

# MODEL AIRPLANE NEWS

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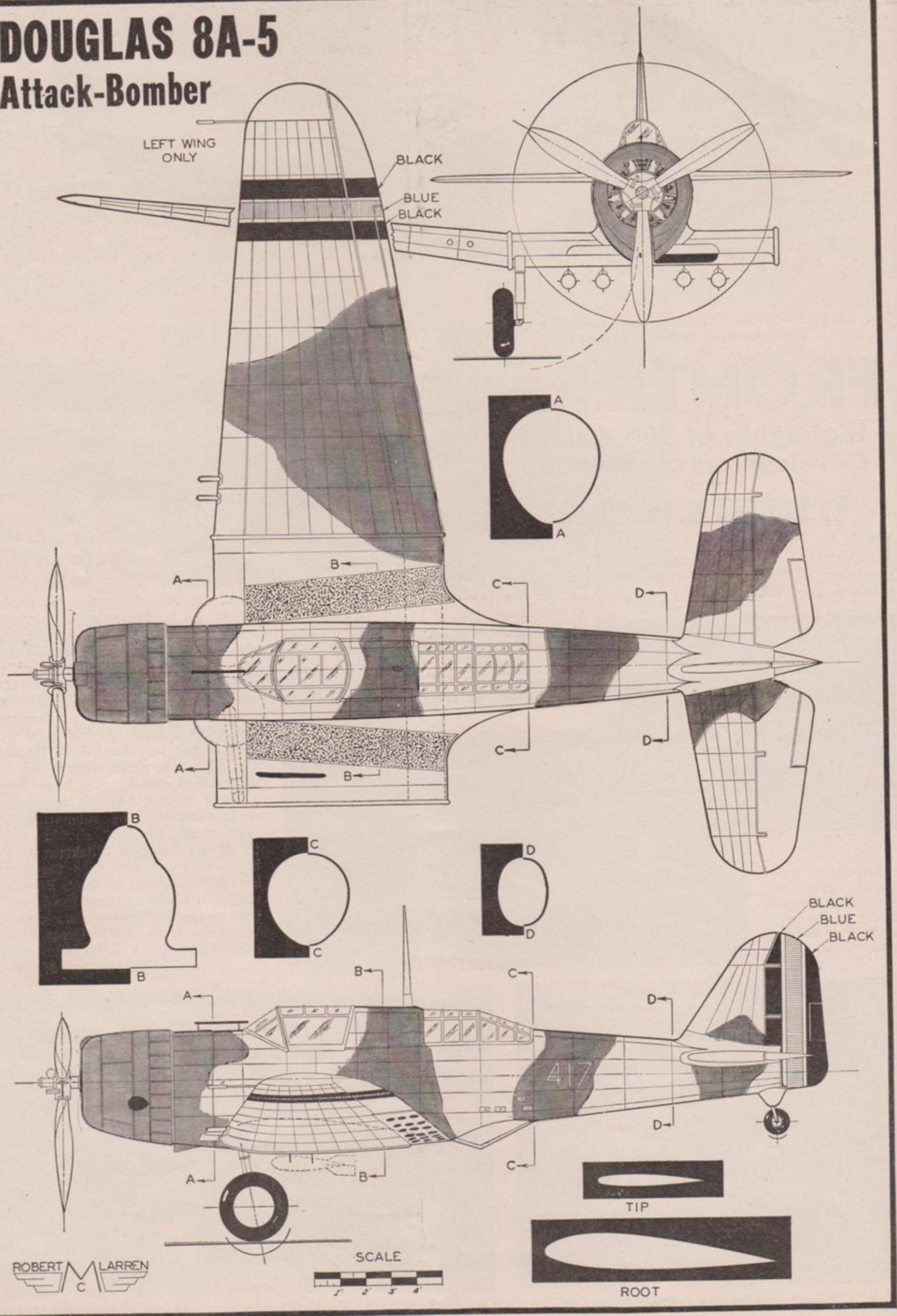
**Douglas 8A-5  
Norwegian Attack-Bomber**





