

BRITISH AIR SHOW HAILS AGE OF TURBINE POWER

By Geoffrey Dorman

Special to Canadian Aviation

FARNBOROUGH, England — Ever since the war, we have been promised wonderful new transport airplanes. This year will be known as the year of fulfillment, for at the annual Air Show staged by the Society of British Aircraft Constructors, we have seen nearly all of the promised airliners in flight.

We saw the great **Bristol Brabazon** 130-ton 100-passenger liner which was conceived in December, 1942. It made its first flight on Sunday, Sept. 4, and on Sept. 8 it flew over this airport. We also saw the **DH Comet** jet airliner which was sprung upon the world so suddenly in July when it made its first flight.

We again saw the **Vickers Viscount** turbo-prop liner which made its appearance last year, and which is now

in production for BEA and BOAC. Then there was the **Airspeed Ambassador** which made its debut in 1947 and which will be on BEA European services at the end of next year.

The **Brab** has yet to prove whether the airlines will want her, but the rest are near operational.

Turbo-prop liners which we saw for the first time this year were the **Handley Page Hermes 5** with four **Bristol Theseus**, the **Miles Marathon** now being produced by Handley Page (Reading) Ltd. with two **Mambas**, as well as a version with four **DH Gipsy Queen** piston motors. **Armstrong-Whitworth** showed the **Apollo**, powered by four **Mambas**, which will carry

ABOVE—Unveiled for the first time at the SBAC Show in England, this **Vickers Supermarine 510** faster-than-sound jet fighter made a vivid impression.

BELOW—Mainliner with turbo-prop power. The **Handley-Page Hermes 5** powered by four **Bristol Theseus** of 2,500 h.p. each.



30 passengers. This is a singularly ugly airplane on the ground, yet when in the air, with the undercarriage tucked up, it looks graceful enough. Though it only flew for the first time in April, we are told that it has already proved itself economical in operational conditions and a number have been tentatively ordered by overseas lines.

On the day before the show I flew from Reading, the home of Handley Page (Reading) Ltd. to Farnborough in the **Marathon** with **Queen** motors. This is a 22-passenger high-wing monoplane costing \$215,000. It is intended for feeder lines, with a normal duration of three or four hours. The noise level did not seem unduly high, and the view from below the high wing is superb.

Marathon With Mambas

Later in the day I flew over in the **Marathon** with **Mamba** turbo-props. At present this is just a shell with no seats or sound-proofing. But even so the noise level is not high, and the two **Mambas** give a terrific urge; one can feel the extra power over the four **Queens**.

We saw that most amazing piece of iron-mongery, the **Cierva Air Horse** take the air and fly well. This is a 24-seat helicopter with three separate rotor systems, powered by a **Rolls-Royce Merlin**. If ever this machine should go into production, there will be two independent **Merlins** each capable of sustaining flight, and the mass of metal girders which act as outriggers for the three rotors, will be faired in.

By way of contrast, the tiny two-seat **Cierva Skeeter**, powered by a 100-hp. **Jameson** motor flew in the wake of the **Horse**, like mare and foal. I heard it suggested that an apposite name for the **Air Horse** should have been the "Flying Night-mare".

Though it is by no means new, the stately progress of the **Short Solent** 39-seat flying-boat, as used on the **BOAC** service from England to S. Africa aroused much favorable comment by its steadiness and its state-likeness. It gave us a reminder of the **Saunders-Roe "Dollar Princess"** 140-ton flying boat which is the last of the postwar promised airliners, which we shall not see until the 1951 Air Show, for it was begun only in 1946, four years after the **Brab**.

We have yet to see the **Brabazon 2**, which will be similar in outward appearance to the **Brab 1**, but will be powered by eight **Proteus** turbo-props which will give it a cruising speed of 350 mph. We might see that next year,

Courtesy, The Aeroplane

RIGHT — The hitherto secret Canberra jet bomber built by the English Electric Co. It is powered by two Rolls-Royce Avon axial flow jet engines. Span is 64 ft.

but it is more likely to emerge with the Dollar Princess (which has 10 Proteus) the year after next.

