

### THREE SIDES TO IT

# The Avro Atlantic

THE FIRST delta wing airliner in the world has been announced in proposal form by A. V. Roe & Company Limited of Manchester. The airliner, to be known as the "Atlantic", is based on the design of the Avro Vulcan delta bomber, and according to Avro will fly non-stop London to New York with ease, in between five and six hours. Cruising speed will be something over 600 mph at 40,000 feet, while passenger carrying capacity will range from 90 to 115 passengers.

The Atlantic will be powered by four turbojet engines (the Vulcan has four Bristol Olympus turbojets in the production version), presumably of the most advanced type available when and if the aircraft proceeds beyond the proposal stage. Avro is promising delivery in 1958 if a reasonable production order is received soon.

Low operating costs will be an attractive feature of the Atlantic, Avro claims. Taking the North Atlantic route as an example, the direct operating costs, as computed by the SBAC method (1953), will vary between 8 and 12 cents per long ton/statute mile, according to wind allowances, and about one cent per passenger statute mile. Block times, dependent on prevailing winds, will be some 6½ to 7 hours westbound and 5 to 5½ hours eastbound.

Dimensionally, the proposed airliner will be large. It will have a span of 121 feet, a length of 145 feet, and a fuselage diameter of 12.5 feet. Maximum gross take-off weight will approximate 200,000 lbs. Payload, which

will naturally vary with route and stage distance, will range from 20,000 lbs. to 45,000 lbs.

All fuel will be carried in flexible fuel tanks within the wing outboard of the engines, and normally the fuel on one side of the aircraft will be used by the engines on that side. However it will be possible to supply any engine from any tank or combination of tanks. The engines themselves will be completely buried, in pairs, at the wing roots. They will be mounted in fireproof compartments and will be accessible from beneath the aircraft.

Each of the two main wheel units will be fitted with a multi-wheeled bogie and a single shock-absorbing strut. When retracted, they will be completely enclosed within the wing. The steerable nosewheel will be retracted into a non-pressurized compartment within the fuselage lines. The hydrau-

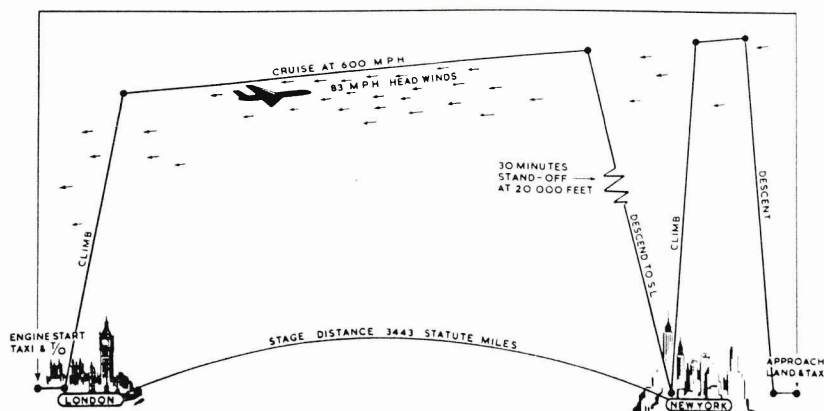
lic braking system will incorporate Maxaret units, which permit the application of full braking power without wheel-locking.

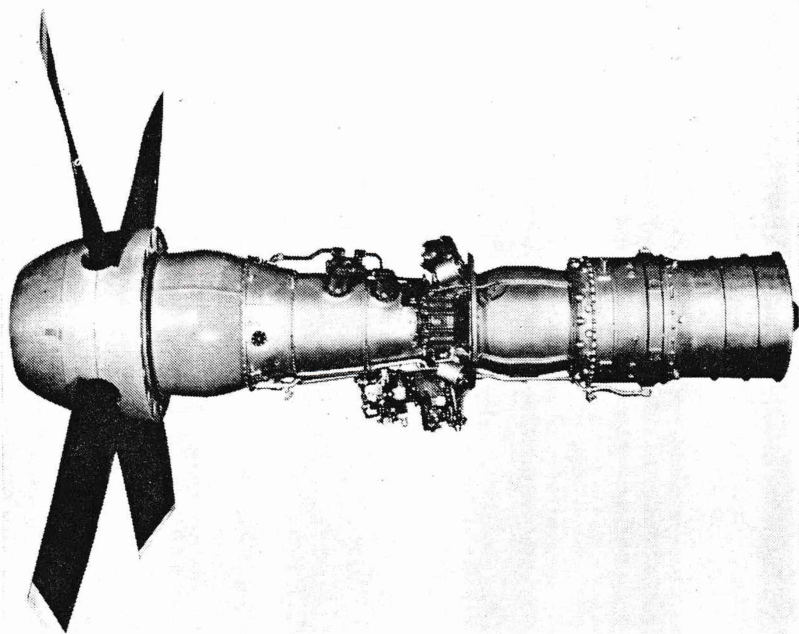
The Atlantic will be available in three variants—basic, luxury, and tourist. All versions will be standardized in the following respects: the flight deck, which has stations for captain, first officer, and navigator/radio operator; the freight loading door on the starboard side of the front fuselage; the entrance door for passengers; the underfloor baggage holds; the emergency exits; the location of the galley, bar, lounge, and toilet facilities; seat pitching (other than in the "high density" version, which has seats for 139 passengers) and window pitching.