# DOUGLAS 8A-5

## Attack-Bomber





# Norwegian Nemesis

THE PLANE  
ON THE COVER

By **ROBERT McLARREN**



The 1200 hp. Douglas 8A-5 attack-bomber flying under Norwegian colors

NATIONS may rise and crumble but their peoples never die. Five times Norway has been crushed and beaten. Four times it has risen again. And today, its free people in Britain and their subjugated brothers in Scandinavia are continuing the struggle for united existence, begun in the ninth century under Harald Haarfagr when he united the seven tribes of Teutonia into a single group. Neutral in the last great World War, Norway nevertheless began the organization and development of an air force as far back as 1915 when the Navy Aircraft Factory at Horten was constructed. Later the Army Aeroplane Factory was built; and since that time the Norwegian Air Force has consisted mostly of native-designed and constructed planes.

In 1938, when the European political scene became a bedlam of threats, broken promises and treachery, the Ministry of Defence began the serious work of increasing the Norwegian Air Force. Price, unfortunately, was the prime consideration in the purchase of imported flying machines and as a result a great influx of German-built fighting and bombing planes resulted.

The famed Junkers Ju. 52 and Ju. 86 trimotor and twin-motored bombers respectively were bought, as well as a number of British Hawker "Audex" and "Hornet" reconnaissance and fighter craft. A small number of Vultee V-11 Attack planes and Northrop 2E ships was also purchased.

The Norwegian Air Force, both military and naval divisions, was utterly annihilated two years ago in the German blitzkrieg on Narvik. The escape of Chief Staff Officer Captain Easen Boe, whose nephew is now an engineer with Vultee Aircraft in Downey, California, and half-a-hundred of his men and machines during the bloody battle is one of the miracles in modern warfare. Taking flight in a squadron of antiquated Fokker seaplanes, the men took off from the demolished Karljohansvern Seaplane Station at Horten, only after it was obvious that fur-

ther aerial action against the smashing, attacking Nazi air machine was foolhardy.

Now, more than a year later, a newer and greater Norwegian Air Force is set to take wing against the conquerors of their landsmen; purchases of King Haakon VII's government, even after the collapse of the Norwegian nation, are being met according to original terms. With these ships the new Norwegian Air Force is flying against Hitler from bases within the British Isles and an admirable string of victories has been registered to the newly-promoted Colonel Boe and his men.

Two types of ships are being received near London by the provisional Norwegian Government Air Arm, the Northrop seaplane attack-bomber and the famed Douglas single-engine monoplane Model 8. Acceptance and tests are being conducted personally by Commander Kristian Ostby, former chief test pilot of the Norwegian Naval Seaplane Factory and now head of the Norwegian Aviation Mission in this country. Also being delivered to the Norwegian forces in England, via Canada and Newfoundland, are the heavily-armed, fast and maneuverable Douglas 8A-5 attack-bombers, our Plane on the Cover for this month.