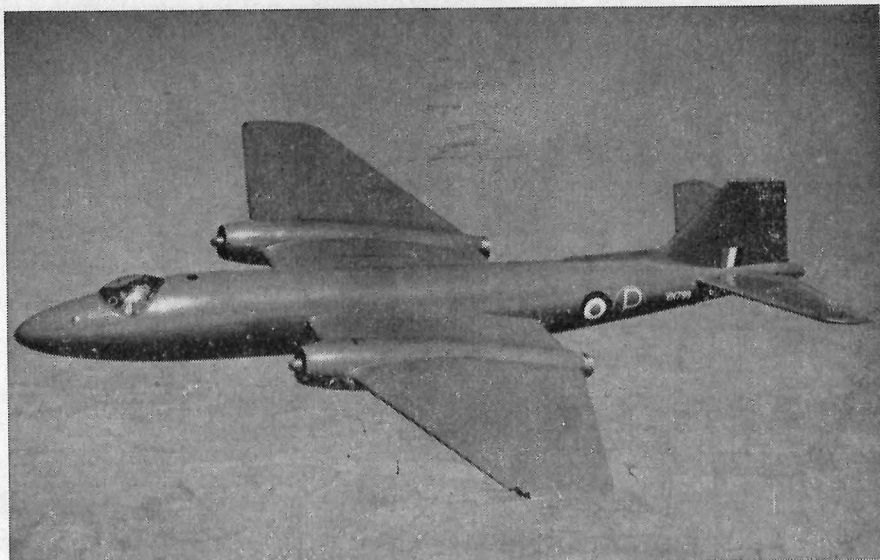
The Brab flew over the Show on the second day at 200 ft. I was greatly impressed by its size and its clean lines.

After the airliners, greatest interest was shown in the **Canberra**, the first British jet bomber. Painted light blue it was most impressive in flight. It was obviously very fast, and Wing Commander Beaumont gave an astonishing display of aerobatics which included rolls, loops, and phenomenal climbs. It is powered by two Rolls-Royce Avon turbo-jets and shows very great promise, especially as it is the first original design by the English Electric Co. Ltd., which has hitherto concentrated on building under subcontract, well-tried types such as the Halifax and Vampire. The designer, however, is well known. He is W. E. W. Petter, who in 1939 astonished the world with his Whirlwind, built by the Westland Aircraft Co. This was the first twin-motor single-seat fighter, and it did fine service in the war as a fighter-bomber.

Interest was next focused on the fighters. Of these the Vickers-**Supermarine 510**, named unofficially the "**Swift**," seemed to be the fastest machine present. The pilot told me he was flying it daily at 650 mph., and in a shallow dive he exceeded 670 mph., equal to the world speed record. Yet this is a standard fighter, not designed for record purposes. All its surfaces are back swept, including wings, tail plane, fin, and rudder. It is the lineal descendent of the Spitfire and has the grace of that famous airplane. It seemed to have the flying characteristics of its great forbear.

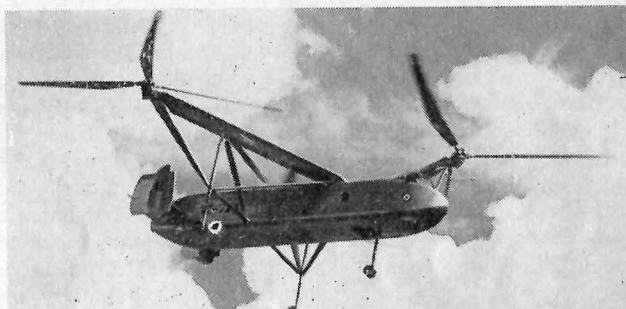
Wimpey Wade was equally impressive with the **Hawker 1052** fighter. Like the Swift, this has a Nene turbo-jet. As its tail surfaces are not back-swept, possibly it is not as fast as the Swift. But as it was designed by the Great Sidney Camm, designer of the Hurricane, Typhoon, and Tempest, I am sure that it is very little, if any, slower than the Swift; and Wimpey showed us how wonderfully manoeuvrable it was.

The Gloster Aircraft Co. showed us that there was still much life in the five-year old Meteor yet. A **Meteor 8**, powered by the latest Rolls-Royce Derwent turbojets, flown by



The amazing Cierva Air Horse, 24-passenger helicopter, jestingly described as "the flying nightmare."

