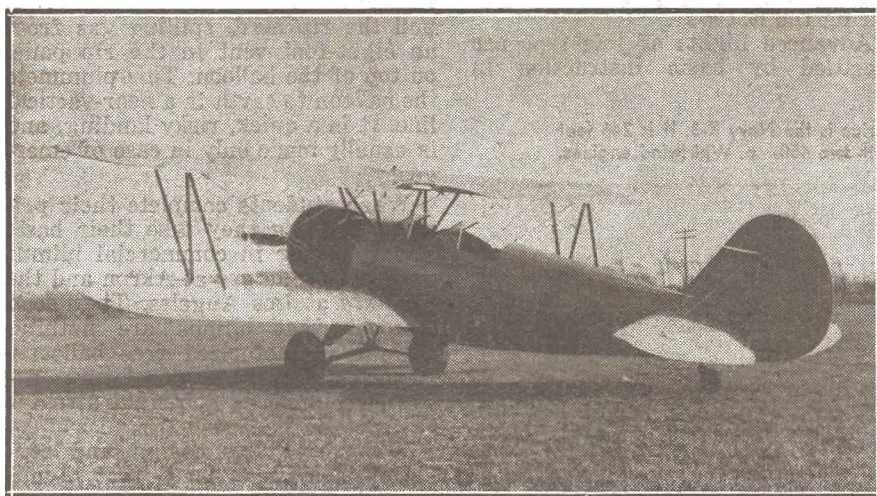
The ailerons and flaps are interconnected so that the entire trailing edge may be depressed.

Power is supplied by an air-cooled twin-row Fiat A.74R.C. 38 engine of 850 h.p., giving a top speed of 313 m.p.h. at best operating altitude. Cruising speed is approximately 280 m.p.h., and landing speed is near 74 m.p.h. This machine is the fastest single-seat fighter in the *Regia Aeronautica*.

Reliable reports have it that Italy has been having quite some difficulty in turning out engines rapidly enough to keep pace with aircraft production

and that German engines are being used to a great extent in later models. Of course this is because of the drastic shortage of raw materials in Italy. This explains why many Macchi C.200s' seen recently have been fitted with liquid-cooled in-line Daimler-Benz DB 601A engines. This craft was not originally stressed for such a power plant.

Other data: Span, 34 feet 8 inches; length, 26 feet 10 inches; empty weight, 3,894 pounds; loaded weight, 4,840 pounds; rate of climb, 2,840 feet per minute; absolute ceiling, 33,000 feet.



FLEET ADVANCED TRAINER

FLEET ADVANCED TRAINER

IN THIS DEPARTMENT we usually try to present only aircraft meant for military combat purposes, but at times a plane is developed that warrants inclusion, combat or not. This new Fleet is in that category. It is a training craft for advanced instruction and is exceeding popular in Canada.

The fuselage is constructed of

chrome molybdenum and welded steel tubing and is fabric covered. A crew of two is carried in open tandem cockpits. The front cockpit is located beneath the top wing trailing edge cut-out, and the rear pit is over the lower wing trailing edge. The crew is protected by three-sided military-type windscreens. The tail sections are braced externally and are covered with fabric.

Arranged as a single bay biplane, the wings are of equal span and are staggered. Structure consists of heat treated dural ribs, heat treated chrome molybdenum fittings and laminated solid wood spars. Covering is fabric. The wing panels are braced interplane by "N"-struts and crosswire. Ailerons are on the lower panels only.

Flight controls are ball bearing at every connection, including all ailerons, elevator, and rudder hinges, and at all clevis mast attaching points. These ball bearings are made of stainless steel, sealed watertight and dustproof, and require but one lubrication for the life of the airplane. Taper bolts are used at all wing hinge and interplane strut connections, thus eliminating wear from vibration.

Power is supplied by an air-cooled radial Jacobs L-6 MB engine of 330 h.p., giving a top speed of 139 m.p.h. Cruising speed is approximately 120 m.p.h., and landing speed is 53 m.p.h.

Other data: Span, 31 feet 6 inches; length, 27 feet; height, 9 feet 3 5/8 inches; wing area, 281 square feet; empty weight, 2,281 pounds.

“UP SHIP!”

With very little fanfare, the Army and Navy are developing lighter-than-air aviation for defense of our shores.

by Howard E. Jackson

MANY PEOPLE think of lighter-than-air craft by remembering past airship disasters—the *Akron*, the *Macon*, the *Shenandoah*. Their lighter-than-air thinking was cremated more than four years ago with the burning of the dirigible *Hindenburg*. Yet there is a huge lighter-than-air defense program in progress right now, under the leadership of Capt. C. E. Rosendahl, the Navy's Number One airship authority.

Lakehurst, the home of lighter-than-air aviation, is being expanded at a cost of about \$2,000,000. The Navy is having its dock and hangar at Sunnyvale, Calif., returned by the Army, at a cost of \$6,500,000. Airship bases are being constructed at South Weymouth, Mass., and Elizabeth, N. C., at an expenditure of \$13,000,000. And similar bases will soon be built in the Puget Sound area, in Southern California, in Florida, and in five undisclosed points outside the continental limits of the United States.

Speculating on the cost of these bases alone should make the taxpayer take interest in the lighter-than-air program. But he knows that, compared with the heavier-than-air expenditure, lighter-than-air doesn't

amount to a pocketful of loose change. And what are 50 airships compared with 50,000 planes? This is a plane-dominated world—in fact, the very multiplicity of hostile airplanes over Europe bars the use of airships to any extent.

But it is a different story within the continental limits of the United States. Because of our growing military aviation might it appears unlikely that enemy planes will try to invade our skies. But hostile submarines are already coming closer, and if they are not stopped now they will attempt to invade the approaches to our most important harbors.

Then Navy blimps will be the first aircraft on active duty in national defense. They will make daily in-shore patrols in search of mines and submarines, they will act as convoy escorts and as aerial “eyes.” Already, Navy “K”-type patrol blimps, augmented by the former Army blimps TC-13 and TC-14, are making daily practice observation flights from Lakehurst out to the 75-mile mark, thus covering the area in which all merchant vessels were sunk or damaged by enemy mines and submarines during the last war.

Advanced flights of this type are preceded by basic instruction in

smaller blimps and primary training in free balloons. Free ballooning is to lighter-than-air as gliding is to heavier-than-air because all airships become free balloons whenever their motors fail.

Lieut. Comdr. Karl Fickes, a lighter-than-air veteran, revived free ballooning after it had been abandoned for more than five years. He is director of student training at the Goodyear training school where the majority of potential pilots are selected from a large list of applicants from the rubber company's own organization. Most students are college graduates with engineering degrees and none has had less than two years' college work.

FLIGHT TRAINING consists of a series of seven free balloon flights of an accumulated flying time of ten hours and 200 flight hours of dual and solo time in basic blimps.

Before a flight, students rig the spherical balloon with the net, inflate the bag with coke gas, and attach the car or basket. While on a flight they learn that they cannot control the balloon on a horizontal plane, that the balloon goes where the wind takes it. So the students read weather signs and search for favorable winds—a search which must be made at the expense of either gas or ballast. In their search they ascend by tossing out sand ballast and descend by releasing gas through the butterfly valve.

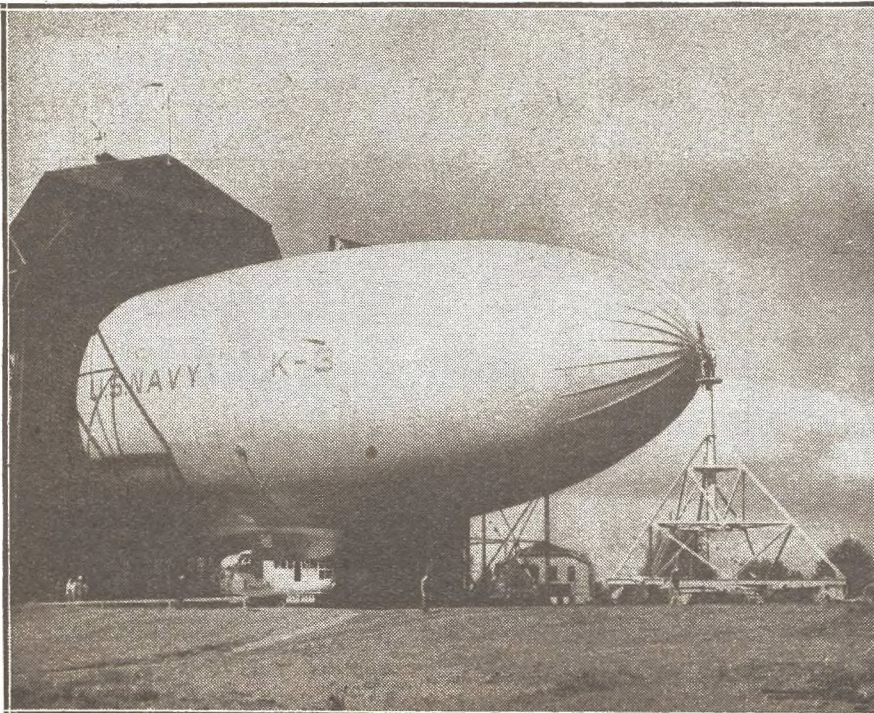
Landing with the help of a ground crew is fairly simple, but landing alone is rather complicated, especially in wooded areas. In order to avoid trees it is sometimes necessary to pull the rip cord, spilling gas from an eight-foot vent in the rip panel on top of the balloon. This plummets the balloon to earth in a near-vertical line. It is a quick, risky landing, and is usually made only in case of emergency.

When students complete their primary training they take their basic airship flying in commercial blimps such as the *Ranger* at Akron and the *Resolute* at Los Angeles. They soon discover that blimps are nothing more than motorized free balloons. However, Navy nomenclature describes blimps as non-rigid airships rather than balloons.

While studying design and construction trainees learn that blimps have no internal structure, no beams or braces of any kind. They are kept rigid by means of the pressure on the skin or envelope; if this pressure is relaxed they collapse. When that happened during the last war, Brit-ishers said that the airship would “be limp.” And then the popular name, blimp, was given to the B-limp type—the designation to distinguish “limp,” or non-rigid, from rigid airships.

Rigidity is possible by means of two ballonets, or small balloons—one forward and one aft—inside the helium-filled gas bag. When these ballonets are inflated they compress

Largest and fastest blimp ever built in America is the Navy K-3. It is 246 feet long and 76½ feet high. Top speed is 80 with two 450-h.p. Whirlwind engines.



the gas and thus keep the skin or envelope rigid. They occupy about 25 percent of the total area of the bag when full; when empty, the diaphragms of the ballonets lie flat on the inside of the bag. Under each of these ballonets is a valve which works automatically to regulate the amount of air.

If the engines are operating, either in flight or while on the ground, the propellers blast air into scoops, just aft of the motors, and through ducts into the air compartments. Either port or starboard engine can fill either forward or aft ballonnet. If the engines are not operating, air is forced into the ballonets by means of an electric or gasoline motor. During the night, members of the ground crew "nurse" air into the ballonets every few hours to keep the ship from going limp.

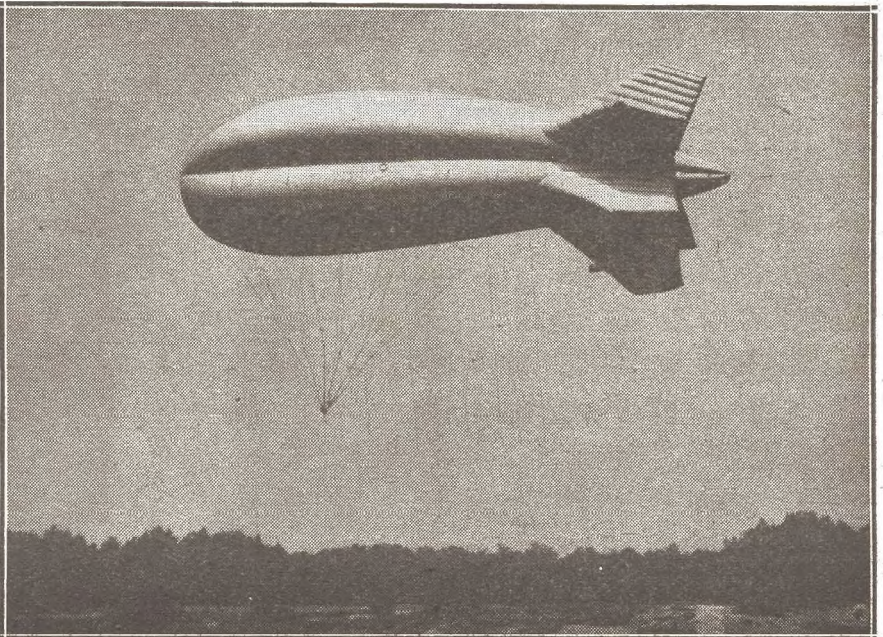
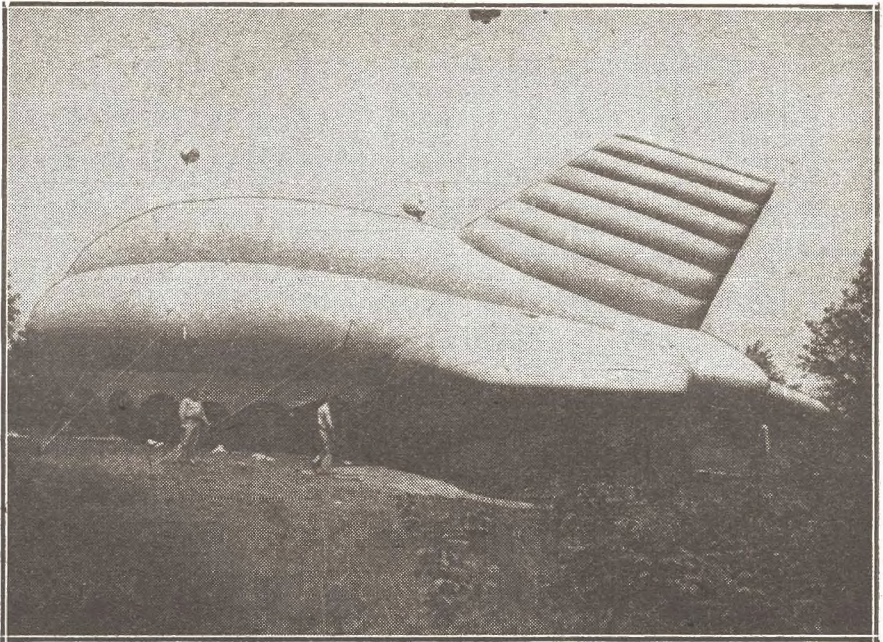
Student pilots learn the standard procedure which is followed before a flight. It begins when the ground crew arrives and "weighs off the ship." Members of the crew are stationed at the railing beneath the car and several others are at the handling lines located on port and starboard, forward and aft. Then the ground crew foreman, by shifting the 35-pound ballast bags, trims the ship until it "floats"—being neither too light to rise nor too heavy to fall.

Then he records and figures the weight of the gasoline, oil, and ballast to determine whether the ship has lost any of its helium. Not only the amount but also the purity of the gas must be checked before flight. Checking is done by means of an effusion-type meter. By recording the time it takes for equal amounts of gas and air to pass through an orifice, calculations can be made, using a mathematical table, to determine the purity of the gas and the impurity of the air.

When the ship is ready and weather reports are checked, it is "walked out" of the dock. And after the ship is clear it is allowed to swing into the wind like a weathervane.

WHEN THE SHIP reaches the point of take-off, instructor and student pilot get aboard, the engines are started, and the mast is disengaged. The handling lines are removed from the stern cables and members of the crew take stations on each of the two forward lines and on the car.

Ballast is removed to compensate for added weight and the ship is again weighed off until it floats. If the flight is to be short, two or three bags of ballast are put aboard to make for better landings. If it is to



Upper right: Where no housing facilities are available, balloons are staked out on the ground. Center: A barrage balloon looks like a cross between a free balloon and a blimp. This Army D-5 is capable of ascent to 7,000 feet. Right: The Strato-Sentinel tops them all with regard to altitude of operation and conditions under which it may be successfully flown. It can ascend at least 15,000 feet.

be an extended flight, enough extra ballast is put on to compensate for the weight of the fuel that will be consumed.

If the field is large enough the pilot takes-off as a plane does on a regular runway; it is the preferred way. By using the small taxi wheel, swiveled under the cabin, the pilot can taxi across the airport, gather flying speed, and take-off with a half a ton overload of gasoline—the ship carrying more than it can lift!

On small fields, the ground crew

foreman stands facing the car and yells "stand by!" to those around the rail on the car. Then, "up ship!" and the boys bounce the car down and then throw it into the air as the lines are released. As soon as the car clears the ground by eight or ten feet, the pilot opens full throttle.

Aerostatically, the ship could ascend by means of the lifting gas alone, but it has additional buoyancy—an aerodynamic lift resultant from the engines and the control surfaces. By pushing backward on the eleva-

tor control wheel the pilot can climb up within a 30 degree angle and he can descend within the same angle by pushing forward on the wheel. He turns right by pushing right rudder, and left by pushing left rudder. All similar to the controls on an airplane, except there are no ailerons.

At Lakehurst, pilots are given basic training in "L"-type blimps and advanced instruction in the "K"-type mentioned previously. In this way, students learn to handle bigger and more complicated blimps. For instance, the commercial blimps, like the *Resolute*, are inflated with 123,000 cubic feet of helium gas, the "L"-type training craft with 123,000 cubic feet, and the "K"-type patrol ships with 416,000 cubic feet.

When pilots have passed the necessary number of hours and adjusted themselves to these advanced ships they are sent out on daily patrols. They report the position and movement of American Naval vessels and armed merchantmen and periodically practice spotting subs sent out from the submarine base at New London, Conn.

The "K" fleet of 48 ships being built is ideal for such patrol work. The ships normally carry a crew of eight or ten men, have radio and navigation rooms, sleeping quarters, and galley. They afford a broad range of observation and have a cruising radius of 2,000 miles. They can throttle down to nothing, while hovering over a suspicious spot, or pursue an enemy at 80 m.p.h.

By bringing the United States—and eventually its outlying possessions—with bases, airships, officers, and men, the Navy will greatly strengthen the lighter-than-air arm of its service. The Army, too, despite the fact it abandoned this service in the form of free balloons and airships, has already ordered several hundred barrage balloons for possible air raid defense.

England is effectively using barrage balloons against dive-bombers. These balloons are anchored by cable and are controlled by power-driven winches. Cables suspended from the balloons entangle and crumple enemy bombing planes seeking to release their cargo at low altitudes. By keeping bombers at high altitudes, the bombardier's aim is frequently thrown off.

Our D-5, four-lobe, four-fin, barrage balloons of 30,000 cubic foot capacity are capable of ascent to 7,000 feet and will be used in defense of strategic objectives such as the Panama Canal. The Strato-Sentinel six-lobe, six-fin barrage balloons are capable of ascent to 15,000 feet and would keep enemy bombing at more than that altitude.

Some still think that our lighter-than-air aviation is dead. If the enemy actually tries to come to these shores, however, the average taxpayer will soon discover that it is far from dead and still farther from being "useless" as many now think.

THE END

The Men Behind Production Lines

by Leslie Kowyer



ALMOST every factory and plant throughout the U.S. at present is building some part or finished piece of equipment for our Army, Navy, or Air Force—from buttons for uniforms and three-plate condensers for radios to armored tanks and sleek bombers. And every part so turned out is built under a scientific method of speeded-up production.

It is no longer the foreman who sees to it that the workers produce. The new men of importance are the methods and time-study engineers who go about planning and timing lines of assembly and operation, setting up systems, quality needed, eliminating one operation, adding others, etc.

Plants have already introduced motion-analysis, to show where motion is gained or wasted, thus improving working conditions and at the same time enabling operators to produce more in a given length of time.

Whether a mechanic takes ten minutes or ten days to turn out a finished piece in many plants the time-study engineer is there to clock him. How long does it take

to pick up a plate, drill a certain hole, weld a tube, assemble a set of gears, mount an engine? Without the stop-watches and the time-study engineers there probably would be only limited increase in the production of war materials for Uncle Sam.

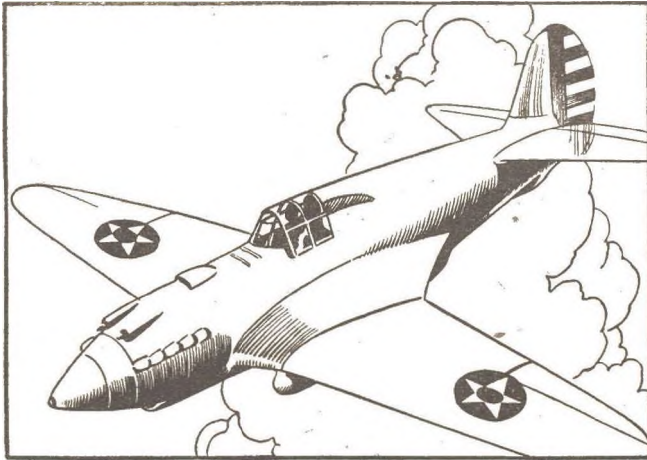
Directly connected with time-study is Planning, or Methods Engineering. A methods man is a person specializing in discovering the shortest practical road between a thousand points.

If you step into a plant manufacturing machine guns, you will note that a thousand and one machines are turning out all sorts of odd-looking parts—and you stand there wondering where and how those parts ever get to meet and fit each other. Here is where the methods men come in. They plan where each department will be located, which order shall be worked on first and which last, arrange the general layout of the floor, and tell where and in what position the machinery shall stand. They also order the experimental department what to try out first and what not to bother with at all.

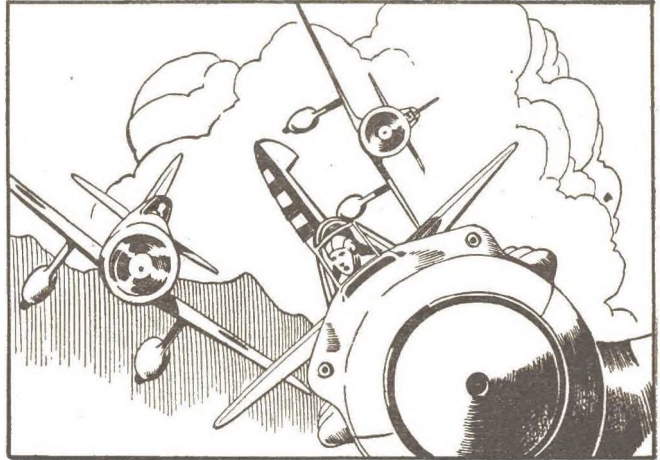
AMERICA'S NEWEST ACES

III—LIEUT. BOYD D. WAGNER—FIRST AMERICAN AERIAL ACE

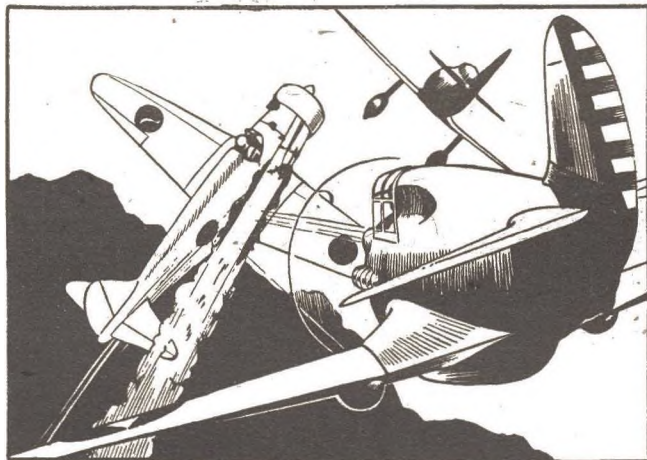
BY ALDEN McWILLIAMS



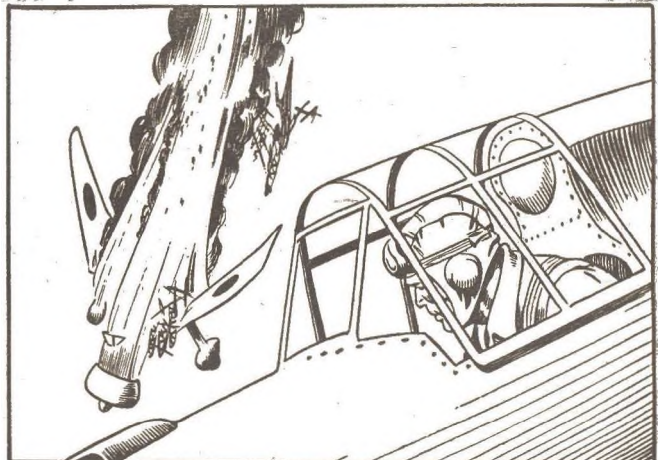
1—The first American to officially rate the title of Ace, Lieut. Boyd D. "Buzz" Wagner has accounted for more than five Japanese planes in combat and has destroyed numerous others on the ground. When the alarm sounded that Jap forces were approaching Appari, Luzon, Lieutenant Wagner took-off.



2—While rocketing toward the invasion point, a half-dozen enemy single-seat fighters challenged Wagner. The American forces were greatly outnumbered but they fought with cool Yank courage. "Buzz" Wagner eluded the bursts from the Jap machines attacking him, maneuvered expertly to attack.



3—After a brief but heated fight, Wagner got one of the Nipponese ships under his guns. He grimly followed, until within effective firing range, and then opened up with all the armament on his Curtiss P-40. The Jap tried to pull away, but Wagner followed tenaciously and sent him down in flames.



4—Then he turned to attack a second Mitsubishi. Again came the maneuvering for position—and again "Buzz" Wagner's guns spoke the only language the Japs know: the language of hate and death. The enemy fighter seemed to stagger in mid-air, and then it shed its wings and dropped to join the first Jap.



5—Wagner continued on to the invasion point where the enemy had established a foot-hold and set up landing areas. Hedge-hopping, he pumped cupro-nickel into hostile planes on the ground. When he eventually returned to his base because of low fuel, a total of 12 grounded Jap ships had been wrecked.



6—On a later mission, U. S. pilots led by Wagner blasted out a nest of 26 Japanese planes at Vigan, more than 200 miles northwest of Manila. Credit for the attack's success was given mainly to Lieutenant Wagner because of his excellent leadership and consistent courage in battle against superior forces.

How Canada Trains Winged-O Men

HARDLY a day passes in which, when turning on your radio, you fail to hear news reports with words like these: "Twenty of our bombers raided Hamburg last night, destroying a section of the city. All our aircraft returned safely."

Sometimes the report mentions only ten bombers. Or again, it may mention thirty, forty, or more. The city may be Berlin, Kiel, or some spot along the Norwegian coast. Sometimes only half, or less, of the bombers are reported as having returned safely.

No matter what the report, its clipped and meager wordage fails to provide even the slightest idea of the courage and skill that made the raid possible, let alone successful. Nor does it reveal the teamwork displayed by the bomber crews from start to finish of a flight that may have lasted

Dropping bombs with deadly accuracy from dizzy heights is a highly specialized job requiring months of training. Today keen-eyed men are learning how to do this job in RCAF schools.

by Flying Officer John L. Scherer, RCAF

Illustrated with official Royal Canadian Air Force photographs

they carry on with their important job over Nazi-occupied territory.

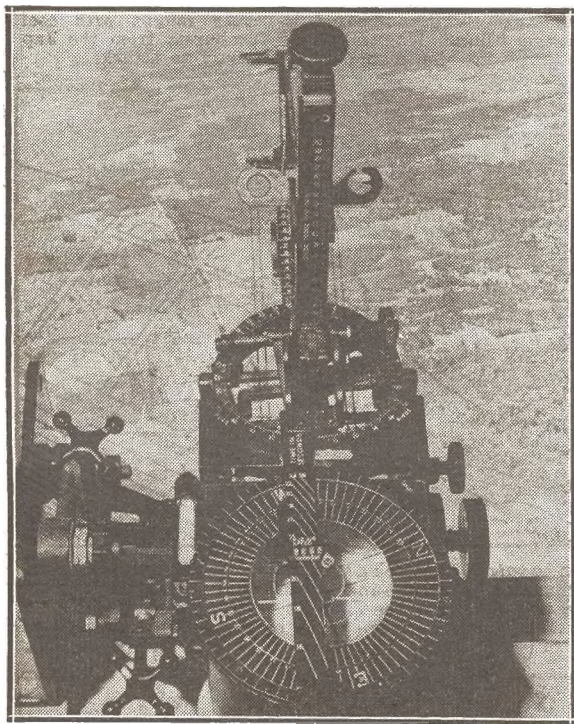
THE CREW of a modern bomber consists of five to nine men. There is the pilot, the wag (wireless operator-air gunner), and the navigator-bombardier or Air Observer. Depending on the size of the bomber, the crew will also boast a co-pilot and as many air-gunners as there are gun turrets.

You have probably read scores of articles on the training of military pilots and the training of wags was described in March issue of FLYING ACES. Therefore, this article will deal entirely with the training of the Air Observer (AO)—that important member of the bomber crew who navigates the bomber on its perilous journey and who sights the target and flips the toggles that release the all-impor-

tant death "bundles from Britain."

Actually the Air Observer can be called the most important member of the bomber crew, although the job calls for teamwork on the part of the pilot, wag, and observer. The hazardous journey of a costly bomber over Germany would mean little if the AO had not navigated it to a precise position over the objective. It would still mean nothing if, once over the objective, the AO lacked the skill to operate his sight so that the bomber's lethal load could be dropped on or close to the selected target. That means "planting" a load of bombs on a pin point a mile or more below, making due allowance for the bomber's speed, the wind speed, drift, etc.

Under the British Commonwealth Air Training Plan, the training of Air Observers for all the air forces of the British Empire is carried out mainly in Canada at ten Air Observer Schools, ten Bombing and Gunnery Schools, and two Special Air Observers' Schools. Candidates are sent to an Air Observers' School only after undergoing a "weeding out" process



From 10,000 feet the ground looks like this to a bombardier. For accurate bombing, allowances are made for speed and other factors.

from four to twelve nerve-wracking hours over hostile country.

However, listening to the frequent broadcasted reports of the Royal Air Force bombing raids, you must often have thought: "How do they carry out the raids? What type of fellows are the crew members? How do they feel when carrying out their mission?"

The answers to these and many other questions of similar type can best be answered by first going behind the scenes to observe the training of the men who comprise the Bomber Command and then to make an imaginary flight with them while

Crews in charge of bombs are generally known as "milkmen," because of the similarity of their chemical-filled training bombs to milk bottles.



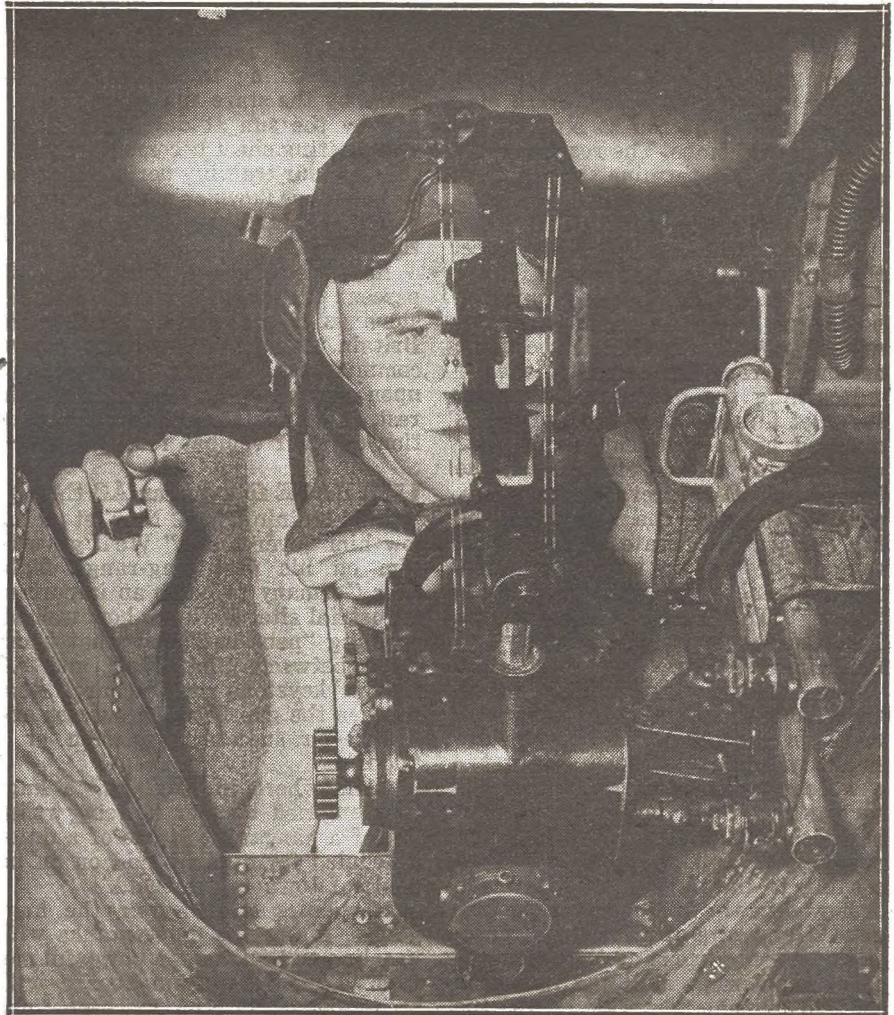
at an Initial Training School.

At the Initial Training School the AO candidate attends classes in mathematics, including general review of arithmetic, evaluation and transposition of simple formulas, simple equations, ratios, etc. He also attends lectures on administration, air force law, hygiene, and other air force subjects.

Upon graduation from the Initial Training School, the future AO goes to one of ten Air Observer Schools. Here he learns to handle the tools of his job—map, chart, compass, camera, and bombsight—with speed and efficiency. The elementary instruction is given in classrooms by means of lectures, blackboard diagrams, and motion pictures.

Practical instruction is provided in twin-engined Avro Anson aircraft, called "flying greenhouses" by the men because so much of their fuselages are comprised of window space so that student observers can see the terrain on either side. Although unimpressive in appearance, the flying qualities of the Ansons make them ideal for navigation training.

Student AO's put in about 60 hours of navigation exercises aboard Anson aircraft, of which ten hours is at night. They fly in all kinds of weather and are checked periodically to determine their progress. The final test consists of a triangular flight on which they tell the pilot where to go, using different methods of navigation for each leg of the hop. Radio orientation is used only in emergencies, in-



In this photo, a student bombardier is at his sight in the belly of a Fairey Battle. His right thumb is tense on the release button.



Left: "Milkmen" at work. When these bombs strike an objective, a dense cloud of smoke is given off which shows an AO's accuracy.

asmuch as on real raids over Germany, radio beams, etc., would be non-existent.

The course at the Air Observer School lasts 14 weeks, and it is study, practice, study, practice day after day, night after night all the way. The use of weather reports, flight computers, compass, and slide rule become second nature. Quality is the keyword, and no student is graduated

until he has proved his ability. Sight is never lost of the fact that the success of a future bombing mission, as well as the lives of several trained men, will depend on the skill acquired by the AO during his training.

UPON LEAVING the Air Observer School, the student AO heads for a Bombing and Gunnery School. Here he again spends hours in the class-

room, but now the subject is bombing instead of navigation. For six weeks he alternates between the lecture room and practice bombing flights made at high and low altitudes.

In the classroom the future AO learns the theory of bombing from A to Z. He studies the chemical and construction features of all types of bombs of varying weight. He helps load bombs onto a test rack similar to those found on aircraft. He practices releasing the bombs by means of mechanical devices, although they fall but a few inches in these practice drops. On an indoor bombing range he learns how to use a bombsight.

The indoor bombing range consists of a specially constructed tower about three stories high. At the base is a scale relief map mounted on a mechanically-operated turntable. In the third floor, overhanging the scale map below, is a platform on which a bombsight is mounted.

By lying on his stomach atop the platform and peering through the bombsight at the map below, the student AO gets the impression that he

is in an aircraft over enemy territory. As the map moves, the student lines up the selected target in his bombsight, makes his computations for air speed, wind speed, drift, etc., and presses a button to signify the releasing of bombs. The results of his computations determine the accuracy of his aim and an instructor records "hits" and "misses."

For practical bombing experience, the student AO goes aloft in a Fairey Battle. Eight 11½-pound practice bombs are loaded in racks under the wings, and the pilot heads the plane out over a range on a nearby lake.

Reaching the designated altitude, the pilot flies a course, or courses, as directed by the student bombardier who is lying on his stomach on the bottom of the aircraft's fuselage, peering through the bombsight he has learned to operate at the indoor range. Through an inter-phone system the bombardier directs the pilot—"Steer 180 degrees . . . Steady . . . Two degrees left, sir . . . Steady . . . Bomb released, sir!"

The 11½-pound practice bombs are filled with special chemicals which result in the release of heavy white smoke when they strike the target—a wood float—or water. Surface observers note the accuracy of the bombardier's aim, tallying the hits and misses. The student AO is graded according to the number of hits made or how close the misses are to the target. After hours of this type of practice, it is not surprising that students gain considerable skill and that near the end of the six weeks' course the hits far outnumber the misses.

Upon completion of the course at the Bombing & Gunnery School, the student AO graduates as a Sergeant Observer and is entitled to wear the observer's badge—a half wing with a large O—on his tunic.

However, our AO is not yet through

with school. He must still take a four weeks' "post graduate" course in astronomical navigation at a special school, learning to navigate an airplane by the stars and moon at night and by the sun at day. The sextant and plotting sheet become his tools in this 30-hour training period, of which 18 hours are flown at night. Advanced bombing instruction is also given at this school.

As with Sergeant Pilots, about 33 percent of the AO's receive commissions as officers before leaving for Britain. Another 17 percent receive commissions almost immediately upon arrival "over there." For the rest, it is a matter of earning promotion on their combat record.

WE HAVE followed an AO through his training days. Now let us follow him "over there." We'll go with him on his first long-range flight over Germany to bomb an important industrial site. We'll see how well his training "pans out," how that teamwork between pilot, Wag, and AO is the keystone in the arch that bridges the gap between success and failure—a successful mission or a "flop."

"Somewhere in England" a huge twin-engined bomber is being rolled out of a hangar. It is one of a dozen scheduled for a night raid on an industrial town in Naziland.

Mechanics swarm over the huge planes, filling the empty tanks with gasoline and oil for the powerful motors. Armourers climb aboard with ammunition for the machine guns that protrude from the numerous turrets bulging from the fuselage sides, bottom and top. They don't overlook the tail turret with its four guns—a real "stinger" for a man-made "wasp."

Small four-wheeled, cradle-shaped carts are rolled out toward the bomb-

ers. Each carries a 500-pound bomb to be loaded aboard the planes. Only four to a plane because of the heavy fuel load that must be carried, for the objective is far away and it is a two-way trip—if the Fates are kind.

The motors bark to life, mechanics scan tiny dials on the instrument board while the motors warm up. Inside an office in one of the hangars, the bomber crews crowd around a table. A Group Captain is explaining the purpose of the raid, pointing out the objective on a map spread out on the table—a map similar to the ones on which the AO's have previously plotted the course to the "target for tonight." The eyes in the serious, eager faces of the assembled pilots and observers follow the Group Captain's finger as it stops on a city in Naziland.

"There's your objective, men. You have your orders and have plotted your courses. Your aircraft are almost ready. May God be with you!" The floorboards echo to the tramping feet as the officers and men rush out of the room and head for their respective aircraft. The night's work is on!

Our observer has climbed aboard his plane and made his way to the plotting table, located just aft of the pilot's cockpit. He makes a last minute check—maps, protractor, computer, dividers, timepiece, pencils, rulers, etc. All are in place, ready at hand.

"Up front," the pilot plugs in his inter-phone and checks with each crew member. "Navigator, all set?" The answer comes back promptly: "Navigator here. Everything tip-top, sir." In a few minutes the pilot has checked with the gunner in the tail, "belly," nose, and side fuselage positions. All are in position and ready to go, so upon receiving a "take position" flash from the operations officer, the pilot taxis his huge craft to take-off position.

While waiting for the other planes to take position, the pilot runs over his cockpit check: H, Hydraulics (landing gear); T, Trim (elevator tab and stabilizer); M, Mixture (full rich for take-off); P, Pitch (fine propeller setting); F, Flaps (lower and raise flaps); C, Carburetor Heat (cold for take-off); G, Gas (reserve tank on). The co-pilot mumbles the letters H,T,M,P,F,C,G and double checks the pilot as he runs through the cockpit drill. All is in order and the planes are now lined up for take-off. Then, with a mighty roar, the planes rumble down the field to rise slowly and gracefully into the night sky.

Our AO is nervous and he'd be the first man to admit it. Of course, he has done all this before in practice, but this is the *real* thing! Did he plot the course accurately? Is the mileage correct? Momentarily, doubts assail him, but then he recalls that he checked his calculations with several of the other AO's earlier in the evening and his confidence returns. He speaks to the pilot, giving him the proper course for the first leg of the

During the instruction stage only light bombs are used. But when this chap completes his course he will be called upon to drop the heaviest type bombs.



journey. The pilot climbs gradually until the plane is flying along at 12,000 feet. Time enough to go higher when they get near the objective.

At regular intervals, the pilot calls various gunners on the inter-phone system. He jokes with each, knowing how tense they are—staring into the black night for signs of attacking enemy planes. After checking with the tail gunner, he talks to the co-pilot. "You know, that tail gunner is like a wow bird—he can't see where he's going, only where he's been!"

The huge planes drone through the night. They are well over enemy territory now and anything can happen. . . . And it does! the port gunner calls on the inter-phone: "Enemy planes, sir. I can see the flames of their exhausts. They seem to be pacing us."

The pilot promptly calls each gunner, telling them to prepare for attack. Then he speaks to the pilots of the other aircraft by radio, telling them to hold position as long as possible, then to break off and head for the clouds "if the going gets too tough."

IN A FEW MINUTES the enemy planes decide to force the issue and dive for the attack. The nose gunner is shooting away at the planes as they come within range. The other gunners are also busy. A dark shape goes by the bomber, exhausts flaming as it pulls up and away. The "belly" gunner reports that he thinks he "got one of the buggers." The tail gunner reports that the bombers in the rear have broken formation and have dived into the cloud layer floating along at 10,000 feet.

With a "Careful, lads, we're going down, too," the pilot of the lead plane pushes the control column forward and the big bomber dives for the protecting layer of clouds. Once in the clouds, he levels off, cautions the co-pilot to watch the carburetor heat and contacts the AO on the inter-phone, "Change course yet?" he says. The AO quickly glances at his calculations of air speed, drift and answers, "Not yet, sir. Keep present heading for seven minutes."