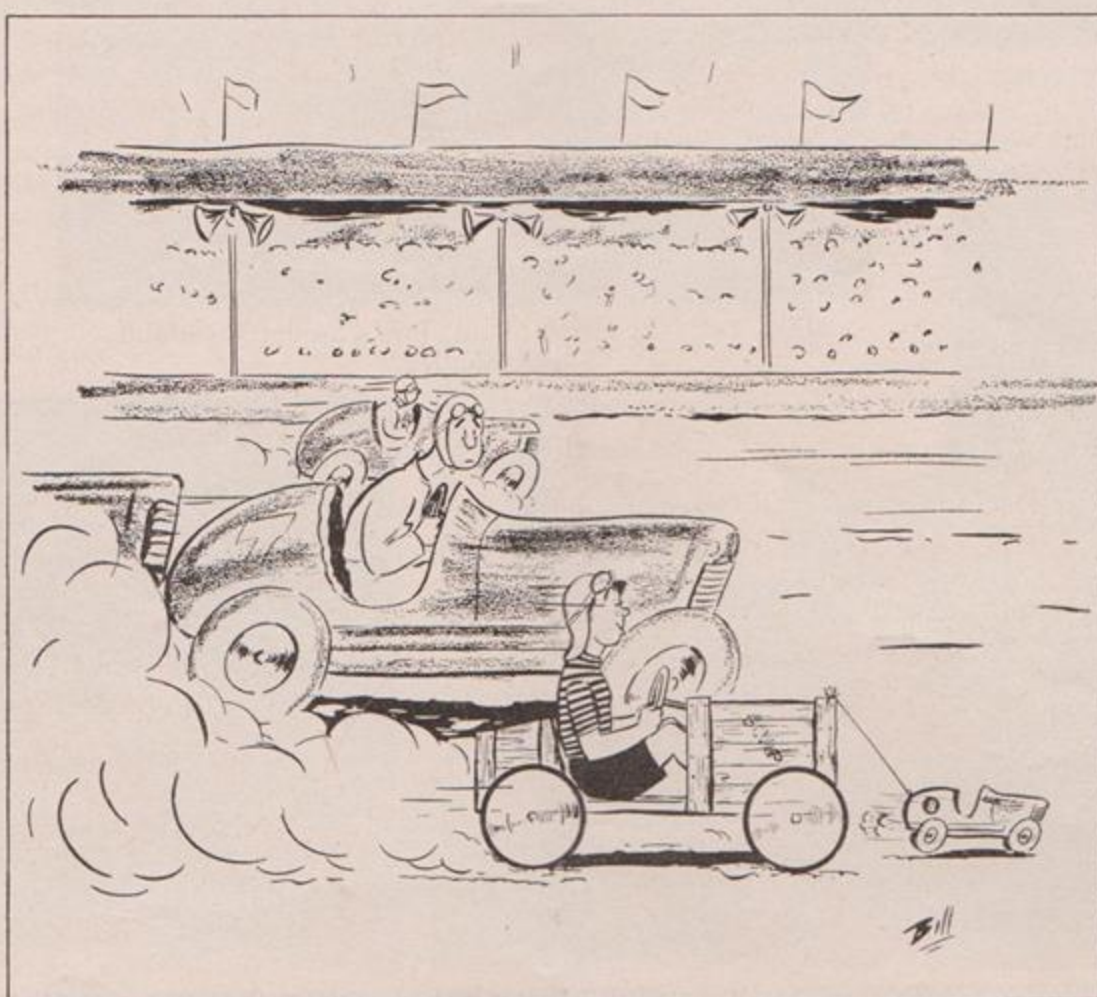
This Plane on the Cover is a plane with

a history, for it has gone through a number of incidences which has shaped the course of aviation history. This ship began under the skilful pencil of pioneer Jack Northrop when he presented the radically new Northrop 2E attack-bomber. Sold throughout the world, this ship has figured in four different civil and international wars. With the purchase of the Northrop interests by Donald Douglas the design went along with the other assets, and a few months later emerged as the Douglas 8A attack-bomber. Sold to Iraq, Argentina and the Netherlands in large quantities, this latest version, the 8A-5, is the most formidable model of the wicked ship and, in addition, presents several new and progressive refinements.

**GENERAL ARRANGEMENT:** The Douglas 8A-5 is a low-wing, cantilever, single-engine, monocoque two-seat attack-bomber with retractable landing gear and is powered by a single radial, air-cooled engine. The crew's quarters is situated atop the central portion of the fuselage, completely enclosed by a sliding glass canopy. The engine is mounted in the nose and is the conventional tractor, full-cowled version. The landing gear folds inward into special "dishpans" located forward of the wing-to-fuselage joint. The entire ship is camouflaged and marked with the Norwegian Royal Air Force insignia.

