

A brief outline of the contents  
The book reviews some of the technical, political and financial influences which shaped the air defences of the United Kingdom during the early years of the Cold War.  
The fifteen years, or so, covered in this book were particularly difficult for the planners of the air defence of the United Kingdom. Initially, from 1949 until late in 1953, the planners had to rely upon refurbished wartime radars for the R.A.F. Control and Reporting System. Our defence capability was thus extremely fragile at a time when the Russians were blockading Berlin, had successfully tested their first nuclear bomb and had large quantities of Land, Air and Naval forces remaining from the Second World War.

When the twelve American AN/FPS3 radars and the British Type 80 radars began to arrive in late 1953 and in early 1954, new possibilities were quickly grasped, by the Air Ministry, with the planning of the Comprehensive Radar Stations of their "1958 Plus Plan". This plan reduced reaction time in the Control and Reporting (C&R) System, but it was realized that the system was still extremely vulnerable to enemy jamming of the radars. This situation was further improved, in 1957, with the development and deployment of the Type 84 radar (L band) which provided an alternative frequency to the Type 80 (S band) thus increasing the enemy's jamming task and improving the resistance of the C&R system to jamming.  
Surface-to-Air guided weapons (SAGW) entered the inventory of the military planners in 1954 with a Joint Air/General Staff requirement for a Fire Control Radar and shortly afterwards the RAF was defining "The Integrated SAGW/Fighter Control Plan in 1962". This led to various SAGW deployment plans being drawn up and considered by the Air Council and the Chiefs of Staff Committee in 1957/58.  
In August 1958, the SAGW/Fighter integration plans for 1962 were given the code name "Ahead". Shortly afterwards, in December 1958, Air Ministry informed the Air Council of the development of a new radar, the Type 85 which, together with a passive detection system, was capable of identifying individual enemy aircraft in a jamming environment which, with the addition of digital data extraction and handling of the radar information, would bring a significant improvement to the defence capability of this country. The price of these new facilities was high, and the deployment was restricted to three Type 85 radars, four passive detection stations and one Main Control Centre (MCC) at Bawburgh, in Norfolk.  
Early in 1959 the Air Ministry entrusted the detailing of these advanced and complex facilities to the "Ahead Facilities Group" comprising officers of the Air Ministry, Fighter Command and scientists of the Telecommunications Research Establishment (TRE) of the Ministry of Supply<sup>1</sup>. Definition of the technical and operational facilities of "Ahead" were essentially completed by early 1960.  
In December 1959, the Defence Committee had concluded that the defence of the deterrent could be regarded as not, in itself, justifiable on grounds that our strategic bases were unlikely to be attacked unless the Russians were, at the same time, prepared to launch operations against the United States and thus initiate a global war. Additionally, the Joint Intelligence Committee estimated that, from about 1963, the Soviet ballistic missiles may achieve accuracies as good as those achieved by manned aircraft. Our own ballistic missiles (Blue Streak) would therefore become vulnerable in their fixed silos. This led to the cancellation of Blue Streak as a weapon and the adoption of the Polaris submarine missile which would be mobile and less vulnerable. (Blue Streak was retained as a possible satellite launcher which, in spite of early promise, was overtaken by the ELDO's<sup>2</sup> Ariane launcher).  
Nevertheless, the Defence Committee realized that we would have to guard against airborne reconnaissance and intense electronic jamming, carried out with a view to neutralizing our defence systems and means of offensive action. The Government also realized that the future requirements for radar cover for air defence and air traffic control were

similar. Additionally, both services were moving towards greater efficiency and effectiveness through the use of automation. A joint system of air defence and air traffic control was therefore examined in depth and resulted in the combined system under the names "Linesman" (Defence) and "Mediator" (Air Traffic Control). Costs in the combined system were escalating and cuts became inevitable. Between July 1960 and June 1962, there were no less than seven assessments of Ahead, with a view to reducing costs. Many changes to Ahead, during this period, were due to changes in operational requirements resulting from reductions in the fighter and guided weapon programmes. The technical and operational concept, defined by the Ahead Facilities Group, in 1959, remained essentially intact. The main changes to Ahead, due to the abandonment of the defence of the deterrent and the requirements of a joint Air Defence/Air Traffic Control System (Linesman/Mediator), included:-

- 1) Removal of the data extraction function from the RTS (Radar Tracking Stations) to the Main Control Centre. (for joint defence/air traffic control use)
- 2) The Main Control Centre sited (above ground) at West Drayton, instead of (below ground) at Bawburgh.
- 3) Boulmer RTS substituted for Bramcote, (due to revised SAGW deployment) and the consequent relocation of the Passive Detection high speed aerials.

The Chief of Air Staff, after many attempts to get approval for the Ahead defence system, which was now to be further delayed by the incorporation of Mediator, finally laid down the minimum that the Air Ministry could accept in order to achieve an air defence system with minimal further delay. He realized that it would be necessary (though undesirable) to accept an above-ground Main Control Centre at West Drayton, a site acceptable to Air Traffic Control. He would, however, require sufficient control facilities at the Radar Tracking Stations as a stand-by to West Drayton.

Linesman/Mediator was finally approved, by the Defence Committee, at a cost of £106 million, in October 1963. Other high technology defence development programmes did not survive the sixties. Blue Streak, referred to above and cancelled as a weapon in 1960 at an estimated cost of some £300 million, did show successful performance on the Australian missile testing range at Woomera (Australia) as the first stage of the ELDO Europa launcher. However, addition of the second and third stages, provided by France and Germany respectively, failed to place a satellite in orbit. The end of Blue Streak came when ELDO concentrated their efforts on the Ariane launcher at Kouru, in French Guiana.

Another costly cancellation of the sixties was the TSR2 (Tactical Strike and Reconnaissance aircraft). The operational requirement was issued in 1957 for a supersonic aircraft with a range of 1000 miles. The first flight of TSR2 was successfully carried out in September 1964. At supersonic speed the aircraft behaved flawlessly. In April 1965 the TSR2, on which £195 million had already been committed, was cancelled and the three aircraft already built were grounded, never to fly again. The development costs of the Olympus 22R Mk.320 engines were not however wasted owing to the use of these engines in the Concorde aircraft.

The book is in hardback cover and includes 204 pages (128 x 296 mms) with some 40 pictures and more than 25 diagrams at a cost of £32.50 plus £2.50 p&p. from all good bookshops (quoting the reference ISBN 0-9546017-0-X) or direct from the author at PO Box 6044, Newbury, RG14 2ZQ (Tel. 01635 49577 or e-mail rhgmartin@wizbit.net).

**Note on the Author:-** Richard Martin joined the Air Ministry Research Establishment (AMRE) in October 1939. Throughout its moves to Swanage (TRE) and Malvern (RRE), he worked on several ground radar projects including radar displays, glider-borne radar ground stations, and he initiated work on digital radar data extraction and processing, demonstrated to the Air Ministry in 1951. He was directly involved in the planning of both 'Ahead' and

/'Linesman/Mediator'. He left RRE, as a Principal Scientific Officer, in 1964, to take up an appointment, as Head of the Studies and Trials Division of the Engineering Directorate, in the European Organization for the Safety of Air Navigation (Eurocontrol) in Brussels, from where he retired in 1977.

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