In seven minutes the AO calls the pilot and gives him the new heading which will lead them to the objective. The plane drones on. A half hour later it breaks out of the clouds. The AO takes this opportunity to check position and is elated to find the big plane almost dead on course. The gunners scan the sky in every direction, but report that they can see neither enemy planes nor their companion aircraft!

The AO is busier than a one-armed paperhanger. Check and double check. He figures they should be over the target in fifteen minutes and makes his report to the pilot. The time drags on now, but then comes the first burst of anti-aircraft and they know they are on the outskirts of the city. The bombardier, another AO, is in position over the bomb-sight. The plane, at 12,000 feet now,



At the training school it's all practice, but the job becomes deadly serious when flying over enemy territory, frequently in the face of withering fire.

heads directly for the objective as the AO calls out the correct approach course on the inter-phone. Nearer and nearer it gets, seeming to creep to the bombardier peering through the bombsight. Then the big moment—and he presses the button that releases one of the 500-pound bombs. The plane wings onward, changing course to confuse the anti-aircraft gunners and searchlight crews.

As the plane swings away from the target to prepare for a second run, the pilot sees another bomber outlined in the searchlights below and to the side. He gives a silent cheer, for he knows that at least one of his companions has found the objective. Now he peers around in every direction, seeking to spot any enemy fighters that may have been sent up to intercept them. He surmises, correctly, that the fighters they had met earlier were supposed to have done the job.

Three times more the bomber braves the hail of flak as it makes runs across the target. This pilot is following the AO's directions, for he is boss of the show now. The pilot notes that flames are shooting from the objective now and he grins at the knowledge that some of the bombs have scored.

The gunners have come to life again. That means fighter planes are on the job, but the "load" has been dumped now and the bomber heads for home, making it a running fight. Bullets have found their way into the bomber and the starboard gunner fails to report to the pilot's inquiry. He motions to the co-pilot to go back into the fuselage. A few seconds later he hears the co-pilot's voice in the phones, "Taking starboard gunner's place, sir. He done in."

The big bomber maintains a steady course, depending on its armament to carry it through. You can't toss these

big ships around like a fighter, so it's fight and run.

So it goes for the better part of an hour. Then, just as suddenly as it had started, the attack ends. The fighters with their limited range have had to call off the fight and return to their base.

The AO calls the pilot to tell him to change course a few degrees. A wind has developed and drifted the big plane off course. With a mental comment, the pilot pays tribute to the AO's watchfulness.

To relax the nerves of his crew, the bomber pilot calls each one on the phone and asks how they made out. The tail gunner provides the heartening news that he thinks he "winged one" just before the fighters broke off. The AO feels sure he made one direct hit and three pretty close. The pilot feels pretty happy now, but the thought that he has lost a gunner brings a frown to his face. "We'll make it up for you, laddie," he comments mentally.

The gods are kind tonight and the bomber meets no opposition as it crosses the Channel. Within ten minutes it is hovering over its home air-drome in the early dawn. A few minutes later it has landed and taxied to the hangar where the crew slowly climbs out.

A few minutes over coffee and sandwiches while the intelligence officers take a report and await the return of the other planes that took part in the raid. Within fifteen minutes, all planes have returned safely. The fact that the gunner on his plane was the only casualty of the raid was like cold water on the spirit of our AO. But when the pilot turned and said, "Good show, laddie," he perked up and felt plenty happy that he was an AO and not an infantryman.

THE END

In the Slipstream

We'll Build the Biggest!

A 2,000,000-man air force—the world's largest! That's the goal now announced by our Army. By way of comparison, Adolf is reckoned to have built up a sky roster of 1,300,000, while the RAF total is put in the neighborhood of 1,000,000. Word of our aero expansion plans brought this statement from the House Appropriations Committee: "If this war is to be won, obviously it will be won with planes and pilots." Which indicates that the Washington legislators have finally "seen the light."

Sub News Fumbled

Sure, John Q. Public was thrilled the other day when Pilot Abernathy and his bomber crew were decorated and news-reeled for bopping that U-boat. But also worried because to date this is the only coastal sky crew so honored—which now gives John Q. the idea that we've only scored *one* aero victory thus far against the raiding subs. Frankly, we think the Government news giver-outers botch this business when they let such implications take root. And meanwhile, we'll ease our own readers' doubts by saying there's excellent evidence of other successful smacks at the pig-boats, both by our blimps and our planes.

Air Raids? Well—

Will our big East Coast cities be sky-raided? Or won't they? Well, here's what Admiral Towers, Navy Aeronautics Bureau chief, says: "Chances of attack at any time in the near future in strength by air on our East Coast cities are rather remote, except an attack in the nature of a stunt." On the other hand, this is what William Courtenay, World War I flyer and London balloon-barrage organizer, says: "German air raids on the Atlantic Coast of America are so feasible I am surprised they have not happened, even while granting that their chief purpose would only be nuisance value."

Post-War Forecast

Prophets contend you can figure on these things after the war: Ten to twelve transport hops a day to Europe, with ships flying well over 100 passengers each. . . . Special instruments enabling planes to land safely and at will despite zero-zero weather conditions. . . . Hundreds of thousands of private flyers operating inexpensive stall-proof craft featuring very low landing speeds. . . . The plane and auto industries supplementing each other in dealership and servicing of planes. Incidentally, many plane builders now fear that the auto men who are currently contributing to the aero Victory effort will, come peace, stay in the field and

give them competition they can't stand. And some auto experts are worrying about "post-war encroachment" by "plane men offering more modern transport and better vehicular designs."

F.A. Often Urged This

Promising new movement is the ATCA—Air Training Cadets of America. It hopes to enlist 2,000,000 Yank youths in the 16-to-18 age range as "volunteer pre-flight students" who may be groomed for future berths in our air services. A similar organization in England has supplied more than 70,000 young men to the RAF. The first experimental training unit of the ATCA has been launched at New York Military Academy, Cornwall, N.Y., and six selected New York City high schools will follow with additional units.

Editorial Slants

Flyer Laura Ingalls was given eight months on charges of dealing with the Nazis. But if you ask us, all such persons should be cooped for the duration—in the interests of American safety. . . . We're glad that some publications took time out to hail Bombardier Levin as well as Hero Colin Kelly. It was Corporal Levin, you know, who actually loosed those eggs on the *Haruna*. . . . Right now, according to some British authorities, Hitler can't muster a first-line air strength of more than 4,000 warplanes. However, we hope the United Nations won't put too much faith in this belittling calculation. . . . No less an expert than General Electric's Waverly Reeves continues to broadcast that story about Flying Fortresses, fitted with Norden bomb sights, being able to "drop" bombs down the funnels of enemy ships from altitudes of 36,000 feet." Sure enough, the Norden sight is decidedly accurate—and we mean strikingly. But that "funnel from 36,000" gag is one of those bits of hangar-flying enthusiasm which you'd never expect fellows like Regyes to fall for. . . . Slowness still plagues the American effort. It took nearly two and a half months for New York City to get its first air raid siren.

On the Fighting Fronts

Those Jappo ships in Macassar Strait were fitted with fancy 9,000-foot balloon barrages—but they were destroyed anyhow. . . . Word that Hitler has built new airports in the Aegean Islands and has begun mass production on planes specially designed for hot climates presages a Nazi charge into the Near East along about the time you read this. . . . Britain's proved that good air raid protection lowers loss of life and property by a solid 90 percent. . . .

Two more things that curbed Hitler in Russia: His synthetic aero gas broke down in the intense cold, and those Luftwaffers who did get over Moscow described the flak handed them as the most effective they flew into anywhere. . . . Not counting the 130-plus score of the AVG flyers over the Burma Road, Yank airmen had downed 289 Nipps as of February 14. . . . The Nazis have had to lighten the armor and reduce the number of guns on their M-109's in order to get them to the combat altitudes of the American bombers. . . . Most of those propaganda pamphlets telling of the huge U.S. war program have been showered upon Brittany, that portion of France most likely to be invaded when the United Nations strike onto the Continent.

And On the Home Front

Willow Run, world's largest plane plant, at Ypsilanti, Mich., is being tuned to turn out Consolidated Liberators at the rate of one an hour by late Spring. . . . Other reports to the contrary, that independent air force proposal is still alive at this writing, for the House Rules Committee is continuing its hearings on the question. . . . Production men don't see any trouble in getting engines and air-frames to make 60,000 warplanes in '42, but they are worried about getting enough accessories. . . . The Navy is inaugurating a special air transport service for fast movement of combat personnel and cargo. . . . In their conversion to aero manufacture, our auto firms will employ twice as many workers as they did in their own peak car production. . . . TWA has given its fleet of five Stratoliners to the Army. . . . The Brownings oldest gun-smithing family in our country, is busy improving weapons to help win this present world struggle. Their 37 mm, sky cannon are tops on warcraft.

Aces Department

Killed: *Captain Wilhelm Spiess*, holder of the Knight's Cross of the Iron Cross, while leading a strafe on the Russian front. He was known as one of the best Nazi fighting pilots. . . . Missing: *Acting Squadron Leader A. L. Taylor*, DFC with two bars, called the most proficient aerial camera man in the RAF. . . . Also missing: *Captain Johann Schmid*, 41-victory Luftwaffer, over the Moscow front. . . . Captured: *Wing Commander Robert R. S. Tuck*, widely celebrated British Ace.

Lighter Bits

Strato Lizzie, renowned cat mascot of TWA, has disappeared again from her LaGuardia Field hangar home. You seen her? Fact is that Miss Lizzie has been missing so many times that the other airlines figure it's a TWA publicity stunt. But don't you believe it. . . . One New Jersey town has the wrong gal for an air raid spotter. Seeing a blimp for the first time in her life, she flashed headquar-

(Continued on page 71)

A LONG TIME ago I thought I had come across the one man who had the kind of light that would pierce the thickest of fogs, and I thought my chance had at last arrived and that I would in short time make my fortune.

Three of us were sitting in a New York City apartment. Most of our talk was aimless until Ted, who knew the inventor, hit on the subject of cross-country night flying and Billings, owner of an Eaglerock, said he thought we should do all our cross-country in daylight because it was safer.

Ted kept talking, and a half hour later Billings and I were well acquainted with Ted's inventor friend and the sort of light he had perfected. "I think," said Ted, "it would be a swell idea to let me get in touch with him and make a date to test the light."

Billings thought the idea was to just make a trip to Maine, where the inventor lived, and stand on the ground while the light was being demonstrated. "Okay by me," he agreed.

"Who's going to fly the plane?" I put in. "It's one thing to fly the marker beacons along an established airway—but it sure is a whale of a different story hop-skipping across the woods, lakes, and mountains of Maine, looking for a beacon which might have the power of four one-inch candles."

My remarks sent Billings and Ted into a hot argument. But it soon cooled off and Ted was left with the task of making a date for Billings and me—a fool's date. Instead of driving up beforehand and having a look-see at the layout and the light itself, we merely figured to fly up on a fairly foggy day, or night, and make a thorough search for the famous fog-cutter.

On a large map Ted showed me the place in Maine, and on a still larger sectional map he pointed to the exact spot in Maine. When fog settles close to the ground there is seldom a high wind, so I had no real worry about drifting off whatever course I plotted. It was very simple: Ted would fly up to Maine with someone else and would get everything ready for a foggy day, or night, and would then phone Billings when the fog was thick. We'd make the trip and would have an easy job locating the "powerful beam of light cutting through the thick soup." Then we'd return to New York and would easily find a financial backer for the invention . . . anyway, that was the general idea.

ON AN exceptionally clear and brisk day Ted phoned and two hours later Billings and I were pushing the Alexander Eaglerock out of the hangar. While I revved up the engine Billings brought out two chutes.

"Why those things" I asked, for we had used them only for stunting.

Billings determinedly waved to strap one on. "I can always buy an-

Fog Flying

Those thousands of dollar signs which Author Yerkow visualized suddenly disappeared on a pea-soup night over Maine!

by Charles Yerkow



An old Alexander Eaglerock, similar to the one used on the "great experiment."

other ship," he explained.

Our time was nicely calculated. We would reach the Maine point towards dusk; and with the fog as Ted described it, things would be ideal for the test—just dark enough and foggy enough to find out about the effectiveness of the light, and yet time enough to fly back to New York if necessary. The point in Maine might give us trouble if the light did not operate (as Ted swore it would) but once we got out of the fog and hit for home our way would be clear and lighted by the highways and towns.

I gave her the gun. As if the old crate sensed the importance of the trip, she tore down the runway with more pep than I had ever felt her display before. In a lazy turn we gained altitude and then I set a course for Massachusetts. We landed at a one-horse airport, refueled, ate, and were off again.

The fog in Maine was there all right, in fact we had touches of fog soon after we left Massachusetts; the mist seemed to be rolling in from the sea, silently but surely. A thought flashed through my mind that an ill wind would push that fog right down New York way.

I checked the time, the compass, the map, the altimeter, and then hauled the throttle back and began a shallow glide. Allowing for the highest elevation around those parts, I leveled off and kept her at the lowest possible r.p.m.'s for cruising. I kept a careful check of my time, speed, and direction, and when I finally rocked the wings we had arrived. All had been arranged to have Ted and his friend throw on the "powerful

beam" the moment they heard an airplane engine.

Billings craned his neck from side to side. It was dark except for the lighted instrument board and I couldn't see anything at all.

I shoved the throttle wide open and the cylinders pounded at the "soup." I took my eyes off the board and glanced around for some trace of light. Billings' dark shape in the front cockpit was doing the same thing, bobbing from one side to the other. I cut the engine and was sure I heard Billings cursing loudly.

AFTER SEVERAL tries with the engine wide open and our eyes glued on the nothingness below, I decided to give the whole nonsense a systematic trial. I set her at cruising speed and proceeded to fly timed squares, covering what I'd roughly calculate an area of twenty miles. Not much of an area, but then I was sure I was above the exact target and couldn't see any need in wasting too much time and gas.

Billings never knew when I started for home, for he was on the lookout from the time we hit that "soup" to the time the first highway lights peaked up at us through small breaks in the fog layer.

When I climbed the old gal out of the fog I actually started for Long Island, but then it dawned on me that the fog was too far to the southwest and might be all the way down to New York. So I cut hard toward the upper part of New York State and set down at Albany.

"Well," sighed Billings after we
(Continued on page 78)



Join the CAP!

Organized along military lines, the Civil Air Patrol is open to pilots and non-pilots interested in the defense of America.

by Joel Wynfield

DESPITE our entry into the second World War, air raids on continental U.S. still seem remote to the average citizen. But when and if they come, the value of our newly-created Civil Air Patrol should fully manifest itself.

The blanket ban imposed on private flying by the CAA on December 8, 1941, was a temporary order to permit immediate investigation of the character and loyalty of licensed pilots. A few days later the CAB issued a set of regulations designed to control civilian piloting in an effort to prevent sabotage and espionage from the air. Further, it was required that after January 8, 1942, every pilot, other than those piloting scheduled airline planes, carry an identification card bearing his fingerprints, a recent photo, and signature. In addition, a civilian pilot before taking off from any airport must receive clearance from a police officer or other public representative designated at such landing area for that purpose and file with such police officer or other representative a written statement showing the type, color, and identification marks of the aircraft, the estimated time of departure, the point of intended landing, the route to be followed, and the estimated time of arrival. As precautionary measure, every civil pilot is under order by the CAB to permit the search of his aircraft upon demand by any representative of the Army, Navy, or CAA or by civil police.

The restrictive influence by the Army and Navy upon private flying during the wartime period is designed to regulate civil flying to keep the airways open for military aviation and to be informed of the reason and whereabouts of all domestic aircraft. It is designed, too, to avoid confusion among air raid wardens and spotters in reporting unidentified aircraft within the immediate vicinity or flying suspiciously over areas designated vital to defense.

The CAP program has already received enthusiastic endorsement from the military services. In voicing his approval of the plan to buttress home defense, Lieut. Gen. H. H. Arnold, Chief of the Army Air Forces, declared: "The creation of the Civil Air Patrol, organized and

trained to supplement the activities of the military forces, is properly in line with the necessity for integrated and total defense . . . the organization of the existing private flying resources is highly desirable from a national defense standpoint."

Lending further sanction to the CAP's purpose, Rear Admiral John H. Towers, Chief of Naval Aviation, commented that "the Bureau of Aeronautics, recognizing the potential strength of civil aviation, is pleased to note the organization of its resources under the Office of Civilian Defense, and will watch with deep interest the development of the Civil Air Patrol."

The plan to voluntarily register pilots of all standings also includes mobilization of additional thousands of aircraft mechanics, amateur radio operators, and meteorologists. Total enlistments, according to Maj. Gen. John F. Curry, National Commander of the CAP, may exceed 200,000. Nine regions, corresponding to the nine corps areas of the Army Air Forces, have already been drawn up to receive these enlistments. Following organization, the next step will be the establishment of a broad training directive to include many phases of activity, both flight and ground.

UPON ANNOUNCING the set-up of the Civil Air Patrol, numerous letters flooded the Office of Civilian Defense requesting information as to status in order to join and how one would best be of service. To answer these innumerable questions the OCD has taken a cross-section of the queries and supplied as much information as possible. A fundamental understanding of the purposes, objectives, and organization plans may be gained from the following:

Will a nation-wide training program be announced? Yes. A training directive for CAP covering both flight and ground service, is in preparation. It is compiled from material furnished by the Army, Navy, Civil Aeronautics Administration, and other experienced sources.

Will personnel and equipment of the CAP be available for requested use by the armed forces or other Governmental agencies? Yes, if individuals are willing to accept service upon such requests. In such cases, orders and remuneration will be provided by the agency utilizing the individual and his or her equipment, where and as authorized by law.

Will personnel of the CAP be used

for combat duty? Not as CAP members. Persons are at liberty to volunteer if they desire.

Will service in the CAP exempt eligible persons from military duty? No. The CAP is definitely a national defense aid to supplement military effort.

Will service in the CAP insure priority in securing aviation equipment or replacements? No such guarantee can be made. First must come the requirements of the armed services. Following them will be those of the auxiliary services, such as the CAP.

Will the Civil Air Patrol be uniformed? Uniforms will be available at reasonable prices through individual Squadrons.

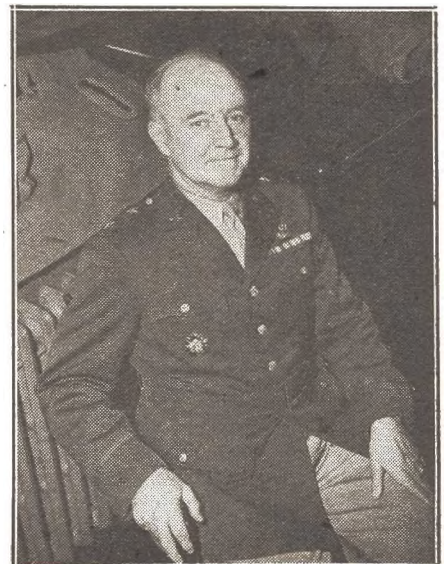
May aircraft or automobiles, voluntarily used by owners for CAP duty, carry distinguishing insignia? The patented insignia of the CAP may be painted or detailed on equipment utilized for the CAP upon written authorization of the State Wing Commander.

Will there be awards for outstanding merit and devotion to duty? Such awards are being developed by the Aviation Planning Staff of the CAP.

Will service in the CAP interfere with daily work? No. The purpose of the CAP is to utilize the time you now spend in casual flying or other aviation activity. CAP will furnish an objective enabling you to take a more worthwhile part in both aviation and the national defense.

Must one belong to the CAP in or-

Maj. Gen. John F. Curry, AAF, National Commander of the Civil Air Patrol.



der to keep flying? The future must carry its own answer.

Who will pay for flying time? The individual will, as far as training is concerned. When and if services or equipment are utilized by any Government agency, payments will be made by that agency if authorized by law.

Who is eligible for service in the CAP? Any citizen pilot of good character, certified by the CAA as private pilot or higher grade. Any citizen of good character, holding a Government certificate for any skill or experience related to aviation, such as A. & E. mechanic, control tower operator, radio telephone operator, etc. For auxiliary duty: Any citizen of good character who will volunteer for clerical work, driving of cars or ambulances, watchman, first-aid instruction, or kindred service. For apprentice duty: Any citizen of good character who will undertake mechanic, airport supervision, control tower, or other instruction under the training program of the CAP.

What is the minimum age requirement? No one under 16 years of age may enroll and no one under 18 will be accepted for flight duty. All applicants under 21 years of age must present with their application a signed letter of permission from their parents or guardians.

May women enroll in the CAP? Yes. All volunteers will be assigned to duty on the basis of their ability.

May one at any time be relieved of duty in the CAP? Yes. You may resign at any time, with the approval of your Wing Commander.

How long will the CAP endure? Until demobilized by the Director of Civilian Defense.

Can one be discharged from the CAP? Yes. For cause, by a Board of CAP appointed by the National Commander.

What would be such causes? Insubordination, consistent violation of air traffic regulations, intoxication on duty, cowardice, etc.

If a person now having a student pilot certificate subsequently attains a private pilot certificate, can he then enlist in the CAP? Yes. The CAP will encourage and assist all airmen to improve their ratings, both flight and ground.

What will the Training Directive call for? Those accepted will study familiarization with naval and military tactics, discipline, military courtesy and rank, technical flight operations, navigation and meteorology, air raid warning service, first-aid, cooperation with other defense organizations, and kindred subjects.

Will the CAP engage in supervised flight operations? At all times there will be problems established calling for the highest pilot and observer skill.

If a pilot does not own an airplane, how will he get to fly other than rental ships? Each pilot-owner will be assigned a co-pilot, navigator, and observer pilots. Piloting is only one of the skills of the modern airman.

It is the purpose of the CAP to weld civil airmen into a force capable of national defense by increasing the knowledge and skill in every type of aviation activity.

Is it important to enlist immediately? Yes. Organization takes time. By getting applications in as soon as possible you will be of great assistance.

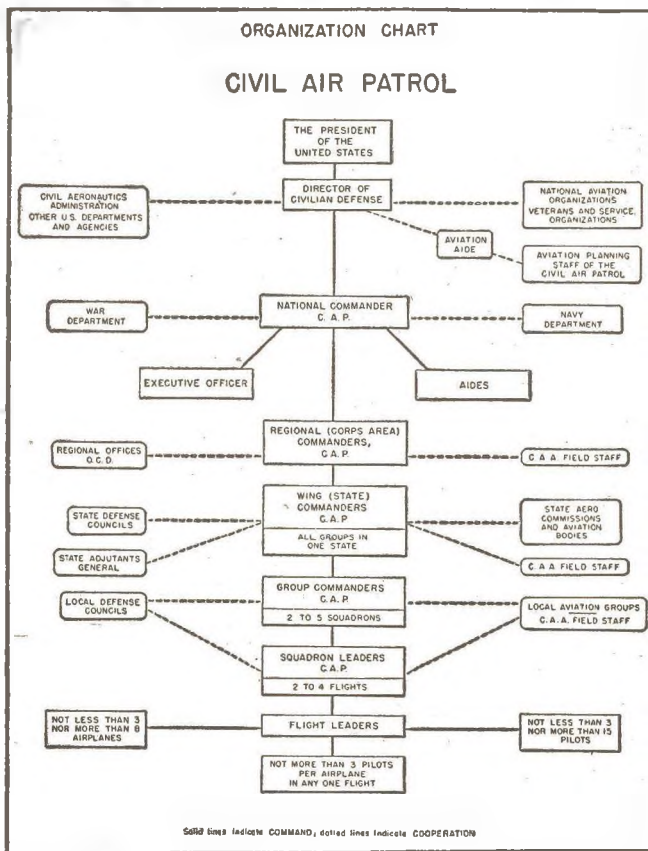
How soon will CAP units start training? Just as soon as organization is completed.

Must one take any examination to enroll? No.

What specific services could a well organized and trained CAP render to national defense? All airports would have to be guarded day and night by experienced personnel.

There are more than 2,000 such airports in the United States upon which no military activity is located. The demand for courier service under war conditions may utilize every pilot and aircraft capable of cross-country navigation. The observation patrol of back-country areas or long reaches of uninhabited coastal areas may be desired by the military establishment. The towing of aerial gunnery targets might be done by experienced civil airmen, thereby releasing military equipment for more important duty. Ferry service for training and observation might be done by more experienced pilots. Under war conditions, many military ships will land in emergency at civil airports. Mechanic personnel to assist at such times will be at a premium. CAP personnel, familiar with all types of aircraft, can assist the aircraft spotters in learning to identify various types. State and local defense councils will have much executive travel and courier service to request. The intimate familiarity of CAP Squadrons with home terrain may furnish valuable information to the military establishment. Patrolling for highway traffic under possible evacuation conditions may be a necessary service to State and military police forces. Searching for military aircraft forced down or crashed in out-of-the-way areas may relieve the military establishments of this responsibility.

What will be the relationship between State aviation civil defense units and the CAP? In each such case plans are in process to enroll individuals and equipment in the CAP.



Where can one get an application for enlistment in the CAP? At any civil airport or CAA office, or from the Office of Civilian Defense, Civil Air Patrol, Washington, D.C.

How can fingerprints be taken? Take the card which you will receive with your application to a police department. Ask them to put your fingerprints on the card. They will gladly oblige.

What about photographs? Attach three 1½" square full-face photographs to your application and fingerprint card. Do not use a snapshot. Photos sent should be as recent as possible. Attach with clip and use no paste.

Send the enlistment application with fingerprint card and photographs direct to the Civil Air Patrol, Office of Civilian Defense, Washington, D.C. Do not fold fingerprint card or enlistment application. Secure a large manila envelope and cardboard for mailing purposes. Mark on envelope: Do not fold.

If a volunteer is accepted, he will be assigned to the Flight or Squadron where he can be most available or render the greatest service. Applicants are reminded not to volunteer unless they are prepared to devote themselves to the interests of the Civil Air Patrol. Applicants should not become impatient if they are not assigned immediately, because it takes time to check records and make tabulations. If an applicant has wide aviation experience he may be called upon to help organize local forces and to keep them functioning after organization.

THE END

THE CRATE IMPERSONATION

OR, HOW PHINEAS MIMICKED—HIMSELF!

by Joe Archibald

NOBODY KNEW better than the Boche in the tag end of the last embroglio that necessity was the mother of invention. Having had most of their top-flight crates flown into the ground, Potsdam's Maxims and Edisons got busy and wracked their noggins to think up a job that would dominate the scraposphere. One little Kraut named Messerfisch must have been born with a caul for he peeked into the future and made a bum out of Father Time. The Prussian prodigy knew very little about planes; armament was his dish, and he served up a cannon around which the Kraut airplane designers built a ship, the Fokker 12. The Messerfisch 20mm. Betsy threw shells the size of Deerfoot Farm sausages, and when one hit it generally meant curtains for an Allied pilot.

The Ninth Pursuit Squadron, pitched outside Bar-Le-Duc, France, was the first outfit to get a taste of Messerfisch's sausages and they got it at breakfast time. A couple of pancakes went with them. Bump Gillis got a shell in the empenage seconds after Howell's flight mixed it with a motley group of Boche over Chambley, and the Scot wondered if some fresh guy had tied a stick of dynamite to his tail for a Boche tracer to play with. Bump landed just inside the Yank lines south of Souilly and he made a mess of the contact with terra firma, for nobody can keep a

tail down when he hasn't a tail to keep down.

Lieut. Phineas Pinkham was all set to write off a Jerry when his upper starboard wingtip exploded in his freckled face. Phineas began cursing a race that would use explosive slugs, but soon tumbled to the fact that no explosive bullet ever made would have been guilty of such assault and battery. The crate that had let him have it threw Spandau slugs at him and then overshot. It was a strange battle-wagon, Phineas thought, as he tried to make the Spad behave. There was a stick protruding from the prop boss of the Boche job. Then it spat fire, and Captain Howell went into a dive just in time.

"Cannon!" Phineas howled while the Spad threw fit after fit. "Where are all our inventors? Every time somethin' new is added it has a Kraut copyright. Well, I will try and get down and turn this heap over to an antique shop or a garbage dump."

Phineas landed in Revigny, finally made the Spad come to a stop between a butcher shop and a bakery. He limped into the butcher shop and sat down on a stool. "If you see some liver around, I think it is mine," he said. "An' give me a chunk of raw beef as this eye is beginnin' to feel like a balloon bein' inflated. It is my luck. This is one time I wanted a permanent injury like a compound fraction or two broken legs."

"I have ze piece of horse meat, *M'sieu*," the butcher said. "Two francs, *oui*."

"Keep it," Phineas snapped. "All it is good for is a colt in the head. Haw-w-w-w-w! I wonder how Bump made out."

LIEUTENANT PINKHAM reached the drome just before noon. There was a council of war going on in the mess. Captain Howell was still shaking despite three slugs of spirits of ammonia, and Lieutenant Wilson was arguing about a transfer.

"Good day to you," Phineas said. "I am here with a towing bill. The Frogs want a hundred francs for clearing up the Spad in Revigny. Where is Bump?"

"He got a message through from Souilly," the Old Man groaned. "They are taking X-rays of him at the hospital."

"I bet they find the first two-bits he ever earned sewed under his skin," Phineas sniffed. "He has no right to be alive after what I saw happen to him."

"That is an awful eye you have got," Major Garrity said.

Phineas clamped his hand over the puffed glimmer and then drew it away. "Take it," he said and tossed an eye to the C.O. It fell into Garrity's lap. It was as bloodshot as a transfusion hypo. Garrity jumped, fell over his chair, and the eye rolled along the floor.

"Glass," Phineas grinned. "But I bet I could give you a rib and not be kiddin'. What a *guerre*. Why didn't the Frogs improve on that Spad cannon they made oncet? If they give up that easy they will have to give up the Eiffel tower and the Louvre."

"How many of the crates did they have?" the C.O. asked after threatening to murder the Boonetown trickster.

"I counted three," Howell tossed at his superior. "Three of those babies are enough to lick a hundred crates packing Vickers. Well, you better drive to Chaumont and give them an earful. Two more Spads washed out. Anybody spot the markings of the other Heinies?"

"Looked like von Blintz' squadron," Phineas said.

"Then we will have to shellac his drome," Garrity lashed out. "We can't wait for our inventors to build a better mousetrap. . . . What am I sayin'? I'm not myself today!"

"Where's Goomer? Let's give the

"Das Pingham, he ist der deffill!" yapped Blintz. "Send out der alarm undt head off der verdammt spy. Ach du lieber! Mein head, it is breaking midt der pain!"





Phineas cut the Hisso and wing-slapped down. He made a perfect one-pointer on top of the Boche Buick and they grappled a few seconds before doing a jack-knife into a frog pond!

new man a drink." Phineas grinned. "Anyway, I bet the new Fokkers have their own outfit and only get mixed up with the others so Allied crates will be fooled. They know we would duck them if they were all alone. They are wolves in sheepskin coats."

Major Garrity and Howell drove to Chaumont. Phineas went to his hut and pored over his library. He settled down and flipped the pages of a book labeled *The Great Herzog, Man of a Thousand Faces*.

Phineas remembered seeing the great Boche impersonator in a Chicago playhouse. Herzog had been one of his idols. He had studied his book diligently and wondered if the Kraut was now spying for the Kaiser. Certainly, Potsdam would take advantage of the actor's inimitable talents. Then there was the Kraut magazine that Phineas had found in a dugout near Dommartin. It had a picture of *Leutnant Bernhardt von Blintz* in it. Since the photograph had been snapped, Blintz had become a *Herr Hauptmann* and had sixty Allied planes to his credit. Captain Howell had been sure he had finished Blintz a month before when he dropped him hard back of the Meuse.

"But he couldn't have," Phineas mused. "I saw that big slob in one of the Fokkers this morning. Had his name on the bus. But he acted funny, that squarehead. Just before that cannon shell smacked me, I had the Kraut dead to rights and it looked like cold cuts for the mess. He didn't even turn an' look at me—didn't fight like von Blintz. I bet the Hopman is dead and somebody is makin' out he ain't. That is German psychology."

Phineas kept looking out the door of the Nissen for a sign of the Old

Man. Time passed and the Bam helped kill it by brushing up on his hobbies. He turned to one book that had to do with mastering the musical saw.

"I should read up more on it," Phineas admitted to himself, "after all the trouble I went to stealin' it in Barley Duck. I almost got the scale down once."

Major Rufus Garrity arrived late. Just as the squadron car rolled toward the French farmhouse, the sounds of airplanes began to knife through the nocturnal quiet. The siren screeched and the Old Man jumped out of the boiler with a patient he had picked up near Souilly. The machine gun crew jumped to the alert, and two miles north of the drome an anti-aircraft battery opened up. Sergeant Casey, boss grease-monkey, fell down a flight of stairs in the old stable serving as mechs' barracks and nearly fractured his tibia.

"Take it easy," Garrity yelled to Bump. "I'll get you to the shelter awright."

"Why didn't you leave me in the hospital?" Bump yelled. "I just met a swell nurse. You brought me back just in time to git killed an'—oh, my back. My sacro-iliac must be tied in a knot. Them planes are close enough to let go. Why?"

The bombproof shelter was full. One personality was not making itself felt, one that was as strong as an odor of onions outside a hamburger joint.

"What happened to Pinkham?" Howell wanted to know. "Say, there ain't no bombs—lissen all of you guys! No Gotha props sing *In the Gloamin'*. I bet a buck against a Bull

Durham sack tag that—Oh, that ape!"

"I think I get it!" Garrity ground out. "That sucker is playin' his saw. Come on, guys!"

Lieutenant Pinkham was surprised when the C.O. and twenty men attacked his Nissen. They would have had the Boonetown wonder if six of them had not tried to get in the hut at the same time. They jammed the door and Phineas picked up a bottle of something that looked like hair tonic.

"Make a move an' I will throw it," Phineas yelled. "It will fix you all up for a cup and some pencils for duration. I am a desperate man. Is it my fault I love music?"

The Old Man and the rest would take no chances with the bottle. They retired in disorder but threatened to get even.

"Haw-w-w!" Phineas howled. "It was hair tonic!" Then he barricaded the door.

AN HOUR LATER, the twanging sounds came again and nobody budged. Six bombs hit in or near the tarmac while Major Garrity crawled under the bed and thought up ways to kill a man without leaving a trace. He would take the saw and perform a magician's trick on the freckled smart Alex, but there would be no magic in the trick.

Bombers went at dawn out to get von Blintz' drome. Then at noon news came into the Ninth Pursuit's executive office that the von's layout had been made to look like a prairie dog's village. There were more holes in it than in a fourth offender's alibi. At least ten crates had been washed up, and when the bombing pilots had last

taken a gander at the Boche tarmac another hangar was rating a third alarm.

Just before dusk the Old Man sent out a patrol to have a look at the Heinie back area. It was "C" Flight, skippered by one Lieut. Corny Wallace. Only three Spads came back. The right wheel was blown off Corny's undercarriage and he did a two-point that was anything but a honey. The Spad went into "A" Flight's tent and nearly decapitated Casey.

Corny Wallace crawled out of the hangar and Phineas helped him up.

"Them bombers was liars," Corny yipped. "They never got the cannon crates. The whole seven of them looked alike and wasn't with decoys. They got a drome somewheres to themselves and they can stay there for all I care!"

"Well, we've got to find it, if we lose every Spad in this outfit!" Garrity bellowed.

"Don't use that pronoun that way," Phineas sniffed. "Use 'I' or 'They' as 'We' ain't interested. Haw-w-w!"

"Oh, no?" Garrity thundered. "We will draw for turns at locating that outfit. No, I got a better idea and it will be fair to everybody. Heard it was used by some Frenchies once. Been hot lately and there's more flies around the mess than there are cooties in the whole A.E.F. I am going to advise the Wing that we're going after these cannon crates. After all, it has been us that they have been working on most."

"Not to brag," Phineas said. "It is because I am a member. The Kaiser still has a price on my dome. Ah-er seems I heard about that way the Frogs picked guys to commit suicide. I—" Phineas clamped his mouth shut, then changed the subject.

The brass hats at Chaumont visited the Ninth Pursuit and congratulated Major Rufus Garrity and his brave men. They went into superlatives and then topped them off with promises of decorations.

"On the thirtieth of May we will get them every year," Phineas cut in. "Boys, it is easy to promise things from a swivel chair. How do you git to be a C.O.?"

"Look here, Pinkham!" the Old Man yelled. "I will not tolerate such insubordination and such aspersion of my character. I will have you know I shot down thirty Krauts before I was promoted. I'll go out in a Spad right now and fly rings around you, you misgotten offspring of a—"

"Oh, I am, am I?" Phineas shot back. "Well, all that saves you is your rank as nobody can insult my family an'—"

"Get wise," Howell snorted. "He is

trying to get busted so's he won't have to—"

"Ah-ha-a-a-h." Garrity grinned like a hungry wolf. "You are getting cold feet, Pinkham. Well, don't mind us, gentlemen. We always are high strung like this, and when we are we are the most dangerous. It is just that we can't wait to go out after those new Jerry ships."

"I understand," a Major said. "Well, we are counting on you guys."

"You will be counting over us, you mean," Phineas went on. "We will not get up at ten. I think I will be excused as there is a letter I wish to write to Iowa. There is an undertaking firm there that does good jobs. I knew this was coming. Last night I



"Haw-w-w-w!" laughed the Bam as he bent his musical saw. "I miter known you guys would angle in and nail this one on me!"

dreamed I was in a poker game and I won ten-thousand dollars with six straight flushes. All spades, too. The ten-thousand is what the U.S. pays out to parents for bringing soldiers into the *guerre* who will be knocked off. Get it?"

THE EXPERIMENT was tried the next day at noon. The July heat was bearing down and you could have cooked an egg on top of the Recording Officer's bald noggin. Flies looped and side-slipped all over the mess, and in front of each pilot was a little piece of biscuit on which a spot of molasses had been dropped.

"The first fly that lands," the C.O. said. "The first piece of biscuit that acts as a tarmac for one of the flies. . . . Well, you catch on?"

Phineas sat rigid, watching the piece of biscuit. A fly came in for a landing, got within a half inch of his morsel of pastry, seemed to stand on its prop for several seconds, then

zoomed up again with an irritating buzzing. Phineas wiped his pan and let his breath go out.

Bz-z-z-z-z-z-z!

A fly swooped low over a biscuit in front of Lieutenant Wilson. It wing-slapped down, made a perfect three-point to the gob of molasses. It made the landing just ahead of the fly that hopped on Howell's tarmac.

"Well," the Old Man said. "Looks like it's you, Lieutenant. Congratulations."

"Don't mention it," the pilot shot out. "I am so happy I could—well, everybody couldn't win. I am just lucky is all. Hah! Go jump in a canal, all of you stiffs!"

Glad Tidings Goomer, mess attendant with the sad peepers of a St. Bernard, suddenly appeared in the doorway of the kitchen and wanted to know who had been musing around his cubicle.

"It ain't my fault there won't be no more sugar for a week," Goomer said. "Somebody tipped a can of shellac all over it an'—"

"Get out of here, Goomer!" Garrity roared. "Don't you dare ever to speak to officers in that manner again or—Shellac, Goomer, did you say?" Garrity made a dive for the piece of biscuit in front of Phineas. His big hand closed over it. He touched his tongue to the gooey brown spot, then banged the biscuit to the floor.

"Oh, you coward!" the C.O. trumpeted. "You are a disgrace to the air corps. Men, he deliberately cheated!"

Phineas suddenly laughed. "Boys, that was funny. I was goin' to tell you. Did you see that fly change his mind? Haw-w-w-w! Well, I am first to go so congratulate me."

Out in the kitchen, Glad Tidings Goomer pored over a map. The Swiss border, he figured, was not so far away for a guy whose life was not worth a plugged sou. He could pack enough food for the trip and would start out at two A.M.

Major Rufus Garrity dropped the chair he was going to break up on Phineas' coco. He said with words that dripped vinegar: "Okay, Pinkham. We can't prove you wasn't going to own up, can we? I know what I think, anyway, you fathead!"

"Suppose the fly had had a cold?" Phineas countered. "I was takin' chances, awright. I used shellac so's the fly couldn't take-off again in case he landed. I didn't want a tie with nobody as then we would have to do it all over again. Anyway, I will go over and look for the Kraut crates at dusk. No matter how this would have come out, I would've been stuck. Wilson would have got mumps before five o'clock."

The members of the Ninth Pursuit group stood out on the tarmac and bid Phineas goodbye. Glad Tidings Goomer stood outside the groundmen's barracks and changed his mind about heading for Switzerland. This kind of a go was going to be poison to Phineas. Even if he did get back, he would be in no shape to get hung.

"Adoo," Phineas called out. "I am a big fly lookin' for molasses. If I get a shellackin' it will serve me right, huh? Haw-w-w-w-w!"

The Spad shot away and pilots cheered. Casey looked toward the boneyard and mentally selected a spot for the groundhogs to dig up in a few hours. Major Garrity put an empty pipe between his teeth and tried to light it with a nail file. Bump Gillis dared anybody who thought Phineas had shed a white feather to put up his dukes, and Howell was scootched down banging something against the ground. It was his watch on the end of a gold chain.

"What time is it?" Garrity snapped.

"Thursday," Bump said.

"We got to get hold of ourselves," the C.O. put in. "We're all mixed up and need a drink."

The Ninth had been saving a bottle for just such an ordeal. They gathered around it while the Old Man pulled the cork. A snake shot out, its head vibrating and making a rattling sound. It was made on the order of an accordion. The bottle was as empty as a schoolroom on the fourth of July.

"That cussed——!" the Old Man roared. "All right, if I don't see him for the next hundred years, it will seem like only yesterday. And get those long faces off before I swing on somebody."

"I hope they take him prisoner and torture him," Howell said.