#### POWER PLANT:

The Douglas 8A-5 is powered by a single Wright "Cyclone" nine-cylinder air-cooled radial engine, model GR-1820-G103. This huge engine is rated at 625 horsepower at 1900 r.p.m. at 30 inches of mercury manifold pressure at cruising altitude; 860 horse power at 2200 r.p.m. at sea level at 37.7 in. Hg. full throttle, and has 1,000 horsepower available at 2300 r.p.m. at 42.5 in. Hg. for take-off and five minutes duration at sea level. This drives a three-bladed Hamilton Standard controllable-pitch propeller equipped with hydraulically controlled pitch-changing units. The fire-wall is located just forward of the center section leading  
(Continued on page 56)







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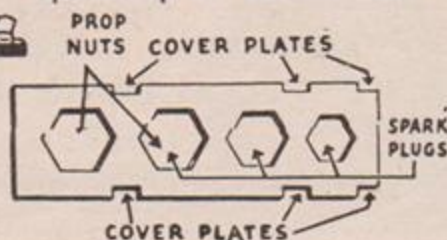


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minces no words when he says models should be what the modelers want to make them and should fly in their own inimitable way. Quoth Mr. Brand recently:

"My conclusion is that gas model flying should be primarily a sport, a competitive game which requires careful training and preparation, through knowledge of the equipment used, recognition of responsibility toward the property and persons of others, and an accepted code of fair play and good sportsmanship. Let's quit trying to tie it up with the high-speed aerodynamics of full-scale aviation. Let's try to keep our flying within the bounds of a reasonable amount of terrain, instead of cutting our over-powered ships loose to be potential sources of damage or trouble. Let's encourage ships that will last, that will fly consistently and reliably, and that won't break all to pieces when they meet an obstruction. Let's make the sport appealing and worth while to a lot of people that are just laughing at it now.

Now take us. We don't know who's right and who's wrong. Maybe it's like the Republicans and the Democrats—both have good ideas. What we do know is that regardless of what type of models are built, as long as common-sense safety regulations exist and are followed, and as long as we develop model airports for the activity, the sport is bound to benefit all who participate.

Perhaps you have some good ideas on the subject of just how models should perform, just what requirements they should meet (if any) from a design and duty standpoint. If so, shoot them in to *Model Airplane News*, attention of the Instructor, and then the other modelers can see what you have to say.

## Norwegian Nemesis

(Continued from page 23)

edge and is of X-4130 corrosion-resistant stainless steel sheet. The engine accessory cowl has a 7/8 inch ventilating duct around the circumference of the fire wall. The engine mount is of chrome-molybdenum steel tubing and attaches on the fire wall at four points, welded to the engine supporting ring at its forward end. This structure supports the giant 1,260 pound engine through eight engine-mount bolts secured through Lord anti-vibration rubber shock mounts. The oil cooler is located atop the power plant compartment and is secured by two heavy fabric straps to permit vibration stresses. The oil cooler is mounted with its face set at a 45° angle with the vertical at the bottom of the power plant compartment. A small retractable scoop lowering 3-5/8 inches down into the slipstream works in unison with the hydraulically controlled cowl flaps, permitting entrance of air to the oil radiator. The spent cooling air is forced out the ventilating ring through vacuum action

of the slipstream.

The carburetor is of the down-draft three-chamber type mounted atop the engine accessory gear compartment. Air for the carburetor is taken from a fixed duct located in the nose of the engine cowl. This duct is 10-3/4 inches wide at its mouth and narrows as it turns inside the cowl and down into the carburetor.

The engine accessory drive compartment includes fuel pump, oil pump, hydraulic pump and vacuum pump and is cooled through another ventilating ring aft of the engine removable cowl, which has 1 inch greater radius than the engine fixed cowl.

The oil tank has a capacity of 13 gallons of oil with provisions made for foaming and expansion. The oil system is provided with a Cuno oil strainer as well as an oil warm-up accelerating compartment within the tank.

FUSELAGE: The Douglas 8A-5 has a full monocoque fuselage and is of the famed Northrop design in which no stringers or channel stiffeners are used. A series of eight bulkheads are laid out vertically in the fuselage jig. The sheet Alclad 24STAL skin is broken in and then rolled in such a manner that the top edge of each strip serves as the stiffener. These sheets are riveted to the bulkheads and lap-jointed over each other so the resultant structure is identical to the conventional bulkhead-stringer combination in strength, but much lighter in weight and much stronger in bending. The fuselage is built in two halves; an upper half, including cutouts for the crew, and a lower half which is constructed integrally with the wing center section. The lower half-shell also contains the cutouts for the retractable bombardment turret and tail wheel.

