

The Miles Monitor

First Target-towing Twin-engined Aircraft to be Specifically Designed for the Work

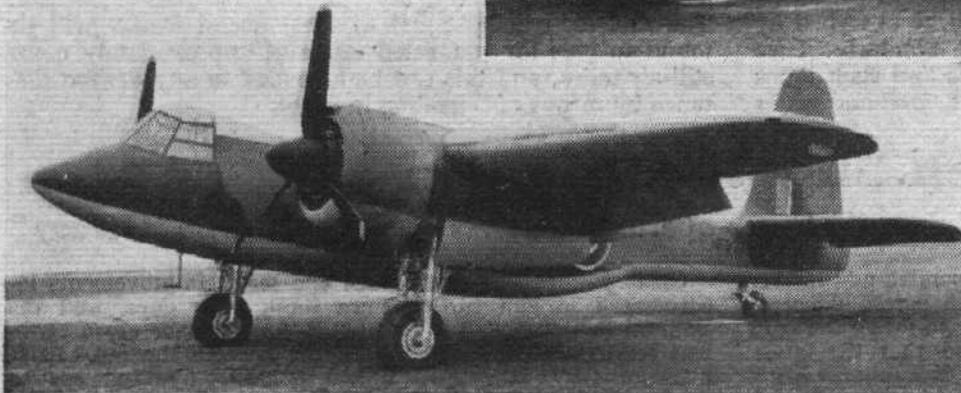
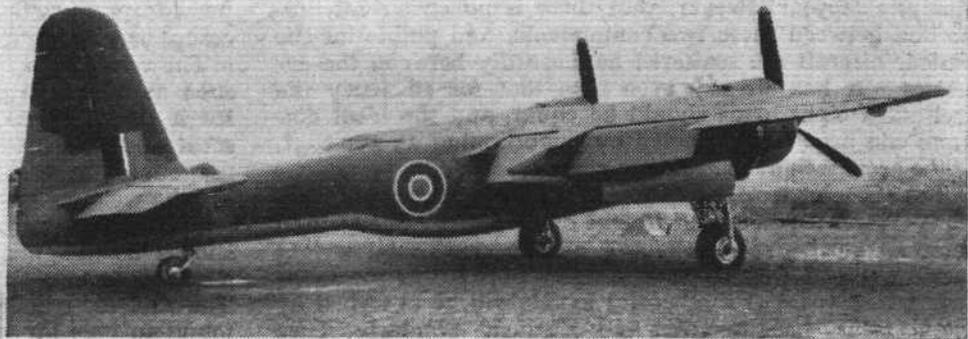
IN 1942 it was decided by the authorities that gunnery training, both for air-to-air and ground-to-air, was becoming a rather serious bottleneck, and that existing types of aircraft for carrying targets were obsolete. Accordingly a specification was issued for an aircraft to be designed for the specific purpose of towing targets; an unprecedented step, since all existing target-towing aircraft had been obtained by converting aircraft originally intended for other duties, e.g., the Boulton Paul Defiant converted from a night fighter; the Miles Master trainer converted to the Martinet target-tower.

A consideration which probably led to this decision was that the speed, range and operating altitude of the then modern fighter had far outstripped the corresponding advances in target-towing aircraft. A Martinet target-tower at 150 miles per hour, for instance, was for all practical purposes a stationary target for a Tempest flying at 450 m.p.h.

The result of these deliberations was specification for a target-tower which would cruise at 300 m.p.h., reach an altitude of 20,000 feet and possess an operational endurance period of $3/4$ hours. The aircraft would also be required to simulate

with slotted-type flaps, which give the Monitor a stalling speed of 90 m.p.h.

The all-metal fuselage has been designed specially to permit the ejection of targets with a minimum possible effort on the part of the crew. This represents a considerable advance upon previous methods of launching in that the operator merely places a target on an endless conveyor belt and, after connecting the target halyard to the cable, pulls a lever. By this means the target is automatically ejected from an aperture in the fuselage, thereby minimising the amount of draught and discomfort usually associated with the opening of doors whilst an aircraft is flying. Indeed, this facility for automatic ejection is particularly important to the pilot and his operator when flying at extreme altitude, where the external temperature may be something like 20 degrees below zero.



With two Wright Cyclone engines the Monitor will tow a drogue at 300 m.p.h.

dive bombing attacks: hitherto no target-tower could hope to provide practice in this relatively new form of attack.

Thus was born the Miles Monitor. Designed and built with the utmost urgency, the Monitor does everything which the specification demanded. It has two Wright Cyclone GR.2600-31 air-cooled radial engines of 1,750 h.p. each driving 3-bladed, constant-speed, fully feathering airscrews, giving a top speed of 360 m.p.h. Cruising at 20,000 feet with a target the speed is 300 m.p.h.

Composite Construction

As the Monitor was also fitted for use by the Royal Navy it was intended that it should be of all-metal construction. Dictates of urgency, however, brought about a decision to fit Beaufighter wings to a fuselage of Miles Aircraft design. Unfortunately for this arrangement Beaufighter wings were in short supply, and Miles Aircraft were obliged to design specially and build very quickly a wing of wooden construction. The Monitor, therefore, is of composite construction.

Briefly, the wing is a one-piece all-wooden structure consisting of two spars with orthodox rib formation and ply covering. Dive brakes are fitted to the wing and are hydraulically operated. Tankage is also provided within the wing for 480 gallons of fuel. Ailerons are of conventional construction, and the remainder of the wing is fitted

with a rotating Perspex cupola, which enables the operator to observe his target and to take photographs whilst gunnery practice is in progress. Housed within the fuselage is a 10 h.p. hydraulic winch of a completely new type designed by Miles Aircraft. It draws its power from three hydraulic pumps driven by the starboard engine. (These pumps also provide the power for the normal hydraulic system of the undercarriage and the flaps.) Towing targets at speeds in excess of 250 m.p.h. made all existing winches ineffective, since there were none which could exceed 6 h.p. The Monitor required something in the region of 9 h.p. for use with the standard sleeve targets at the speeds envisaged.

Monitor tail surfaces are of all-metal construction and embody a very large tailplane and a large single fin and rudder, giving a big margin of positive stability—essential when launching targets.

In the interests of rapid production, Miles Aircraft adapted the standard Beaufighter undercarriage, which consists of two main wheel shock absorber units with retracting mechanism of conventional design. The Beaufighter tail wheel, automatically self-centring and retracting with the main wheels, was also used.

For a target-towing aircraft the Miles Monitor is a large aircraft: the use of two large engines, the carrying of specialised target-towing and radio equipment gives it an all-up weight of 21,000 lb. Its span is 55ft., length 47ft., and wing area 500 sq. ft. Wing loading is 42 lb. per square foot, and whilst this may appear high, it is quite acceptable when it is realised that the power loading is only about 6 lb. per h.p. The Monitor can climb to 25,000ft. in 30 minutes.