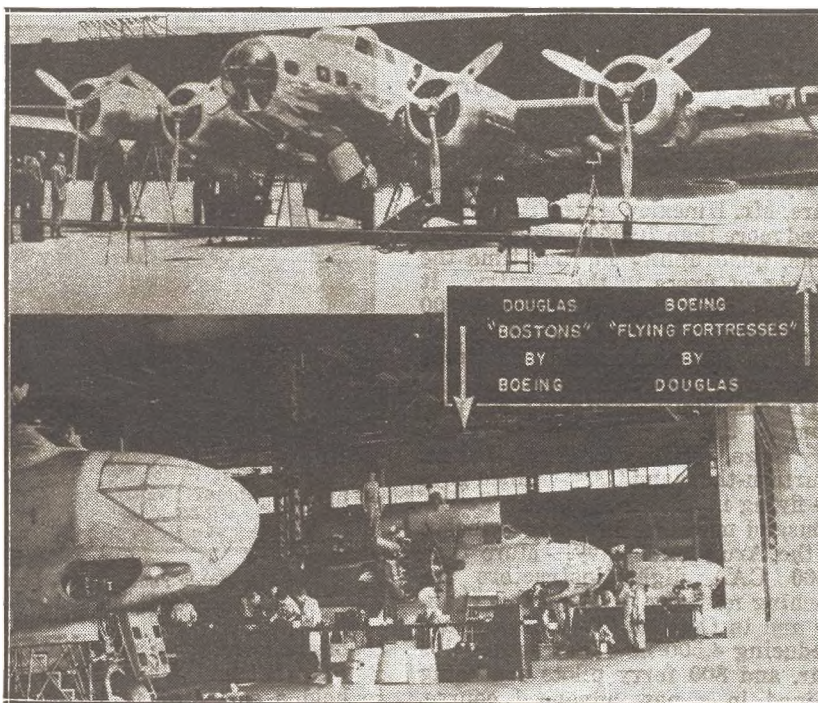
"You can't help likin' the cluck," Bump admitted. "Well, I will go to the Nissen and pack his things to save him time in the morning."

PHINEAS flew over Conflans without mishap. It was a temptation for the wit from Iowa to let one of the Coopers go down into the railroad yards there. He swung the Spad's nose northeast and headed in the general direction of Dusseldorf. Kraut anti-aircraft guns began poking at him before he got over Vigy and he came down under the bursts of scrap-iron to look at what was left of a Heinie drome. Smoke still boiled up from the mess the U.S. bombers had made, and Heinies were scampering around the blister on terra firma like so many ants.

A solitary Rumpier appeared in the sky, and Phineas gave it a wide berth, all the while getting closer to the ground so that he could spot a Boche tarmac. The Jerry gunners began getting the range again and the shells burst all around Phineas' bus. The Yank looked upstairs again, saw three specks dancing at a height of six-thousand.

Blam! Heinie shrapnel showered the Spad and bit through the wings.

Fortresses of Democracy



SAVING PRECIOUS TIME in the construction of modern aircraft urgently needed under the Government's bomber program, Douglas and Boeing have exchanged tested and proven designs for the Army Air Forces' A-20A attack-bomber and the B-17 long-range heavy bomber.

Douglas engineers at the company's "blackout" plant in Long Beach, Calif., are shown studying details of the Flying Fortress

above; lower portion of the photograph shows A-20A's in production at the Boeing plant.

With some 7,000 men and women already producing assemblies for Douglas attack-bombers and military transports, the company is preparing for the additional large-scale assembly of Flying Fortresses. A \$13,000,000 expansion program to double its facilities and make possible such production was launched recently.

Another burst hit the fuselage between crash pad and rudder post, and when Phineas got the Spad under control the empennage was not on speaking terms with the rudder bar. A strut risked suit for non-support and gaddled about aimlessly.

"Well, it is down the bannisters for me," Phineas said. "If I stay upstairs I will soon be without a Spad around me. Imagine bein' brought down by Archie. I am slippin' awright. I wonder who will get second shot at the cannon crates? Wonder if I should take the laudanum now."

The bottle of sleep syrup had come from Waterloo, Iowa, three weeks before. Phineas' aunt, Philomena, had sent it and had written a note which she had wrapped around the bottle. She had told Phineas that she had heard about how aviators must suffer when they are falling from a height of twelve-thousand feet and know they are going to get a harp. So she had told her nephew that she was sending the laudanum for him to carry so he could spare himself from such mental anguish.

"Haw-w-w-w-w-w-w! Aunt Philly

was always a worst pessimist," Phineas gulped as he nursed the Spad toward the center of gravity. "She made Uncle Cy wear a belt and suspenders both at the same time. I will take it like a man. That looks like a good place to land over by that woods."

Phineas cut the Hisso and wing-slapped down. Too late he saw a motorcar come out of the woods, but perhaps it was a very good thing—for the boiler knifed right under the Spad and stopped its forward motion. Spad and Mercedes sedan grappled with each other fiercely for several seconds and then rolled down an embankment and into a shallow pool where frogs set up an indignant protest.

Phineas shook the fog out of his mental assembly and crawled out of the pit that had taken in a lot of water. There was no sign of any of the passengers who might have been in the Boche Buick. Phineas was sitting up and coughing up half a pond-lily pad when he saw the trunk that hung from the back end of the overturned

(Continued on page 74)

On the Light Plane Tarmac

NON-COLLEGE AIR TRAINING

THE CAA Civilian Pilot Training Program is now regarded as one of the great progressive steps in aviation history, according to Robert H. Hinckley, Assistant Secretary of Commerce for Air. In three years, Mr. Hinckley states, it has produced more than 70,000 young civilian pilots, quadrupling in that time the number of flyers in the country. It now has some 600 colleges and 100 non-college training centers in all parts of the nation, and hundreds more are on the waiting list.

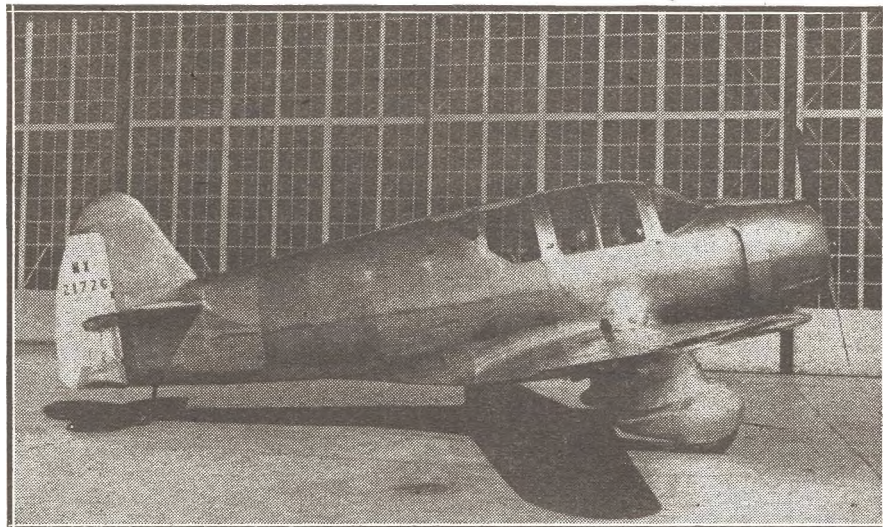
The contributions of the CAA program to the war effort already are very large, yet they have only begun. Fourteen-thousand CAA-trained boys are flying in the air services. Seventy-thousand more are in other branches of the Army and Navy. More than 2,000 CAA flight instructors are teaching military flying in this country and in Canada. Our centers are producing 4,500 new instructors this year, and 800 ferry pilots are being trained in a new advanced course. Today the CAA training is more closely integrated with the Air Forces than ever before, and this integration is being increased to the limit.

In short, we now have an excellent aviation teaching and training system for people of college age. But what about the high schools and elementary schools? There we have virtually nothing in the regular courses. There are some 2,000,000 boys and girls who are building and flying model airplanes on their own, in private clubs; this shows a large demand on the part of the younger folk which the schools have not met.

If this should be a long war, then boys just now entering high school will have to fight in it. In any event, the most important post-war commercial field will be aviation. If our boys are destined to fight, they should be as skilled as possible; if they merely must compete in the post-war economic struggle they should be skilled at the kind of work in which there are plenty of jobs.

On that basis, Mr. Hinckley states he is convinced that the facts of aviation should be taught in the regular courses of elementary and high schools—in connection with mathematics, geography, biology, physics, and chemistry. He insists that the theories thus developed should be applied in practice by the building and flying of model aircraft; that in the high schools the more talented might build simple gliders in manual training classes.

This proposal is not just a twinkle in somebody's eye. A committee of eminent educators was working on it before Pearl Harbor. They saw this "blind spot" in our educational system and wanted to correct it. They want local school officials to see it for



This sturdy Paulic XT3-B, from all indications, has met with little success. Construction is all-metal and visibility is excellent. A Scarab 125 is used.

themselves and to do something about it. To that end, they are proposing to hold a series of regional conferences throughout the country to talk over this problem with local school officials and ask their help.

We of FLYING ACES believe it is about time the higher-ups are waking up to the fact that millions of boys and girls in this country are air-minded to a burning degree. But, unfortunately, these air enthusiasts have been overlooked entirely by the Government. They have been left to get into aviation any way they could—if they could at all! Hundreds of thousands of dollars have been spent by these boys for instruction—but many of them, after getting in possibly six or seven hours of dual, have been forced to drop out because of lack of money. Several such cases have come to our attention. For instance, a young chap was in the office recently and we asked if he had a license. He said: "I got in 39 hours of dual and solo but then had to drop out because of lack of money."

This young man had been burning with aviation fever for many years. He built models, collected a scrapbook, has read hundreds of aviation magazines, and has a file of more than 3,000 negatives of airplanes. Then he scraped up enough money to start flying and hitch-hiked to the field every Saturday and Sunday to take his half-hour or hour. But now, after 39 hours, he has been forced to drop out.

There are undoubtedly thousands of such cases, and while these boys are not college material they would probably be as good for military flying as the next one. Our Army is now training pilots in wholesale lots to stave off any possible air disaster—but this should have been foreseen years ago, as this magazine consistently pointed out. Since crying over spilled milk is useless, however, the

only thing we can do is be sure that we are never again caught short. The plan mentioned previously by Mr. Hinckley seems to give a partial answer to this—but, as far as we know, *actual flight instruction does not come into the picture*. The plan, therefore, will not and cannot be without reproach until some such mention is made.

A CHALLENGE TO INSTRUCTORS
ARE INSTRUCTORS responsible for accidents resulting from stalls occurring during turns at low altitudes? Read the following comment made by the Safety Bureau of the Civil Aeronautics Board:

"While examining a group of 20 accident reports submitted to us recently, we were again appalled with the continued repetition of accidents resulting from stalls at low altitude. *All of the 20 occurred while the pilot was attempting to make a turn.*

"A tabulation of the causes of these 20 accidents shows that nine resulted from stalls during the landing approach, and three from stalls occurring during the first turn following take-off. In no case was there any indication of reckless flying, and in all cases the person involved was either a student or a private pilot with limited experience.

"One of the twelve stall accidents occurred after engine failure on take-off and in two other cases a landing was probably being made because of engine trouble. In only the first, however, was there any definite emergency at low altitude, and in that case the pilot attempted to turn back when there was a good field straight ahead."

It certainly appears to us that this is a sad commentary on the ability of our so-called modern instructors and the instructional methods used. This magazine for years has been stress-

ing that turns should not be made at low altitude or without sufficient speed, and we shall continue to "harp" on that subject until eventually this flying practice has been eliminated completely.

In *Up and At 'Em*, Col. Harold E. Hartney states that in the first World War flying was not far enough advanced—up to about 1916, at least—for pilots to know better. But then it was discovered that when the engine failed the best system was to continue to fly straight ahead. Aviation, we always thought, had progressed a long way since those days, but the same mistakes are still being made—even with all the warnings

are slowing down the return of completed applications to the State Wing Commanders.

Most frequent errors are: Missing, incomplete, and smudged fingerprint cards; missing photographs; illegibility in signing applications; and unsigned oath of allegiance.

Numerous inquiries have been received from special groups who want to enroll as units, keeping their group identity. But the national policy is against such "group enlistments," although all members are welcomed as individual applicants. Student flyers are particularly urged to join the CAP.

Ohio leads in the number of enroll-

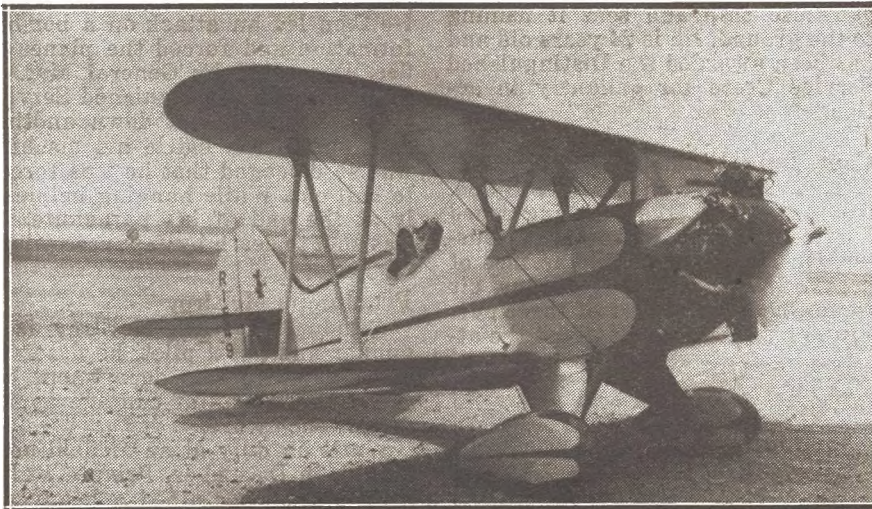
office work of the organization.

To speed the clearance of applications, which have to go through 30 operations before they can be sent back to the State Wing Commanders, the headquarters staff in Washington has been increased from three to 100 girls. They are working in three shifts because of the acute shortage of office space in the wartime capital.

NEWSY NOTES

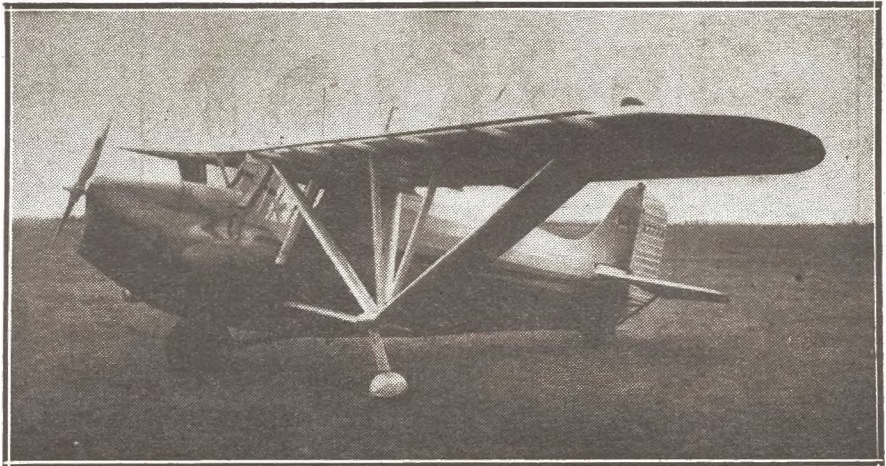
ATTENTION New Yorkers.—A U.S. Government Civilian Pilot Training Course, non-college phase, is being offered at no cost to young men between the ages of 19 and 25. The course consists of 72 hours of ground instruction in meteorology, navigation, Civil Air regulations, and general service of aircraft. The ten highest-ranking students will receive a free Government Flight Scholarship for further training. The course is given and supervised by the Junior Chamber of Commerce of the Bronx and will be conducted at 2488 Grand Concourse at Fordham Road. Phone Fordham 7-3500 for additional information.

Testing Spotter System.—The Third Interceptor Command is enthusiastic over the results of the Aircraft Warning System by the Florida CAP. Lieut.-Col. Charles W. Lawrence, Air Corps, wrote Maj. Wright Vermilya, Florida Wing Commander: "The members of your force volunteered their services and flew the courses prescribed by Headquarters



With only a 16-foot span, the Greenmaier Melberg Ward MGW-1 Snuffy is one of the smallest ships built. Engine is Lambert.

Right: Like the Paulic, this Hall-Aluminum machine was none too successful. Fixed leading edge slots are installed.



that are given. To put it simply, it's just thoughtless and utterly stupid flying—and nothing else!

CIVIL AIR PATROL

ENLISTMENT applications for the CAP now total more than 16,000, according to the NAA's *Washington Newsletter*, and additional blanks are pouring in at the Office of Civilian Defense at the rate of about 850 per day. Estimates of the number of volunteers at points where membership drives are being conducted show that many more applications are being prepared throughout the country.

Of those filed thus far, certificated pilots still run about 85 percent. It is best that pilots be cleared first since their work in the program is most important and a larger volume of non-flying applicants would overload the facilities of Washington clearance at this time. But it is to be expected that a much larger percentage of auxiliary workers will be enrolled as the squadrons are formed and completely staffed.

Applicants should take extreme care in filling out their blanks legibly and completely. Errors and omissions

ments, with New York, Pennsylvania, Michigan, Illinois, New Jersey, California, and Texas among the states where volunteers are joining in large numbers. In some of the smaller states where available pilots are not so numerous, a large percentage of the pilots have already applied. Approximately 80 percent of the applicants thus far are pilots, but, of course, the Patrol is open to all citizens over 16 who can render effective service.

Women pilots are joining, too. The Ninety-Nines have rendered effective aid in many areas through the valuable combination of secretarial and aviation experience which makes them highly useful in expediting the

in an excellent manner. This exercise enabled us to test the training of observation post, filter, and information center personnel and the necessary communications details." Colonel Lawrence suggested that similar exercises throughout the country will be valuable in testing the Warning System and that funds be secured to compensate members of the CAP for such work.

Pilots for Artillery Grasshoppers.—The Field Artillery is losing no time in starting courses at Ft. Sill, Okla., for pilot-mechanics to fly light planes on artillery observation assignments. The first class consists of a group of Field Artillery officers
(Continued on page 80)

War Flyers in the Headlines

Against Axis forces, American Army and Navy flyers are once again showing the stuff of which they are made. They are carving niches for themselves in the Hall of Fame!

EVEN THOUGH the Japanese hordes are still advancing on all fronts through sheer weight of numbers, their sky forces are being pounded unmercifully by Yank flyers. Our pilots are quickly adding new and sensational victories to their tallies, with surprisingly small losses. The grim determination to win this war—and quickly—is driving our gallant flyers on. Following are recorded the deeds of some of the winged demons of Democracy who are sending the rising sun crashing in utter defeat.

Lieut. Randall Keator

Early in December, Lieutenant Keator was engaged in an aerial patrol over Luzon, Philippines. He sighted and engaged a number of Japanese planes, on their way to attack U.S. troops under the command

of General MacArthur, and dived to the attack. After shooting down one enemy machine, he was joined by other American craft, and in the resulting action two more Jap planes were shot down. On the way back to his home field, gasoline and ammunition having run very low, Lieutenant Keator pursued another Japanese ship and sent it flaming to the ground. He is 24 years old and has been awarded the Distinguished Service Cross for gallantry in action.

Capt. Jesus Villamor

This Army captain, a Filipino, was awarded the Distinguished Service Cross and Oak Leaf Cluster. On December 10, in the face of heavy fire from strong enemy air forces, he led his flight of three pursuit ships into action against the at-

tacking Japs. By his example of courage and leadership, and at great personal hazard, he was enabled to rout the attacking machines. On December 12, this officer, again at great risk beyond the call of duty, led a flight of six pursuits against 54 enemy bombers, causing damage to their formation.

Lieut. Marshall Anderson

On January 17, heading his pursuit group, Lieutenant Anderson attacked a superior force of dive-bombers and shot down one plane. He then led an attack on a bomber formation and forced the planes to flee. Decorated by General MacArthur with the Distinguished Service Cross, he later shot down another Jap, but in the battle his machine was so damaged that he was forced to bail out. While hanging helplessly at the end of his parachute, he was shot to death by Japanese pilots.

Pvt. Joseph McElroy

Although Private McElroy is a gunner and not a pilot, he deserves to be listed in this department because of his acts of courage in the face of enemy fire.

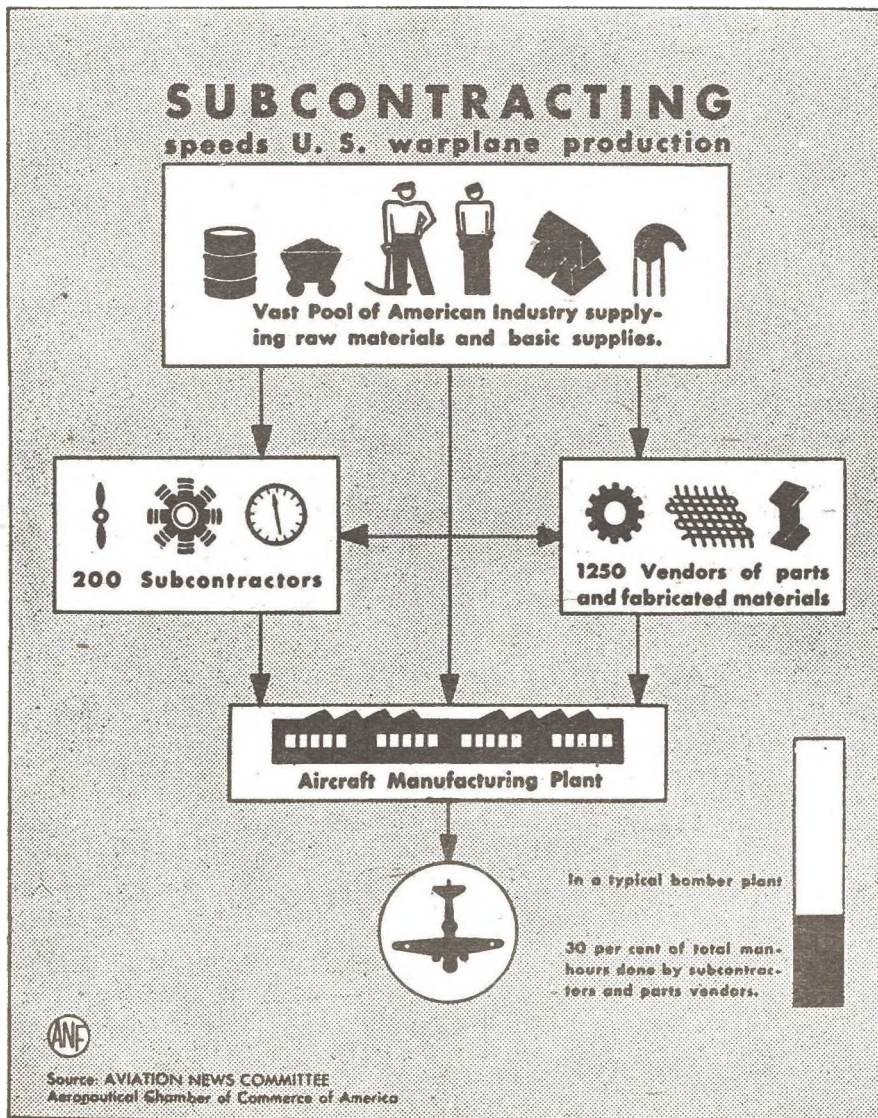
While on duty at an airfield near Manila in December, Private McElroy's station sustained a heavy attack by Japanese planes. Instead of running for cover, however, McElroy dashed to his grounded plane and, using the swivel gun mounted on it, shot down one enemy ship in flames. Remaining at his gun, regardless of fire from the Japanese, he forced two other hostile planes to withdraw, both emitting dense trails of smoke as they fled. He has been awarded the Distinguished Service Cross.

Ensign Frank Fisler

This Navy ensign, aged 25, was awarded the Navy Cross. In December he was in command of a patrol plane operating off the island of Oahu. On patrol he sighted eight Army airmen adrift in a collapsible rubber boat of the type carried in patrol bombers. Displaying great skill and at extreme personal risk, this officer brought his plane down in seas which were running 40-foot high. He effected a rescue and returned to Pearl Harbor. This heroic deed was an inspiration to every officer in the Hawaiian area.

Capt. Alvin J. Mueller

Participating in a bombing raid on an enemy airdrome, Captain Mueller's plane was struck twice by anti-aircraft fire and attacked by ten Japs. Mueller remained aloft for twenty minutes more, however, fought off the enemy attacks, and protected his
(Continued on page 72)



JOIN THE FLYING ACES CLUB

Honorary Members

President and Mrs. Franklin D. Roosevelt
ex-Vice Pres. John Nance Garner

- | | |
|--------------------------------|-------------------------|
| Casey Jones | Rear-Admiral Byrd |
| Wallace Beery | Col. Eddie Rickenbacker |
| Al Williams | Colonel W. A. Bishop |
| Col. Scaroni | Major G. A. Vaughn, Jr. |
| Major von Schleich | Willy Coppins |
| Lieut.-Col. Pinsard | Glenn L. Martin |
| G.-M. Bellanca | Walter H. Beech |
| Capt. B. Sergievsky | Zack Mosley |
| John K. Northrop | Dwane L. Wallace |
| Colonel Roscoe Turner | Josef Veltjens |
| Charles W. A. Scott | Col. A. P. de Seversky |
| Richard C. DuPont | Donald W. Douglas |
| Maj. A. W. Stevens | Major C. C. Moseley |
| Capt. O. A. Anderson | Clarence D. Chamberlin |
| Major Fred Lord | Mrs. Charles S. Baylus |
| Lieut.-Col. Theodore Roosevelt | |

Official Charters

F.A.C. Flights and Squadrons are recognized at GHQ only after they have received their official charters. These illustrated documents, printed on fine paper and portraying various features in the field of aviation, are excellent for framing and display. Their inspirational text is in keeping with the high ideals and aims of our Club. Each charter application must include a full list of proposed group members and their addresses. Each of these members must hold his regular F.A.C. card, obtained by clipping and sending in the membership coupon printed on this page. If applications are approved, Flight Charters are issued for 25c, and Squadron Charters for 50c. Send the correct fee with your application. It will be returned if the Charter is not granted.

WIN YOUR WINGS

Save This Whole Coupon for
CADET OR PILOT
insignia of the F.A.C.



All members with Official Membership Cards are eligible for Cadet Wings. This coupon, with two others and 10c, entitles members to Cadet Wings. Do not send this coupon alone. Save it until you have three. Then send them in all together with a self-addressed envelope and 10c to cover cost of wrapping and mailing.



All enrolled members who have won their Cadet Wings are eligible for Pilot's Wings. This coupon, with four others and 10c, entitles Cadets to Pilot's Wings. Do not send this coupon alone. Save it until you have five. Then send them all together with a self-addressed envelope and 10c to cover cost of mailing.

Send the Whole Coupon

regardless of which kind of wings you wish. Separate sets of coupons are needed for each insignia. Canadians send 15c, or three International Reply Coupons. Overseas readers send 1/-, or five Reply Coupons secured at the Post Office. Only one pair of either kind of wings to a member. If yours are lost, send 25c for new ones (2/-overseas). [52]

Do Your Full Share to Advance Aviation

To advance the cause of aviation, over 50,000 men and women, boys and girls, have banded together to form the **FLYING ACES CLUB**.

It is the easiest club in the world to join. Just clip the membership coupon, fill out, and mail it to GHQ with a stamped, self-addressed envelope. Your official card will then be forwarded to you. After joining, you can quickly win promotion and the right to wear the various insignia of the Club.

In the **FLYING ACES CLUB** there are two kinds of local organizations, known respectively as Squadrons and Flights. A Squadron must have eighteen members, including its leader. A Flight must have a total of six. You can start either of these groups in your own community by enrolling your friends in the Club, then applying for an official charter as detailed in the column at the left. *Each member must hold an F.A.C. card.*

Meetings and activities are conducted among the squadrons and flights according to the wishes of the members. GHQ has established no rulings in this respect, nor are there any dues or red tape whatsoever. The entire idea of the Club is a common meeting ground in an international organization for the lovers of aviation in its various phases. Many local Squadrons and Flights hold regular contests and public events. Many hold weekly meetings for model building, and instruction, and even regular flight training.

Awards and the Aces' Escadrille

After the membership card, and Cadet and Pilot's wings, comes the Ace's Star. This is awarded for enrolling five new members, using, of course, a separate coupon for each. As an Ace, you are then eligible for membership in the **FLYING ACES ESCADRILLE**. Then you may win truly handsome awards. Among these are the Distinguished Service Medal and the Medal of Honor, two of the finest decorations that have ever been designed.

Any member who has reached the rank of Ace is eligible for membership in the **FLYING ACES ESCADRILLE**, an advanced organization which replaces the old G-2 unit and opens the way for participation in a definite program contributing to the forward movement of aviation.

To enroll, an Ace must apply direct to Escadrille Headquarters, giving his name, age, address, rank, and highest award already won in the Club, and enclosing a stamped, addressed return envelope. If he is approved for membership his instructions will be forwarded. Membership in the Escadrille is limited to American and Canadian members only, at present.



Every loyal Clubster should wear a pair of these official embroidered wings. Done up in the regulation colors of the **FLYING ACES CLUB**, blue and gold, the wings measure 4 3/4" from tip to tip and are 1 1/4" high. The letters F.A.C. are neatly embroidered in gold in a semi-circle against a blue field piped with red.

They're just the thing you want to sew onto your sweater or lumber jacket, and they stand out against any background. Order your wings now. The price is 25 cents. Enclose a self addressed and stamped envelope with your order.

Keepers of the Log

In order to keep in touch with GHQ, every squadron should appoint a member with a facility for writing as Keeper of the Log. It shall be the duty of the Keeper of the Log to send in regular reports of interesting doings of his squadron. His is an important job, because it is only by means of interesting squadron reports that life can be given to the **Flying Aces Club News**.

Photographs, too, are an important consideration for the Keeper of the Log. Either the Keeper himself, or any other member with a camera, should keep a photographic record of the squadron's activities, for reference purposes, to show prospective new members, and to allow a selection of pictures to be sent to GHQ for reproduction in our monthly **Club News** pages.

The cost of film, prints, etc., would be a legitimate charge against the squadron's own treasury or could be covered by members' contributions. A number of flights and squadrons, incidentally, send us prints which have been taken, and completely developed and printed by foto-fan members of the outfit.

Correspondence

In all correspondence with GHQ where a reply is desired, enclose a stamped, self-addressed return envelope with your letter. GHQ receives thousands of letters weekly, and cannot undertake to answer those who do not heed this rule.

Official Supplies

We also have a new supply of swell embroidered wing insignia that'll look top-notch on your sweater. They're made of the official Flying Aces Club colors, blue and gold, and are available at 25c each. Order now before the supply is exhausted.

May Membership Application

I, the undersigned, hereby make application for membership in the Flying Aces Club. I agree to live up to its rules and regulations; to foster the growth and development of aviation; and cooperate with all other members in the work of spreading aviation information, building up confidence in flying for national defense and transportation. I will aim to build up the Club and its membership, and do my best to win the honors that the Flying Aces Club offers.

My name is
Age [52]
Street
City State

Do you build airplane models?
Mail this application, enclosing a self-addressed, stamped envelope. Canadian and overseas readers send the application, self-addressed envelope, and an International Reply Coupon worth 5c, secured at the Post Office.

FLYING ACES CLUB, 67 W. 44th St., New York

Flying Aces Club News

by Clint Randall

National Adjutant, Flying Aces Club

JUST AS WE ARE about to go to press in the late afternoon, the mailman brought us a single solitary letter. It was from our old pal, Percy Chorley, of London. Percy always sends his missives marked "air mail" so's to make sure we get them and not the Jerries—as so many letters from England are now lying on the ocean's bottom. Anyway, you readers might recall Percy's offer some time ago in which he expressed his willingness to serve as an "information depot" for members of the FLYING ACES CLUB who wish to get the dope on any particular phase of aviation. Perc says that quite a few Clubsters have written him not only in quest of aviation data but also wishing to trade aero mags.

Perc's latest letter tells us that he has more than 200 magazines—all U.S. aviation, and from the pages of these mags he has filed away and indexed 11,000 entries. Articles which cover everything from hydraulically operating landing gears to drawings and photos of every type of plane are to be found in his extensive archives. And "the use of his files is open to all the members of our club." Perc says that all you have to do is write for the information, and in due time he'll air-mail his reply back to you. He swears it's no trouble and he's tickled pink to keep up the correspondence with the boys "over here." So if you fellows want to take advantage of a very generous offer, write Perc at 47 Pollards Hill North, London, S.W. 16.

Aside to Perc: Your D.S.M. entry showed good workmanship, but the judges think that better photos would have turned the trick. When the ship is covered you might be able to send us better pics. So try.

Just the mere mention of D.S.M. brings us to that always pleasurable task of deciding this month's winner.

This flying scale model of the "Army BC-1" built from plans in the May 1941 F.A. won the D.S.M. for George Adair, of Ontario, Canada.



And the judges again found two entries which outpaced the others. So sound the clarions!

FIRST CHOICE

of the judges is the photo of the "Army BC-1" flying scale which was built from the May 1941 issue of F.A. by George D. Adair, 22 Lamb Avenue, Toronto, Ontario, Canada. George tells us that it is one of the best models he has ever built; it flies like a charm and always makes good three-point landings. George also dabbles in photography and develops his own prints. To him model building and photography are the finest hobbies.

Yes, George, we know lots of FLYING ACES Clubsters who'll agree with you on that score one hundred per cent.

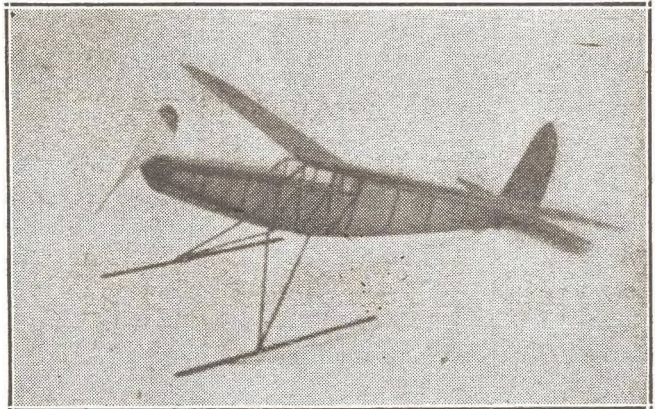
The second winner of the D.S.M. is Jimmy Singleton, 5508 First Avenue, South, Birmingham, Alabama. Jim simply tucked his entry into an envelope with a slip of paper and identified it as a "Convertible Ski Job" made from plans which appeared in the March 1937 issue of F.A.—short and sweet. The picture,

as you readers can see, is a neat one and so is the model itself. So the judges, feeling rather generous this trip, decided that both George and Jim were deserving of the medal and just upped and gave it to them. We are not bad people, are we, fellas? We'll play ball.

So George and Jim, it's congratulations to both of you, and when this issue catches your



Three members of the FLYING ACES CLUB took first prizes in a recent model contest at Johnson City, N. Y. Left to right: Stanley Jesionowski with Senior Dart; Ed Rowe, Waco C-6; and Al Vanack, Grumman F3F-3.



Second D.S.M. award goes to Jimmy Singleton, Birmingham, Alabama, for his "Convertible Ski Job" built from plans in the March 1937 issue.

eye on your local newsstands (unless you happen to be a subscriber, then you'll get the good news several days beforehand) the Distinguished Service Medals will be on their way. Yes sir, you lucky dogs, they're something to be proud of. Wear 'em in good health, too!

Now you other fellows, don't feel sorry for yourselves. Just buckle down, finish that model you began or get started—we don't care which, and shoot the pictures to us post haste for the coming judgment day. But remember you must be a member of the FLYING ACES CLUB in order to submit your entry.

If you aren't a member, just trickle on down through the pages of this worthy magazine until you come to that dignified looking page which reads: JOIN THE FLYING ACES CLUB. Read all of it and if you think you'd like to join the ranks of our loyal thousands, just clip the little coupon, fill it out, and mail it in. With it you may send in your photo-entry, too. That makes you a bona-fide member and your entry is considered okay. Simple, isn't it?



Meet Aurelio Vazquez one of the oldest members of the Club. He is an expert airplane engine mechanic with the Service Test Unit of Patterson Field, Fairfield, Ohio, Army air base.

Elsewhere on that page you will see a little ad which describes the embroidered gold and blue wings. These wings sell for twenty-five cents apiece, and by golly they sure look swell mounted on your lumber jacket or sports sweater. Sew 'em on and show 'em off. It's a great way of letting people know you're a member of this fast growing, world-wide organization.

WE'VE RECEIVED many letters from satisfied readers who received their copies of Dave Cooke's *War Wings*, and they all praise it sky high. And now Dave tells your N.A. that his new book titled *War Planes of the Axis* will be ready the early part of May. This book contains all the dope on the air forces of Japan, Germany and Italy, and also gives the background of each country's air force, specifications, and details of their fighting planes and bombers and is just loaded down with photographs—two hundred or more. So if you're a keen student of aviation both of these books deserve a place in your reference library.

Augustus Allen, Jr., of 48415 Michigan Avenue, Chicago, Ill., C.O. of the Sixth Squadron of the FLYING ACES CLUB, sends in his report of progress.

He informs the Escadrille H.Q. that through his efforts he managed to get up a model airplane display in the George Hall Library in this city which drew much attention. He also informs us that in April, his squadron is going to have a model contest called "THE FLYING ACES MODEL-CRAFT CONTEST," and that model mak-

ers from all over the city are invited to participate.

We're holding any decision pending the award of points on Gus' Escadrille Assignment record until we get a full report on the April model plane contest. So don't forget Gus, send in all the details. Meanwhile it will be a good idea for Chicago Clubsters to contact Gus for more details on this city-wide competition.

The photograph of the three Clubsters holding their models are winners in a recent model meet held in Johnson City, N.Y. Edward Rowe, in the center of the trio, was awarded first prize in the senior event for his scale Waco C-6. The ship was built from a twenty-five cent kit, and by adding interior details Ed made the job so realistic that he won hands down. The chap on his left, Stanley Jesionowski, is first-prize winner of the junior event with a Senior Dart model.

The smiling chap on Ed's right is duplicate prize winner, Al Vanack, with his Grumman F3F-3. The contest was conducted by a local model supply store which not only stimulated its own business as well, but really brought the boys together. Ed tells us that after seeing "Target for Tonight" (reviewed in these pages a short time ago), it left him gripping the arms of his seat. Yes, by all



The war relic den of which a corner is shown, belongs to Jimmy Shutt, Columbus, Ohio. The arsenal is quite varied but also quite harmless.

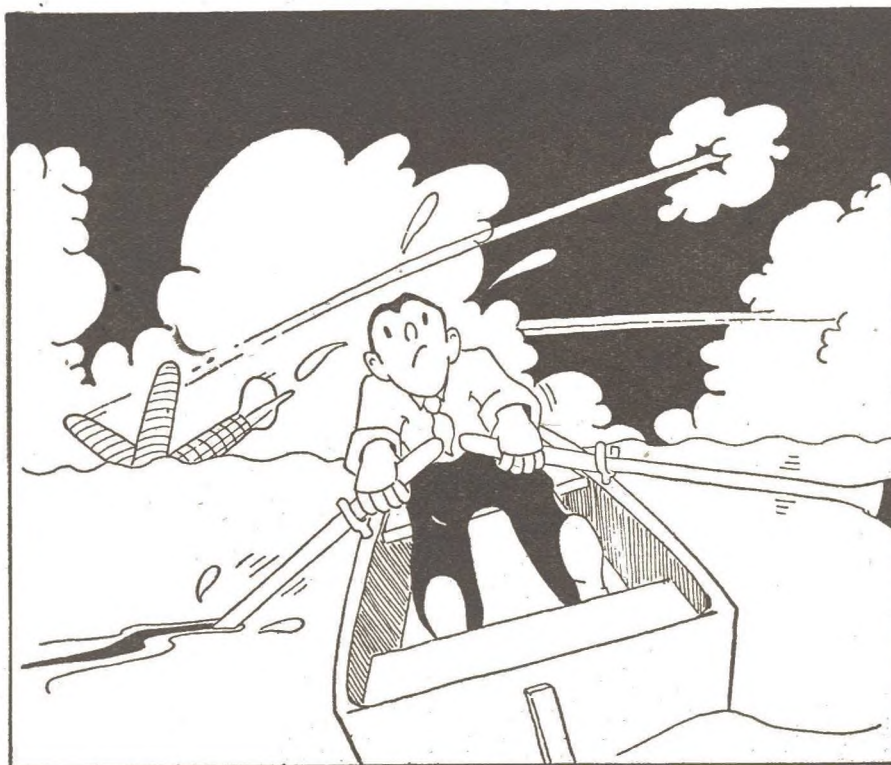
means fellows, make it a point to see this fine British picture if you get the chance. It will be around for some time to come.

The young man in uniform is our old pal Aurelio Vazquez, 720 West 5th Street, Dayton, Ohio, who writes us apologizing for not having contacted us much earlier. Aurelio is an old member of this club, and explains that his duties have kept him so busy that he has had to forego his usual hobbies for the time being. But like a pilot looking for a hole in the fog to let down and have a look-see, Aurelio found this opportunity and came through with news about himself.

Aurelio swears on a stack of Holy Bibles that it was FLYING ACES that started him off on a career of aviation. And he is proud to tell that to us "in black and white." He started as a model builder and studied aviation until he was awarded an air-

(Continued on page 70)

"Now I know why they call this an R. O. W. event."



All Questions Answered

Bob Fiscus, Leechburg, Pa.:—Cartoons submitted to F.A. should be drawn on white paper with black ink. Sizes are optional, but they should be in the same proportion to those we usually publish. However, the market is now closed, since we have bought up enough cartoons for the next several months. Sorry, but I haven't even heard of the Dornier Spindle. We cannot vouch for the authenticity of the figures given on the Douglas B-19, since the data presented were the only material released. The latest fighter accepted by the Army, as far as known, is the Republic P-47B Thunderbolt.

Charles Donald, Union City, N.J.: To contact Alan F. Kitchel, address letters in care of Universal Newsreel, 1250 Sixth Ave., New York City.

Norbert Kasper, Chicago, Ill.:—I'm afraid you'll have to build your model of the Lockheed P-38 from guess work, as far as internal structure is concerned. That plane is still plenty secret and mechanical details have not been made available for publication.

Bill Bailey, Wakita, Okla.:—I've checked my files, and of the information you request only the following is available: Franz Buchner, 40 victories. The only source I can suggest for the other data is one of the authoritative history books dealing with the aerial aspect of the first World War.

Art Gunning, Sag Harbor, N.Y.:—As I've pointed out so many times before, study all the math, geography, and physics you can get in high school if you intend to apply for Air Corps training.

Harry Mileal, Bronx, N.Y.:—Parachutes were not used to any great extent by pilots during the first World War. Observers in balloons, however, did use them. The word itself means to stop, or to parry, a fall.

John De Murley, Asbury Park, N.J.:—Several model airplane companies sell kits of the Curtiss SO3C-1. I suggest that you look over their advertisements and pick out the one which you think might be best. Sorry, but because of the different companies advertising in FLYING ACES, we cannot suggest any particular one.