—Courtesy,
The Aeroplane



Flying Dart — The Avro 707 Delta research jet aircraft, which is a bomber. It is powered by a Nene engine.

—Courtesy,
The Aeroplane



The Miles Marathon, feeder liner powered by two Mamba prop turbines. It is in production by Handley-Page.

—Courtesy,
The Aeroplane



Gloster's Polish test pilot, Charnowski gave the greatest impression of sheer speed. He made some astonishing climbs and dives. On one occasion he dived across the airdrome from 5,000 ft.; and as he flattened out he passed over our heads at about 200 ft., with a speed which must have taken him well into the sonic region.

It sounded like a bursting bomb, and looked more like a projectile than an airplane.

At the end of the program we saw a **Meteor** powered by two **Rolls-Royce Avon** turbojets. The prototype Avon was shown to us last year in a Lancasterian, but we were given no de-

(Continued on page 52)

Jetliner

(Continued from page 46)

proper functioning of the system to pilot.

Air Conditioning and Pressurization

The air conditioning and pressurization units are integrated into a completely automatic system to supply fresh air to the passengers at a comfortable temperature and pressure for all conditions of flight.

Either filtered or ram air is passed from wing intakes to the two cabin superchargers, one on each power plant gear box. Each supercharger has a capacity of approximately 30 pounds of air per minute at 30,000 ft. altitude against a cabin differential pressure of 8.3 lb./sq. in.

A constant flow of about 60 lb. of air per minute at all altitudes is maintained by automatic regulation. Either supercharger is capable of delivering this flow up to 13,500 ft.

Automatic control of cabin pressure is maintained by a discharge valve, set to provide sea level conditions up to 21,500 ft. At 30,000 ft. the cabin pressure is equivalent to 4,000 ft. altitude. The rate of pressure change in the cabin during the climb and descent is also automatically controlled, and may be preset to the desired value by the pilot.

The ventilating air is conditioned as to temperature by equipment in the accessory compartment. Heat is supplied by a combustion type heater of 200,000 BTU per hour capacity. Cooling is provided by heat exchangers and a cooling turbine. The operation of this equipment is automatically controlled.

British Air Show

(Continued from page 23)

tails of its static thrust. I hazarded a guess that, as it was the successor to the Derwent which gave 3,500 lb. thrust, and the Nene which gave 5,000 lb. thrust, the Avon will give 7,500 lb.

The nacelles which house the two Avons are considerably bigger in cross-section than any previous motors we have seen in the Meteor, and it was announced that the Meteor, which can climb to 40,000 ft. in four minutes, is the fastest-climbing airplane in the world. We watched it climb from ground level, almost vertically until we lost sight of it in the clear blue sky.

There were two quite new fighters which had been on the secret list till the day of the show. These were the **DH 112**, and **DH 113**, both develop-

ments from the Vampire. The 112, is named the **Venom** and was flown to perfection by John Derry who had taken it for its first flight the day before the Show. His confidence in it is shown by the fact that he did two rolls on its very first flight; and he flew it at Farnborough as though he were quite accustomed to it.

The power plant is a new version of the **Goblin** turbo-jet which gives 66% greater thrust than the Goblin fitted to standard Vampires. The leading edge is slightly more swept back than on the Vampire which will give it a higher Mach number. As it is a development of the Vampire, having identical fuselage and tail unit, it will not need the usual two or three years' development trials. As all the factory tooling for the Vampire can be used for Venom production, this "fighter of tomorrow" is available almost at once. Moreover, it has the handling characteristics of the Vampire.

The DH 113 is at present named the "Vampire two-seater," for like the Venom it is a development requiring most of the Vampire tooling. It is primarily a night-fighter with a two-seater nose with full radar, on the lines of the Mosquito night-fighter.

We also saw, for the first time, a Meteor and a Vampire whose motors were adapted for "re-heat." This is

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a method which can suddenly, for a brief period of a few seconds only, give about 40% more power. It is done by injecting many gallons of fuel into the jet pipe after the mixture has passed the turbine. This results in a great increase in expansion of the gas which vastly increases the thrust. This method could be used when extra speed was needed for only a few seconds to catch an enemy, or in case an extra-rapid take-off were needed. (It is very extravagant of fuel, of course.) The great increase in "urge" is clearly visible to the eye, and this is sometimes accompanied by a great burst of smoke and flame.

