THE ROLE OF THE DEMONSTRATOR AIRCRAFT IN THE DEVELOPMENT OF A NEW AIRCRAFT/WEAPON SYSTEM

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1. INTRODUCTION

Over the past 40 years, the Aerospace Industry within the United Kingdom has used research and demonstrator aircraft during the design and development of new aircraft. Many such examples can be identified ranging from the Short SB5 (used in the development of the English Electric Lightning) and Avro 707 (used in the development of the Avro Vulcan) to the Handley Page HP115, Bristol T188 and BAC 221 all used in the Concorde programme.

Over the last decade British Aerospace has conducted two consecutive demonstrator programmes, the Fly-By-Wire Jaguar programme and the Experimental Aircraft Programme (EAP). These two programmes were extremely successful and provided a major contribution to the development of the next generation combat aircraft known as the European Fighter Aircraft (EFA).

This paper reviews the role of the two demonstrator aircraft programmes and highlights the considerable benefits provided to the EFA development programme.

2. THE DIFFERING ROLE OF THE DEMONSTRATOR

A research or demonstrator aircraft can fulfil a number of roles as typified by the Short SB5 and the Hunting 126. The Short SB5 investigated the low speed aerodynamic characteristics of a number of different highly swept wing and tail configurations whereas the Hunting 126 investigated the concept and benefits of the jet flap.

The two BAe demonstrator programmes which are the subject of this paper emphasise the different roles of such demonstrator aircraft.

The Fly-By-Wire (FBW) Jaguar programme was a ground and flight test programme to demonstrate the feasibility and benefits of a single technology - that is, Active Control Technology (ACT).

The EAP demonstrator programme represented a much broader programme intended to demonstrate a wide spectrum of technologies which included advanced structures, aerodynamics and systems. This programme was subsequently extended to include trials with direct relevance to the EFA configuration.

The conduct and benefits of each programme are considered in detail below.

3. THE FBW JAGUAR PROGRAMME

In the mid 1970's BAe were committed to a new generation air superiority fighter. Theoretical studies had indicated that the best solution would be provided by an unstable, unconventional aerodynamic design. Active Control Technology (ACT) would be needed to stabilise and control such an aircraft, but ACT was a new and unproven technique.