Billy Ashdown, Coburg, Ont., Can.:—On April 26, 1939, Fritz Wendel reached 469.225 m.p.h. in a special souped-up Messerschmitt Me. 109; 354 m.p.h. is for the stand-

ard military type. Even though several other planes have gone much faster, the 469.225 mark is the world's official speed record, because it was reached over a measured course and the flight was witnessed and verified by the *Federation Aeronautique Internationale*.

Andrew Gaggero, Union City, N.J.:—*The Wonder Book of the Air*, by C. B. Allen and Lauren D. Lyman, may be purchased from the John C. Winston Publishing Co., 1001-1016 Arch St., Philadelphia, Pa. The price is \$2.50.

Howard Dahlmann, Mineola, N.Y.: F.A.'s editor, Dave Cooke, is doing another book for the McBride Publishing Co. It is called *War Planes of the Axis* and will have almost 200 pictures of German, Italian, and Japanese airplanes, along with descriptive material. The book will be ready about May 5 and will probably sell for \$2.75. Mr. Cooke says to thank you for your swell comments on *War Wings*.

Roy R. Hurth, Sweet Water, Ala.:—Yes, the Douglas B-19 heavy bomber does have a tail turret. Exact armament data have not been released, but it is said that "several" high-caliber machine guns are mounted.

Romer Stevens, Wood-Ridge, N.J.:—We are not in the market for aviation fiction, since all of our stories are written to order. I suggest that you send your material to one of the dime novels. They have a large market and are always seeking new stories and new writers.

Wilfred Messier, Jr., Central Falls, R.I.:—The following back copies of FLYING ACES are available: February, 1940; September, 1941; October, 1941; January, 1942; February, 1942; and March, 1942. They may be obtained from our Accounting Department for 20c each.

Theodore S. Dourney, New York, N.Y.:—As far as I know, no air shows are contemplated for New York at any time in the near future. I would say that there probably won't be any more until the war has been fought to a conclusion.

Joseph Kotcka, Clairton, Pa.:—The following Aces were the topnotchers of the first World War: Manfred von Richthofen, 80 victories; Rene Fonck, 75 victories; Edward Mannock, 73 victories; William Bishop, 72 victories; Raymond Collishaw, 68 victories; Ernst Udet, 62 victories; James McCudden, 58 victories; Erich Lowenhardt, 56 victo-

ries; Donald McLaren, 54 victories; William Barker, 53 victories; Philip F. Fullard, 53 victories; Georges Guynemer, 53 victories; A. B. Proctor, 52 victories. Richthofen's book, *The Red Battle Flyer*, may be purchased from Airbooks, P.O. Box 958, New Rochelle, N.Y., for \$4.50.

Russ Scheidler, Minneapolis, Minn.:—FLYING ACES has been reaching your city later than usual because of transportation and distribution difficulties. We do our best, however, to get it out on time every month.

Fred Hammel, 1542 W. Culver, Phoenix, Ariz.:—Sorry, but our supply of the February, 1937, issue has been exhausted. Perhaps some of our readers will be able to mail you plans of the Fokker D-36 four-engine transport which appeared in that issue.

James Cooledge, Castle, N.Y.:—Fire-power can certainly be increased by adding more guns, but that's not always possible. It's just like saying that you can be a better runner if you take longer strides. Some ships are stressed for a certain number of guns of a certain caliber and, under ordinary circumstances, cannot be fitted with additional weapons. The Curtiss SB2C-1 is now standard equipment; according to our information, it is coming off the lines in large numbers.

Frank Hodges, Whitesboro, Tex.:—You have just about as much chance obtaining plans of the Rolls-Royce Merlin engine as a snowball has existing in Hades! Pictures of the engine, however, are shown in *Aerosphere* and, I believe in *The Aircraft Yearbook for 1941*.

J. Sheehan, Chicago, Ill.:—It is an accepted fact in aviation circles that the Gotha bomber was a German copy of the British Handley-Page. You might try the Jarrett Museum of World War History, Steel Pier, Atlantic City, N.J., for the purchase of a photograph of Baron von Richthofen.

John Jacobs, New York City:—The chief difference between the Spad 7 and the Spad 13 was in the engines. The 7 had a 150 Hissco and the 13 a 200-h.p. Hissco. I do not have all the details you ask about those World War Aces. Fokker, Sopwith, Bristol, Albatros, and Pfalz made triplanes in the First World War. They are not made today because we have powerful enough engines to get upstairs fast—which was what the triplane was noted and designed for.

THE END



When lower wing panels on Ray Fagan's gas Fokker D-7 were wrecked, he continued thusly.

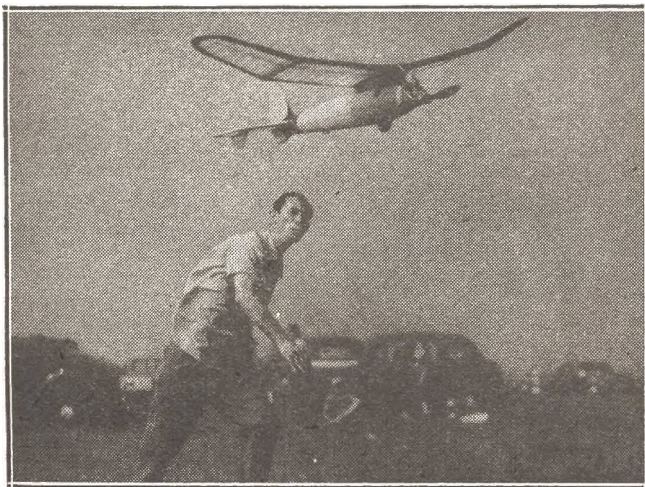


Oscar W. Kopmek of Queens County, N. Y. and "banana peel"-type fuselage gas model.



Sal Taibi, with the NACA model laboratories at Langley Field, still finds time for gassys.

With the Model Builders



Max Jurist test glides his Comet-powered job. This model, an original design, is planked, silk covered, and features a clever retracting gear.



DeWitt Blossom of New York City prefers scale gas jobs. His Bunch-powered Corbin Ace showed excellent flying characteristics.

Ed Yulke, of the Brooklyn Skyscrapers Club, goes in for unusual types. This Canard job, powered with an Ohlsson "23", flew well in tests.

This tail-boomed job is used by John Clemens of Dallas, Tex., to tow a banner around the field where contests are in progress.



HOW YOU CAN RECOGNIZE JAPANESE WARPLANES

Old or new, Japanese airplanes, upon reaching our shores, can do much damage. Remember Pearl Harbor? So familiarize yourself with facts, figures, and photos so that when and if—you'll be on the alert!

by Seton David, Jr.

JAPANESE AVIATION, military as well as naval is formally under the control of the Emperor and the Chief of State. On the premise that the "king can do no wrong" criticism of its air arm by the Japanese military in any manner is absolutely forbidden. Censorship therefore is very strict. Because of this rather impenetrable censorship, information regarding the efficiency and strength of the Japanese Air Force has been pooled from bits of fragments on the subject from various reliable sources, and, added together, make it possible now to give a fair picture of the Nipponese air arm from both a qualitative and numerical standpoint.

That the Japanese aircraft industry is notoriously unoriginal in their endeavor to create a first class air power, is widely known to most analytical students of aviation. By in-

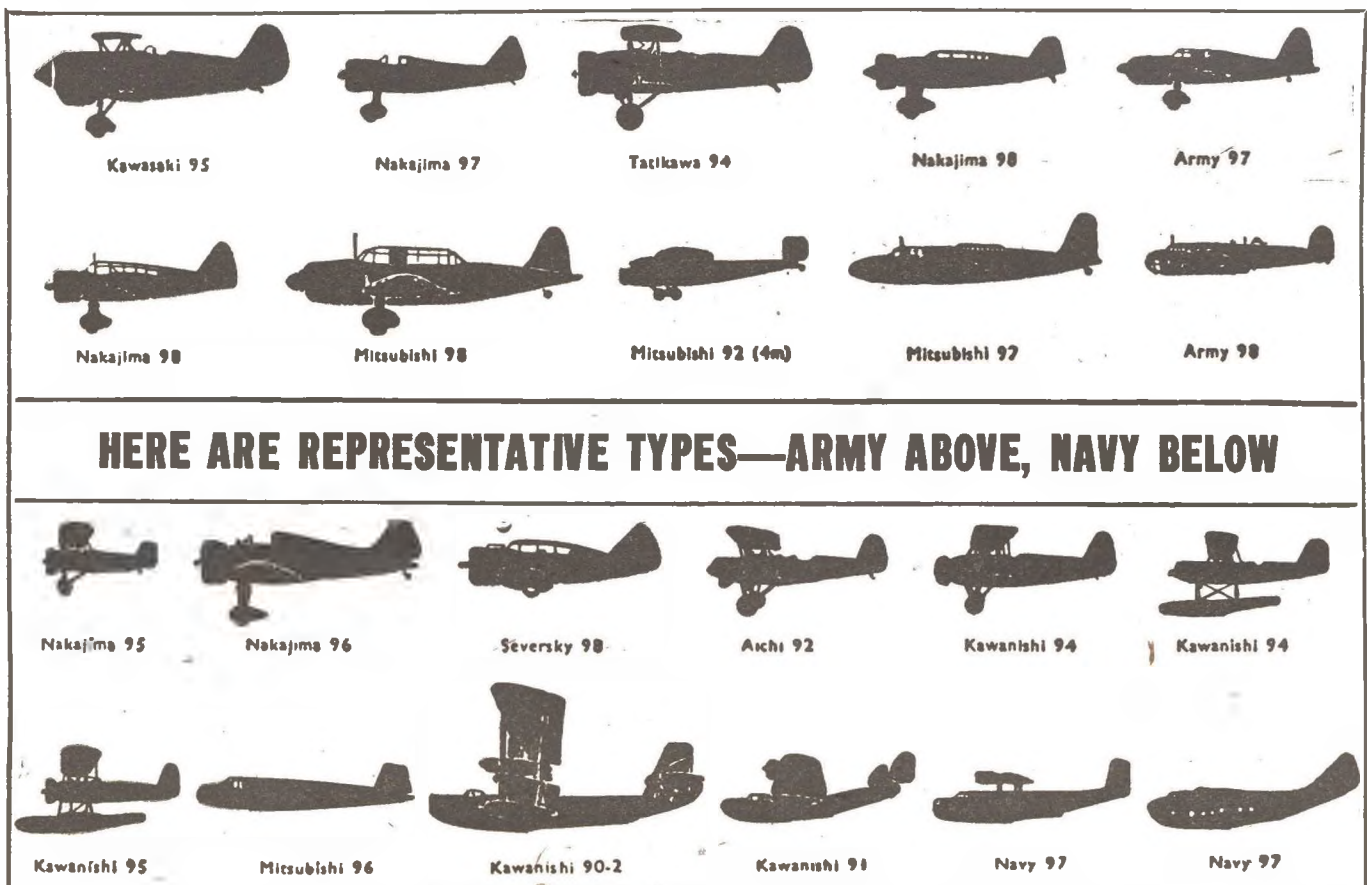
stinct the Japs are imitators and lack originality. And because they are conscious of this fault they seek to hide it from the sight and frank criticism of the world. The most obvious fault, impresses one of the fact that the close resemblance of Jap military and commercial aircraft to comparable designs of Europe and North America are too much so to be accidental. Their system of copying is tacitly demonstrated by their building of planes from whose originator has been also obtained the manufacturing rights for these machines.

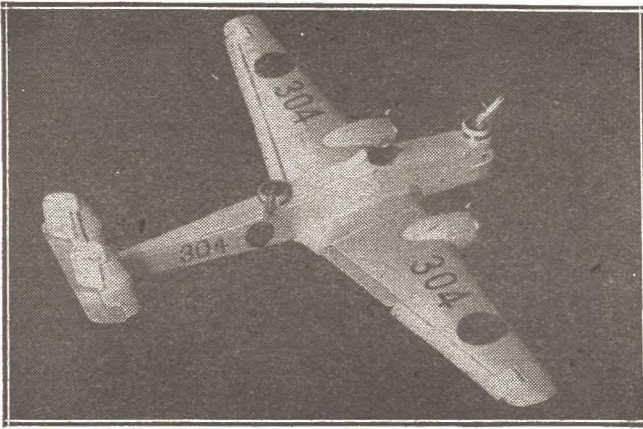
Their is no doubt that Japan figures in the lowest range on the list of great air powers. According to well informed sources, it is said that in all Japan there are not more than 3,000 planes of all types—military, naval, training, and transport. There is no central control of Japanese aeronautics. Military aviation is under the

authority of the Minister of War and naval aviation under the Admiralty. Civil and commercial aviation are departments of the Minister of Transportation, while aeronautical study and research are dealt with by the Minister of Education.

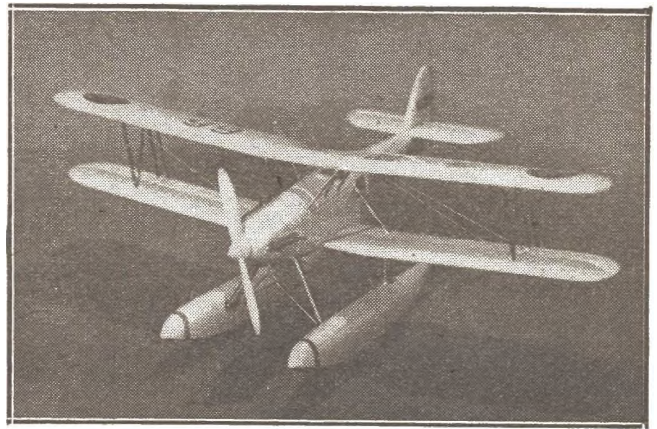
Of the two branches of air service, the army is considered the strongest in personnel and machines. It is composed of three operating corps. The first is the fighter, followed by reconnaissance, and lastly, bombardment. The second corps includes three aerial regiments with expeditionary forces in China while the third corps consists of six aerial regiments and several independent squadrons that cooperate with the army in Manchuria.

Bombing and fighter squadrons are normally composed of ten planes each. A reconnaissance outfit has nine planes. The composition of an "aero regiment" is flexible; it can contain

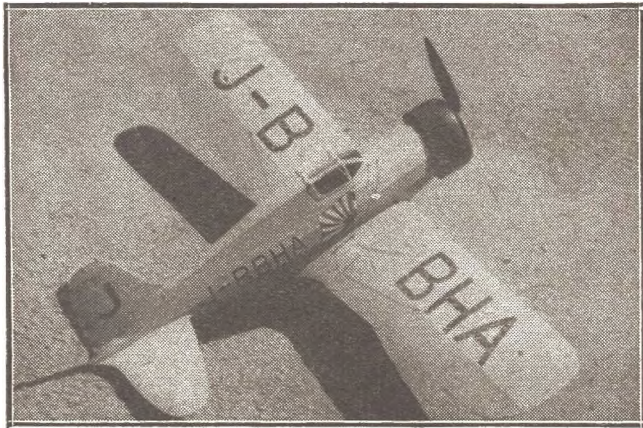




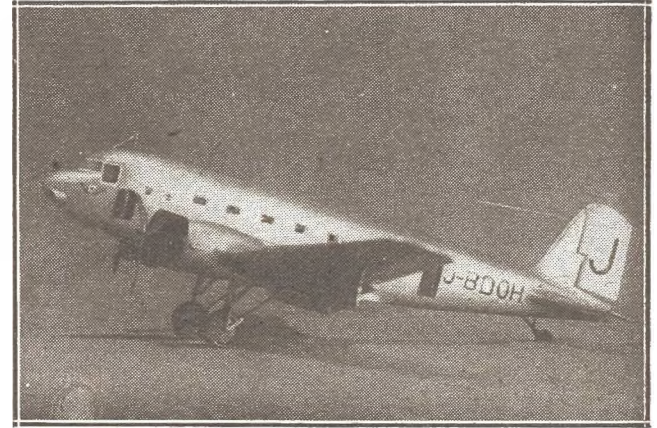
The design for the MITSUBISHI army type 93b long-range bomber is of Junkers origin. All-metal corrugated covering.



KAWANISHI navy scout-bomber carries a crew of three. It is powered with an Aichi-Lorraine 300 h.p. engine. Built in 1936.



NAKAJIMA A.N. 1 is a stubby, broad-wing single seat fighter not unlike our old Army Boeing P26-A. Top speed is around 261.



NAKAJIMA-DOUGLAS DC-2 built under license since 1936. Twin Cyclones 710 h.p. Used as paratroop transport. Speed 217 m.p.h.

two, three, four, or five squadrons. The composition of a squadron is also variable, some squadrons being used for bombing and others for observation, interchangeably. In summing up there appears to be about 110 squadrons in the whole Japanese Air Force. Of these 35 to 40 are fighters while the remainder are light and heavy bombers, and reconnaissance ships. The army is reported to have six pilot training schools while the navy has but one. The total flight personnel graduated from these schools does not exceed 700 pilots a year.

Naval air strength consists of seven aircraft carriers, five seaplane tenders and a number of ships equipped with catapult devices. According to the German naval authorities the Japanese aircraft carriers cannot be considered very capable for the service for which they must perform. They are slow, wieldy and hold not more than 60 planes each. Altogether Japanese carrier planes total around 330 machines. Last figures released in September 1939 show that Jap air strength consists of 3,000 army pilots and 2,100 naval fliers.

EVEN BEFORE the Jap assault on Pearl Harbor aircraft production in the volcanic island was reported to be about 250 machines a month and these, divided between the army and navy. A serious shortage of raw materials such as aluminum, high

grade steel, manganese, rubber, and cotton make it impossible for Japan to keep up with even one-fifth the production of her Allies who, too, are running into difficulties as time goes on. For Japan to anticipate her Nazi and Fascist Allies to send her reinforcements of latest type aircraft by either rail or air, is as much a pipe dream as is her vision of eventually dominating the western world—or as some Tojo official so seriously put it—"to dictate from the White House."

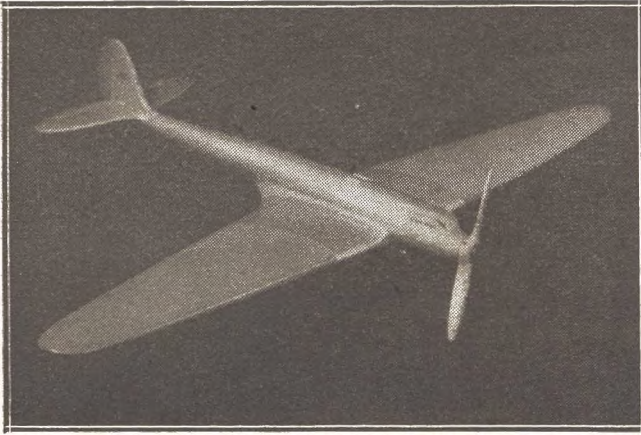
Jap aircraft production employs a small number of workers. Certain types of machinery for mass production cannot be obtained and many aircraft parts must be fashioned by hand. And coupled with this technical inferiority, her plight is anything but an encouraging one.

Japan has always been an air-minded country even though her aero developments cannot be considered up to par with other nations. Her youth have experienced the joys as have other youth the world over in building and flying model aircraft. Centuries ago, the Japanese favorite pastime was flying weird looking kites or dragon-shaped creations and contests were held for days at a time with contestants seeking to establish kite endurance records. Her natural products of bamboo, rice paper, silk, and preserving lacquers have enabled the air-minded boys and girls to develop model planes about the same

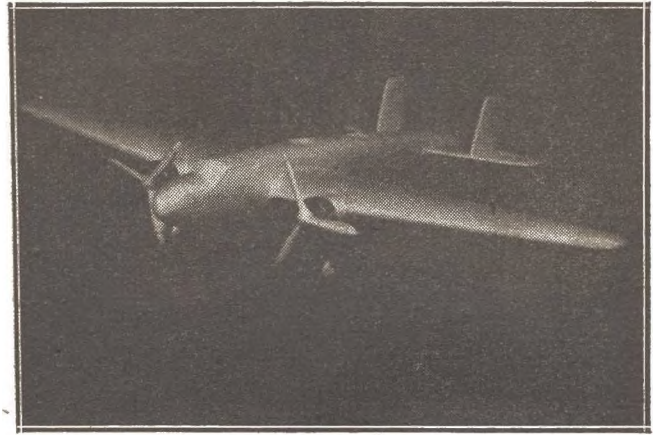
time the model hobby became started in the Western world, and from the samples of their workmanship seen hereabouts, it is rated as excellent.

The Nipponese have an air youth plan whose development is based on the Nazi *Luftjugend*—or Air Youth. Physically fit young men whose ages range from 12 to 15 are given training as part of their school curriculum. During the first couple of years the youngsters are instructed in building and flying model planes most of which represent the military ships currently used in the Japanese air force.

The purpose and function of every airplane part is driven home to them. To die in aerial combat is glorious. And when gas modeling reached the Orient, Japan imported several American makes of gas engines, duplicated them so cheaply that any modeler could afford to purchase one. The youth who indulged in the popular hobby constitute the main source of supply for Japan's pilot training program. But her lack of training equipment and the hasty manner in which the program is carried out has given Japan the reputation of having the highest accident rate of any nation's air power. This fact plus the concentrated effort of the democratic powers to drive the Japanese planes from the skies is the dagger with which Japan is slowly but surely pointing toward her national heart.



The KOKEN machine is a long-range craft powered with an 800 h.p. Kawasaki engine. Commercial job, it has military possibilities.



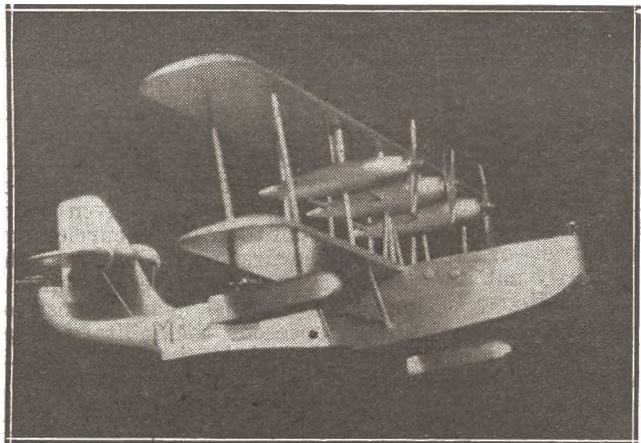
MITSUBISHI SOYOKAZE ("Breeze") is the navy's long-range bomber, type 96. It has a ten hour endurance at cruising.



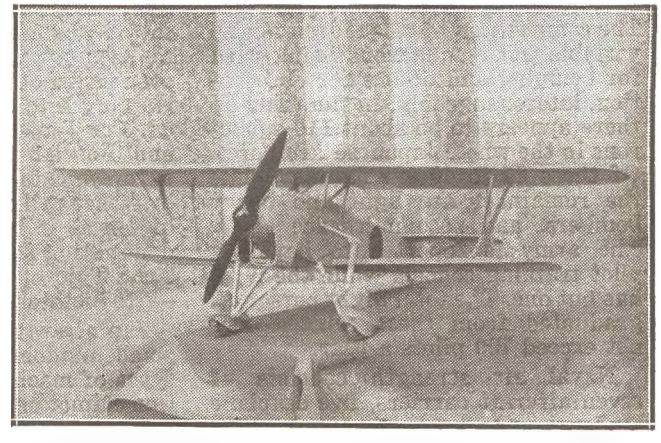
NAKAJIMA type 90 is used as a navy shipboard fighter. Looks like our 1932 Boeing P12-C. It is powered with a 450 h.p. engine.



This MITSUBISHI bomber 93d retains the sad looks of a Junkers K-37 model of early '30 vintage. Twin 700 h.p. Mitsubishis.



A long range naval reconnaissance boat is this KAWANISHI 90-2. It's powered with three 825 h.p. Rolls-Royce "Buzzard" engines.



KAWASAKI type 93 is an army day-bomber built in 1936. Has a 600-700 h.p. engine, is all metal, and very slow.

IN AN ENDEAVOR to aid conscientious air enthusiasts, ever on the alert for enemy planes, the following list has been prepared from the latest reliable sources and along with the photographs of scale models of typical Japanese craft, this information may be considered as up-to-date as can be obtained during this conflict. The photographs have been supplied through the cooperation of Mr. Al Barnett, of International Models Co.

The MITSUBISHI army type 93b is a long-range bomber, typical of Junkers design Model K-46. The Jap

version is powered with twin Nakajima "Jupiter" engines of 450 h.p. each. The "Jupiter" engines are of British design and have been manufactured under license agreement for several years by the Nakajima works. Its crew of five is composed of a pilot, co-pilot, bombardier, and two machine gunners. One is located in an open turret in the extreme nose while the second gunner's pit is located mid-way of the fuselage. Wings taper sharply at both edges, Ailerons as well as tail surfaces are balanced. Inboard of the ailerons are landing flaps. Engines are covered with

Townend type ring cowls. All metal construction with corrugated covering. Wing span measures 66 feet. Maximum speed is 155 m.p.h.

One of the popular types of reconnaissance or scout-bombers of the navy is the KAWANISHI 94. This ship is also of German origin taking its design from the Heinkel seaplane. It is a two or three place job with the pilot seated under the center of the upper wing with accommodations for a spotter-navigator and machine gunner behind. This ship came out around the latter part of 1936 and was powered with an Aichi-Lorraine

300 h.p. water-cooled engine. Wings of equal span measuring 48 feet 8 inches have single bay "N" type struts with another strut behind operating the ailerons. The floats are all metal. Length over-all is 31 feet 8 inches. Armament not available. This job operates from a seaplane tender.

If one recalls the stubby, squat-looking appearance of our Boeing P26-A then he should have no trouble identifying the NAKAJIMA A.N. I. This ship has broad straight wings wire braced to a landing gear completely housing the landing struts and wheels. The fuselage is of monocoque design constructed of dural tubing and bulkheads and is covered with sheet metal. Wings are made with steel spars and wood ribs. Leading edge is plywood covered and the rest fabric. Tail surfaces are of metal construction and fabric finish. Rudder is balanced. Armed with twin guns firing through the prop disc. Engine covered with an NACA cowl. Prop adjustable pitch type. Span, 35 feet 5 inches; length, 24 feet 5 inches; height, 11 feet. Top speed at 14,000 feet is 261 m.p.h. Is powered with a Nakajima III engine of 550 h.p. at 1950 r.p.m.—700 h.p. at 2100 r.p.m. Climb, 2,620 feet per minute.

The NAKAJIMA DOUGLAS DC-2 is still being turned out under a license granted from the Douglas Company several years ago. Machines of this type in use by the military are em-

ployed as paratroop transports and for personnel ferrying. Easy to recognize as bears identical outlines to our domestic kind. This early version is powered with twin Wright "Cycs" each of 710 h.p. and swinging controllable pitch props.

Of German Junkers design, the KAWASAKI army type 93 is outmoded in appearance, load carrying, and performance. A large number of these machines were built and equipped with Kawasaki B.M.W. engines and wood propellers. Metal interior construction with outer skin covering of corrugated metal. Slow and lumbering, the ship carries a fair load of bombs at a top speed of 136 m.p.h. Ceiling limit is 16,400 feet.

Early in 1932 the Boeing Airplane Company of Seattle, Washington, designed and built a monoplane which, to close observers of airplane development, seemed to be identical in design to the Army's P-12C except that this model had a parasol wing arrangement with a double set of parallel sloping brace struts on either side of the body. This experimental craft seemed to have possibilities but after extensive tests the Army dropped it for a still later development of the Boeing biplane fighter.

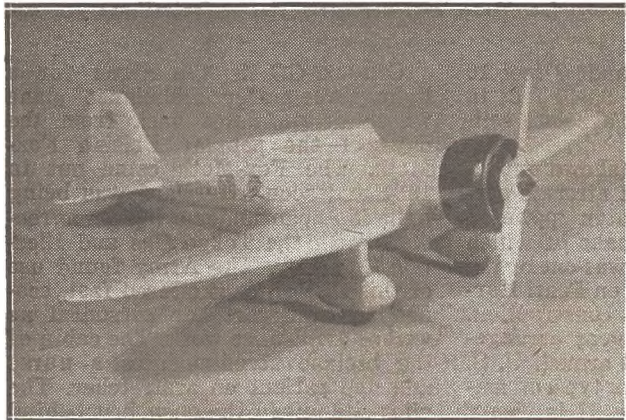
The Japanese apparently liked this short pugnacious-looking craft and began producing them in 1933.

The fuselage was circular in cross-section and of monocoque structure. Ailerons had narrow chord. Power

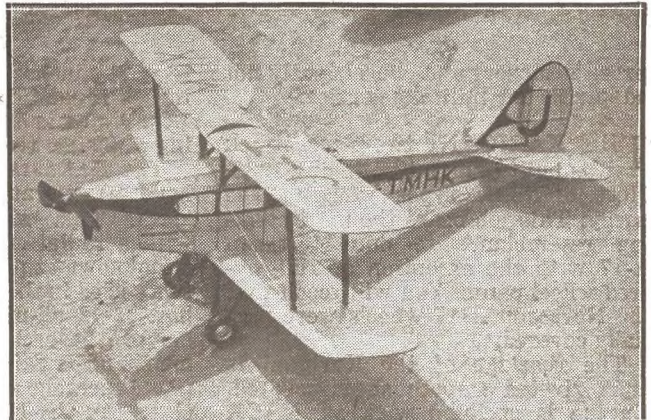
was supplied with a 450 h.p. Nakajima "Jupiter" engine encircled with a Townend type ring cowl. Propeller was a regular Hamilton Standard Steel. Wing span measured 36 feet; length, 23 feet 11 inches; height 10 feet 2 inches. Details of its armament have never been divulged but it is believed that this model did not possess more than two .30 caliber guns which were located under the cowl and firing between the revs of the prop. Top speed 198 m.p.h. with a climb to 5,000 feet in ten minutes.

The KAWASAKI C-5 was one of the first attempts in the low wing monoplane field. This machine, if some are still in service, is used as an army communications ship. It is primarily a two seater but can accommodate three. Fuselage is metal structure and metal covering. Wings are of wood ribs and steel spar construction with fabric covered surfaces. Ailerons are balanced. Power is derived from a 800 Kawasaki-B.M.W. engine. Span is 43 feet 11 inches; length, 30 feet 4 inches; height 13 feet; top speed 208 m.p.h.; range, 7 hours at cruising speed. Full length wheel pants encase the entire landing gear arrangement. There is no external bracing of the wings.

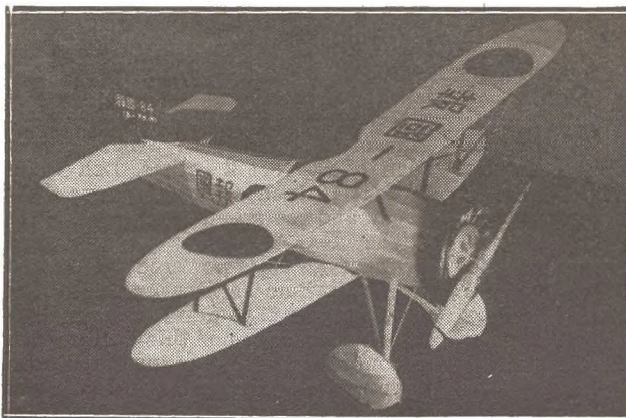
The details of construction of the KAWASAKI commercial type biplane must remain unidentified for the time being—and just as well. A thorough search reveals that this machine is used domestically as a mail and ex-



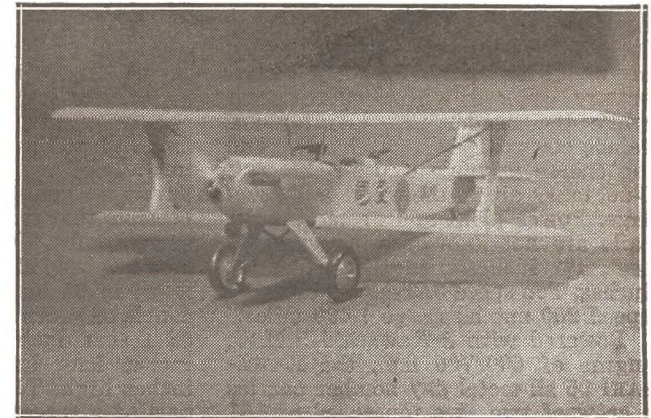
KARIGANI ("Wild Goose") was produced in 1938 and bears a strong resemblance to our Northrop A-17. Speed 300 m.p.h.



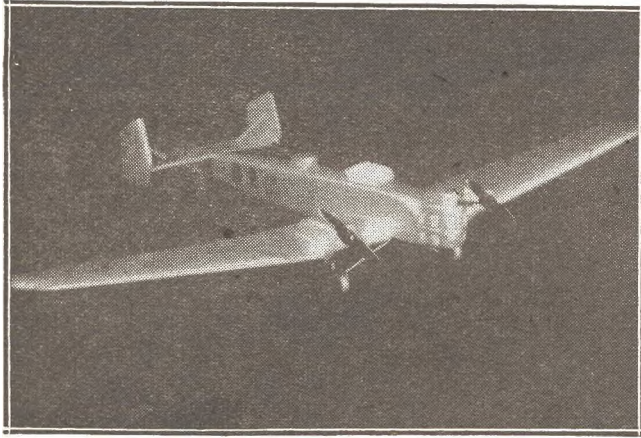
CHIDORI-GO is a three-seater light transport powered with a 130 h.p. engine. This design in reality is a D.H. Fox-Moth.



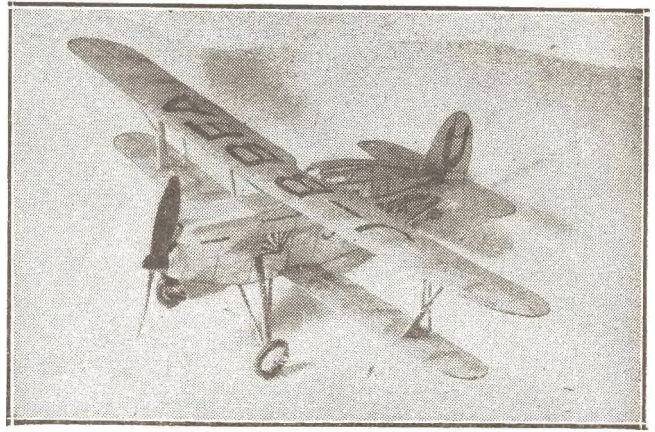
NAKAJIMA type 90 modified with streamline wheel housings is identical to type 90. Both ships used "Jupiter" engines.



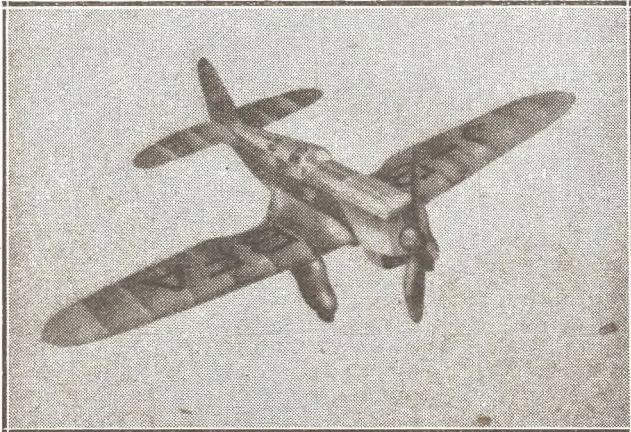
KAWASAKI 88 is an army reconnaissance-bomber powered with a 450 h.p. B.M.W. engine. Has a top speed of 136 m.p.h.



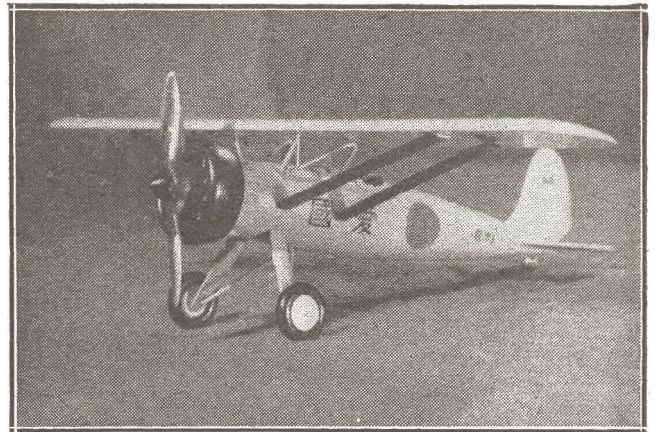
KAWASAKI 93 is an all-metal corrugated job powered with twin B.M.W. 600 h.p. engines. Top speed about 161 m.p.h.



An unidentified KAWASAKI type biplane. Because of its cockpit enclosure it is believed to be an air mail job.



KAWASAKI C-5 is an army communication ship accommodating a crew of three. Powered with a B.M.W. engine. Speed, 208.



NAKAJIMA type 91 is a copy of condemned Boeing parasol experimental job Model 202. Jap army uses it. Engine has 450 h.p.

press transport and consequently not adaptable for military service.

THE KARIGANI two-place attack was built in quantity during 1938. Most of these types went to the Army. This job bears the most striking resemblance to our Northrop A-17 with the exception of full-covered wheel pants. You will recall that the Northrop A-17 wheels were partially covered.

The fuselage of the Karigani is flush riveted smooth sheet covered. Engine is enclosed with an NACA type cowl and fitted with a Hamilton Standard constant speed propeller. Ailerons are of metal frames and fabric covered. Split edge wing flaps beneath the body extend to within three inches of the ailerons. Rudder and fin are metal frame. The fin and stabilizer are covered with smooth sheet while the rudder and elevator are fabric covered. Full wheel pants and leg encase a single oleo shock strut. Fuel tanks are in the wings and fuselage. Power plant and armament details are not known. Wing span 39 feet, 4¾ inches. Length 27 feet, 11 inches. Top speed 310 m.p.h., cruising speed 200 m.p.h., range 1,490 miles.

Powered with a Kawasaki-B.M.W. engine of 600/700 h.p., the KAWASAKI 95 all-metal day bomber carries a crew of two at a top speed of 161 m.p.h. Construction data of this ship is not known in detail. It has a wing span of 42 feet, 8 inches; length, 32

feet, 9½ inches and stands 9 feet 10 inches high. Climbs to 9,840 feet in 12 minutes and has an absolute ceiling of 22,960 feet.

The NAKAJIMA 97 (shown in silhouette) operates from aircraft carriers. This single-seater powered with a radial engine make of which is unknown at present, was one of the types used in the attack on Pearl Harbor. It is all-metal in construction, has cantilever landing gear arrangement and is fairly well armed. U. S. pilots meeting with this type of machine say the Nakajima 97 is plenty maneuverable in tight spots but can be well out-distanced by our own craft. This type is being made in large numbers and are used as standard fighters wherever the Jap air arm operates.

The KOKEN machine was built expressly for long-distance flights and endurance runs. It is powered with an 800 h.p. Kawasaki "V" type prestone cooled engine. While this ship is purely a commercial craft, it is quite possible that it would be revamped to carry bombs. The best record the Koken has been able to hang up is 7,240 miles in 62 hours and 23 minutes a couple of years back. It has a span of 88 feet 6 inches, and is 49 feet 2 inches long and stands 11 feet 9 inches high. This craft was built as part of a research project by the Institute of Aero Research of Tokyo University. Its range is calculated to be over 9,000 miles.

CHIDORI-GO is the name for a light three-seater ambulance plane whose origin dates back from the days of the popular British Fox-Moth. The Fox-Moth came out in 1934 and soon afterward was being built in Japan under a license agreement with the Tokyo Gas and Electric Company. The Army found use of this ship since it offered fast, economical transport for personnel as well as ambulance work. The cabin of the biplane accommodates a nurse and one patient on a stretcher. The pilot sits out in the open just behind the trailing edge of the top wing. The wings are of equal span, single bay with a reserve gas tank located in the center section of the wings. The plane shown in the photo accompanying this article is powered with a six cylinder in-line Cirrus engine of 130 h.p. Later models were equipped with a seven cylinder radial air cooled engine of 150 h.p. Both wings have a span of 30 feet 2 inches. Length is 25 feet 10 inches. Cruising speed 99 m.p.h. and top speed 122.

The NAKAJIMA navy shipboard fighter type 90 is powered with a 450 h.p. Nakajima-Jupiter engine—both of which are 1934 developments. Latest type machines of this designation undoubtedly have been improved both in power plant and armament and are being used in quantity. No construction details are available. Its top speed is known to be about 192 m.p.h.

(Continued on page 70)

News of the Modelers

All model clubs are urged to send us reports of activities for inclusion in this department—advance dope on contests, club activities, and results of meets. Such news should be sent to us as promptly as possible.

Army Modelers

Among those who have been considering ways and means of keeping model builders who have entered the nation's armed forces acquainted with the changing model picture is Frank Zaic of New York City, proprietor of the famous Model Aeronautics Yearbooks and a member of the AMA Technical Committee.

The following is Frank's suggestion for a new model aeronauts' unit. Your comments and suggestions will be appreciated by both Mr. Zaic and Academy Headquarters.

PURPOSE: To help model builders now in service to continue their favorite hobby and also help them meet their fellow model builders through publication of lists.

SERVICE: It is proposed that the Academy of Model Aeronautics act as a clearing house for the members. Prospective member would send his name to the headquarters. A list containing members from his particular district would be sent to him in return. After a certain period the list would be revised and his name included.

It would be up to every camp to organize its own group. Academy Headquarters would assist as much as possible by furnishing information on club organization.

The Academy would endeavor to provide list of clubs which are active in a particular district; and try to have such clubs hold meetings and contests so that the service men could attend them.

It is further hoped that the various magazines and manufacturers cooperate by granting substantial discount to the members of the M.A. U.S.A.


The members need not be members of the Academy. Also, this organization would not be part of any other service organization. The basic thought would be to have each camp provide its own activity. If by chance inter-camp contests result, so much the better. "Of, by, and for" model builders in full sense of the word.

RESULT: It has been found that if a person can pursue his hobby he will be happy no matter where he may be. Such a hobby also provides a common meeting ground which is most essential in a strange place.