WINGS: Chief feature of the Douglas 8A-5 is its odd wing structure, first perfected by John K. Northrop with his famed "Alpha" mail-plane and subsequent transport models and later used on the widely-renowned Douglas DC-2 transport. Working on the theory that a stressed skin wing should be lightly loaded, Northrop decided to completely do away with spars and carry bending and shear loads throughout the entire wing structure. This saved weight and as a result the "multi-cellular" type of wing structure was born. In this method the wing actually is composed of eight spars; each rib-spar intersectional compartment is a small box-girder unto itself. The wing itself is divided into five main portions, the center section built integrally with the fuselage bottom-shell, two outer panels and two removable wing tips. There is no integral means of attaching the outer panel with the center section. The ends of the spars are covered with sheet rubber and the outer panel is supported in place. The two sections are then joined through the use of 157 bolts placed laterally through the wing joint bolting angles riveted to each wing sections. This

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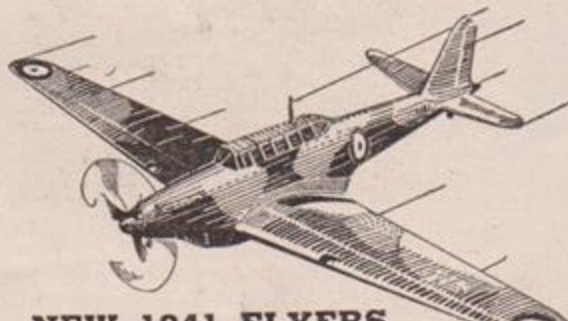
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entire structure is covered with an attach-angle strip which is stretched into position and bolted at the trailing edge only.

The ailerons are of aluminum alloy construction and fabric covered. Through use of lead weights, bolted into the nose-section sheet covering, they are dynamically and statically balanced. The flaps are of the peculiar "perforated" variety in that a series of 1-3/4 inch holes in four parallel rows have been punched out of them. This, because small areas of burbling air are set up about each hole which gives much greater drag than the hitherto used flat sheet flaps.

LANDING GEAR: Because of the peculiar multi-cellular design of the wing, many disadvantages have had to be overcome. Fuel tanks, bomb racks or landing gears cannot be stowed within this type wing as the cutting out of a portion of spar or rib would destroy its strength, rigidity and unity. Therefore the landing gear retracts inward and upward into two formed-sheet inverted "dishpans" located on each side of the fuselage forward of the wing leading edge. The landing gear is composed of two single-strut full cantilever legs, two hydraulic brake assemblies and two large streamlined tires. No anti-torque forks are used as the upper swivel joints of the landing gear legs overcome this condition. Retraction is by hydraulics with a visual and mechanical warning system employed. The up- and down-latches are mechanically and automatically operated.

HYDRAULIC SYSTEM: Landing gear, flaps, engine cowl flaps, bomb doors, bomb-aimer's turret are hydraulically controlled. The engine cowl flaps are operated through use of a single actuating strut operating a system of linkage which opens and closes the 16-cowl flap sections. In addition the oil-cooler retractable air scoop is linked mechanically with the engine cowl flaps so that both engine and oil cooler are instantaneously provided with needed cool air. Landing flaps are actuated by a single actuating strut with two opposed pistons which open and close in opposition to each other. The conventional link-arms are interconnected with the flap-operating torque tube and with each flap stiffener. Full deflection is set at 45° down.