The basic version is so laid out that 94 passengers may be accommodated in three compartments. The forward cabin will have seats for 24, the centre

## Flight Plan

LONDON — NEW YORK





## P & W T-34's for Sale

A Pratt & Whitney gas turbine engine is being offered for sale commercially in Canada, the U.S., and abroad for the first time in the company's history. It has been announced by John W. R. Drummond, vice-president of Canadian Pratt & Whitney Aircraft Co. Limited.

The engine, a commercial version of the T-34 turboprop, is the PT2F-1. It is in production at Pratt & Whitney Aircraft, East Hartford, Connecticut. Recently exhibited at the 20th International Air Show in Paris, it is scheduled to be shown in Canada, along with other Pratt & Whitney engines, at the National Air Show in Toronto, September 19.

The engine is of Pratt & Whitney's own design and is the most powerful single unit propeller turbine ever made available for commercial sale, Mr. Drummond says. The civil PT2F-1 is rated at 5,600 eshp.

The U.S. Navy, sponsor of the T-34, recently authorized its release for sale to friendly countries. This is the first time that any American turboprop has been offered for sale outside the U.S.

As a military engine, the T-34 has been ordered by both the USN and the USAF. It will power a USAF Douglas YC-124B Globemaster, and two USN Lockheed R7V-2 Super Constellations, which are scheduled to fly this year. More than 7,000 hours of test running, including flight operation in the nose of a Boeing B-17 flying test bed, have been accumulated on the engine. The commercial version is said to be suitable for installation in modified versions of some current production types of airliners. P & W is at

present preparing for large scale production of the turboprop for both military and civilian use.

Wilkinson's "Aircraft Engines of the World" describes the engine as having a 13-stage axial compressor driven by a three-stage turbine. There is a single annular combustion chamber of stainless steel with perforated flame chamber inside the combustion chamber.

The compressor rotor is of steel construction, has 13 rows of inserted steel blades, and is supported in two anti-friction bearings. The two-piece stator casing, made of stainless steel, has 13 rows of ring-mounted steel stator blades.

The turbine has a fabricated stainless steel casing and diaphragm, with inserted nozzle vanes and two rows of stator blades. Three air-cooled rotor discs, each with one row of inserted blades, are attached to the drive shaft, which is supported in two anti-friction bearings.

The propeller is driven through a compound spur reduction gear (0.91:1) which is flexibly coupled to the compressor rotor shaft. Provision is made for installation of a Curtiss-Wright 3-bladed Turboelectric electrically operated propeller, or a Hamilton Standard 4-bladed hydraulically operated unit.

Dimensions of the engine are: diameter, 30 in.; length (as shown), 155 in.; frontal area, 4.9 sq. ft.; weight (without prop), 2,550 lbs.; weight/max. eshp ratio, 0.45 lb./eshp; fuel consumption (normal), 0.62 lb./eshp/hr. The T-34 military version is rated for take-off at 5,700 eshp, or 5,300 shp plus 1,040 lb. th., at sea level.

cabin will have seats for 15, and the rear cabin, 55. Each row of seats, divided into groups of three and two with intervening aisle, will be flanked by windows. When the bar is omitted, 109 seats may be installed. In the rear compartment, individual bunks, hinged from the cabin walls above the seats, will provide alternative accommodation for 11 of the passengers.

The luxury variant will use the same layout as the basic, except that there will be only four seats in each row, with a central aisle. This will permit the use of larger, more luxurious individual chairs. Compartments from front to rear will accommodate 20, 12, and 44 passengers respectively, and the total of 76 will be increased to 88 if the bar is omitted. Bunks will be provided for 11 passengers in this version as well.

In the tourist version, each row will have six seats with a central aisle, and the totals in each compartment will be 29, 18, and 66 respectively, from front to rear. This total of 113 will be increased to 131 if the bar is omitted. The provision for bunks remains unaltered, but their installation is optional.

The cabin will be pressurized to 9 psi, which ensures a cabin altitude of approximately 8,000 feet when the aircraft is flying at 45,000 feet. Adequate heating, ventilation, and air conditioning will also be provided, as is normal in a modern airliner.

Quietness in the cabin is an important consideration and from the illustration at the top of the preceding page it is evident that all of the Atlantic's normal passenger accommodation is ahead of the noise cone of the jet pipes.

The accompanying flight plan shows a typical westbound Atlantic crossing from London Airport to Idlewild, New York, a stage distance of 3,443 statute miles. The fuel reserves have been calculated to comply with the full allowances recommended by BOAC and include diversion of 215 statute miles to Washington, D.C.

This is equivalent to a still air range of 6,070 statute miles from starting engines at London Airport to engines stopped at Washington. The operating altitude will increase from 40,000 feet to 45,000 feet as the weight of the aircraft decreases—this procedure will result in more economical operation.