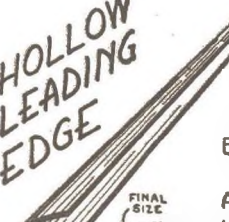
AMA Structure Not Affected

The setting up of Air Youth as a division of NAA with headquarters at Washington does not affect the structure of the AMA. Rather, the consolidation means that the Academy, its members, and its activity will benefit. For quite some time it has been necessary that the Academy be rather a heterogeneous organiza-

NOTES FROM THE WORKBENCH BY RAY WEEKS



HOLLOW LEADING EDGE

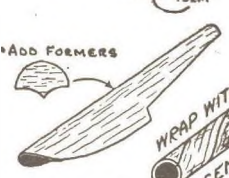


FINAL SIZE
CROSS SECTION OF SOLID FORM


HOLLOW LEADING EDGES MAY BE MADE BY BENDING SHEET Balsa AROUND A SOLID FORM. CUT FORM 1/32" OR 1/16" SMALLER THAN DESIRED FINAL SIZE. STEAM Balsa THOROUGHLY, BEND OVER FORM AND BIND IN PLACE WITH CLOTH TAPE. BAKE LIGHTLY IN OVEN.

OTHER SHEET Balsa FORMS MAY BE MADE ALSO SUCH AS PONTOONS, MOTOR TUBES, FUSELAGE HALVES ETC.

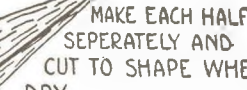
ADD FORMERS



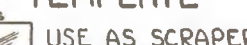
WRAP WITH TAPE WHILE FORMING
CEMENT ALL SEAMS THOROUGHLY WHEN DRY



MAKE EACH HALF SEPARATELY AND CUT TO SHAPE WHEN DRY




LEADING EDGE TEMPLATE
USE AS SCRAPER AND TEMPLATE.



RUBBER

- STRETCHING AND PRE-WINDING ALLOWS MORE TURNS.
- WINDER SPEEDS UP WINDING OF MOTOR.
- RUBBER GOES "DEAD" QUICKLY IF LEFT STRETCHED OR WOUND.
- FLY MODEL AS SOON AS POSSIBLE AFTER WINDING TO KEEP RUBBER "LIVE."


COCKPIT COAMING




RUBBER TUBING OFF ELECTRIC WIRES WHEN SLIT IN TWO IS HANDY FOR RIMS OF COCKPITS & TIRES OF DISC WHEELS.

DECALS

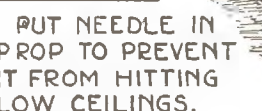
DECAL TRANSFERS FROM YOUR PAINT STORE ARE THE EASY WAY TO PUT DESIGNS ON YOUR MODELS. LETTERS AND NUMBERS ARE EASILY APPLIED TO WING SURFACES.



HELICOPTER



PUT NEEDLE IN PROP TO PREVENT IT FROM HITTING LOW CEILINGS.



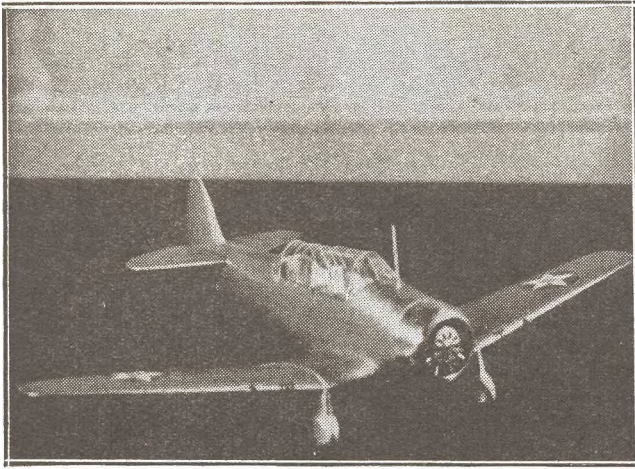
tion and was consequently required to engage in some activities which were not included in the original Academy set-up.

Now the Academy will be in a position to give greater emphasis and attention to technical matters and scientific progress in all fields of aeromodelling. Leader memberships, sporting licenses, and chapters will continue as at present until NAA has its Air Youth Division completed and in good working order. At that time there may be some new duties required of the Academy and its leader members. Perhaps some of the promotional burden will be lifted from its shoulders. But in no way will the

AMA, the governing body for model aviation in America, be hidden by the NAA-Air Youth Division bushel. Instead, the Academy's light will shine even more brightly throughout the land as the scientific and technical directing head of all this official aeromodelling activity.

Fifteenth National Meet Awarded to Chicago

The 15th National Model Airplane Championships are scheduled to be held in the city of Chicago some time in August, 1942, it was announced by AMA headquarters. Sponsorship is expected to be by the Chicago Park
(Continued on page 72)



Two views of the completed replica.

ACCORDING to the Aeronautical Chamber of Commerce, North American Aviation is producing more basic and advanced type training planes for our air forces as well as for foreign governments than all other aircraft companies combined. Hard to believe, nevertheless it is true. N. A. trainers are as much a familiar sight at military airports as are Cubs at civil flying fields.

Our Navy trainer solid scale this month is none other than a replica of that old standby NJ-1 to which Naval air cadets advance after earning their wings in the primary ships. And it was in this type machine that hundreds of RAF and CRAF fledgelings won their wings, too.

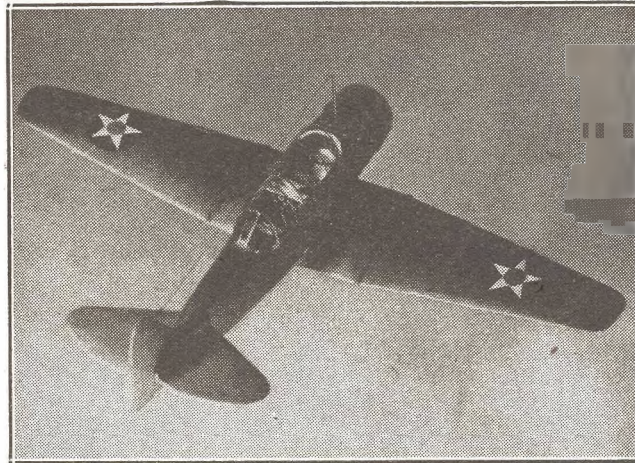
The ship is all-metal in construction. Wings are covered with sheet alclad while the fuselage is fabric covered. Power is supplied by a Pratt & Whitney Wasp of 550 h.p. swinging a controllable pitch propeller. The model may be carved from either medium hard balsa or soft white pine.

FUSELAGE AND WINGS

TRACE THE OUTLINES of the fuselage from cowl to extreme tail but do not include that of the cockpit canopy. This part will later be built up of metal hoops and covered with pieces of sheet celluloid.

Secure a medium-hard piece of balsa whose dimensions equal that of the size of the fuselage and upon this trace the outlines of stiff paper template. The outlines of the airfoil section where the wing stubs join the body should also be traced and then that portion is to be cut away. The cockpit portion should be dug out about half the depth of the fuselage block and cleaned out with coarse and smooth sanding. Instrument boards, control sticks, rudder pedals, and miniature seats should be installed to add realism. The interior of the cockpits should be painted light gray or aluminum.

The frame of the cockpit canopy may be constructed by using half-round hoops of thin music wire or bamboo slivers painted aluminum. From side and top views, the posi-



tions of the individual frames may be ascertained and held fast with dabs of cement. Upon completion, the whole unit should be covered with cellophane or thin sheet celluloid. Separate pieces of transparent covering must be used, of course, because of the "step" effect of the canopy. The radio mast, which may be cemented in place later is shaped from a strip of bamboo and streamlined. The aerial is attached as shown after the entire model is painted.

The wings may be made in two methods. The first method is to shape the wing in one unit whereby its dihedral panels are planed into shape. Or, with the stub wing portion, which is cemented to the scooped-out portion underneath the fuselage to which is later attached the right and left wing panels. The effect is the same when completed, however, so the builder may choose whichever way he is accustomed to carving replica models.

In either case, apply cement generously to the scooped-out portion underneath the fuselage and press the stub wing panel firmly into position. Insert small model making pins deep into this part with their heads well buried. Apply dabs of cement to fill in holes left by submerged pins.

If the wing panels have been made separately they may be attached by first inserting fair sized bamboo pegs part way into both panels. The remaining sharpened ends are inserted into the stub wing. Before closing gap, apply cement between joining edges,

NAVY TRAINER SOLID SCALE

Carving this scale job is pleasant work.

by Harry Appel

press firmly together. Use small model making pins to aid in holding the dihedral angle until the cement hardens. Later they are to be removed and their holes filled with cement.

The filleting portion shown on Plate 3 is designated by the shaded area around the stub wing. Plastic wood or any good filleting compound may be used. After it has hardened, go over the surface

with smooth sandpaper and apply two or three coats of clear dope. The ailerons, tabs, and wing tip sections are marked with pencil deep enough to leave their impression visible after paint has been applied.

The stub and wing panel "divider" as shown by E-E on Plate 3 and by the solid black line in both front and top views is simulated by cementing a piece of bamboo all around the joining sections and applying cement along both its edges to give it a rounded out appearance. These strips should be painted black.

LANDING GEAR, TAIL, ASSEMBLY

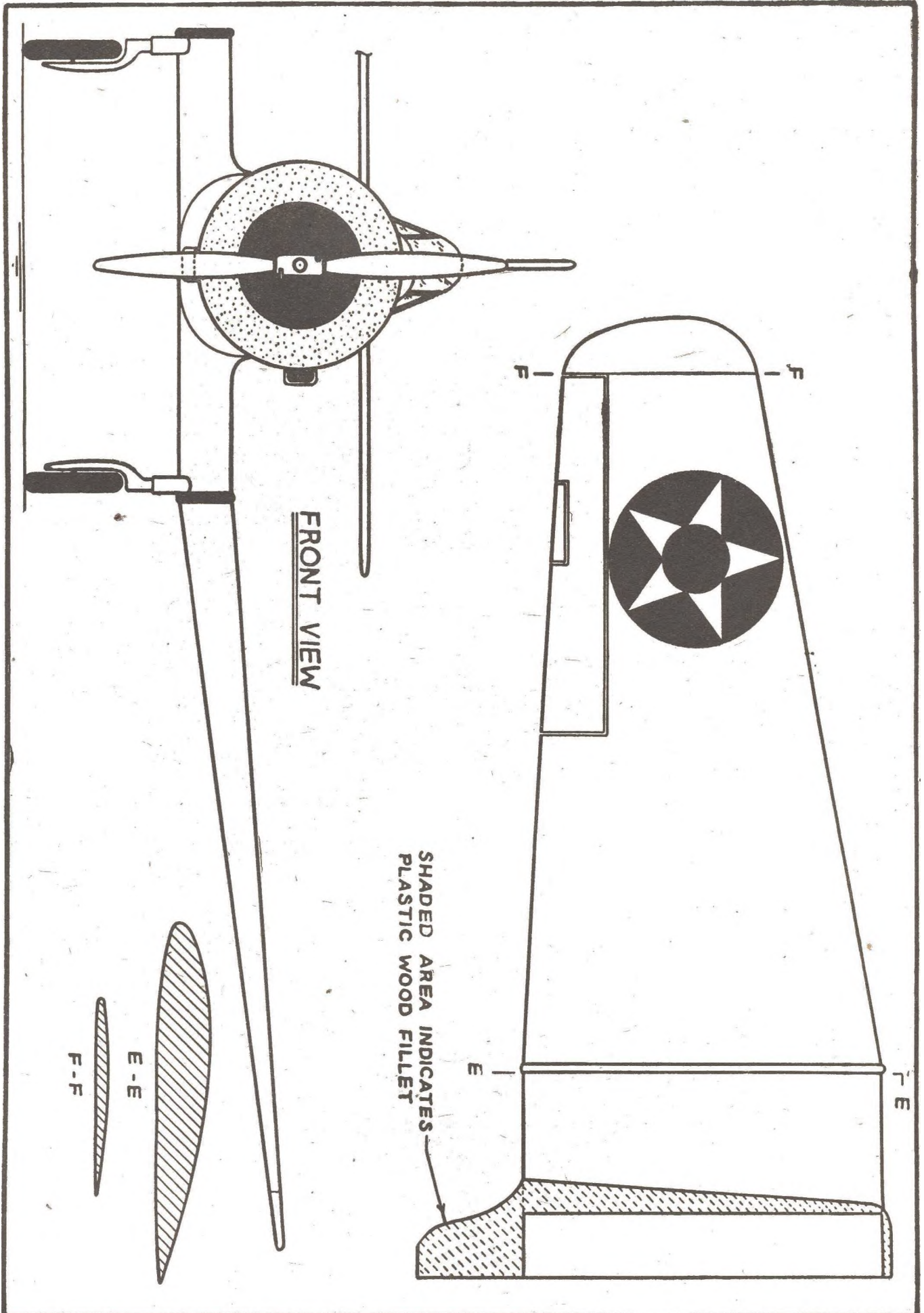
THE LANDING GEAR struts and wheel pants may be carved in one unit. Use hard balsa for this purpose. A series of laminated pieces may be made and shaped as a strut-leg if preferred. The balloon tire wheels are held in place with strong pins. Cement the landing gear legs in place and insert small pins to hold them fast. The tail-wheel fork is shaped from thin strong music wire and attached as shown.

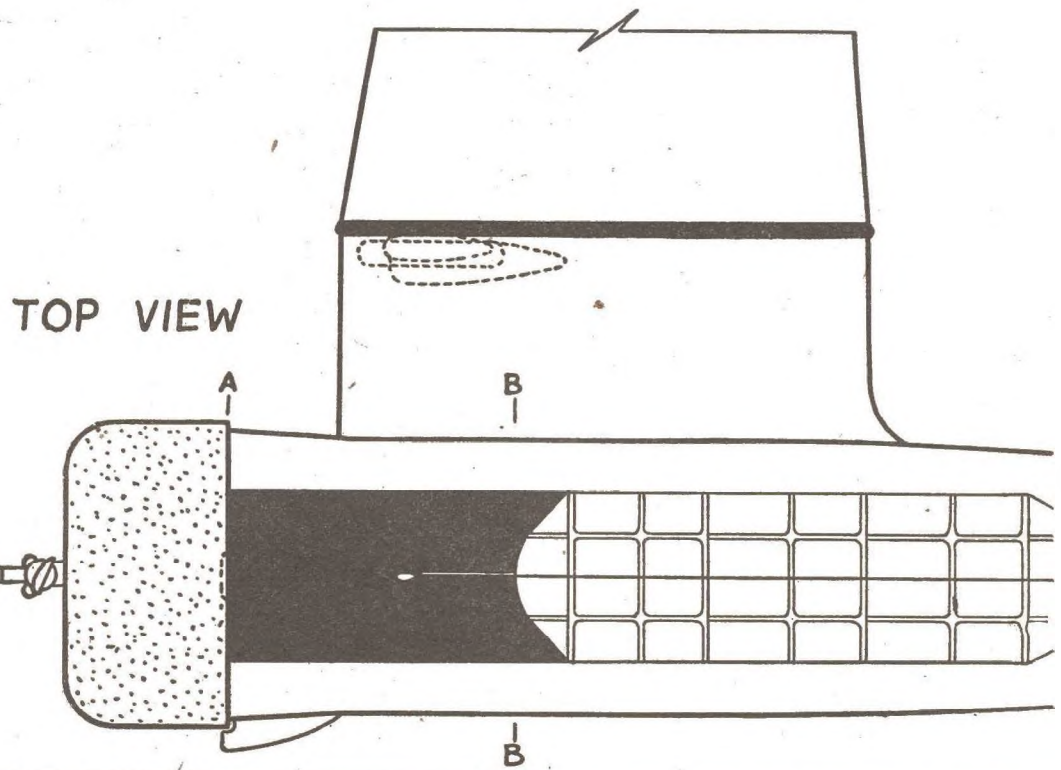
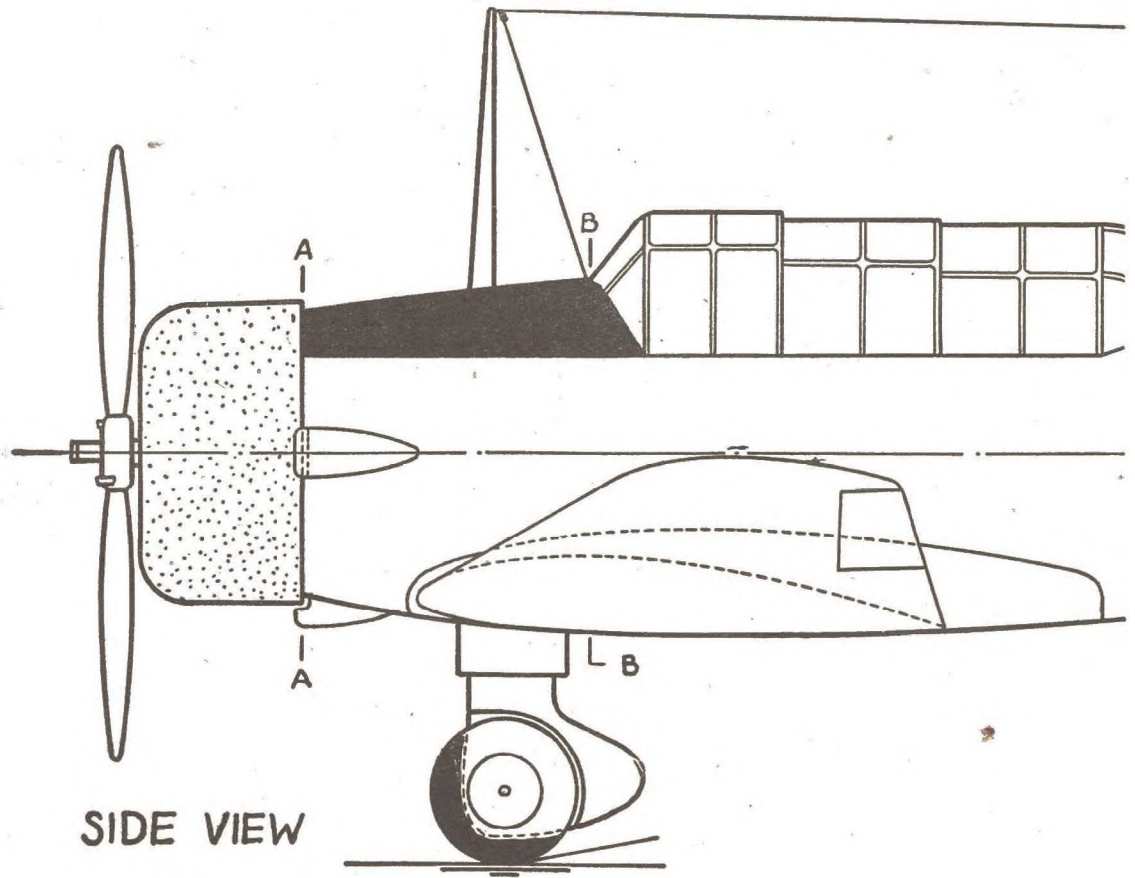
Both rudder and stabilizer parts are cut from equal thickness sheet balsa to respective shapes. They are sanded to streamline shape. Attach these surfaces with cement and check for perfect alignment. Before mounting these parts it is best to mark out the hinge and tab outlines.

A controllable pitch-type propeller is carved to the shape shown; drilled for mounting with a long pin and

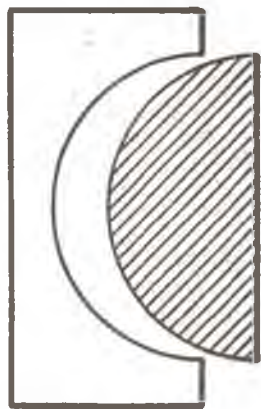
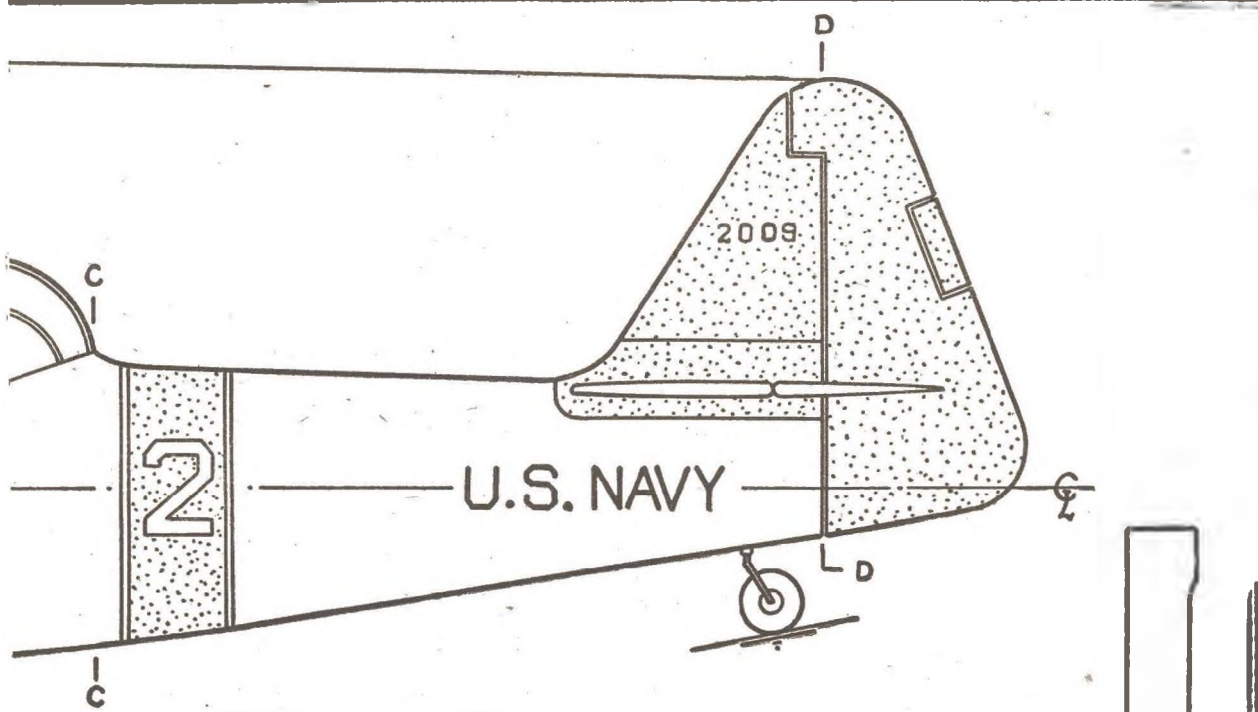
(Continued on page 73)

BUILD THIS NAVY TRAINER SOLID SCALE—Plate 1

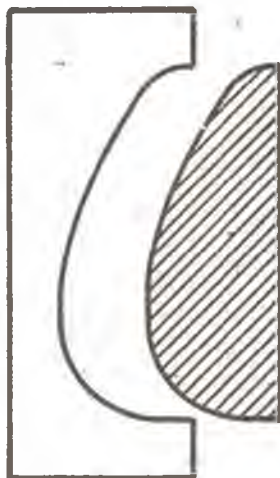




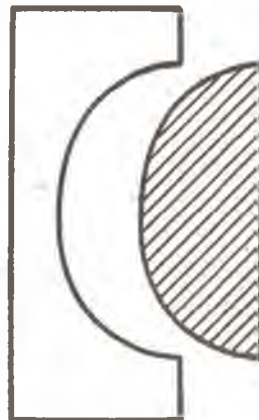
BUILD THIS NAVY TRAINER SOLID SCALE—Plate 3



A-A



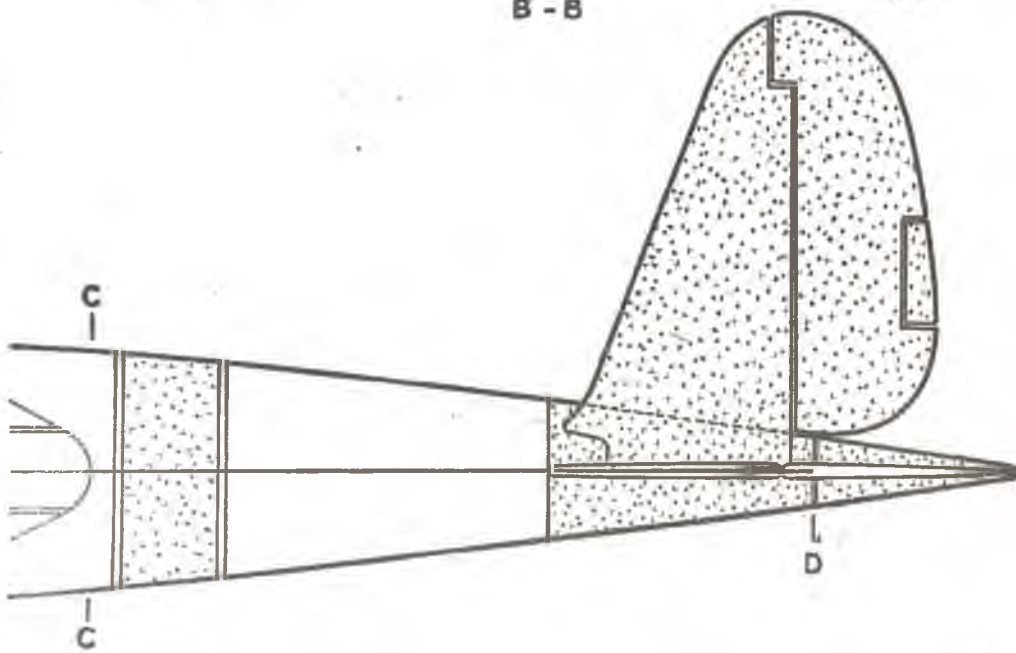
B-B



C-C



D-D



LEON SHULMAN'S

SUPER SKY-ROCKET "B"

A champion designer and flyer tells how you can duplicate his consistently prize winning Class "B" gas model. It's worth the effort.

LAST YEAR, at almost every contest throughout the country, Class "A" Sky-Rocket models were zooming around the skies, and totaling many excellent flights. In the Class "A" Sky-Rocket fleet, another Bantam powered Sky-Rocket of larger dimensions zoomed and glided to greater heights than its baby brothers. This new ship, the Super Sky-Rocket "B," powered by any class "A" or "B" engine, proved to be the best in the Sky-Rocket series, because of the more efficient airfoil and the better proportions for the power used.

The new Super Sky-Rocket, built by one of the Kresge Aero Club members, won for him many prizes. Misfortune and bad luck, however, seemed to curse Joe Ospensen, its builder, because every contest he took it to, it flew out of sight for the day. The lowest time of these flights was over 10 minutes and the longest was 49 minutes on a 21 second motor-run-timer!

On one hot summer day, at a Sky-Scraper Club outing, the ship flew out of sight on an 18 second motor run, for 1 hour and 10 minutes. Two days later we received a letter from the captain of a fishing boat telling us that the ship was fished out of the Long Island Sound off Fire Island and according to the boat's log, was picked up at 10 minutes after 3 o'clock, and the model was launched at a few minutes before 12 o'clock that day. Aside from this exceptional flight, at the National Meet it turned in a flight of over 4 minutes on a 15 second engine run.

FUSELAGE CONSTRUCTION

SINCE ALL THE PLANS shown for the Sky-Rocket "B" are not full size, they will have to be drawn to its proper dimensions. By all means follow all the dimensions *carefully*. This is easily done by using an ordinary rule and a straight edge. Brown wrapping paper is about the best paper for the model builders to draw his working plans on, since it is cheap, strong and takes pencil marks and erases easily. Be sure to be careful when the dimensions are concerned, since the proportions may be changed. The fuselage is not difficult to draw,

since the full size formers are given. The stabilizer has an elliptical outline and rudder has a simple curve. Trace the fuselage formers onto the 3/16" sheet by 3" medium stock balsa. The front bulkhead "A" is of 3/32" plywood. Only the first former "A" and the last former "D" have notches completely around the bulkhead cir-

their respective locations, using plenty of glue to hold them firmly in place. The keel is then made of 3/8" sheet balsa and is also glued firmly in place and allowed to set until hardened. The stringers are then added, one pair of opposite stringers at the same time, working from the nose to the tail.

Glue on one pair at a time making sure that the stringers follow a smooth flowing curve. Referring to the sketches with the drawings will simplify construction and help you understand the fuselage construction better. After soaking the keel strips in hot water for a few minutes, to limber up the grain in the wood, the keel is now added by gluing the 1/8" by 3/8" balsa onto the bulkheads, then the 1/8" by 1" strip glued on top, working from the nose towards the tail. The motor mount supports are now added as detailed on the nose sketches. The landing gear is bent to shape as specified. Make sure that the landing gear legs are 5 1/4" and bolted to the fire-wall with the metal fitting and then glued from its connection with the fuselage to the wheel, then silked over, then reglued, doped and shellacked after the nose cowl is added. The nose cowl is made of 1/2" sheet as specified, and glued solidly to former "A."

The windshield former is glued in place and the windshield itself is added. When the sub-rudder is completed it is then glued onto the keel at the rear of the fuselage. The floor board is made of 3/16" by 1" sheet balsa and glued onto the inside of the formers "A," "B," and "C." To complete the fuselage before covering we must now do the wiring.

The position of the battery box, timer, and coil are shown in the fuselage plane. The wiring diagram shown should be used, or any other diagram that is a complete circuit.

WING AND TAIL ASSEMBLY

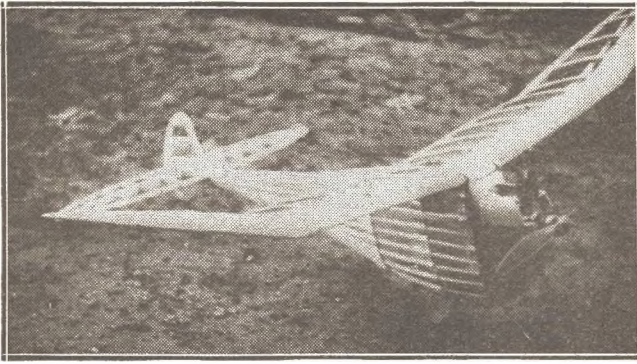
THE SKY-ROCKET WING is simple to build and is exceptionally strong as has been proven after many severe tests. Make two rib templates of hard balsa cut from 1/16" sheet balsa and 23 rectangular pieces slightly larger than the rib



A familiar smile and pose characterizes Leon Shulman at almost any large model contest. With him is Cliff Travis, right.

cumference. The others are without any so that the stringers can be flowed onto the bulkheads smoothly. In building an airplane using this type of construction, the use of the eye as a guide seems to be more accurate than a rule.

The crutch is the first to be constructed on the ship since this is the foundation for the model. The crutch is made of 3/16" by 1/8" balsa and made to follow the dimensions on the plans. After the complete crutch has been made, the formers are added to



Showing sheet balsa covered leading edge and solid nose cowling construction.

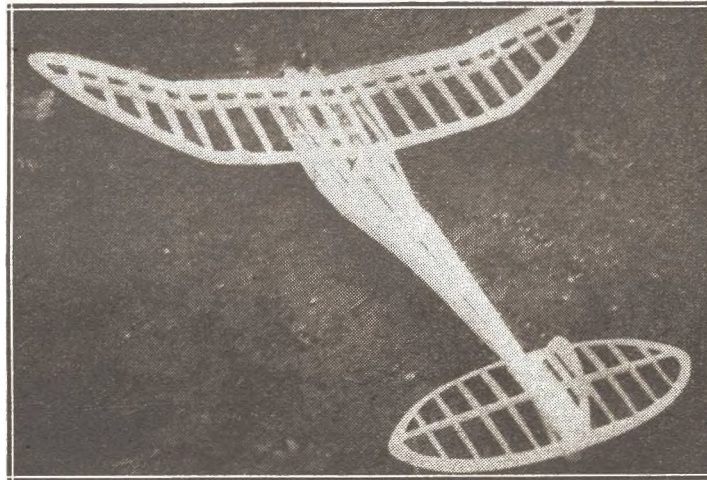
template. (It would be well to make at least four more ribs than necessary—these can always be used later for repairs). By standing all the rectangular pieces of balsa on end they can be evened out so that it will resemble a rectangular solid block. Then place the two rib templates on each side of these pieces of balsa, making sure that they are lined up with one another. Drive a few pins through the rib templates into the bunched pieces from each side, making sure that it is quite solid. By cutting with a sharp knife or coping saw, this so-called block can be trimmed so that it will have the outline of the air-foil. By using coarse sand paper all bumps can be smoothed out. By finishing smooth with fine sand paper, the outline should be accurate. The notches for the spars should now be cut into the ribs. This can be done either with a saw or razor. After extracting the pins, the ribs should be completed and all alike. Then by cutting from the rear of the ribs, the proper length is obtained. Sanding ribs to required shape complete the rib's shape.

The spar should now be joined as shown in sketches, making sure that all joints are near perfect. The gussets on each side of the joints are of sheet balsa and should add great strength to the spar. The center ribs can then be placed on to this spar in their proper positions and glued in place. The wing tip ribs are made from the center ribs, cut off at the trailing edge to give it its proper length. The leading edge and trailing edge should then be glued in place.

The tips which are cut from sheet balsa are then fitted into position, making sure that the wing tip outline is so glued to the rib that the top camber fits flush with the top surface of the sheet wing outline. You will note by looking from the side that the wing tips assume a negative angle. This is done to decrease any stalling tendency the ship

may have, therefore assuring a flat glide. The sheet balsa leading edge can be fitted to the wing after the $\frac{1}{8}$ " by $\frac{1}{4}$ " square balsa top spar is in place. After the sheet balsa leading edge is in place, add the cap strips to their respective positions. The wing is then finished smooth by cutting and sanding excess wood so that the airfoils of the wing are smooth.

The trailing edge of the tail is cut from $\frac{1}{4}$ " soft sheet balsa. It is then placed on the plans and pinned into position. The leading edge of $\frac{1}{4}$ " square hard balsa should be



Polyhedral wings and special airfoil section contribute to its endurance qualities.

soaked in water and also pinned in position. The spar of $\frac{1}{8}$ " by $\frac{1}{2}$ ", and ribs of $\frac{1}{16}$ " by $\frac{1}{2}$ " are cut and inserted as shown in the sketch. Cement securely at all points and when dry use a penknife or sand-block to cut the ribs down to meet the leading and trailing edges, which are sanded to a smooth air-foil section. The rudder outline is cut from $\frac{1}{4}$ " sheet balsa. The rudder rib is $\frac{1}{4}$ " square. When

the assembly has been completed and the glue hardened sand to symmetrical air-foil shape.

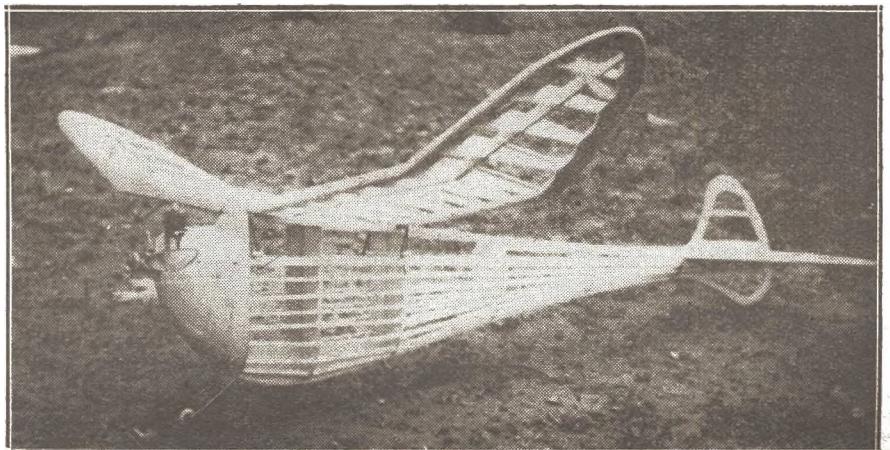
COVERING AND ENGINE MOUNTS

IN COVERING the Sky-Rocket, very little trouble should be encountered. The fuselage should be covered first. Light silk-span should be used since it can be applied wet or dry. In this case it is advisable to apply it wet since the fuselage has many curves. It is advisable to cover the fuselage in as few pieces as possible. This is quite simple when working with wet silk-span since it can be stretched easily without tearing. The wing and tail are then covered, bearing in mind that the paper should be cemented to the *underside* of the wing surface. This will result in a true wing section. When completely covered the wing must be water sprayed. Brush on three coats of clear dope. It is not necessary to add more since the silk becomes brittle.

Because of many crashes a ship is bound to receive, removable mounts have proven to be the best in every respect. The type of mounts used here allow the motor a thrust range of approximately 4 or 5 degrees in every direction. The mounts are made of hard wood and bolted to the hard-wood motor bearers. Since almost every motor has different mounting dimensions, mounts of different sizes will have to be used to fit these motors. The method of mounting is illustrated in the sketches.

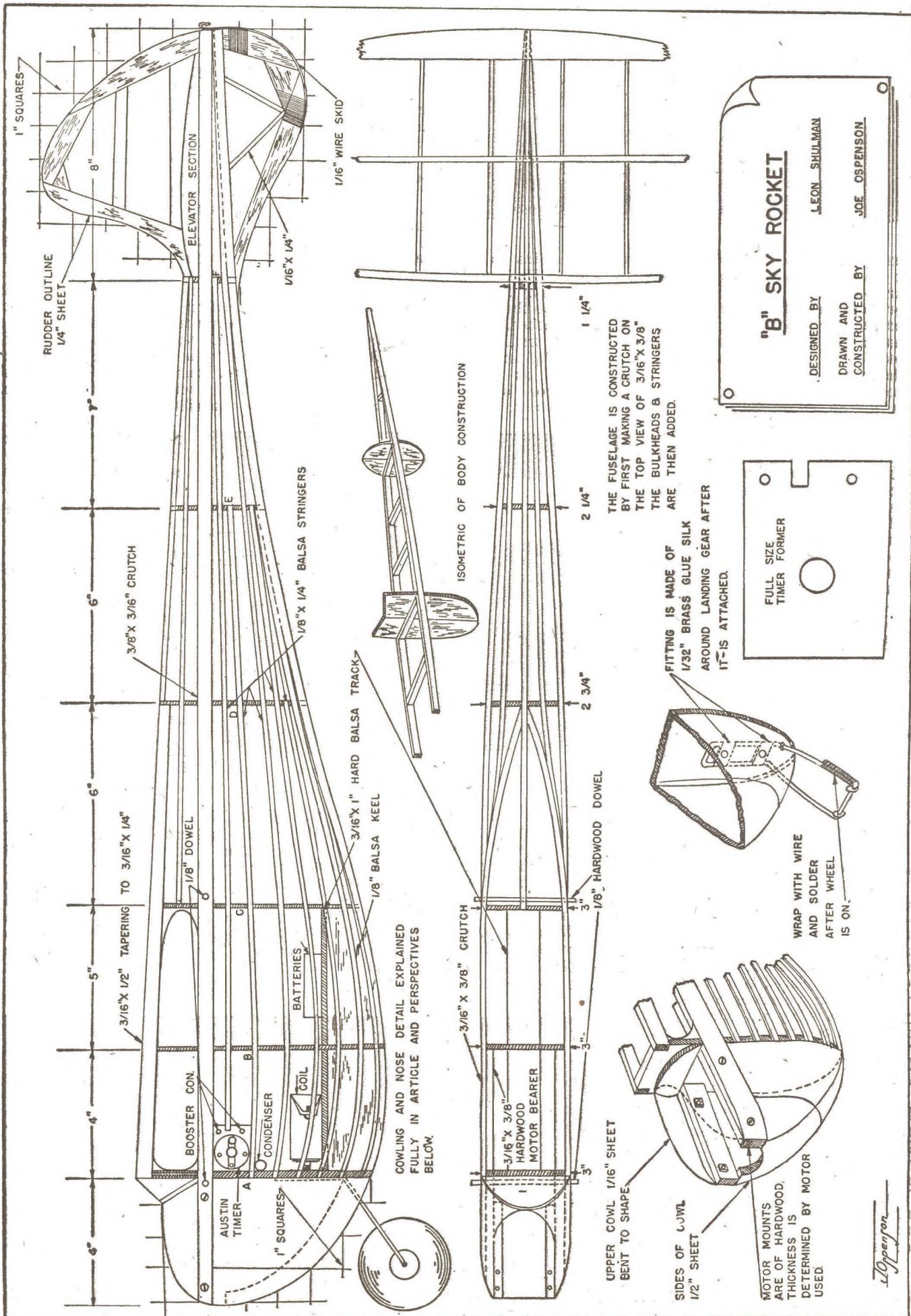
TEST FLYING

ALTHOUGH the Sky-Rocket series have all proved to be good flyers, we cannot guarantee that they will fly right off the board. We know that no two objects can ever be alike and this is also the same in models. It will be relieving to know that almost all the Sky-Rockets tested, proved successful and there should not be any reason why yours shouldn't—if the
(Continued on page 73)



Fuselage stringers running full length give the framework excellent rigidity and strength.