EMPENNAGE: The vertical and horizontal stabilizers are of full cantilever construction, the horizontal stabilizer spar being a through-beam bolted to the rear of the fuselage tail post flange. Both stabilizers are of symmetrical airfoil section, the horizontal stabilizer being interchangeable right-with-left and built up on a framework of ribs of the pressed-flange design. The skin plating is of the rolled-channel section identical with the fuselage. The skin is riveted to the ribs and spars and houses control rods, trim tab drums and electrical wiring. The elevators are riveted to a through torque tube which is, in turn, attached to the horizontal stabilizer hinges by bolted ball-bearing housings. The rudder is of the balanced type, standard dural construction, fabric covered. Both elevators and rudder are dynamically and statically balanced through lead-weighted nose sections and are equipped with controllable trimming tabs operable in flight from the control wheels located within the front and rear cockpits.

EQUIPMENT: The Douglas 8A-5 is completely equipped with a full set of flight and engine instruments including a Pioneer altimeter, sensitive altimeter, clock, tachometer, airspeed indicator, rate-of-climb indicator, compass, Kollsman air temperature gauge, full pressure gauge, oil and temperature gauges, carburetor temperature gauge, Weston thermocouple, ammeter, MotoMeter fuel gauge and suction gauges in both cockpits. The front cockpit only has a Sperry gyro-horizon and a Turn-and-Bank indicator. The pilot is provided with a complete command set receiving and transmitting radio equipment, an enclosed loop antenna and inter-phone switch and microphone. The rear cockpit carries fire extinguisher, transmitting switch and inter-phone. The co-pilot-observer-rear gunner-bombardment officer also handles the bombing equipment described in the following paragraph. Standard equipment includes Goodyear tires, Bendix wheel and brake assemblies, Cleveland pneumatic shock absorbers, Exide aircraft battery, SKF, Norma-Hoffmann and Fafnir engine and plane control bearings, Pyle-National navigation lights on wing tips and rudder, S & M landing lights located within each landing gear well, Walter Kidde fire extinguisher and Exclipse electric engine starting system.

ARMAMENT: The Douglas 8A-5 is one of the most heavily-armed attack-bombers in its class. Each outer wing panel carries one .30 and one .50 caliber machine gun. These guns are free-firing electrically-controlled with manually operated charging and clearing systems. The thirty-caliber guns carry 200 rounds of ammunition each, the fifty-calibers carry 800 rounds each. The entire fuselage structure, from the bottom to the closed section between the cockpits, is a bomb bay. This structure consists of vertical-type bomb racks, each bomb being located in a separate compartment. There are four rows of twelve bombs each; these are the twenty-five pound fragmentation variety used for troop and personnel assault and various light bombing work. The bomb exit chutes in the fuselage bottom are not unlike conventional flare exits in that they are spring-mounted to open by the released bomb's weight and to close after its exit.

The rear gunner handles a single 30-caliber free-firing machine gun mounted on the newly-patented Bell Aircraft machine-gun adapter. Eight machine-gun ammunition containers, holding one hundred rounds each, are stored in shelves within the rear cockpit along the rear portion of the fuselage.

Immediately below the rear gunner's station is a large retractable enclosure which hinges from the rear and swings down into the airstream. The forward portion is glass enclosed and the implacement is used as an observatory when the rear gunner acts as bombing officer. A bomb-sight is mounted on the forward lower portion of the hinged section. It's the free-floating, hand-operated design used for quick aiming, where accurate aim is not as important as speed by the attack-bomber on offense.

CREW: The pilot is located high and well forward, enclosed by a sliding hatch constructed of moulded plastic acetate sheet assembled with tubular rivets. The wind-





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shield is shatter-proof, high-grade glass of the familiar blue-green tint to dampen sun glare. The rear gunner is also enclosed with a special sliding canopy. The hatch's rearmost portion hinges at its lower, forward point and folds upward, exposing the rear gun as it swings out on its trunnion. The hatch's upper portion thus projects up into the airstream 2-3/4 inches, providing shelter from the airstream. When a great field of action is desired, the entire structure may be pushed forward within the covered portion between the cockpit.