Those of us who stayed late on the day of the "dress rehearsal" were rewarded by seeing the arrival of the latest from the Avro stable. This is a single-seater scale model of a projected four-jet bomber. It is named the **Avro 707**. The wing-plan is in the form of the letter "delta." It looks very like a paper dart.

It did not fly in public; but I have never yet seen any plane land at such a collosally high speed. My guess was that it touched down at 150 mph. or more. I am assured that it **can** touch down at 130 mph, which is exceedingly fast for such a small

craft. The Delta is undoubtedly a harbinger of things to come.

The **Westland Wyvern**, which we saw for the first time last year, powered by the latest Rolls-Royce piston **Eagle** motor, was flown this year with the **Python** turboprop, the most powerful motor driving an airscrew in the world. This is a naval strike fighter which can carry torpedoes and/or bombs.

Of the aircraft designed for private owners, the most interesting was the **Auster "Autocar."** This is powered by a Gipsy Major, and sells for \$7,500. Another version of this machine, which can carry a stretcher case and doctor probably will be given the name "Amathyst."

All who love loud bangs and fireworks were vastly impressed by a **Fairey Firefly** which made a rocket-assisted take-off, which shot this two-seater off the runway in a few yards.

The show began on Wednesday, Sept. 7, and was open to overseas guests for three days. On Sept. 10 and 11, Saturday and Sunday, it was open to the public and on these days 270,000 paid for admission.

This is the fourth SBAC Show since the war and it gets better each

year, as also does the organization.

In addition to the flying show, there was also a static exhibition at which most constructing firms have stands where they show models of what is flying this year, or what they hope to fly in the future. The motor makers show complete motors, some of them sectioned.

De Havillands also showed the only Canadian-designed machine both in the air and on their stand. This was the **Chipmunk** which is now being put in production here as an RAF trainer.

Handling Fuel

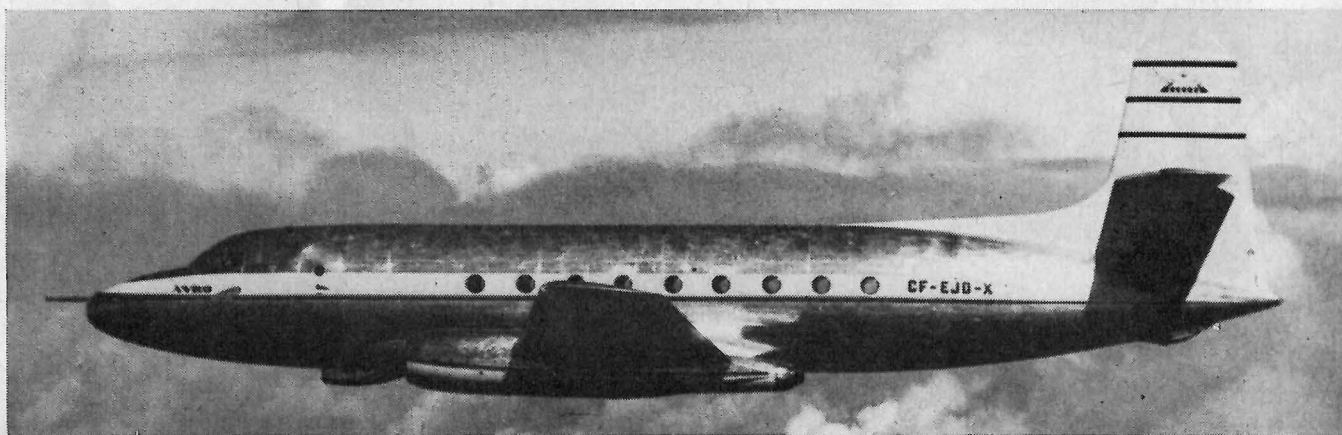
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should be in progress during refueling.

I. No switches on plane should be operated during refueling.

GROUNDING POSTS, in the form of rods extending into the earth of a potential sufficient to handle maximum static discharge, should be made available by the airport authorities in the apron and other refueling areas.

Using Drums or Cans — When refueling from gasoline drums or cans,



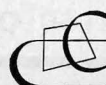
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