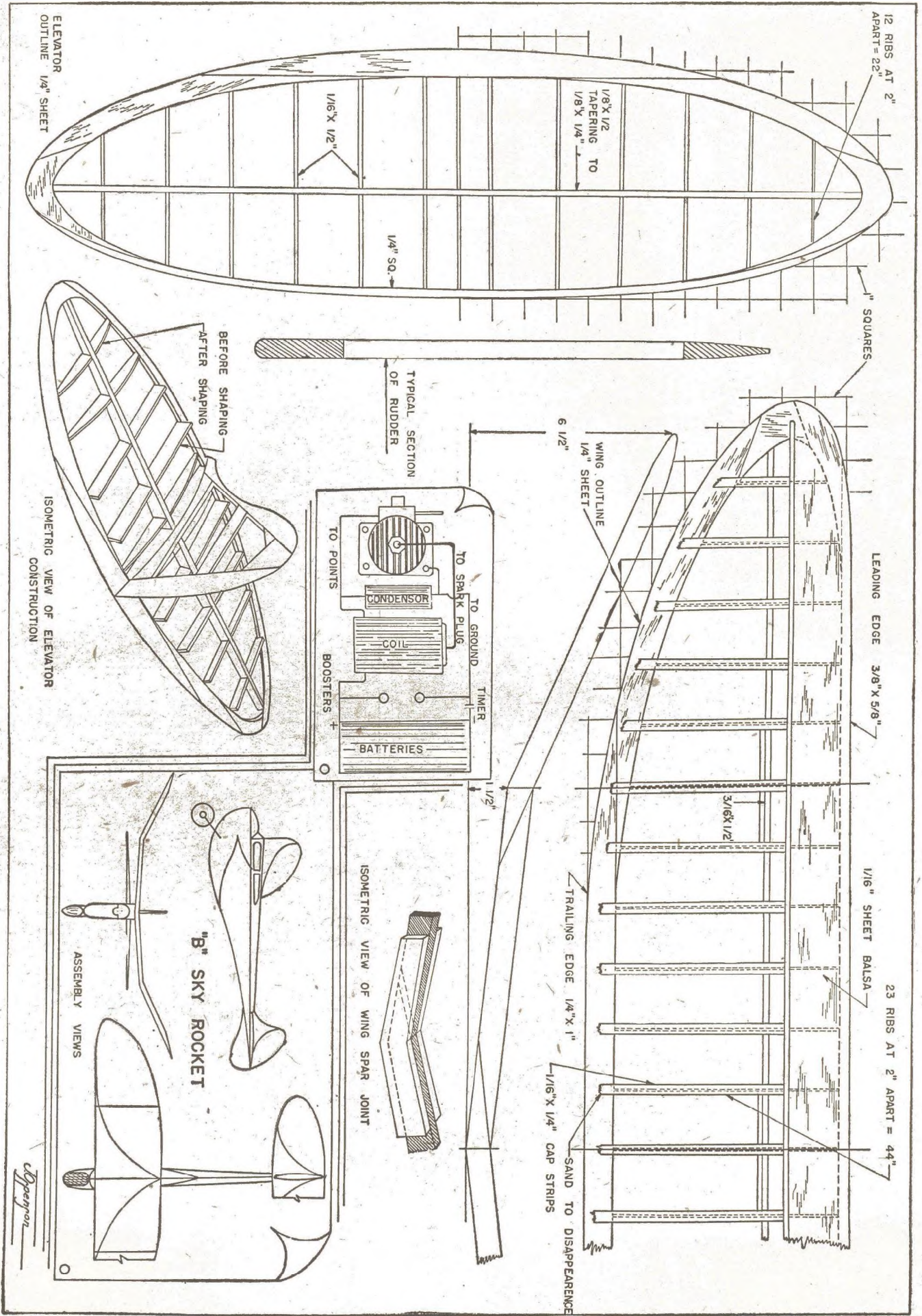
SHULMAN'S CLASS "B" SUPER—Plate 1



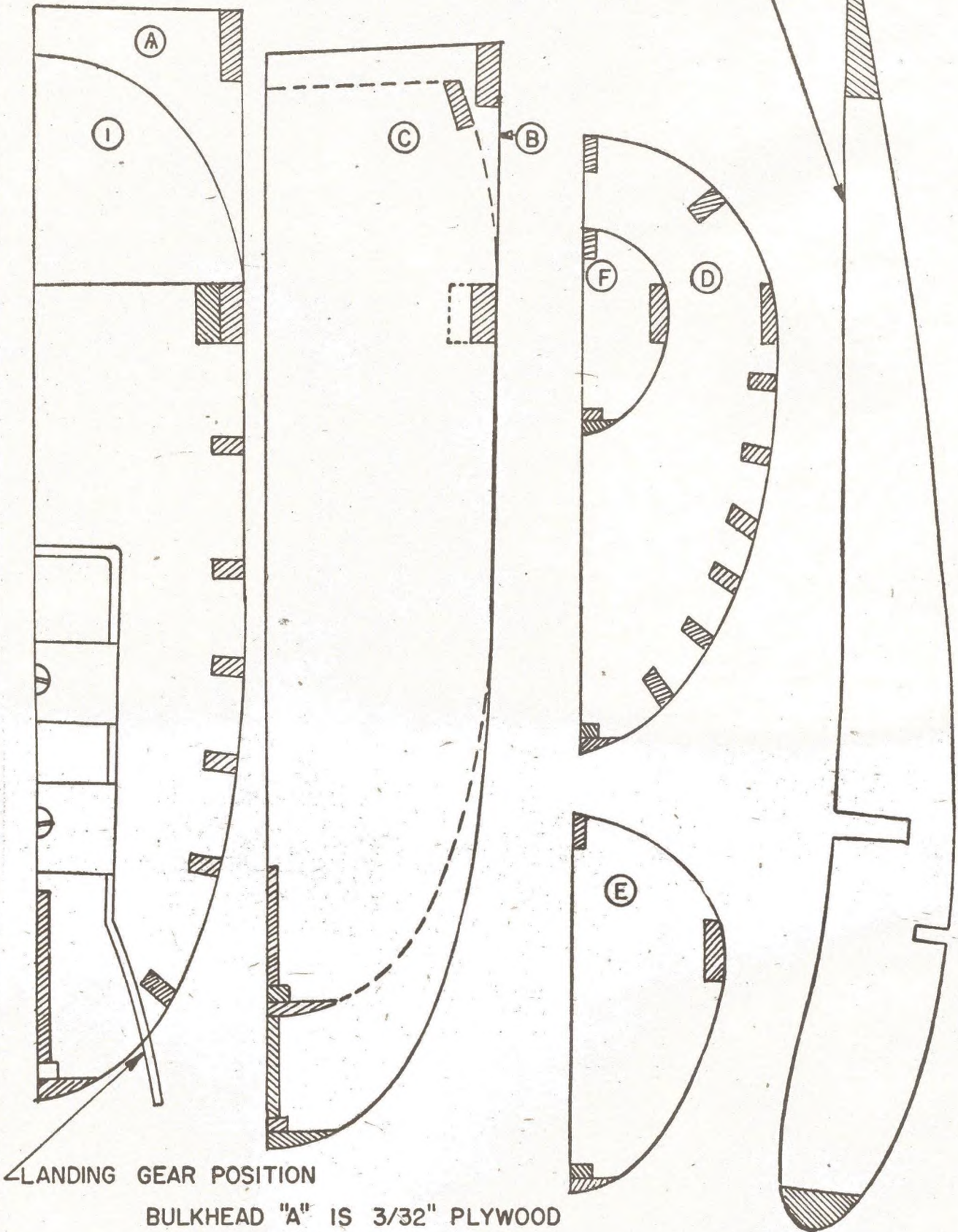
"B" SKY ROCKET
 DESIGNED BY LEON SHULMAN
 DRAWN AND CONSTRUCTED BY JOE OSPENSON

Joe Ospeison

SHULMAN'S CLASS "B" SUPER—Plate 2



FULL SIZE RIB SECTION



LANDING GEAR POSITION

BULKHEAD "A" IS 3/32" PLYWOOD
THE REST ARE 3/16" SHEET

SCALE
FULL SIZE

J. J. Jenson

START A MODEL AIRPLANE CLUB IN YOUR COMMUNITY

Now is the time for all good modelers to come to the aid of their country. Scale models for aircraft recognition purposes are needed. Model clubs can help greatly. Start a drive now. Organize! You furnish the members—we'll furnish the publicity.

by George T. Weider

IN ALMOST every community, no matter how small, there are usually a number of young men and boys who build and fly model airplanes. Some of these boys may have watched other enthusiasts fly their models and decided they, too, would like to do the same. Other fans become "victims of the aviation bug." Regardless of what prompts young aero enthusiasts to indulge in the model plane hobby, it nevertheless remains that model plane building and flying has become the most popular pastime among the youth of America. Perhaps the use of the word "pastime" seems a bit too lackadaisical for the reason of this hobby, but many model builders have never had a chance to indulge in this form of craftsmanship from a purely pastime standpoint and have engaged themselves in this work to earn their daily bread.

Modelers have achieved recognition for their work. It has led them to do engineering and research, and most young men entering the various fields of aviation today started with building and flying model aircraft. As a recreational activity it provides a basis for a future career in aviation, and offers the maximum for participants in filling their leisure hours as well as in the formation of attitudes of sportsmanship, in pleasant recreation, in expression of interest in a live subject, and in securing of pertinent and current information on an important phase of life. In training for craftsmanship, in motivating of ingenuity and in the development of fine personal characteristics, all these have gone well to make good citizens.

A few weeks ago Secretary of the

Navy Frank Knox asked model plane builders in the schools throughout the country for 500,000 aircraft models for training military personnel in aircraft recognition and range estimation in gunnery practice. These models likewise will be important in the training of civilians in aircraft recognition, an essential element in civilian defense.

The Navy's Bureau of Aeronautics has prepared plans and specifications for model planes and has furnished them to the U.S. Office of Education, who have distributed them to state commissioners of education, who, in turn, will send them to schools in each state.

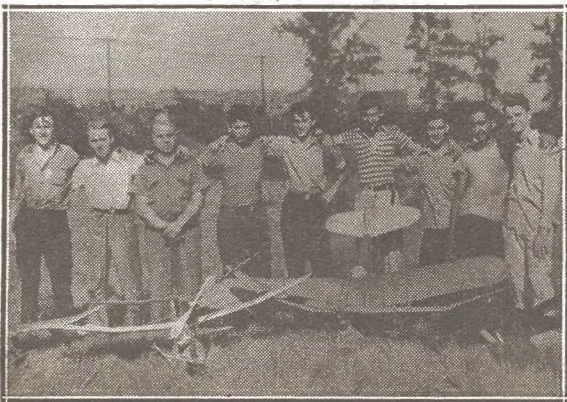
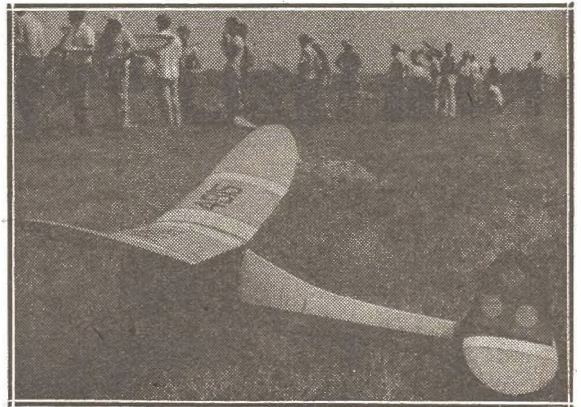
All models built for the Navy and civilian spotters will be to the same scale. Each school undertaking the building project will be required to set up a technical committee to inspect all the models constructed. Models will be made of light wood on a scale of one inch to seventy-two inches with careful attention to features that aid in identifying the particular type of plane. This is important.

To individuals and groups, with no school connection, who are interested in the model building program, it is suggested that they assist in stimulating local interest in the program through local high school authorities. Since the Navy Department is sponsoring the program through the Office of Education, the entire direction of the project

in each community will be in the hands of local school authorities and all participation must be arranged through them.

TO START a get-together movement in order to assemble all the model builders in your community, the first thing to do is to post notices on the bulletin boards in your public and high schools. If the community is a very small one, ask your local theatre manager to have a slide flashed on the screen during a Saturday afternoon matinee asking that all interested boys meet at a certain place and time. Other mediums to further such a notice is to ask the local news publishers to give you a free box in which a notice may be featured. Another way is to direct your message upon a large poster and ask some air-

Contestants from many communities gather at a mutual flying field to vie for gas and rubber powered endurance records. Meets such as this stimulate progress in model plane design as well as further America's most popular outdoor hobby. Below: The Mercury Mites of Brooklyn—a real progressive bunch of fellows.



mind merchant to display it in a prominent place in his store. A boys' furnishing store is a good place, too. Outside a theatre lobby is another. Of course passing the word along by word of mouth also helps. Nevertheless, be energetic about it and let the news travel fast. At the earliest convenience try to arrange a meeting place.

Now the problem of leadership is necessary. A leader of a group must have certain outstanding qualities. Not only must he be able to direct the activities of the club, but he must be their official spokesman, and preferably be the oldest as well as possessing a matured outlook on life. He should be able to maintain respect and serve as a model example for all the members of the club. If among the new members there is not an older person to whom the responsibility for the

Your own public or high school is the best place in which to stimulate interest in an aero club. Manual training teachers in most cases are eager to serve as counsellors and instructors. This group is part of the model club of Bensonhurst (Bklyn.) Jr. High.

lar vote, the election of officers should be held. They shall be: President, vice-president, recording secretary, sergeant-at-arms, and treasurer. In the event that any of the club members are too young to have the responsibility of handling the club's funds, the Senior Advisor shall be the treasurer.

In order to expedite the forming of the club, the Advisor, or the Director should he wish to be called, should appoint temporary officers using discretion in selecting these leaders as the club's success will depend largely on the youthful officers. Meetings should be conducted under elementary parliamentary procedure. At the first

Publicity and model exhibits can most always be arranged with the local movie houses and especially so when aviation pictures are being shown. Photo above shows some of models entered in a contest held by a Loew's theatre. Below: Winne. and their awards.

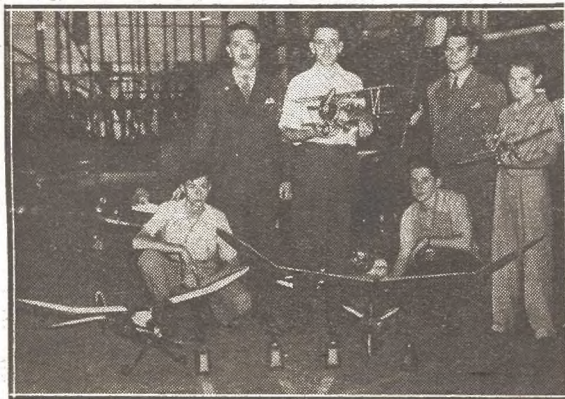
regular meeting of the club, make it a point to secure a sponsor. He should be a person, prominent enough to get your club local publicity, or having influence with the local chamber of commerce, and who can prevail upon other public spirited citizens of the community to aid with a

little financial backing which would go for awards, the use of a meeting room in a central location, etc.

The duties of the Senior Adviser is to aid the club in any manner possible in regard to meet organization, prize sponsors, club meetings, and club activities of all kinds, and should counsel the officers and members at all times.

The president will preside at all meetings of the club and act as spokesman

Several members of the Bronx Metcalf Aero Club, were expert enough at modeling to be called down to Langley Field experimental laboratories where they are engaged in wind-tunnel model work.



directorship can be given, then it is best that the members approach a citizen of their town, who is known to be airminded and of good character and ask him to assume this directorate.

Any air-conscious person will see the benefit of assuming the leadership of such a forward-marching organization and should be happy to accept. A local scoutmaster may be asked to assume the post of Senior Adviser if members prefer. If such a man is known, go to him first and discuss your plans with him before attempting to form the model club. Get him to take the initiative in publicizing the membership drive. Respect your leader's judgment and cooperate with him in every respect.

Once all the members have been gathered and a name has been chosen for your club by either ballot or popu-

on all matters pertaining to it. The vice-president acts for the president if he is unable to serve due to unavoidable circumstances.

The recording secretary will keep the minutes of all meetings and the attendance roll of such meetings. He must provide himself with an official minute book for this purpose. It will also be the duty of the recording secretary to keep a record of the "official flying time" established at all official meets of the club. No record should be considered as official unless certified by the Senior Advisor.

The next step is to select an instructor. The clubster with the most experience by virtue of the number and various types of models he has built or by having successfully placed high in model competitions should volunteer to serve as the instructor. If the Senior Advisor is familiar with model planes and his experience and background serve him well, he should assume this position. The fact remains, however, that the most experienced modeler who can best qualify for this post should be assigned to it. He should know his subject well in order to teach it and should encourage the other members to be original in their design and act as consultant on any new club project.

Classes for beginner modelers should be held regularly. If possible they should be held more than just once a week since fair weather is now coming along and these beginners will have the opportunity to fly their models outdoors as well as enter beginner competitions.

If a club is composed of members of whom some have no experience in



model building, these members should be segregated, and on certain days asked to attend classes where theory of model design and beginners model construction will be taught them.

Blackboard instruction is best to begin with and no model supplies or kits should be handy to the beginners as this only serves to distract them. Theory should last for one hour at least and then followed by allowing the students to ask any questions they will on the subject.

IN THE WORKSHOP classroom the instructor should make it a point not to build parts of the model for the student but rather show him how it should be done. By building a part for a beginner it may result in a habit with others and soon become a nuisance and therefore should be avoided. Let the student learn by doing and profit by his mistakes. In a classroom full of students there are invariably, agitators. They are bad to begin with and should be dealt with firmly. It is important that club members indulge in their hobby in good spirit and cooperation with one another. Club members who insist upon annoying others should be expelled from the club.

Inter-class competition is a good way to keep up a lively interest and promote individual initiative and resourcefulness. At the same time, the instructor should not allow too much time to be devoted to the club where it will necessitate his giving up his own model building time completely.

If this is done he will find that older members of the club will display a lack of interest because of the "kindergarten" aspect of the beginner modelers. To avoid this the instructor should design or make available advanced type models for use by the older modelers and at the same time keep the younger boys moving forward on advanced type models so that no beginner finds himself incapable of passing just a certain stage of model building. The best method in avoiding distaste or jealousy among the model builders is to have classes open to the junior modelers at one time during the week and at another time for advanced modelers. Modelers should engage in open forums and lectures. If a beginner shows promise of handling advanced work and is aggressive, he should be "promoted" to the advanced class.

One of the most difficult periods of classroom instruction is when the theory and practice of carving propellers comes up. Most model beginners slip here. The instructor should have the boys grouped around him and he, with prop blank and knife in hand, should see that all the boys likewise equipped follow him in every step so that they may learn to carve expertly in a short time without undue waste of propeller wood.

If there are small boys in the club who do not take to building models or get the knack of using tools as quickly as the others, do not discourage them. In fact, give them a little more of your time and have them concentrate

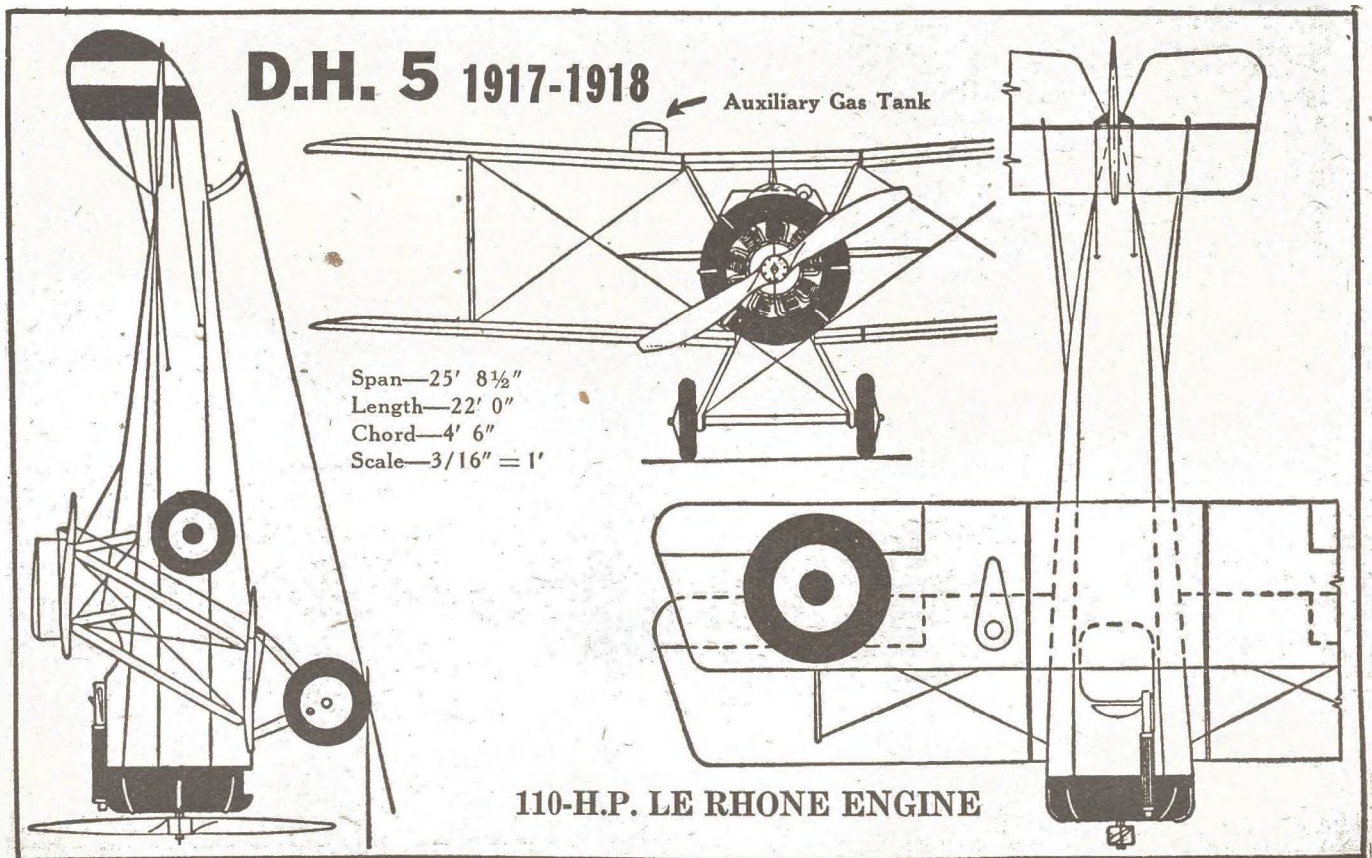
their work on the simplest form of stick models or gliders. Neglecting these youngsters only tends to discourage them and has a lasting effect of prejudice. If the instructor's interest is manifested, the beginners will respond rapidly.

In order to facilitate the model building program and make the general welfare of the group resourceful, the instructor should encourage the model builders to build up their own tool kits. As the modeler builds larger and better craft he will add to his tool supply and make himself dependent upon his own equipment instead of borrowing others and sometimes causing a grievance by failing to return it. Each modeler should have his own tool box and either leave it in the club room or take it home with him after each work shop period.

Tools most frequently used on simple rubber powered jobs include: Single edge razor blades, common household pins, a pair of round nose pliers, cutting pliers, a carving knife, a pair of metal cutting shears, a metal edge rule, and some inexpensive draftsman tools such as curves, compass, and T square.

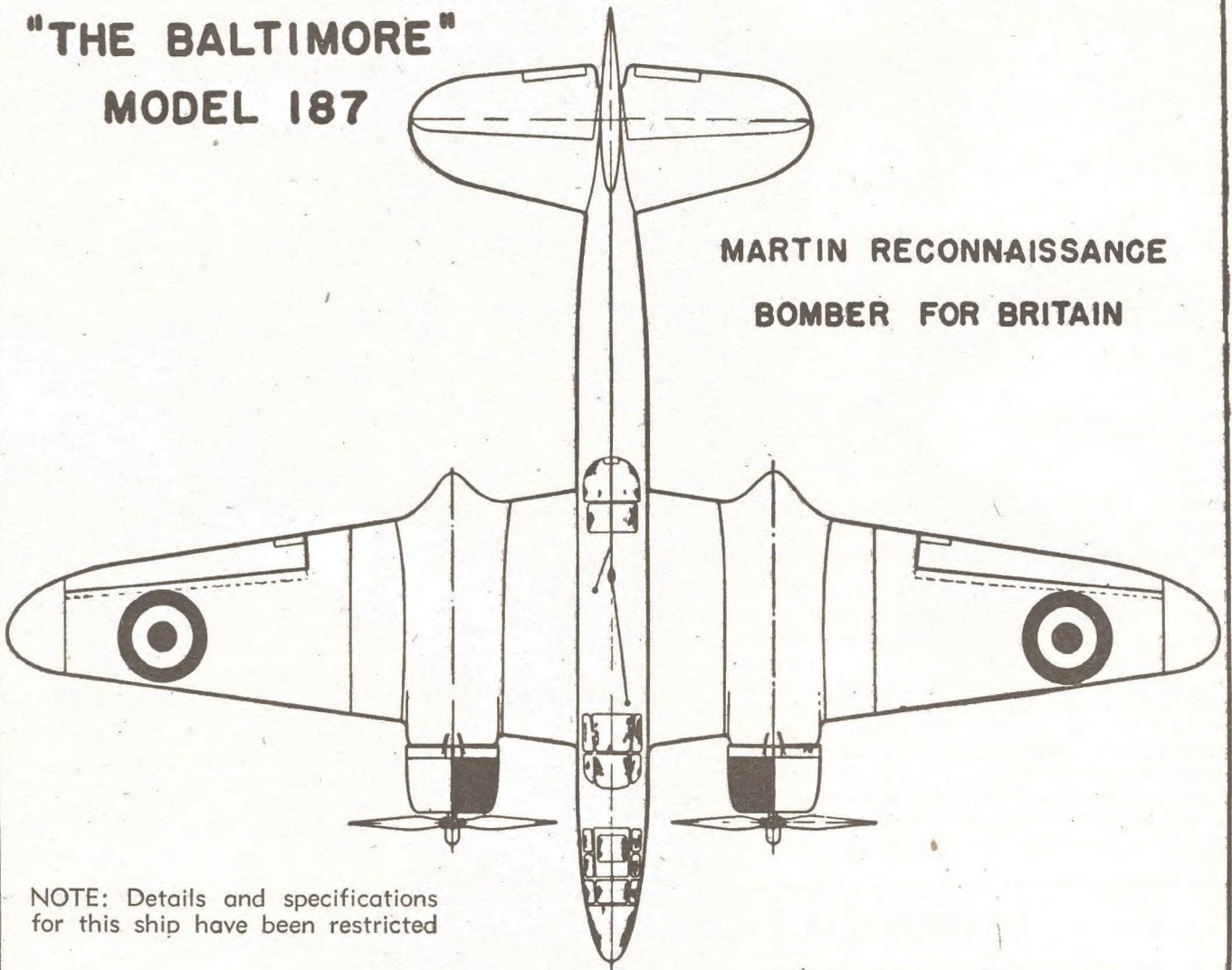
Rules for official AMA contest type models, classes, categories, and method of running a sanctioned contest whereby the records established for certain type model craft may be held for national recognition are obtainable from the headquarters of the Academy of Model Aeronautics, 718 Jackson Place, N. W. Washington, D. C. THE END

WORLD WAR I THREE-VIEW DRAWING—Number 4

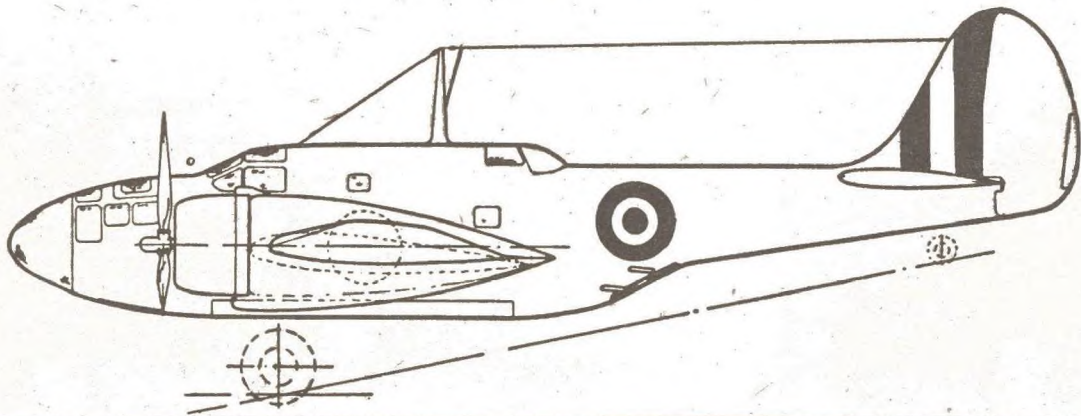
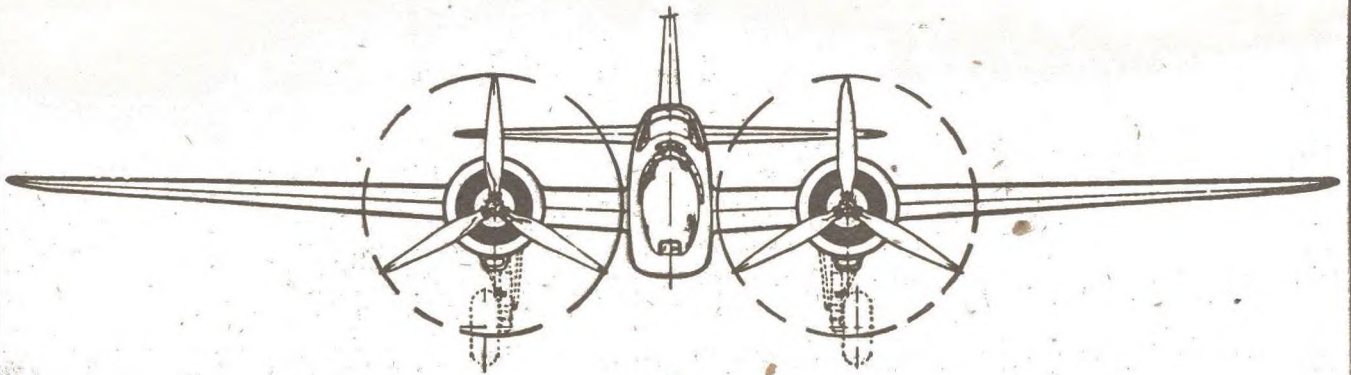


**"THE BALTIMORE"
MODEL 187**

**MARTIN RECONNAISSANCE
BOMBER FOR BRITAIN**



NOTE: Details and specifications
for this ship have been restricted



A.H.

You Said It!

Here's your corner, buzzards, and it's open to all readers who have a model argument they want to get off their respective chests. Make your comments short and snappy, and we'll try to squeeze 'em in.

World War 3-View Dept.

Model Editor, FLYING ACES:

Have been reading the mag for a few months. Boy! what a mag. More World I three views. Keep 'em Coming!

JOHNNY AIKENS,
Portland, Me.

Fine Fella

Model Editor, FLYING ACES:

Dump the World War I three views in the biggest lake you can find. Print more present war jobs.

EUGENE FINE,
Brooklyn, New York

Swap Dept.

Model Editor, FLYING ACES:

I built the "F.A. Moth" and the "Paragon" a short time ago, and though I haven't had a chance to fly them, they look like they're going to cop the national records.

Heard a lot about the "Hi-Climb-

er" and I'd be glad to trade issues containing the "Moth," "Paragon," "Scale Bombs," and "Snoony Silhouette" for the plans of the "Hi-Climber."

PAUL MATHES,
1726 Harrison St.,
New Holstein, Wis.

Editor's Note: Readers are reminded to please include the date of the issue in which plans of models or other articles have appeared. This makes it convenient for readers who have missed these editions to look them up.

CORRECTION MARCH 1942 F.A.

Typographical errors appearing in article titled HISTORY OF AIRCRAFT INSIGNIA AND IDENTIFICATION MARKINGS is regretted and herewith called to your attention:

Under paragraph title FRANCE, page 45 3rd line, the year "1918" should read 1913.

Page 46, second column, 9th line should read, December 11, 1914.

He Started It All

Model Editor, FLYING ACES:

Congrats on publishing that first World War Three-View. It sure looks good to see an old crate like the Dolphin. I've already finished mine. I placed it alongside a Curtiss Mohawk and those who see them pick up the Dolphin first. I'm not going

to miss a single copy as long as the Three-Views are published.

SIMON CODMAN,
Harrisburg, Pa.

Likes the Model Section

Model Editor, FLYING ACES:

Whenever I buy your swell mag the first thing I do is turn to the model section. There ought to be at least one issue just full of model plane drawings.

HERBERT HERMAN,
Bronx, New York

Model Editor, FLYING ACES:

I have been getting your great mag for some time now, but I slipped up on some copies.

I need editions of the following: Dec. 1939, Jan. 1939, Aug. 1939. In return to anyone sending me these issues I will send him copies containing plans of the "Moth," "The Whisper," "Bambino Bipe," "Teardrop Stick," and "Baby Sportster."

CLYDE HARE, Jr.
619 Ballentine,
Bloomington, Ill.

He's All Right

Model Editor, FLYING ACES:

What happened to the Model Editor? All of a sudden he's been feeding us with solid scale plans.

JERRY ZWIEG,
Brooklyn, N. Y.

Logging the Motor Market

O.K. De Luxe and Special

BOTH O.K. engines are essentially the same in their construction. The difference between the De Luxe and the Special lies in cubic inch displacement and weight.

Their cylinders are machined from solid billet with heads and ports integral. There are no gaskets to form a heat dam which make these type of engines free from heat distortion. Cylinders are finished by grinding

and lapping. Pistons are machined from solid steel and are hardened, ground, and lapped to the cylinder. The piston pins are made of steel, hollow-drilled, hardened and free floating, and which are fitted with aluminum end pads to protect the cylinder walls.

The gasoline tanks are made of translucent "Bakelite" which is impervious to such solvents as high grade octane gasoline, ether, benzol, alcohol, etc.

Crankshafts are machined from one piece steel, counter balanced, and with the timing can integral. They are hollow-drilled hardened and ground to a micro-finish. The connecting rod for the De Luxe model is made of drop forged steel, hardened and lapped. The timers used on both engines are made of steel. A trunion pin is cast into a bracket and the breaker arm bushing is reamed to close tolerances which prevents point flutter, thus making the timer able to perform under full speed range.

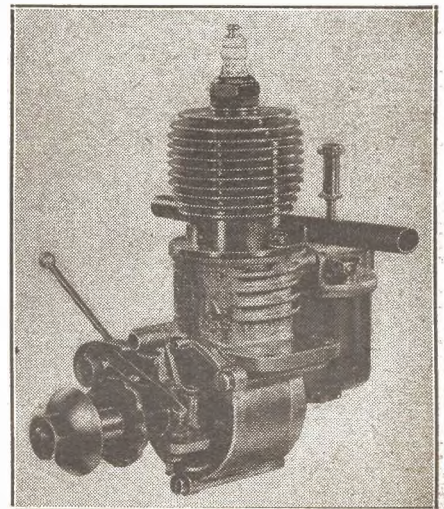
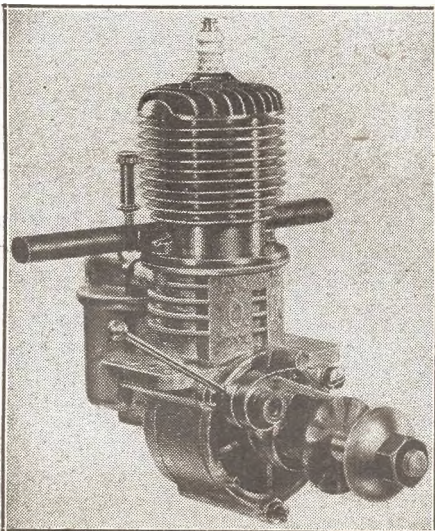
The needle valve is shake-proof, having an adjustable thimble with threaded barrel which is split to clamp upon the thread of the needle valve tube. The lower end of the barrel is

provided with a spring clamp ring for uniform tension.

Specifications: De Luxe model, bore, .900; stroke, .969; cubic inch displacement, .616; horse power, 1/4 at 5,500 r.p.m.; weight with coil, condenser and tank, 12 3/4 ounces.

Special model, bore, .900; stroke, .950; cubic inch displacement, .604; horse power, 1/4 at 5,675 r.p.m.; weight with coil, condenser, and tank, 12 ounces.

THE END



Left: The O.K. De Luxe. Right: O. K. Special.

DEATH FLIES THE BEAM

(Continued from page 17)

thought he'd finished me, too."

"Lock him up!" Bradford ordered curtly. Jackson and the bluejacket headed for the brig with Horuti. The captain eyed Trent dubiously.

"We didn't learn much, commander."

"More than he meant us to," said Trent. "Shelton wasn't delirious after all when he signaled about the hidden cat. It must have some significance we don't get. It's a pretty fair guess that Shelton tangled with Horuti somewhere close to Maki. Horuti followed but couldn't see enough in the dark to finish him off. Or else he wanted Shelton to lead him back so he'd find out how big a force we have. Maybe Shelton suspected he was followed—or else he knew he was dying and knew he wouldn't last long enough to land and give us the message."

The C.O. nodded. "Sounds probable. But why did Horuti land when he could have flown back and escaped?"

"Perhaps he had to know how much that message told us, and if we were going into action because of it. He couldn't fly around without being heard, so he landed. Or his engine may simply have cut out on him while he was gliding in, to see what he could discover. In the dark, he may not have seen the destroyers when he tried to get away."

"We've got to know the truth about Maki—tonight," said Bradford. "I'm going to let you and Crabb go ahead."

"Come on, Mort," said Trent.

"Wait," said the C.O. "I'm going to send Lieutenant Jackson and two other pilots with you in Grummanns, to bring back word in case—"

"In case we get liquidated," Trent grinned. "All right, captain, we're ready any time they are."

BRADFORD sent his orderly to inform Jackson of the order. "One thing you must remember," he told Trent, "if Maki has been converted into a strong air base, the *Lexotoga's* present course must be changed. Despite our own planes, dive-bombers might get through and sink us. Either the entire Task Force will have to concentrate for an attack on Maki, or we'll have to by-pass it until our other objective is attained."

"Don't worry, sir," interposed Crabb. "I'll flash word the minute we see the set-up."

The C.O. looked at the clock "Ninety . . . it'll take about thirty-five minutes to reach Maki. I'll have the ship on alert, planes on deck, ready for a quick night attack if you report the island is an air base. Meantime, I'll have a blinker message flashed to one of the destroyers and they can take one of your K-type receivers to the flagship so the admiral can hear your report. If necessary, he can order immediate attack, or one at dawn when we will be closer."

By the time Jackson and his pilots were ready, the destroyer was on its way to contact the flagship. Trent looked around the little group.

"We'll get our altitude and glide in from 18,000 feet. You three men will stay on top until you're sure everything's clear."

"What if the Japs get your ship?" Jackson said bluntly. "How will we know whether you had time to send a message? Our receivers won't catch that new high-frequency stuff."

"I'll flash my lights or fire a Very rocket," answered Trent.

As they went up from the ready-room to the flight-deck, a sandy-haired junior lieutenant caught up with them.

"Commander Trent—I'd like to see you a second."

Trent stopped. "What's the matter, Denny?"

"There's a spy on board!" Denny said tensely. "When Shelton crashed, there was a map in his cockpit. I saw it, but I was helping him get out and I didn't think about it until a few minutes ago."

"Well?" said Trent.

"It's gone. I asked the men who moved the wreck, and nobody turned it in."

"It wasn't clipped to Shelton's knee?"

"No, it had come off and it was caught under a rudder pedal. I think it had something written on it—"

"Then somebody got it right after Shelton was lifted out," muttered Trent. "I looked in there and I didn't see any map. Can you remember who was in that group?"

"The crash squad and Shelton's mech, and a petty officer named Beckett."

"Round them up on some excuse and then search their quarters," directed Trent. "I'm taking off right now, or I'd tend to it myself. Report what you find to Captain Bradford."

THE Curtiss and the three Grummanns were waiting, engines idling, when they reached the flight-deck. The Grummanns took off first. Trent climbed into the Curtiss' front cockpit, and Crabb settled himself in the rear. At a flick of the control officer's lighted wands, Trent sent the dive-bomber roaring off into the darkness.

It was 165 miles to Maki. Trent climbed to 17,000, leveled out to keep well under the fighters. They were about half the distance to the island when a bright glow, as from an explosion, lit up the horizon. The light quickly faded.

"Now what?" Crabb said dismally through the interphones. "I think I'd better report that."

"Hold your horses, old bean," returned Trent. "Wait till we find out what goes on and how come."

A few minutes later a faint, flickering light appeared on the horizon. It seemed to be at the approximate location of Maki.

"I suppose that's a beacon, so we won't miss it," growled Crabb.

"Dig out the binoculars," said Trent.

Crabb passed them forward, and Trent trained them on the island as the Curtiss glided in.

"Looks like a shed on fire," he reported. "I don't see any Japs around. I wonder how this hooks up with Shelton's message."

"Say, that's right! He said 'fire on Maki,'"

"I thought he meant for us to fire on the island. This may be—"

"What's that beyond the fire? Looks like a plane."

"It is—but it's on its back. Guess we'd better drop a flare and check up on all this."

Trent jerked the release, gunned the engine and pulled up in a climbing turn as the flare blazed. The three-mile, irregular expanse of Maki was brilliantly revealed below. On the east, a cove cut into the island, and the shore beyond rose sharply for about sixty feet, then flattened out into a gradual ascent. A quarter of a mile inland, the palm trees had been cleared to create two intersecting runways. Two thatched huts stood to the west of the north-and-south runway. The burning shed was near the intersection. Aside from a Mitsubishi dive-bomber which lay upside down by the west runway, there was no sign of a Japanese air force. Trent circled lower, watching for camouflage nets, but the island seemed to be barren of defenses.

"If they had any planes here, looks like they pulled them out in a hurry," said Crabb. "Might as well call the *Lexotoga* and tell 'em no Japs here."

"Okay," said Trent. "Wait a minute—what's that down in the cove?"

He banked over the shore, spiraled down to a thousand feet. Floating debris covered the water. Some of it looked like charred wood, and on a jutting reef at the side of the cove lay what appeared to be the bowsprit of a schooner.

"Looks like a ship had blown up," said Crabb. "Not long ago, either."

Trent stared down at the wreckage. "It could have been that glare we saw. Maybe they had a supply ship here and were afraid it would fall into our hands."

"What are you going to do?" demanded Crabb, as Trent swung back over Maki.

"I'm going to land—as soon as you send word to the *Lexotoga*. Report 'Island deserted. Landing to check up.'"

Crabb switched on his special transmitter, tapped out the message. By the time he had finished the flare had gone out, but the flames from the burning shed were enough to mark the runway. Trent blinked his navigation lights until he saw an answering flicker from one of the Grummanns above. Then he landed.

The Curtiss stopped, brakes on. Trent looked around carefully, then cut off the engine. The hush that followed was broken only by the moan of the Grummans' wings, as the three fighters circled down.

"Stay here, Mort, and keep your eyes peeled," said Trent, as he climbed down. "There might be a Jap or two lurking behind a palm tree."

"They'd have to be pretty skinny, from the size of those trees," grunted Crabb. "Know what I think? I think Horuti radioed back that message Shelton flashed us, and the Japs just high-tailed out of here."

"Well, I'll take a look-see, anyway," Trent unholstered his .45, warily circled the burning shed. By now, the flames had died down, and he could see an overturned fuel drum inside. He walked around the two thatched huts, halted abruptly when he saw a dim light shining through the doorway.

TWO of the Grummans landed as he tiptoed toward the shack. Jackson climbed from the first fighter, leaving the engine idling. The other pilot went over to the Curtiss, and Jackson came toward Trent.

Trent motioned him to the side of the hut, and Jackson reached for his gun as he saw the light. Trent took a quick step to the entrance, kicked the door wide open. Then he slowly lowered the .45. Jackson joined him, and they stared silently into the hut.