**SPECIFICATIONS:** The Douglas 8A-5 has a wing span of 47 feet 9-1/4 inches and is 32 feet 7-1/2 inches long. It stands 9 feet 9 inches high and has a wing area of 364 square feet. This gives it a wing loading of 20.7 pounds per square foot of wing area, taken from its empty weight of 5348 pounds, useful load of 2320 pounds and gross weight of 7668 pounds. This also gives it a power loading of 8.9 pounds per brake horsepower. A fuel capacity of 252 gallons is stored in two large tanks located within the fuselage below the pilot's compartment, the upper surface of the wing center section acting as the tank's lower surface. A reserve supply of 86 gallons is contained in the left tank.

**PERFORMANCE:** For its weight, power and class, the Douglas 8A-5 is one of the best performing ships in service today. Top speed is 268 miles per hour; cruising speed at 62-1/2% of throttle, 204 miles per hour and landing speed with flaps down of 65 miles per hour. Service ceiling is of 28,400 feet and absolute ceiling, 29,680 feet. It can climb at 1460 feet per minute and has a service range of 1450 miles.

This, then, is the ship with the history. This, then, too, is the ship which will make history, which will join the gallant steeds of Haarfaqr as he joined the scattered Norwegian tribesmen, of Magnus I as he drove wicked Canute of Denmark from Norway, and of Haakon VII as he severed the final tie with Sweden and gave Norway her independence. The Douglas 8A-5 attack-bomber may well play the leading role in this modern story of a people who will rise again, this time on wings that spit death-dealing bullets.

**Build a Model Douglas Attack-Bomber**

Here is the scale model you've been waiting for, a ship which is simple to build, which is of conventional design. For this Douglas 8A-5 is a model you "detail

hounds" can go "wild about." And don't forget that camouflage! It'll make your model as deadly-looking as the big ship which is now fighting Hitler's Hordes over London.

**FUSELAGE:** Take a block of good, clean, solid balsa and carve to the rough shape of the fuselage. Cut out the special silhouette-templates; properly fit them in place. With a well-protected razor and model-knife, whittle these rough edges down to shape. Now sandpaper, using a rough, coarse grade for first application and finishing off with a fine grade before pronouncing the job done. Take great care in applying the templates and make sure that fuselage cross sections are in true alignment with templates.

**WINGS:** Cut both wing panels from the right wing shown on the drawing but be careful, in shaping them, you form wings in opposite directions. Whittle rough outlines and airfoil shape, then apply templates. Sand the wing smooth and finish off with a fine grade of sandpaper, making sure an accurate airfoil shape is maintained. Paint the wing and fuselage before assembling. Camouflage should consist of brown, green and dark red in odd patterns all about the fuselage and wings.

**TAIL SURFACES:** These are cut to shape as shown on the drawing and sanded into true symmetrical airfoil sections; that is, both surfaces, upper and lower, have identical curvatures. These, too, may be camouflaged according to general pattern of the fuselage.

Assemble the ship, using purchased tires and a purchased cast, three-bladed propeller. Pay careful attention to the three-view drawing and excellent photograph shown at the beginning of the article. Upon completion spray the entire model with a coat of clear lacquer. Why not mail photographs of the completed model to MODEL AIRPLANE NEWS, 551 Fifth Avenue, New York City?

**Flash News**

(Continued from page 33)

don-to-Melbourne Race and accepted delivery on the many DC-2 and DC-3's purchased by his company. When war was declared 40 of K.L.M.'s 60 pilots went into military uniform; many were killed in air action. Parmentier escaped, first to France, then to England. There he made a strange deal with the R.A.F.! He was to have a ship, preferably a Dutch plane, fuel and oil and freedom to attack the Germans in his own way. His family had been wiped out in the Blitzkrieg. For weeks he has been visiting Rotterdam nightly bombing, blasting and machine-gunning everything in the air and on the ground. The R.A.F. sees him disappear after each raid only to return for his Koolhoven fighter, gassed and armed, the following evening. The Nazis have placed a price equal to \$10,000 on his head.

**Correction**

The S.J.G.M.A.A. Contest will be held at Pine Valley, N.J., on April 20 and not on April 23 as stated in the last issue. This will be an A.M.A.-sanctioned contest and detailed preparations are being made to insure its success.