There was no one inside. Cigarette stubs and an old Japanese magazine lay on the floor, and a soiled blanket on a bunk gave evidence of recent occupancy. In the middle of the floor stood a table on which stood a charcoal sketch, lighted by an oil lamp. The sketch, so crudely done that it might have been the work of a child, showed an angular cat with huge claws. Underneath was written: *Shima neko.*

"What the devil!" said Jackson blankly.

"*Shima neko* means 'island cat,'" said Trent. He frowned at the sketch, then suddenly wheeled. "Come on, we've got to get off this island!"

"Huh? What's wrong?" exclaimed the Texan.

"This whole thing's a fake—we may have run into a trap!" Trent headed for the doorway. Just as he reached it, he heard a shout, then a roar as the Curtiss' engine started up. Jackson hastily followed him outside. The pilot of the second Grumman was running toward the hut.

"Japs—I don't know where they came from!" he yelled.

Two Nakajimas on pontoons were charging in at the lone Grumman overhead. As Trent and Jackson raced back to their planes, a third Nakajima

zoomed into sight from the direction of the cove. Wheeling into the light of the burning shed, it pitched down at the grounded planes.

Four streams of tracer shot from the Jap ship's cowl and wing. Jackson's pilot crumpled beside his riddled fighter. Mortimer Crabb swung the Curtiss' power-turret, sent a furious blast up at the Nakajima. The Jap hurriedly banked out of the lighted space. Trent shoved Jackson toward the Brewster.

"Go ahead—get clear and tell Mort to warn the Skipper!"

Without waiting for the Texan's answer, he raced to Jackson's idling fighter. The third Nakajima had joined the others to bring down the



beleaguered Grumman. Trent vaulted into Jackson's ship, snapped his belt and sent the fighter hurtling down the runway. The Curtiss was two hundred feet ahead, taking off.

Trent pulled the Grumman into a screeching zoom, caught the nearest Nakajima under his guns. But he was a split-second too late. The Navy pilot, after a valiant battle at odds of three to one, suddenly toppled over his controls. The fighter struck in a clump of palms and burst into flames.

ONE of the Jap ships was staggering from the Navy man's last burst. Trent savagely drove a blast through the cockpit. The pilot crumpled from view, and the Nakajima went floundering down to a crash. The two other Japs had whirled to attack the Curtiss. As Trent reversed to aid Crabb and Jackson, the tail of the ship quivered under the impact of bullets.

Trent backsticked, threw a swift look behind, expecting to see still another Jap plane. Instead, he saw the

flaming muzzles of double-mounted machine-guns firing from a pit in the ground. He turned back to the fight, but the Curtiss was going down, smoke pouring from its cowl. Trent groaned, but the Japs gave him no time to watch the Curtiss. Separating in quick chandelles, the two Nakajimas darted in to crisscross the Grumman's tail.

On shrieking wings, Trent threw the fighter into a vertical bank. His tail was for an instant directly toward one Jap, but the other plane, ahead, almost blanketed the rear man's fire. Trent thumbed the stick-button, saw the pilot in front of him jump spasmodically. The Nakajima yawed crazily, its guns still spouting. Trent dived underneath, hoping to lead the man behind him into collision with the pilotless ship.

Crackling tracers smoked past his head, as his pursuer nosed down to follow. Trent rolled to throw his prop out of range, but in vain. There was a muffled report, a high-pitched scream, as the unleashed engine revved up. He cut off ignition and fuel, hastily switched on his radio transmitter.

"T-19—Jap planes hidden on Maki!" he shouted into the mike. "All four of flight downed! Look for secret seaplane base on east of—"

Br-t-t-t-t! Bullets hammered savagely across his cowl, hurtled splinters of dural and Plexiglas back into his face. He dropped the Grumman in a steep forward slip, away from the glare of the burning shed. Another burst tore through the right wing. With a sudden decision, he whipped back across the island. The Grumman howled into a brief dive, leveled off ten feet above the ground.

The burning fuel shed loomed up directly in Trent's path. Bracing himself, he hurled the fighter straight into the blazing wreckage. A flaming upright flew over the wing, and embers went in all directions. In the abrupt darkness beyond, he could see nothing for a moment, but he knew he was headed for the cove. A second later he felt the wheels touch.

Unsnapping his belt, he climbed out onto the wing, still holding tight to the stick. Unbraked, the Grumman plunged toward a little clump of palms above the water. He waited until the ship was within sixty feet of the trees, then let go.

CHAPTER III

THE HIDDEN CATS

HE struck doubled up, rolling. A moment later there was a rending crash, followed by a scraping and a loud splash below. He tumbled against

the side of a palm tree, started to slide down the incline to the cove. A few feet below, the slope flattened into what seemed to be a ledge, and he lay there, trying to catch his breath.

Muffled voices came to his ears, and he sat up, gazing around in the dark. There was no one near him, and he was forty feet above the water. He was peering up the slope when to his astonishment the ledge on which he lay began to move. He tried to scramble up, but it was too late. The flat surface was moving slowly sidewise, as was a section of the slope below. Trent started. He was on top of a huge sliding door!

Dim greenish light showed from the space the great door had hidden, and Trent saw that there was another door sliding open on the other side. In a brief glimpse before he threw himself flat he saw a score of Japanese looking out into the cove.

"Goran nasai—look!" exclaimed one Nipponese. "There is the tail of the plane sticking out of the water. It must have dived in."

"It rolled over the edge," said a harsher voice. "Turn on a light—make sure the American did not swim free."

"But Captain Kenako, is it safe?" protested the first man.

"Do what I order!" snapped the one addressed as Kenako. "The sound-rangers report there are no other planes within a hundred miles."

A spotlight went on, played across the tail of the Grumman, then slowly covered the surrounding water. It was still traversing the cove when the remaining Nakajima landed and taxied in toward the hidden base. Trent hugged the shelf until the seaplane's engine went off and the ship drifted inside.

"Enough of the light," came Kenako's voice. "The pig was obviously drowned. I should like to have had him alive."

"They are better fighters than we were told," said another voice. It had a shrill, angry note. "The first man was bad enough—but this one was a demon."

"They were both undoubtedly drugged," Kenako said hurriedly. Trent grinned to himself. Then as the spotlight went out he cautiously raised up for a glance into the base. One look, and he saw how it had been built. The original shore had sloped up at a point farther back, and the Japs had merely extended the higher ground by roofing over the low area. Steel uprights supported a trusswork for about as far back as he could see. Apparently there was a fairly deep layer of earth on top of the hangar roof, so that grass and a few smaller palms would grow there.

EXTENDING almost to the entrance of the base were three seaplane catapults, placed parallel so that three planes could be launched simultaneously. The true meaning of Shelton's message came suddenly to Trent. . . . "Have hidden cat" must have been meant for "have hidden

catapults," but the young ensign's failing strength had given out before he could finish.

Trent risked another quick look over the top of the camouflaged door. He could identify Kenako—a short, burly Jap, the only one with a captain's insignia. Kenako was talking with the Nakajima pilot, a young, wedge-faced Jap with a shrill voice. Beyond them a crew of mechanics was hooking a boom onto the Nakajima for raising it onto a cradle. Steel doors at the rear of the launching-chamber stood open, revealing the hangar space in which at least twenty planes were dimly visible. Trent recognized some as Mitsubishi dive-bombers which had been equipped with pontoons.

"The warning was sent by Major Horuti," he heard Kenako tell the Jap pilot. "He had us prepare the trick in case more planes came to investigate."

"It is as well he did," retorted the pilot. "If all four American planes had been in the air, we would have been lost before you could launch the others. But where is the *chosa* now?"

Captain Kenako looked worried. "He should have been back before this. I am afraid he was shot down after sending the warning."

The pilot turned to look toward the sea, and Trent ducked out of sight.

"Then we do not know how many American ships there are?" he heard the Jap's shrill voice.

"No, but we will be ready for them at dawn—no matter how many," said Kenako. "We have a prisoner from the plane you forced down," he added with an ugly note, "and if he knows anything I shall soon get it out of him."

Trent felt something sick inside. One prisoner . . . Mortimer Crabb or Jackson? Perhaps, he thought grimly, the dead man was the luckier . . .

He heard Kenako give an order, and in a moment the huge doors began to slide shut. He waited for a full minute after they had closed, then crawled up the incline. It was fairly easy, for the Japs had stretched canvas over irregular blocks of wood, to create the illusion of a rough coral slope. With the protruding points for handholds, he reached the flatter ground above and stopped for a moment to consider the next move.

His radio to the *Lextoga* might not be acted upon until daylight, if then. In the meantime, the prisoner down in that Jap hellhole would probably be tortured to death.

Trent stood up, estimated the spot where he had jumped from the Grumman. He crawled over the ground on hands and knees, but failed to find his .45. Possibly it had gone over with the plane. He would have to work it unarmored.

He closed his eyes, trying to recall the exact location of the machine-gun "fox-hole" from which the Japs had fired on him. It was approximately halfway between the burned fuel-shed and the cove. That meant it probably served as another entrance to the base,

for the hidden hangar extended back almost that far.

Trent bent down, rubbed his hands in the dirt and smeared his face and neck. Then he took off his flying-suit. He was wearing the naval air service forestry-green uniform, which was dark enough for his purpose. By scattering the embers of the fuel-shed he had eliminated it as a guide-point, but he knew the general direction. Again on hands and knees, he made his way toward the fox-hole.

HE had gone about two hundred feet when he saw flashlights off to the right. Several Japs were examining the Curtiss, which had ended up off the runway. Trent crawled closer, stopped short as the flashlights silhouetted a small hut between three palm trees. A Jap sentry stood leaning against one side, watching the men at the plane.

Trent wormed his way back a few yards, then around behind the largest tree. He had barely reached it when the Japs returned from the Brewster. They deviated around a dark spot in the open ground beyond the hut, and he surmised this was the concealed machine-gun post.

Jabbering with each other, the Japs went into the hut. Trent edged closer, saw the flashlight reflections alter, then shift to the ceiling. He was right. There was a passage leading down into the base, but instead of leading to the fox-hole, it ran to this harmless-looking nipa shack.

The sentry had followed the men inside. Trent got to his feet as the sound of voices died out. He was crouched beside the doorway, hands outstretched, when the sentry emerged. Like a flash, Trent was on him. His hands shot around the Jap's throat from behind, thumbs pressed tight under his ears. The Nipponese gave a convulsive leap, dropped his rifle. Trent toppled to the ground with him, but held on.

For a moment, the Jap's fingers clawed wildly at Trent's hands. Suddenly his head jerked forward and he sagged in a limp heap. Instinctively, Trent started to release his hold. Then he grimly tightened his grasp. Below, an American was facing death—or worse. There was only one way to insure this sentry's silence . . .

A MINUTE later, he dragged the Jap's body out of the hut. The man's broad-visored cap was a fair fit, but his blouse was too small in the shoulders. Trent struggled into it, smeared his face again, and picked up the sentry's bayoneted rifle.

Inside the hut he found an electric lantern on a chair. He switched it on, inspected the floor. A dirty grass rug had been kicked carelessly aside, and he saw a trap-door. Turning off the lantern, he raised the trap an inch. A faint light showed from below. He lifted the trap higher, saw a flight of steps and a bricked-up passage. There was a turn at the bottom of the stairs and the dim light came from somewhere beyond. Apparently no one else

was on guard at this end.

Trent went down silently, closed the trap-door after him. A cautious glance around the turn revealed a bricked vestibule. Two doors led from it, one of which stood open. He could see into a long corridor with doors on the right-hand side. The nearest was labeled "Major Horuti," the second one "Captain Kenako." The others were in shadow, but he surmised that all the officers were quartered in this section.

He put his ear against the other vestibule door, heard metallic sounds of men working on planes. He was about to open the door a fraction of an inch when a scraping sound from Kenako's room made him jump back. He stepped back into the space below the stairs, but Kenako's door remained closed. Then he heard the shrill-voiced pilot.

"If the captain will permit me, I will make this stubborn American speak."

"I am equal to that," came Kenako's harsh answer. Trent gripped the rifle, swiftly reached the captain's door. From inside, Kenako's voice came with a suddenly furious note.

"Light the candle! Now, you American dog, will you tell us or would you prefer blindness?"

Trent's ice-cold hand turned the knob. With a lightning motion, he threw the door open and leaped inside. Kenako was stooping before the bound figure of Mortimer Crabb, a candle flaring close to the prisoner's eyes. The skinny Jap pilot stood at his elbow.

Both of them whirled as Trent entered. The pilot sprang back with his eyes bulging, and his mouth flew open to cry for help. Trent lunged, brought up the butt of the rifle under the Jap's jaw. The pilot's head flew back with a vicious snap, and he went down without a sound.

Kenako had dropped the candle. He gave a frantic jump for the door. Trent sprang in front of him, drove the bayonet toward his throat. Kenako shrank back against the wall, his horrified eyes glued to the shining blade.

"Eric!" Mortimer Crabb said huskily. "Thank God—they were going to—"

"I know, Mort," Trent said tautly. He shoved the bayonet tip under Kenako's chin, held it there while he shot a quick look at Crabb. The Japs had tied him to a heavy wooden chair. Trent's grim eyes came back to the trembling Nipponese.

"Untie him!"

Kenako dropped to his knees, fumbled with the knot. Perspiration dripped from his forehead.

"Watch him, Eric," Crabb said hoarsely. "He'll try to trick you."

"One yip and I'll cheerfully slit his throat," said Trent.

"How did you get in here?" Crabb whispered.

Trent reached back without taking his eyes from Kenako, closed the door. "Never mind about that, old bean. The important thing is getting out."

"We've got to warn the Task

World War Books

Volumes reviewed in this department may be obtained from Airbooks, P. O. Box 958, New Rochelle, N. Y. Airbooks cannot promise to in all cases supply books for the prices quoted, since the price is determined by demand. It is suggested that two or more alternative titles be chosen when ordering, in case first selections are not available.

Heaven High-Hell Deep, by Norman Archibald, \$3.00.

This is classed as one of the best books written about the first World War; as a matter of fact, *Sagittarius Rising* (which was reviewed last month) and *Heaven High-Hell Deep* are generally called the best books dealing with the war in France.

Even though this Archibald book is just another personal experience story, beginning at the beginning and carrying through to the end of the war, it is written in such a manner that it is entirely different from the average World War account.

Archibald had somewhat the same experiences as other airmen—the training period, first flight over the lines, battle in the sky. But he had just a little more to add than most writers, for he was shot down over Germany and made prisoner. And the experiences he had in prison camp were equal to those any flyer had in the skies.

The supply on this book is exceedingly limited, and we suggest that you order promptly if you expect to get it for your library.

Winged Warfare, by Maj. William A. Bishop, \$2.50.

One of the most sought volumes of the first World War, this book was published in 1918.

In this book you follow "Billy" Bishop on many of his most amazing adventures. You "dig in" with him behind a bit of sheltering cloud, you pounce with him upon a formation of six or eight enemy machines, you hear the taut cloth of your wings ripping under a torrent of machine gun bullets, you are dazed by the desperate chances you must take—and in the end you do not wonder that Bishop won so many medals for valor.

This book is almost all air battle, explaining methods of attack and retreat, what it is like to have machine gun bullets whistling around your ears, and how it feels to shoot down an enemy—and how it feels to be shot down yourself.

Quentin Roosevelt, a Sketch With Letters, edited by Kermit Roosevelt, \$3.00.

On July 14, 1918, Quentin Roosevelt fell in France in aerial

combat over the German lines. He was buried by the enemy with military honors near the little town of Chamery. Before his death, however, Roosevelt left a story of his adventures in letter form—letters that were not meant for publication and which were full of first-hand information, because they were written on the spot and not years later.

Although Quentin Roosevelt's record of victories was low—only one confirmed—this book is none the less impressive and important, because it tells the story of a fighting flyer eager with enthusiasm, ready to pit his plane and skill against all comers.

Georges Guynemer, Knight of the Air, by Henry Bordeaux, \$2.75.

Translated from the French by Louise Morgan Sill, this is the story of one of the most idolized flyers in the first World War. He had 53 victories and was France's Ace of Aces until his death on September 11, 1917, when he was shot down over Poelkapelle, Belgium.

If you seek a history of the Guynemers, young Georges' life before the war, his instruction in the Air Force, and his battles, there can be no substitute for this book. For background history, we consider it even better than *Guynemer, Ace of Aces* (reviewed last month).

Scarlet and Khaki, by T. B. Marson, \$2.75.

Although this book is not all aviation—the "Scarlet" section being devoted to hunting—the aeronautical part contains one of the very finest accounts ever written of the famous Royal Flying Corps No. 56 Squadron. Actual combat reports are given by Capt. J. B. McCudden, Capt. Albert Ball, Lieut. Rhys-Davids, and many other ranking Aces.

Adventure's a Wench, the autobiography of Charles Veil as told to Howard Marsh, \$2.50.

Charles Veil in the first place tried to enlist with the British, but they wouldn't have him. So he decided to "get even" and tried to become part of the Germany army. That application, too, was turned down—so he ended up in the Lafayette Escadrille flying for France.

After scores and scores of thrilling experiences, Veil was eventually transferred to Russia and saw action against the Bolsheviks.

Adventure's a Wench is dedicated to the four great F's—Fun, Fighting, Flying, and Famine. And we might add that it's exceptionally readable, interesting, and informative—and well worth a place in your bookshelf.

Force," mumbled Crabb. "I tried to get a message through with the K-set, but they hit my transmitter."

"It's all right, I warned them."

Crabb shook his head. "No—they jammed the air with artificial static."

Kenako finished untying Crabb, backed away under Trent's savage gaze. For an instant his black eyes went to the Jap pilot's shattered jaw, the odd angle at which his head lay.

"Right," Trent said pleasantly. "His neck's broken. But he died a lot easier than you will if you try anything."

"What do you want?" Kenako moaned.

Trent jerked his head toward the telephone on Kenako's desk. "Order those camouflaged doors opened, and a Mitsubishi moored outside, engine warmed and radio tested. Guns and bomb-ranks are to be loaded."

"You—what are you going to do?" gasped the Nipponese.

Trent smiled coolly. "We're going to blow this place to hell."

CHAPTER IV

THE CROONING CRABB

FEAR and rage struggled together in Kenako's black eyes. "You're insane—you can never escape from here alive."

"Let me worry about that," said Trent. "Pick up that phone. And don't forget I know Japanese air slang, too."

"They will ask questions—they will wonder why I should give such an order," protested Kenako.

"Tell them it's for a possible emergency flight later tonight—something you learned from the prisoner. And get this straight. If you slip up, and anybody comes in here—" Trent made a significant motion with the bayonet.

The Jap cringed, reached for the phone. Trent stepped close, to hear what came through the receiver. Kenako gave the order, sweating profusely as he explained.

"We'll never make it, Eric," Crabb said hopelessly, as the Jap hung up. "They've got lights in the hangar, and men working. That dirt on your face won't fool them for a second."

"That," said Trent, "was only to help me get in here. I've figured a way out. We'll wait here ten minutes, in case they should call back about the ship."

"We must've been blind, not to see what Shelton meant in that message," Crabb said dully. "That wasn't 'short line'—it was 'shore line.' He was half dead, and he dragged out the 'e' into a 't.' He meant for us to fire at the Maki shore line west of a wreck. Remember that stuff we saw floating—"

"I know," said Trent. "I doped out that part, too. There must have been a wrecked schooner on the reef. When Horuti relayed Shelton's message, he told them to get rid of the wreck and stage that monkey-business about the cat. There was a sketch somebody had drawn—"

"Jackson told me, just before the

Japs shot him." Crabb's long hands worked for an instant. "Eric, they murdered him in cold blood after we landed, in revenge because they lost two ships and pilots. They'd have murdered me, too, but this one here wanted to question me."

Trent looked at the candle Kenako had dropped. His face hardened.

"I never thought I'd like killing—until this war. These Japs aren't human—they're even worse than animals."

A flicker of hatred touched Kenako's eyes, vanished. From out in the direction of the cove came the sputtering roar of an engine starting up. It settled into a steady drone, then diminished in volume as the ship was taxied outside. After two minutes it ceased, and Trent heard the rumble of the camouflage doors being closed. He waited another minute, but no call came.

"I guess we're ready," he told Crabb. Then he fixed his eyes on Kenako. "We're going up through the hut and down to where the plane's moored. Your one chance of living depends on our getting to that plane."

Kenako wet his lips, made no answer. Trent raised the bayonet, and Kenako moved toward the door. Mortimer Crabb followed close behind Trent.

"Open it up," ordered Trent.

Kenako turned the knob, and the door swung open. Trent went rigid.

Covering them from the hall were three Japs with tommy-guns!

"A neat bit of planning, Commander Trent," said a mocking voice. Horuti stepped into sight from behind the machine-gunners. For a second, his eyes flitted to Kenako's livid face.

"Major, I was going to trick them!" cried Kenako.

"Of that, we will speak later," Horuti said curtly. He motioned to the machine-gunners. "Bring the prisoners. You will come, too, my dear captain."

Helpless before the tommy-guns, Trent let the rifle drop against the wall. Horuti's gaze passed over the dead Jap pilot.

"Major, I was helpless," Kenako moaned. "But I intended to—"

Sudden fury broke through Horuti's pretense of coolness. "You cowardly fool! If I hadn't come when I did, the Americans would have destroyed all our bases in this area!"

"I thought you—I feared you had been shot down," faltered Kenako.

"I was captured!" snarled Horuti. "Thanks to these two you were helping escape, I was locked in an American brig. But for the German agent, Beckett, I would have been doomed. He killed a guard and let me out, and he helped me get away in a fighter—although I almost plunged into the sea taking off."

THE guards herded Trent and Crabb into the main hangar space, with Horuti and Kenako following behind. At least a hundred Japanese were swarming over the planes, preparing them for flight. The steel

doors to the launching-chamber were quickly opened up at Horuti's signal.

"We're attacking tonight—immediately!" Trent heard him tell Kenako. "While I was aboard the *Lextoga*, Beckett told me they had apparently received word from Trent that there was no danger at Maki. The carrier is less than 150 miles from here now, but anything can happen. They may force the truth out of Beckett—and that would mean full attack on Maki. We've got to hit first. Once we've wiped out the carrier, we can concentrate on the rest of their raiding force. Even if some of their planes get off, they'll have no place to return to."

"Major Horuti, let me lead the attack," begged Kenako. "Let me prove—"

"No, you will remain here—under arrest." Horuti coldly turned his back, barked several orders to the scurrying pilots and mechanics. Three Mitsubishis had already been hoisted onto the catapult cars, and the hooks were being transferred to three more for quick follow-up in launching. The big doors were already open, and Trent saw the Mitsubishi he had expected to use in the escape. Several Nakajimas were lined up for launching down the ramp, with the catapults this time reserved for the heavily loaded dive-bombers.

Horuti wheeled after a quick inspection of the preparations. He beckoned to the machine-gunners, and the two prisoners were marched over beside the first catapult. Horuti flicked a sharp glance at Kenako.

"You tried to force these two to speak?"

"Only the lieutenant, Major," Kenako answered, with a venomous look at Trent. "He was very stubborn, though I threatened to put out his eyes."

Horuti looked back at Trent.

"You would not like to die, Commander? You are a man who is fond of life. . . ."

"Major Horuti, if you will let me have a bayonet," began Kenako.

"Hold your tongue!" snapped Horuti. "I've no time to waste with you. There's one-thing we still don't know—the number and type of the American raiding vessels. Beckett knew only a few."

"Then we may be running into dangerous odds!" cried Kenako.

"In that case, we'll attack only the carrier—then return here and wait our chance." Horuti turned his mocking eyes on Trent, but behind the sardonic look Trent saw the man's hatred. "You are the *Lextoga's* intelligence officer—you have that information?"

"Tell him to go to hell, Eric!" rasped Mortimer Crabb.

Trent made no answer. Horuti fired an order at a passing mechanic, and the Jap brought a roll of stout cord. The Japanese pilots were waiting nervously in a group at the door to the launching-chamber. Horuti saw them, nodded.

"I will give you your orders in a

moment. Meanwhile, lay off a course of 72 degrees, to intercept the *Lextoga*." The pilots went to work on their maps, and Horuti unrolled part of the cord. Deliberately, he tied one end to Trent's right arm, jerked it tight.

"Commander, I am going to have you tied behind the exhaust-port of that first catapult. That is, unless you tell me all that I want."

IN spite of himself, Trent felt a cold chill go over him. Three years before, he had seen an officer accidentally step in front of a catapult's exhaust as it was fired. The back-blast had blown off his head and hurled his body overboard.

"I see you understand," Horuti said curtly. "Make your choice—I give you twenty seconds!"

Trent stared across at the catapult crew. Two powder bags had been carried from a magazine behind a steel door, while a hand-truck with more bags was loaded for the other catapults.

"Fifteen seconds!" said Horuti.

The Japs at the catapult had stopped to watch Trent. He raised his sleeve, wiped his face, and the watching pilots roared.

"Mort—they'll find it out, anyway," Trent said hoarsely.

"You—Good Lord, you wouldn't tell them?" groaned Crabb.

Horuti was watching, a look of astonished, incredulous pleasure in his beady eyes.

"Ten seconds, Commander," he said.

"You swear you won't—you'll keep your word?" Trent mumbled.

"Eric—you can't!" shouted Crabb.

Trent whirled, slammed a left to Crabb's jaw. Crabb staggered back, slipped on the wet ramp and plunged backward into the water. Trent spun around to Horuti.

"All right, I'll tell you—I'll tell you!" he cried desperately. He closed his eyes, stumbled against the side of the catapult. "First, the *Lextoga* . . . heavy cruisers, the—"

Horuti had dropped the roll of cord. He shoved one of the guards aside, snatched a pilot's map and pencil.

"Heavy cruisers—quick!" he snapped.

"Here—I'll write it!" Trent took a step forward, then with a swift leap he sprang to the catapult platform and dived headlong into the water.

"Horuti—the cord!" screamed Kenako.

THERE was a deafening explosion, a blinding glare as flame shot back from the open breach of the catapult powder-chamber.

Trent's head was under water as the explosion came. The shock-waves instantly deafened him, and he came up in a weird inferno in which there was no sound. He saw Crabb floundering dazedly a few yards away. He swam to him, pointed to the Mitsubishi, and they struck out together.

Crabb scrambled aboard, and Trent hastily released the mooring-line. At

Aero Book Reviews

Any volume described in this department may be obtained, at the price quoted, direct from the publisher named and at the address given. When writing for a book, kindly mention that you saw it reviewed in FLYING ACES.

Aerial Photo Technique

Aerophotography and Aerosurveying, by James W. Bagley, McGraw-Hill Book Company, 330 West 42nd St., New York City, \$3.50.

The chief aim of this book is to deal with aerial photographs, standard laboratory practice and the various methods of utilizing aerial photos for making standard and exploratory maps, mosaics, and engineering surveys. Broad in scope, logical in arrangement, and strictly up-to-date, this important new text covers the fields of regular mapping and exploration mapping in thorough detail, and is profusely illustrated with photographs and line drawings.

For Youngsters

How Things Work, by Creighton Peet, Henry Holt and Company, 257 Fourth Ave., New York city, \$2.50.

This book is definitely for the younger set. It concerns the adventures of two curious youngsters who want to know how things work. The "things" in the book are everything from scissors, bridges, nutcrackers, clocks, automobiles, submarines, thermometers, cranes and a whole slew of things. The book is full of interesting pictures and facts.

And we might add, even to adults like this reviewer, how certain things work has been explained to him for the first time, too. This edition has been selected by the editorial board of the Junior Literary Guild as the outstanding publication for young boys and girls.

How It's Accomplished

Grand Strategy, by H. A. Sargeant and Geoffrey West, Thomas Y. Crowell Company, 432 Fourth Ave., New York City, \$2.00.

The authors of *Grand Strategy* have traced the evolution of modern war. In the early days only force was used; then to force was added persistence, resources, timed action, and in the case of the present conflict, *morale*.

The authors have described the grand strategies successively attempted by Napoleon, Wellington, Bismarck, Hitler, Churchill, Roosevelt, Stalin, and their peoples. In describing these strategies they have presented sensibly the basic

reasons for the rise and fall of the dominant nations since the French Revolution.

Learning How

Practical Arc Welding, by W. J. Chaffe, published by Hobert Trade School Inc., Box FW 80, Troy, Ohio, \$2.00.

The sudden acceleration of industrial activity due to the national defense program has induced recognition of the fact that Arc Welding is the effective answer to most problems involved in speeding up production in an economical way. And the result has been an unprecedented demand for trained welding personnel. This book covers the subject beginning from the history of Arc Welding.

History In the Making

Your Future Is in the Air, by P. P. Willis, Prentice-Hall, Inc., 70 Fifth Ave., New York City, \$2.00.

This volume covers the story of how our airlines made people air-travel conscious. The rapidly expanding use of the highways of the air makes it almost impossible for us to keep abreast of the changes that the airplane is effecting in the world today, let alone to forecast accurately its influence upon our life of tomorrow.

Your Future Is in the Air is a fascinating record of the growth of air travel and points out the significance of the manner in which airplanes are rapidly changing as well as shaping the future of this world.

Anti-Bomb Menace.

Aerial Bombardment Protection, by Harold Everett Wessman and William Allen Rose, John Wiley & Sons, Inc., 440 Fourth Ave., New York City, \$4.00.

In the fall of 1940, after the first severe bombings in England, the authors of this volume felt that it was necessary for engineers and architects to begin the study of technical measures for the protection of civilians from aerial bombing.

Through this intensive study evolved the information woven into this excellent book. A good part of the basic information on the action and effect of aerial bombs was obtained from foreign sources. In brief, the book is primarily devoted to a detailed discussion of those measures which can be and should be undertaken to make building construction resistant to the effects of bombing. While it makes informative reading to the laymen, this volume is far more valuable to engineers and architects and other technical departments of municipalities.

(Also see pages 71 and 76 for other reviews)

his swift gesture, Crabb signaled the switch was on. Trent jumped onto the tip of the pontoon, jerked the prop and dropped into the water. The already warmed engine caught, revved up. Trent barely caught the pontoon as it swept by, dragged himself up. He felt the engine idle, and a second later pulled himself onto the wing to reach the front pit.

Bright, acrid smoke was pouring out of the base. A spotlight went on, a yellowish blur, and a moment later Trent saw a Nakajima fighter slide out from the ramp to the side of the catapults. Two men on the wing were fighting to reach the cockpit. The blurred yellow light fell on the faces of Horuti and Kenako. Suddenly Horuti stepped back, and a pistol blazed.

Kenako doubled over, fell headlong into the water. Horuti jumped into the cockpit, gunned the idling engine. Trent opened the throttle of the Mitsubishi just as Horuti saw the other ship. A fiendish, gloating look shot into the Jap's face as Crabb tugged at the unfamiliar rear-pit gun-controls.

The Nakajima swerved and Horuti's cowl guns blazed, almost dead on. Trent kicked hard rudder, and simultaneously he felt Crabb's guns throb.

He stared back, almost into Horuti's spouting guns, Crabb's tracers stabbed across the Nakajima's wing, into the cloud of smoke that hid the secret hangar.

For the second time, an explosion rocked the Japanese base. A sheet of flame shot from the yellow cloud, out over the tossing waves. It was like a red avalanche that swept down over Horuti. When the blast faded, the Nakajima was ablaze from nose to tail. Trent had one fearful glimpse of Horuti's face through the flames. Then it was gone.

Without looking back, Trent sent the Mitsubishi speeding across the cove. As the ship lifted, he closed his nostrils with his hand, blew until his ears had cleared. Mortimer Crabb was shouting something at him, and he climbed until he could throttle back in a flat glide.

"When we land," yelled Crabb, "I want you to give me a good sound kick. I might have known that was an act—but I didn't tumble until you knocked me into the drink. I know a pulled punch when I feel one."

"I was afraid to tip you off," said Trent. "I didn't know it would work."

"What in Hades happened?"

"I managed to slip that cord over the firing mechanism. They had two powder bags in the breech. The flare-back set off the other bags they had on the hand-truck. Apparently you finished the job."

"Me?" ejaculated Crabb.

"Sure. Your tracers hit something in there—probably some gasoline. Nice work—especially as Horuti just about had our goose cooked."

Trent gunned the engine again, climbed out over sea. Suddenly Crabb-pulled the rear pit throttle shut.

"How in tarnation are we going to get down without being shot?" he

bellowed. "When the *Lextoga* gang spots this Jap ship, they'll make us look like a sieve."

"Simple," said Trent. "Turn on the transmitter and start singing 'Sweet Adeline.'"

"Mort, no Jap in the world could ever sing 'Sweet Adeline' with your inimitable manner. Somebody aboard ship is sure to recognize your unique rendition."

"Well, all right," Crabb said dubiously. He switched on the mike, and began to sing in a sepulchral and slightly nasal voice. After a minute Trent reached down and cut off the transmitter.

"What's the idea?" demanded Crabb.

"Frankly," said Trent, "I'd rather be shot." THE END

beautifully until it ran into a tree. The tree is still there.

Well, fellows, we gotta close up shop now as the five-fifteen is whistlin' and supper is waitin'. So adios!

THE END

JAP PLANES

(Continued from page 48)

It has an adjustable pitch metal propeller, motor encased with a ring cowl and guns fire through troughs on each side of the fuselage. The Nakajima Aircraft Works established in 1917 by two brothers bearing that name has been located on the outskirts of Tokyo ever since.

A VETERAN of Japan's long war with China, the MITSUBISHI Soyokaze is still being built in increasing numbers to supplement the losses of this type which have been unfortunate in meeting up with fast American and RAF fighters. In general appearance the ship resembles our old Boeing 247 with the exception of its twin rudders. It is long, sleek, and about just as fast.

This five place bomber is powered with twin Mitsubishi "Kinsei" engines each turning out 900 h.p. and driving Hamilton Standard controllable pitch propellers. It has a wing span of 82 feet, is 52 feet 6 inches long, and stands 12 feet high. The landing gear retracts into the engine nacelles. Its cruising speed is around 160 m.p.h. and it can remain up ten hours.

The KAWANISHI 90-2 is a six place reconnaissance flying boat whose design and manufacturing rights were granted to the Japanese government by the Short Bros. firm of Great Britain. The design is several years old and its performance is poor by comparison to latest types.

The ship is powered with three Rolls-Royce "Buzard" engines of 825 h.p. each which turn large diameter wood propellers. It has a top speed of 133 m.p.h. Wing span is 101 feet and length 72 feet.

The planes depicted in silhouette and not described here are in some instances Japan's latest models and therefore no information is available. One can note, however, that the derivation of certain craft are typically European and others of American origin.

KAWASAKI type 88 is manufactured by the Kawasaki Dockyard Co., Ltd., who are well known shipbuilders. In the early twenties they received the rights to manufacture Salmonsens biplanes and engines. Type 88 is one of their more recent models having been developed a few years ago. It is powered with a 450 h.p. B.M.W engine driving a wood propeller. Its design is of German Dornier origin. Large numbers of this type have been supplied to the army and navy and is used as a light bomber and reconnaissance job. The ship is built in two

CLUB NEWS

(Continued from page 41)

craft engine mechanics' license. He is now with the Accelerated Service Test Unit at Patterson Field, Fairfield, Ohio, the great Army air base.

See, fellas, it just goes to show that once aviation gets in your blood stream the best doctors can't help you. Besides, who wants help?

CLUBSTER JIMMY SHUTT, 2490 Bexford Place, Columbus, Ohio, sends us a picture of his relic corner. The relics are a combination of the past and present. Jim identifies the articles in the photo, so see if you can follow him along. Here goes:

"The long picture at the top is of my father's Company during the last war. The helmet on the left is an Austrian officer's and the one on the right is the one my father wore during the last war. On top of the mantel on the left is an old western "44" and to the left is a candlestick holder taken from the ruins of a church in France.

"In the center is a control stick taken from a ship that burned when the airport near us caught fire. The rudder at the far right is from the same plane. To the right of the control stick is a photo of an RCAF pilot, a pair of binoculars taken from a French Opera House in 1918, and a one-pound cannon shell. On the small shelves at the left there is a long strut from a Puss Moth, and in the front of that is a part of a strut from a D.H.4 and three 30-06 shells.

"On the top shelf there is a prop lock from a Nieuport 28 and a gear from a Gnome Rotary engine. An old piece of fabric from a Nieuport 28 is at the top left. Below this is a model of a Liberty engine that I made. The other pictures are of the football team of our school which went undefeated for two years, and a picture that I drew.

"The planes at the top of the picture are of a P-40 and a Stuka."

Jim says that he's built a swell gas job from plans in F.A. and it flew

versions. The light bomber carries 1,100 pounds of bombs and has two machine guns mounted on the rear turret while the reconnaissance job carries three guns, camera and radio equipment. This ship won a competition event which the Jap Army held for a new type bomber plane. Span of both machines is 49 feet 10 inches, length 36 feet 11 inches. Maximum speed 142 m.p.h. and range, five hours.

THE END

SLIPSTREAM

(Continued from page 28)

ters that a *submarine* was flying over her post! . . . American Airlines has taken its company insignia off its lump sugar—because passengers were taking these now-precious packets home for souvenirs. . . . Born during Buffalo's recent test blackout, the seven-pound daughter of the Jacob Lingerms was named Dawn Siren. . . . Straw parachute dummies at MacDill Field, Fla., have been fancily dressed up, painted, and tagged with such names as Hedy Lamarr, Lana Turner, etc. . . . Particularly disconcerting to the ear, the Tacoma, Wash., air raid sirens had nearly every dog in town howling to high heaven first night they were turned on.

Personal Patter

To *Capt. Aaron Abston*, of Tuscaloosa, Ala., a big salute! His A-A battery at Bataan had knocked off 13 Japs as early as January 17. . . . *Maj. Gen. Mason Patrick*, 79, first chief of our Air Corps, died in late January. With Billy Mitchell, he continually urged true recognition of air power. But Congress wouldn't hear of it. . . . Harold Gatty, globe-circling companion of *Wiley Post*, is now with our Air Force in the Netherlands Indies. . . . And the *Key Brothers*, former Mississippi endurance record holders, are in Far East Flying Fortress crews. . . . Appointment of *Laurence S. Kuter*, 36, as an Air Force General, is swell. Means we're getting some much-needed young blood. . . . Hey, *Charley Augustus*—when are you going to turn in that Nazi medal so it can be melted down for bullets?

Chatter

It now comes out that Japan practiced the Pearl Harbor attack on the Korean port of Fusan until every man had his job down pat. . . . RAF Marshal Trenchard advocated making Malaya a great air base as early as 1927—but the British topnotchers wouldn't listen. . . . For an unsubtle piece of fear advertising, see page 43 of your February 16 *Life*, wherein the Pullman Company warns readers against airline flying. . . . The CAB has granted American Export Airlines a temporary certificate for New York-Ireland service, and the company's new four-engined Sikorsky boats are slated to make the initial

Aero Book Reviews

Any volume described in this department may be obtained, at the price quoted, direct from the publisher named and at the address given. When writing for a book, kindly mention that you saw it reviewed in FLYING ACES.

Their Indomitable Spirit

The Voice of Fighting Russia, by Lucien Zacharoff, Alliance Book Corp., 212 Fifth Ave., New York City, \$3.00.

Author Lucien Zacharoff, whose articles are familiar to most readers of FLYING ACES, has just completed his third and latest book which deals with the Soviet war situation. "Zach," an expert on Soviet military affairs, has compiled and edited this book which is an account of every phase of the opening weeks of the war between the Soviet Union and Germany.

In an effort to preserve the spirit of the manuscript, whose pages are permeated with gunpowder smoke, "Zach" considered it his prime function to avoid all unnecessary editing. His job was not to polish and streamline the various contributions since the unaffected and straightforward reports of eyewitnesses and participants of the "greatest battle in history" are entitled to the reader's attention in whatever form their authors may choose to present them.

The preface of this ringing firsthand account of embattled Russia has been written by Hewlett Johnson, Dean of Canterbury. Contributors to this work are Premier Josef Stalin, Alexei Tolstoy, including outstanding war correspondents, poets and novelists. So if you're interested in what is going on in the Soviet theatre of war until the Nazi aggressors have been banished from the earth, let this book help you open up new avenues of understanding of a great people and their equally great leaders.

Exupery's Story

Flight to Arras, by Antoine de Saint-Exupery, Reynal & Hitchcock, 386 Fourth Ave., New York City, \$2.75.

Flight to Arras is the author's "recollection in tranquility" of those final shattering days of May, 1940, when, though defeat was certain, the flyers of France, pitifully few though they were, fought on.

The framework of Exupery's book is a single evening's action—a photographic sortie carried out at 33,000 feet in defiance of the German fighter planes, followed by an observation flight at 2,000 feet over German tank parks around burning Arras, within range of every German battery.

Here is a grim story of war flying as experienced from moment to moment by a pilot who is one of the greatest living writers—the frozen controls, jammed machine guns, the laconic scraps of conversation between the crew, the alternations of depression and exaltation, the silence and the total immobility within the sealed cockpit, and the moment of final jubilation when the mission has been accomplished and the crew are safe at their base again.

Tales of A Fighter Pilot

Falling Through Space, by Richard Hillary, Reynal & Hitchcock, 386 Fourth Ave., New York City, \$2.50.

In the critical months of August and September, 1940, a gallant little band of fighter pilots in their swift Spitfires and Hurricanes, stopped the German Luftwaffe over England. Richard Hillary was one of those gallant pilots to whom Winston Churchill paid his noblest tribute: "Never in the field of human conflict have so many owed so much to so few."

But Hillary is not merely an excellent fighter pilot. He can write like an angel as well as fly like one.

In *Falling Through Space* he has not only told his personal story but has given a vivid account of the impact of the war on the individual, particularly those modern knights whose sword is a plane.

Here are the supposedly soft young students of Oxford, the tough ones from Australia, the quiet, dogged men from the farm, factory, and office—all transformed by something bigger than themselves into a fellowship as noble as history has ever recorded. The story moves swiftly and the reader will find this book an invigorating tonic as well as a renewal of faith in the cause for which we are all fighting.

Saga of War Captives.

We prisoners of War, edited by Tracy Strong, Association Press, 347 Madison Ave., New York City, \$1.00.

In this little book, you will hear from sixteen prisoners. These officers and soldiers tell what they think, what they do, how they feel. In simple language they take you inside the gate and let you walk 'round and 'round the yard with them and 'round and 'round in their minds.

The censors have changed nothing in each prisoner's personal essay. The thoughts, hopes, philosophies of some of the four million prisoners of war are caught up by their comrades who express themselves best.

(Also see pages 69 and 76 for other reviews)

hops after April 1. . . . Grumman suggests that garage space, becoming idle due to auto and tire restrictions, be used for building warplane parts. . . . United Airlines topped a list of 12 transport outfits getting National Safety Council awards for 1941. . . . Neither TWA nor AA now require stewardess prospects to be registered nurses, since girls with this training are now needed in the national services. . . . The Chinese press has dubbed the AVG airmen "Flying Tigers." . . . Members of the Textile Workers' Union of America are certainly no pikers! They're out to buy \$25,000,000 worth of defense bonds—enough to buy an aircraft carrier! . . . The Billy Fiske Bob-Run Trophy, on display at Lake Placid, was named after the first Yank killed with the RAF. . . . North American B-25 medium bombers are now called "Mitchells" in honor of the great foresighted General who championed American air power in the days when our country's aviation was held back by kiwi brass hats.

New Stuff

Automatic filing and tabulating machines which are almost superhuman tell our Air Corps supply men the location of every engine, prop and part in the country at any minute they want to know. A teletype network feeds the info to Wright Field. . . . Excellent airport surfaces are now made economically from 80 percent common earth and 20 percent cement. It's good for 10 years. . . . They now say a deep red light is better than blue for blackouts. Enemy flyers can't see it as easily as the blue. THE END

WAR FLYERS

(Continued from page 38)

formation leader's plane, which had lost one engine. He finally returned to his base, where it was revealed that his machine had been hit more than 100 times. He landed, without crashing, despite damaged controls.

Capt. Fred T. Cummings

Cummings attempted to salvage a plane by rushing into a burning hangar in the Philippines. He taxied the ship outside at the same time Japanese dive-bombers spotted it and roared down to attack, wounding Captain Cummings in the head and arms.

Lieut. Louis M. Abernathy

While scouting off the East Coast in a North American B-25A, Lieutenant Abernathy spotted an enemy submarine a few hundred feet away and 10 degrees off the port side. He instructed the crew to take stations as he went into a shallow glide toward the U-boat.

Four 500-pound bombs were dropped, and then Abernathy pulled up in a steep bank to watch the effect. There were whirlpools in the water, then an oil slick, followed by

another oil slick. It was evident that the submarine had been sunk.

Other members of the crew were Second Lieut. Arthur J. Kush, copilot; Second Lieut. Thomas C. Day, navigator; Sgt. Joseph R. Tokar, radio-operator; Corp. John J. Duffy, engineer; and Pvt. Donald J. Raheer, bombardier. THE END

MODEL NEWS

(Continued from page 49)

District and the *Chicago Times*, as in the previous two years. Meet management personnel will be pretty much as it was last year, and it is expected that Steve Meuris will serve as Meet Manager and John Rappold as Contest Director. F. E. Kardes, Supervisor of Crafts, Chicago Park District, will have an important part in arrangements for this annual official competition.

August was decided upon as the best month after many communications had been received from aeromodelers throughout the country asking that a later date be selected than in previous years. Full cooperation of the National Exchange Club has been pledged and it is significant to note that Maurice Roddy, Aviation Editor of the *Chicago Times*, is also the chairman of the Exchange's Aviation Committee.

Headquarters for the contest in all probability will be the Hotel Sherman, as in the past, inasmuch as models of craft now being used in the European and Pacific war will be utilized by air spotter groups and home defense groups throughout the nation.

More information on the 1942 National Meet will be presented as it is made available and at the moment individuals and clubs are requested not to write National Headquarters for detailed rules or a schedule of events.

1942 Nominating Committee

The Executive Committee of the Academy has voted upon the 1942 Nominating Committee and announced that it is as follows: For District I, Gunnar Munnick, 101 Alstead Street, Quincy, Mass.; District II, E. N. Angus, 24 Ormond Avenue, Oaklyn, N. J.; District III, Richard Korda, 3223 E. 116th St., Cleveland, Ohio; District IV, Gordon Light, 1213 Belvedere, Baltimore, Md.; District V, W. T. Thomas, 105 N. Halifax, Daytona Beach, Fla.; District VI, R. H. Sommers, Stix, Baer & Fuller, St. Louis, Mo.; District VII, H. F. Auler, 1743-45 Fond du Lac Ave., Milwaukee, Wisc.; District VIII, Joan E. Clemens, 2112 Greenville Ave., Dallas, Texas; District IX, Jack Morales, 1118 O Street, Lincoln, Nebraska; District X, Barney Snyder, 7306 S. Vermont, Los Angeles, Calif.; District XI, Nevilles (Jim) Walker, 4404 N.E. 39th Ave., Portland, Ore.

Under "Article VIII—Nomination

and Election of Officers," the following sections apply:

Section 1. National officers shall be nominated by a nominating committee, composed of eleven leader members, one from each of the AMA districts in the United States. These eleven leader members shall be appointed by the AMA Executive Council sixty days prior to the date of the annual meeting.

Section 2. The nominating committee shall meet during the Annual National Model Airplane Contest to make nominations for national officers. In the eventuality that one or more AMA districts are not represented at the scheduled meeting of the nominating committee, the president shall be authorized to fill such vacancies from AMA leader members present who may reside in districts not represented.

Section 3. Nominations may be submitted in writing to the members of the nominating committee by any AMA leader member in good standing prior to the meeting of the committee. Committee members who, for some reason, find it impossible to attend the meeting of the nominations committee, are authorized to transmit the nominations which they have received to the place where the meeting is to be held and such nominations shall receive full consideration of the nominating committee.

Section 4. All national officers shall be elected by mail vote, ballots for which shall be forwarded to all leader members of the AMA in good standing not later than 15 days following the meeting of the nominations committee. The mail vote shall be handled by the AMA Headquarters Director, but the counting of the ballots shall be under the direct supervision of the general manager of the National Aeronautic Association.

All members of the Academy, both leader and associate, are privileged to express their thoughts concerning the eligible candidates to their district representative of the nominating committee. It has been agreed that the executive committee inform this nominating committee that it should not hesitate to make nominations from among its own membership.

This publication, insofar as possible, will carry communications regarding various candidates endorsed providing such communications are brief and to the point. Now is the time to start thinking about Academy officers for the 1942-43 season.

Roll Call

The Academy's National Defense Roll Call of active model airplane clubs in the United States has met with considerable initial success. A number of registrations have been filed with Washington Headquarters and the recent issues of the model airplane magazines carry the Roll Call form. It is to be expected that additional registrations will flow in from this source.

Manufacturers have evidenced a

desire to aid the AMA in compiling this very essential listing of all model aero clubs. Comet Model Airplane and Supply Co. has distributed several thousand copies of the Roll Call form throughout the country and a supply of these forms is available from the Washington office should any other concerns wish to aid in the survey.

If your club has not yet registered, you should take it upon yourself to make sure a form is filled out immediately and sent to Washington.

Every leader, every club, and every active modeler can help. Make sure that your group has been registered with Headquarters in the National Defense Roll Call and make certain that National Headquarters has your correct address, as well as the address of every member of your model aero group. Don't burden Headquarters with unnecessary correspondence; keep them informed of your activities, but be terse and, above all, typewrite all communications.

THE END

SKY-ROCKET

(Continued from page 55)

plans have been carefully adhered to.

By following common sense instructions carefully you shouldn't have any trouble in piloting your Super Sky-Rocket "B" through the hazardous portion of its life. The plane when completely assembled should balance at approximately 1/3 back of the leading edge. If it does not balance at this point, shift ignition weights in fuselage to obtain the correct balance. The model should be test-glided in tall grass "just in case." If all the incidence is built in as required, the ship should have a smooth flat glide with a slight right turn looking from the rear forward. Before attempting to fly the model check the thrust adjustments so that the motor is directed 3 degrees to the left from rear forward and 0 degrees horizontal thrust line, and a bit of right rudder.

By allowing the motor to run smooth and at a medium speed the model should be launched into the wind from shoulder height. With a motor run of twenty seconds the model should climb in a left circle

while under power and glide to the right on motor shut off. After continuous testing with gradual increase of power, the model should climb in a fast tight left corkscrew and roll out into a right floating glide on its motor cut. After testing the model consistently until you are sure that it will fly well you can then open the motor wide and start a hoofing downwind but fast. We sincerely advise an automobile or bicycle handy when flying the Super Sky-Rocket "B" on a 20 second engine run full opened. After a few flights with this engine run, you will not wonder why we added S-U-P-E-R to Sky-Rocket.

If you have any comments or questions please write the author, care of this magazine, enclosing a self-addressed envelope. THE END

NAVY SOLID

(Continued from page 50)

then painted aluminum. The face of the cowling is painted black as shown in the front view drawing on Plate 3. The ear-like air scoop is made from scrap wood and mounted as shown on the side of the cowling and on the bottom.

Before painting the model it is best to give the entire craft a couple coats of clear dope. Between each coat, a light once-over of smooth sanding is suggested. More than two coats of dope may be applied so as to build up a fine glossy surface before the actual colors are applied.

The wings are painted chrome yellow—which is a mixture of orange and yellow to get a well ripened orange effect. The stars in regulation colors are placed on both upper and lower surfaces of the wings. All moving surface hinge lines are marked out in india ink. Rudder and elevator is painted bright red. This is shown by the closely dotted effect on the tail surface drawings. To the fuselage itself is applied two coats of bright aluminum. The band around the body is red, outlined in white, and the numeral in black.

U. S. Navy at the tail end is lettered in black. Cowling is red. Portion of the top of the fuselage forward of the cockpit is painted black. Tires are black. THE END



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on page 74 of this issue

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PHINEAS

(Continued from page 35)

jalopy. Big black letters tantalized him. They said: The Great Herzog!

The Boonetown wonder was still marveling when he heard little noises in the wreckage. A Spad wing lifted and a citizen of Germany crawled clear and made funny sounds in his throat. He got close to Phineas and lifted his noggin—and then Phineas really got the surprise of his hectic life. His own face looked up at him! Freckles, rusty colored hair, and buck teeth. The nose was a little on the bias.

"I am dead and it is my spirit tryin' to get back into me," the Yank thought, his flesh crawling all over his bones. "But where would my spirit have got an auto? Wce gates, huh?"

"Ach! I must be looking in der mirror vunch *heim*? Or it ist my reflection in der pond? *Wast ist*?"

Phineas smelled a rodent. The great Herzog! The man of a thousand faces. Impersonating Phineas Pinkham at some Kraut stag party, that was what! The Kraut was still a trifle whacky. Major Garrity's problem reached inside his coat and withdrew a bottle. Time was of the essence and not a second was to be lost.

The astute Pinkham cranium started ideas rolling off his mental assembly line. There was a desperate chance to get the location of a Jerry drome and Phineas Pinkham was going to take it.

"Have some spirits of ammonia, pal," Phineas said.

"Der truck was on der wrong side of der road undt—Ach, mein head. Let me drink vunce."

"Drink twice, three times," Phineas said and tipped the bottle. When he had the dosage figured about right, he told the Kraut he had better get him to a house where he could lie down. And when he got the great Herzog into the woods, the Heinie sighed and went as limp as a Drachen.

LIEUT. PHINEAS PINKHAM got busy. He stripped off his flying togs and then yanked the apparel from Herzog. He cast aside all his identification—papers, dogtag, everything. He confiscated the great Herzog's calling cards and press clippings, along with the squarehead's clothes. It was a job getting Yank flying gear draped around the sleeping actor. There had to be no bottleneck in the Pinkham mental assembly line.

"Well, I will impersonate myself which has never been done before," Phineas grinned as he dragged the Heinie back to the frog pond. "He

should be out of circulation for at least seven hours"

Phineas pushed the sleeping impersonator into the frog pond so that only the head and shoulders were visible. Then he yanked the trunk off the car and got it open with some keys that had belonged to the German actor. Yes, there was another rust-colored wig in the supply of his trionics. Phineas pulled it over his own thatch of hair and had to snicker.

"Impersonatin' myself. Haw-w-w! What won't I try next?" Then sweat suddenly began to pour out of the Pinkham countenance. "The Coopers," he gulped. "They didn't blow up when— Oh-h-h, I could faint. Then it must be my lucky night and how can I lose? Well, I will wait for the Boche to come. I better put a set of thin false teeth over my own uppers, though. I got to look like I am imitating me."

Another load of Heinies came out of the woods ten minutes later. A Fokker D-7 pilot had spotted the collision and had reported it the moment he had found a place to set down.

"Das Pingham!" an *oberleutnant* howled. "*Handen hoch!*"

Phineas shook his head, reached into his pocket, and handed the officer a card which said: The Great Herzog. Then he showed the Krauts where Phineas Pinkham was reposing. He talked a mixture of Kraut and English.

"I am on der way to giff der greatest performance," Phineas said. "I must keep talking like der *leutnant* so I will not forget der rehearsal as it will be *mein* best role. *Der gros Herzog! Ach, undt du lieber yedt!* Here I am in der car *undt* along comes der real *Leutnant* Pingham. Ha, I bring him down mit der Mercedes? *Ein, zwei, drei* days der *frauleins* sew together der Yangkee suit. *Idt* ist hard to talk mit der false teeth. Der flyers who shoot der cannon is vhere I go. Loogk, from der Kaiser here is der letter saying I must entertain der brave flyers."

The *oberleutnant* read the letter and held out his hand. "*Gut!*" he said. "I am proud to meet der *gros* Herzog. Once in Munich I see you act der Charlie Chaplin *undt* das Lloyd George. I laughed mit stitches. You will be more famous as ever. You bring down der upstart mit der Mercedes mit eight cylinders."

"I am sorry to haff to speak der English, *Herr oberleutnant,*" Phineas tossed out. "But I liff der parts I haff to play. While der disguise ist on, I am der bummer I impersonate. In an hour or two I vill act for der brafe men who fly der planes that vill win *der tag*. Hoch der Kaiser!"

The squareheads dragged the mulled character out of the frog pond and Phineas' entire fuselage oozed fretting moisture lest the great Herzog lose his nose or shed his false uppers. But the Prussian patsy was too relaxed to fall apart and he was dumped into the Heinie jalopy and securely tied. The Potsdam patriots had snagged Phineas three or four

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times before and had let him get loose from their clutches and they were taking no more chances with him. One Kraut suggested that they take even less chances and wrap the prisoner up in a big sheet of tarpaulin and then put more rope around him.

"Ja. This time we should make sure-of der Yankee," Phineas said. "Ach, it ist too bad ve are at var, nein? What an act ve could haff! *Der gros Herzog undt* der flying magician on der same act. We would pack der halls from one side of der world to the other. I vill talk to der *Amerikanischer* in der prison camp."

"We vill shoot him," the *oberleutnant* said. "I bedt das *verdamt* oopstart ist come ofer to bomb der von Blintz' airdrome where you going *Herr Herzog!* Hah, ve fooled der Spads. Ve haff der young gentleman flying Blintz' old Fokker D-7 undt all der time von Blintz ist leader of der Fokker 12's."

"*Der Amerikanischer* are so stupid," Phineas said and laughed with the squareheads. "Now, I save der vords for idt ist nodt easy to talk vith der make-up on, *mein freunds*. Ooops, der vig almost comes off when I laugh, too. Three hours I take to put on der ugly face of der Yangkee."

"Oh, so many times, *Herr Herzog*, haff I laugh when I think of you doin' Charlie Chaplin," the *oberleutnant* iterated. "Maybe you vill do it for us at Metz sometime, *hein?*"

"It ist for der Vaterland," Phineas said. "Nothing ist too much for one's country, *mein kamerad*. Dutchnand oober alls. Gott strafe England! There is no God but Al—er—*Hoch der Kaiser!*"

THE PILOTS of Hauptmann von Blintz' staffel, flying the new cannon crates, greeted the great Herzog with all the fanfare and schnapps that were at their command. Two little Dutchies packed the trunk full of props up to a room in the big Alsatian farmhouse and gave the eminent Kraut Thespians an hour of privacy, for he was temperamental like the majority of great artists. At this point Phineas was not kidding.

Phineas proceeded to make the world safer for Lieutenant Pinkham, and he put a blond, close-cropped wig over his own real locks. Then he put the rust-colored toupee back in place. Now, he thought, let some nosey, suspicious Kraut yank at his wig.

At the Heinie mess, a playful Prussian did just what Phineas had anticipated. He lifted the Pinkham wig and looked underneath while his comrades howled with glee and became even more unwary. Heinies arrived from a Fokker D-7 outfit and assured the squadron commander that the Yankee ace was ready for shipment to a stockade. First, one said, Phineas was to be paraded through the streets of three of Germany's largest cities.

The Boonetown wonder almost slipped up halfway through the repast. Habit nearly threw him by

dropping an ugly-looking beetle in von Blintz' soup. The *Hauptmann* was at first indignant. His stomach heaved a little and he gave the little Kraut mess monkey a buffet in the chops that sent the flunkey backed-along all the way to the kitchen.

"Haw-w-w-w-w!" Phineas enthused and plucked the vermin out of the *Hauptmann's* mess of potage. "It is swell catin'. Haw-w-w-w-w! Licorice. I—er—Phineas looked for the nearest Luger and mentally measured the distance to a window.

"Ha-ha-a-a-a-a!" chuckled von Blintz. "Idt ist positively amazing, *hein?* Such ein imitation. Vunce I heard der bummer laugh. I was just der *Herr Leutnant* then undt we captured das Pingham. Drink to greatest actor in all der world, *mein Herr*. To der *gros Herzog!* Long may he lif undt—"

"You ain't kiddin', boys, I fooled you, didn't I?" Phineas grinned and his knees changed from aspic to good solid bone and sinew again. Outside, a power plant began to set up a fuss.

"*Mein plane*," von Blintz said. "Ach, sweet it sounds, *hein?*"

"Like a letter from home," Phineas said. "I never heard nothin' so sweet."

"Pretty soon yedt, idt ist time to put on der entertainment, *hein?*" von Blintz asked. "First you gif us der ugly Yangkee ace, then Charlie Chaplin, undt then maybe Wilson? Ve make der stage ofer at der end of der room. Ach, no more schnapps. *Donnervetter!*"

They had consumed plenty, Phineas thought. There was no telling how much they had imbibed before his arrival. Two hours had gone by. The great Herzog had at least six more in which to loll in the arms of Morpheus, Phineas hoped. He had to get out there to a Fokker 12. He took a gander at a possible guinea pig—*Hauptmann* von Blintz.

"After Charlie Chaplin," Phineas said, "I vill do von Blintz, ace of aces."

"Ja? I bedt you can't fool nobody," the Kraut said thickly. "I bedt you a hundred marks you can't fool der groundmen. You walk out to der Fokker undt try undt get in der plane yedt. Ho, ho! At last der *gros Herzog* vill be stumped."

Blintz did not have too much chin. A little padding inside his upper lips ought to do the trick, the Boonetown wonder thought. Here he was, a fly who had found the molasses but was stuck in it. Blintz had a big nose with a hump on the bridge. His eyes were as blue as a jilted bride. His eyebrows were blond and so was his mustache. He was as bald as a China egg.

Phineas hoped the Heinies would not hear him laughing inside. The Kraut had swallowed the bait.

"I vill go upstairs vith der *Hauptmann*," Phineas said. "I must use him for der model. One of us vill come downstairs and I hope I vin der hundred marks. There is a *fraulein* in—" He had said enough. "Let us go, *Herr*

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Aero Book Reviews

Any volume described in this department may be obtained, at the price quoted, direct from the publisher named and at the address given. When writing for a book kindly mention that you saw it reviewed in FLYING ACES.

Flying South

Wings Around South America, by Alice Dalgliesh, Charles Scribner's Sons, 597 Fourth Ave., New York City, \$2.50.

When the author and her illustrator, Katherine Milhous, decided to go to South America in search of material for a juvenile history of the ten republics, they went by plane. This method of travel made it possible for them to spend much more time in villages and cities and thereby obtain a better view of the country as a whole.

While most similar travel books are written from notes and illustrated from rough sketches, Misses Dalgliesh and Milhous did their work on the spot, and thus none of the local color is lost in either description or art.

Highly recommended for younger readers who have the spirit of travel and adventure in their blood.

How Wars Are Fought

Military Science Today, by Lieut.-Col. Donald Portway, Oxford University Press, 114 Fifth Ave., New York City, \$2.50.

Originally published in England, this book deals with some of the most interesting aspects of military tactics, and explains why some campaigns of this present war were successful and why others were not. There is a wealth of material here regarding all aspects of military warfare, and although it goes into the subject thoroughly there are not too many technicalities for the average reader.

Wings of Fiction

Pilot of the High Andes, by Frederic Nelson Litten, Dodd, Mead & Co., 432 Fourth Ave., New York City, \$2.00.

For older boys, this fiction book from beginning to end is chock-full of adventure and excitement. It is aeronautically correct in all instances, because Author Litten is a pilot of wide experiences and knows the flying game probably as well as anyone.

The plot is laid in the Chilean Andes—both under and above. Joe Tyson is the main character, and he not only has dramatic air experiences but also has stirring adventures far underground in a copper mine, where he is working

with blind miners in the ancient Carrizal mines.

For readability and enjoyment, this book has no peer in its class.

A Yank in China

Hankow Return, by C. S. Archer, Houghton Mifflin Co., 2 Park St., Boston, Mass., \$2.50.

This fiction book was written and published before America's entrance into the war, but now it assumes more of a place than previously.

Hankow Return is the first novel about an airman in China, and it gives a really extraordinary picture of our Chinese ally and the difficulties being encountered through fighting the Japanese invader tooth and nail. There is no rah-rah ballyhoo here, but straight, readable fiction written with an eye to fact and actualities.

All of the behind-the-scenes difficulties—dud ammunition, defective armament, and foreign-inspired official hampering—are explained thoroughly. Previously, China was the victim of racketeers, as far as arms and armament were concerned, and this picture is clearly painted.

Author Archer is well qualified to write such a book, for he is an airman with the Royal Air Force and spent much time in China. His battle tactics and air scenes are absorbing and accurate to the most minute details.

For War Students

Modern Battle, by Maj. Paul W. Thompson, W. W. Norton Publishing Co., 70 Fifth Ave., New York City, \$2.75.

According to the jacket, "There is probably no nation in the world whose citizens are as uninformed as ours about military and naval affairs and related problems of national defense." If this is so, the Norton Publishing Co. is certainly doing its utmost to rectify the situation, for they have published more modern military books than any other company—excellent books, too.

This volume, *Modern Battle*, is tops for the budding military strategist. Some of the actions explained in detail are: "What Happened at Sedan," "Break-Through on the Somme," "Arras to Dunkirk," "Capture of the Eben-Emael," "Crossing the Meuse," etc. It's all great stuff for readers interested in tactics.

Modern Battle is based on reliable source material and is written in narrative form and in simple and non-technical language. For a well-rounded war library, add this book to your library shelf containing *Military Science Today* and Al Williams' *Airpower*.

Hopman. I, der great Herzog, never take a dare. Nefer haff I failed to star as anybody but meinsel! You are goin' to be surprised."

Phineas went upstairs and told von Blintz to sit in a corner while he delved into his trunk to get out the makeup. A blonde mustache and a tight-fitting cap to go over the head. Herzog had a complete wardrobe. Phineas really looked as hairless as a banana. Even von Blintz sucked in his breath. The Boonetown miracle man crammed some wadding between his lower teeth and his lower lip. He put wax on the bridge of his nose and moulded it into shape. He spread grease paint over his countenance to wash away the freckles. He shaved off most of his eyebrows and put a mole on his cheek. After gluing on the mustache, he trimmed and kneaded it into proper shape.

"Now giff me your uniform, *mein freund*," Phineas said. "Der helmet and goggles. Der mechanics are used to seeing der great ace coming out with der flying helmet in his hand, *hein?*"

"Gott!" von Blintz said. "Ach, vhat a joke! I bet you Fritz vill throw der fit vhen I come to der door undt shout for him to hold der spy, *hein?* Ach, you are a master, *Herr Herzog*. Better meinsel I don't look vhen I see in der mirror. Here, I giff you *mein* uniform. Ho, ho! Nefer have I had so much fun since der days mit Heidelberg!"

LIEUT. PHINEAS PINKHAM, alias the great Herzog, alias *Hauptmann* von Blintz, donned the uniform of the leader of the cannon crates and looked at himself in the mirror. "Cripes!" Phineas yipped. I mean *Gott!* Nefer haff I been better as an artist, *mein freund*. Vell, I am going downstairs undt valk right out to der Fokker. Is *mein* plane ready, Fritz? *Mach schnell, dumpkof! Kon-takt!*"

"My, my," von Blintz chuckled. "It is ready undt varming up. Somet'ing it is a liddle wrong mit der engine and der bummers vill vork all night to find out which ist, *Herr Herzog*. Shake der hand for luck, *ja?*"

It was the last thing *Hauptmann* von Blintz remembered for fifteen minutes, his holding out his hand. Phineas hung one on the Kraut and caught him before he dropped so that no sound of a forced landing could reach the enemy below.

"Well, here goes somethin'," Phineas said. "My greatest starrin' role. If I flop, there vill be some swell reviews in the mornin' papers in Berlin. I wish I had another drink of schnapps. Stiff upper lip, white tie for dinner, an'—carry on, old chap. Stout feller, what? You are nuts!"

Phineas plunked downstairs. He adjusted a monocle before he got to the Jerry mess. He stiffened like a ramrod and yelped, "Achtung!"

"Gott!"

"Himmel!"

"Ach du lieber! I bet you idt ist von Blintz."

(Also see pages 69 and 71 for other reviews)

"In ten minutes, the real *Hauptmann* will come down," Phineas said. "Now I go out undt make der hundred marks, *kamerads*. Haw-w-w-w-w! This time I admit I ain't who I am supposed to be. What a day." He walked out of the Kraut headquarters and to the tarmac. A little Jerry non-com dropped a coil of wire and snapped to salute.

The miracle man from Boonetown strode to the Fokker 12 and acknowledged the salute of his mechanic. He began pulling on his helmet. The mech threw a stream of gibberish at him and smiled, patting the Fokker fuselage with the palm of his greasy hand.

"*Gut!*" Phineas said, "*Kontakt.*" The little limberger fiend apparently had tuned the Mercedes engine up right and was telling him so. He guessed Fritz thought the great von Blintz was going to do a turn or two over the field to make sure of a perfect bus for the morning fuss.

Phineas got into the Fokker pit and felt for the controls. The new cannon carrier was the same as all Fokker D-7's, as far as the engine went. The fuselage had been stretched out a little to make room for the kick-back of the new Kraut cannon. The Mercedes roared and Phineas jammed the throttle up the brass and started away.

"Oh, man!" Phineas yowled when his wheels spurned terra firma. "My greatest role. I hope it don't git burned before I reach th' lines. Oof widder's sons!"

In the Jerry mess, the Fokker pilots went into no end of confusion.

"Herzog is taking der Fokker! He ist not a flyer. Something it ist wrong! *Hauptmann! Hauptmann* von Blintz! You hear us? *Hein? Ach!*"

A Kraut ran up to the leader's quarters, found von Blintz just beginning to move his little finger. The pilot threw a pitcher of water over him and the *Hauptmann* sputtered and opened his eyes wide.

"*Wast ist?* The bumper hit me, Rudy! Where is der plane, *hein?* I never gave der orders!" von Blintz roared. I—*nein*, don't let me say it, Rudy. *Nein!* It can't be, yet—*Pingham!* All der time he was impersonating himself. He ist der *deffil!* Send out der alarm. Head off der *verdamm* spy! Call all—*Ach*, I am so sick!"

ON THE DROME of the Ninth Pursuit Squadron, Major Garrity and his gang had given up. It was nine-thirty and Phineas had been out four and a half hours.

Garrity, Howell, and Bump Gillis kept pacing up and down. The Old Man suddenly stopped and yelped: "I hear a Jerry plane. Duck!"

"It ain't no Gotha," Howell said. "He's flying high, too. Maybe it's Phineas, huh?"

The droning sound came closer. The night flyer came down to about a thousand feet and dropped a boot. It caromed off the roof of the farmhouse and caught Glad Tidings Goomer with a pretty billiard shot.

The message in the boot cast gloom over the tarmac after the mess attendant was revived. It said:

To the Ninth Pursuit Squadron:
I, von Blintz, shot down
Leutnant Pinkham late today.
We will give him a hero's funeral.
We are so sorry. Ha ha.
Hauptmann von Blintz."

"That's that," Garrity said. "In the morning we will have ceremonies. Study the Bible tonight, Captain."

An hour after dawn Casey's slaves were setting up a wooden cross on a knoll a quarter of a mile from the tarmac. Overhead, the planes droned and dipped their wings in salute. Captain Howell had sat up half the night thinking up an appropriate eulogy and send-off. Bump Gillis sat under a tree and dabbed his eyes. It was touching, to say the least.

A motorcycle roared up to the consecrated area, a brass hat in the side-car. The Major wanted to know who was being buried. Major Garrity found voice with difficulty and told him.

"Somethin's screwy, Garrity," the Major said. "A new Fokker, one of those buses packing a cannon, landed outside Vaubecourt last night and the doughs grabbed the Heinie and locked him up. It was von Blintz wearin' only one boot—or so everybody thought until they brought the guy some chow. Instead of it being a Kraut in the klink, it was a flyer named Pinkham. He had a false mustache in his lap and took off the top of his head while we watched him. He sure gave you guys a merry-go-round."

"Wha-a-at? You mean it was that gorilla in that bus last night?"

"An' me sittin' up all night thinkin' of prayers!" Howell said. "We'll knock his brains out. We'll—"

"You can't. The guy brought us in a Fokker 12, and he has the location of the Heinie drome where the others are," the Major said. "Boy, I got to laugh. This is rich! Put up a cross, too, huh? How many of you cried? Ha! Ha-a-a-a-a-a!"

"I knew he'd try an' git me," Glad Tidings Goomer said. "That was some shot with the boot. I'd like a transfer, Major, as . . ."

"Well, come on," the C.O. said. "Pull up the cross and we'll save it. He can't keep on goin' like this forever. I got to find out how he pinched that crate before I bust him one—I mean, before I bust."

"He impersonated himself," the brass hat from Vaubecourt said.

"Listen, I can stand so much kiddin', Major," the Old Man growled. "But there's a limit."

"All right, wait until he tells you. I wouldn't be surprised if you were takin' orders from him in a couple of weeks."

Phineas arrived at the drome with two French generals, one American general, and a British red tab. He called the American general "Eddie" as he stepped out of the big car.

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"I am reportin' back for duty," Phineas said to the Old Man. "What kind of a funeral was it? Haw-w-w! Eddie, this is my superior—and don't laugh. His mother dropped him on his face when he was two years old. Hi ya, Bump!"

The C.O. swelled up and got the color of violet, but he had to take it.

"Three times I have had a funeral," Phineas snickered. "I am their favorite air corpse. Haw-w-w-w-w-w! Would you believe it, von Blintz posed for me so I could imitate him? I just walked to th' Fokker and told th' Kraut to turn the prop. It was nothin', really. But I'm savin' medals."

The Old Man got the story piece-meal. He got the last instalment three hours after the U.S. bombers had blown the 12's off the real estate of Alsace-Lorraine.

Pilots heard Major Garrity conversing with three brass hats from the Wing a few hours later.

"I haven't had much time off in this war," the C.O. said wearily. "Got to have at least two weeks. I'm goin' to the south of France where a swish of a trout's tail makes a noise like thunder, it's so still. I got to think this thing out all by myself. A brain is a delicate mechanism, gentlemen. Nerves are hitched to it, you know, like control wires on a Spad. When they snap, you're Napoleon or Louis the Fifteenth—or even a guy like Phineas. No war is worth it. The chimes sound nice today, don't they? I wonder why it ain't Sunday."

A colonel looked at another colonel. He leaned against him. "No bells ringing, Clarence. We'd better see what we can do for the Major, what?"

THE END

FOG FLYING

(Continued from page 29)

landed, "I suppose Ted will yell his head off that we never showed up."

"Maybe they couldn't get the darn thing working," I tried to soothe him. "While they're pumping that gas in, let's eat something and find out where we sleep."

"Like hell! If I sleep I'll do it in my own bed."

So an hour later we were again following the dark streak of the Hudson River into New York where, incidentally, the fog had not arrived. When we landed we were told that Ted had been phoning every half hour, that he was due to call again any minute.

"You talk to him," said Billings. "I'm disgusted with the mess."

I knew I hadn't missed my destination, but telling Ted the truth would make his friend feel pretty badly about his invention. There was a chance, of course, that something had gone wrong with the mechanical end of the light system, in which case another try-out would be arranged.

When Ted called he started in by lauding the power of the light; he told me he knew we had found them

and had seen the light by the way I had continued to circle overhead. When he was all spent with his side I told him that I was not circling but was flying squares and that I had never seen any trace of a fog-piercing light.

I slowly put the receiver back on the hook, and I'm still able to see what I saw then in my mind's eye: a huge pile of dollar bills being blown all over the airport by a whipping wind, and Ted Billings, and yours truly standing there watching—with our hands in our pockets!

THE END

ITALIAN PLANES

(Continued from page 10)

- horse power 9-cylinder air-cooled radial.
- M.F. 10—C.M.A.S.A. two-place catapult reconnaissance-fighter flying boat. Fiat A30RA 600 horse power liquid-cooled V-12.
- C. 99—MACCHI five-place high-wing reconnaissance monoplane flying boat. Two Isotta Fraschini Asso XIRC15 880 horse power liquid-cooled V-12's.
- Ro. 44—MERIDIONALI single-seat catapult fighter biplane on single pontoon, equipped with tip floats. Piaggio PXR 700 horse power 9-cylinder air-cooled radial.
- Ro. 43—MERIDIONALI two-place catapult reconnaissance-fighter biplane. Piaggio PXR 700 horse power 9-cylinder air-cooled radial.

COMMERCIAL TRANSPORTS
ITALIAN AIR FORCE policy includes only two transport types for service with the military forces in peacetime. Under a wartime emergency, however, the following listed civil aircraft automatically become available for military transport and patrol-reconnaissance duties.

- Z. 506—CANT three-crew 16-passenger trimotor low-wing monoplane on twin pontoons. Three Alfa Romeo 126RC34 750 horse power 9-cylinder air-cooled radials.
- G. 18V—FIAT three-crew 18-passenger low-wing monoplane. Two Fiat A80RC41 1100 horse power, 18-cylinder twin-row air-cooled radials.
- G. 12—FIAT four-crew 14-passenger trimotor monoplane. Three Fiat A74RC42 770 horse power 14-cylinder air-cooled twin-row radials.
- C. 94—MACCHI three-crew 12-passenger amphibian monoplane. Two Wright Cyclone SGR-1820F3 770 horse power air-cooled radials.
- C. 94—MACCHI. Same as C. 94 amphibian, with landing wheels eliminated.
- C. 100—MACCHI 26-passenger trimotor flying boat monoplane. Three Alfa Romeo 126RC10 800 horse power 9-cylinder air-cooled radials.
- Sm. 75 — SAVOIA-MARCHETTI three-crew 24-passenger trimotor low-wing monoplane. Three Alfa Romeo 126RC34 750 horse power

9-cylinder air-cooled radials.
Sm. 83 — SAVOIA-MARCHETTI
 three-crew 24-passenger trimotor
 low-wing monoplane. Three Alfa
 Romeo 126RC34 750 horse power
 9-cylinder air-cooled radials.
SM. 87 — SAVOIA-MARCHETTI
 three-crew 24-passenger trimotor
 low-wing monoplane on twin pon-
 toons. Three Alfa Romeo 135RC34
 1,400 horse power 18-cylinder twin-
 row air-cooled radials. **THE END**

PLANE PRODUCTION

(Continued from page 5)

and upward of 2,000,000, including the motor car people, to produce 125,000 planes next year. It means an output jumping from \$1,500,000,000 last year to nearly \$4,000,000,000 this year and nearly \$9,000,000,000 next year. I am not divulging any military secrets here, because none can use my remarks to break down the number of planes by each type and because more of everything is required to make a four-engine bomber than a two-engine bomber, a pursuit, or a trainer. All vary in weight and the number of man hours required to build them.

I should like Hitler's hordes and the self-styled sons of Heaven to know this. We are underway toward a tenfold increase in our output of four-engine bombers, by far the best of their type in the world. They are for long-range, high-altitude offensive warfare and are the every symbols of destruction.

There is no precedent for us in gearing to this all-out production. Think of what it demands. Taking all types, 185,000 planes in two years means an average of more than three engines per plane and a total of approximately 555,000 engines. Take the spark plug as one little item alone. It means spark plugs by the millions, possibly 50,000,000. And those 50,000,000 spark plugs must not be wrong, or the crew and a flying machine worth up to \$330,000

will fail and be on the casualty list.

I have outlined the present situation in our part of the war program. In closing, I want to leave a thought concerning the future.

While intent on winning this war, we are building the world's most comprehensive aviation plant and are training millions of young men in this field. We should come out of the war with from 1,000,000 to 2,000,000 pilots and millions of trained mechanics and other technicians and specialists. We will have airports throughout the Western Hemisphere ready for peacetime operations. Our aircraft engineering shall have made epochal progress. We will be able to produce aircraft vastly more economical to operate, faster, and in all ways more efficient. We can ply the airways of the whole world with passenger, mail, and cargo planes. New York and London will be less than 10 hours apart. But will we be able to preserve all this—or most of it—for the airways of a world at peace? Will we maintain our aviation plant as a safeguard against future aggressors? Or will we conform to past history and allow our defense industries to sink into complete inadequacy through economic attrition as time dims the horrors of the present conflict? That, I believe, is something we must be thinking about while winning this war. **THE END**

FIGHTER FUTURE

(Continued from page 13)

advanced XFM-1A model.

So, we might gather that—for the present, at least—multi-place fighters are not to have a place found for them in the Air Forces. However, experiments are still being conducted. In this regard, Major Hoyt Vandenburg recently stated the following:

"Fighter planes of tomorrow, patterned greatly around the basic idea of the Bell multi-place fighter, are on the boards of our engineers right

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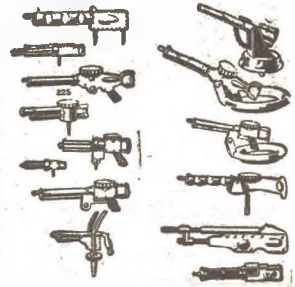
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now. They may not necessarily incorporate all of the YFM-1's features, but their general design will be toward heavier armament—possibly even three or four of the 37mm. cannon and six or eight .50 caliber guns—and they will carry a crew of from three to five men, creating virtually impregnable fortresses of themselves and yet maintaining considerable maneuverability and striking prowess which the big bombers lack."

Speed, range, and maneuverability are necessary to make a fighter a first-line machine. But fire-power is the most important necessity. A plane without sufficient guns, no matter how fast, how maneuverable, or how great its range, is still not to be ranked as tops. With this fact in mind, aeronautical engineers have been designing ships around guns, instead of building a machine and stressing it for armament. Thus, we see that the entire concept of designing has been changed. While it is true that more guns have been added to planes in some isolated instances, this mere installation problem is by no means the answer.

SINCE the Law of Diminishing Returns holds true with aviation as well as with farming or any other field of endeavour, one can understand that in the not too distant future single-seat or two-seat fighters will be so loaded down with guns that one or more of the other factors leading to military prowess will suffer. Speed will necessarily become lower because of added weight of guns and ammunition, range will likewise be cut down, and maneuverability will be less because of decentralized weight.

The obvious solution to counteract these drawbacks is to make the planes larger. But there again the entire purpose is being defeated, for maneuverability, which is so essential to the modern school of warfare, will consequently suffer to a marked degree. And speed, by the same measure, will be decreased.

What, then, is the answer? Since fire-power is so tremendously important, where can engineering take us, if performance and other factors suffer because of this increase in armament?

The only logical answer, as this reporter sees it, is to change the entire theory of fighter aviation. Taking for granted that fighter aviation will not be eliminated entirely—as it well might in years to come, as bombers become faster and more invulnerable—its future will in all probability lie in multi-place types. The only reason for a fighter is to carry guns. And since they are for

this purpose—and since there is a limit to armament on present models and present design types—fighters of the future will undoubtedly be large planes, possibly even greater in size than the Boeing B-17, with gun turrets at all vantage points.

Aerial fighting, in such a case, would be more of a battle of fire-power than before. Ships, instead of maneuvering and fighting for position, would fly level and battle with sheer weight of broadside fire. The most heavily protected and heavily armed would be the victor, with the one with the least armor plating and smaller guns being the vanquished. And, too, the important men will be the gunners and the pilot will be just an aerial chauffeur.

Many of you readers will not agree with the contentions set forth above, but remember that aerial warfare is still in its infancy and has just begun to evolve as a military arm worthy of more than just mention. Also remember that destruction, and not glory, is the main theme of warfare. A broadside from a battery of heavy caliber guns would be much more effective than concentrated fire from smaller weapons could ever be. And so it is not unreasonable to believe that aerial battles of the future will be more of a "naval" fire-power proposition than maneuverability and speed as they are now. **THE END**

LIGHT PLANES

(Continued from page 37)

and enlisted men, 90 percent of whom are graduates of recent CAA pilot training course. The instruction period lasts about six weeks and includes 50 hours of flight training and 25 hours of ground study. If the first experimental training succeeds, some of the pilot-mechanics may be detailed as instructors at other Field Artillery schools.

Private Planes for Army and Navy.

—A new call has gone out among private plane owners to sell their ships to the Army and Navy. Last Fall, most of the twin-engine machines were bought up and the present purchase involves mainly the larger single-engine jobs. In some cases planes have been offered as gifts. Selections, however, will be based on types wanted rather than those offered.

Airworthiness Certificates Extended.—Because of the heavy load of work placed on CAA inspectors, it would be impossible to endorse all the outstanding airplane airworthiness certificates before their regular date of expiration. Those which expire during the first half of 1942, therefore, are being extended by six months beyond their expiration dates, except for scheduled air carrier planes. **THE END**

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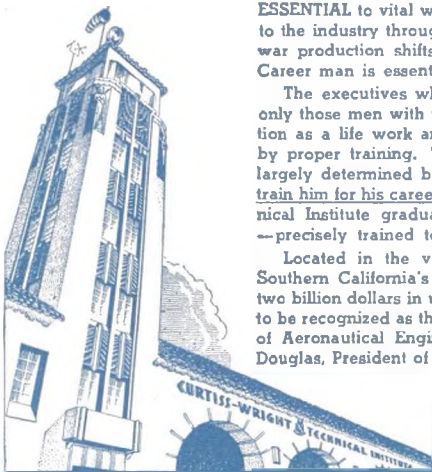
this school for his own son's training, which pointedly indicates the high standing Curtiss-Wright Tec has attained in the aircraft industry since its establishment in 1929.

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