CF-105, was completed by the summer of 1954. It had two Rolls-Royce RB-106 engines with afterburners and a two-man integrated fire-control system; the armament was a mixture of air-to-air missiles and 2.75-in. air-to-air rockets.

But early in 1954 the RB-106 engine project was abandoned by Rolls-Royce. Orenda were at that time designing a large supersonic engine as a private venture which was well matched to CF-105 requirements but would not be available for the first few aircraft. The Curtiss-Wright J67 appeared to be the most suitable engine for the earlier version and the initial aircraft were therefore designed around it. However, in 1955 it became obvious that the U.S.A.F. was going to abandon the development of the J67, and the Pratt & Whitney J75 was substituted.

Configuration

The R.C.A.F. had established a requirement for a two-seat twin-engined aircraft. Preference for a crew of two was partly based on the complexity of the newer fire-control systems, and the fact that, while the chosen system was intended to be entirely automatic during the mid-course and terminal phases of the attack, it was the intention to press home an attack on the basis of a manual mode if the automatic mode should fail.

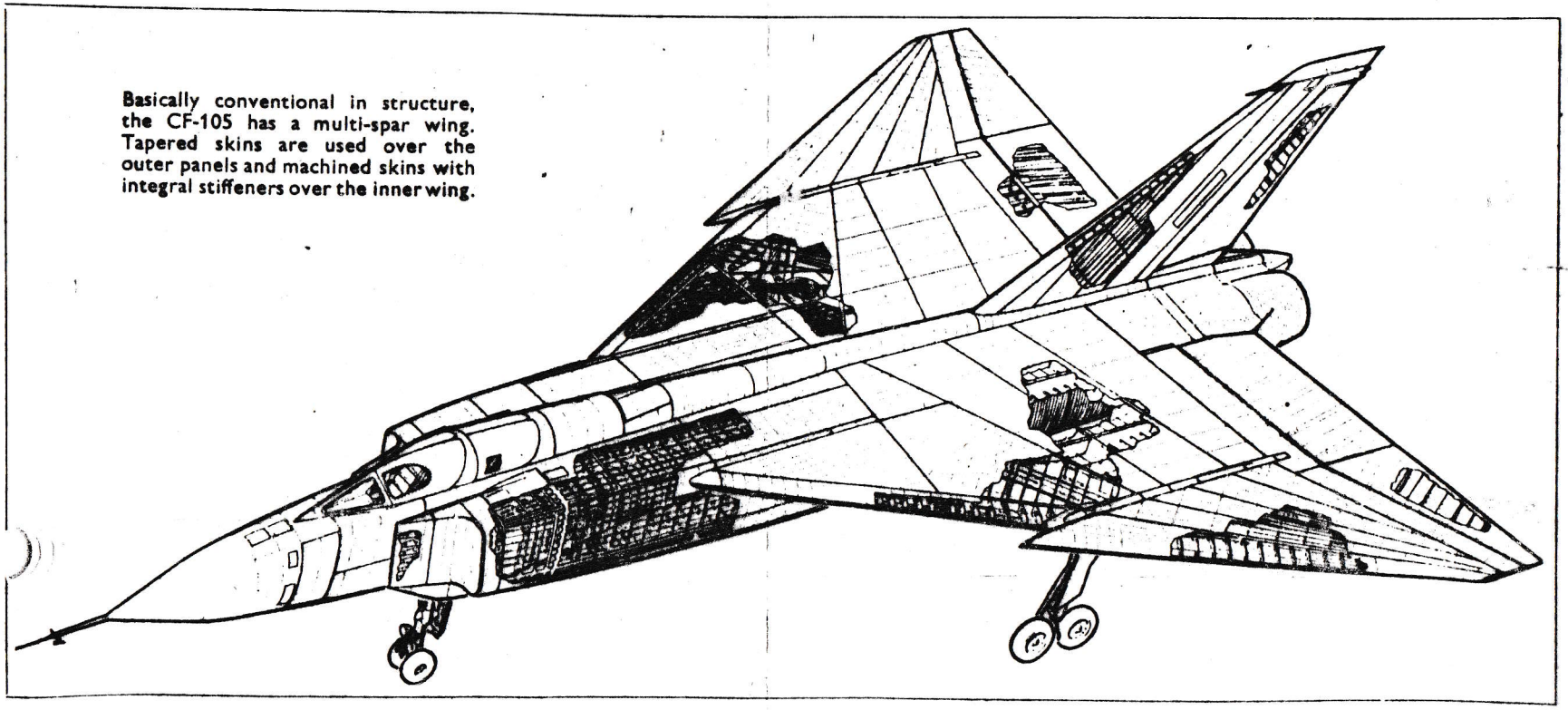
The choice of two engines was based on a combination of circumstances, the advantages being obvious in reduced attrition, especially during training. One of the most important powerplant factors, however, was that with the very large weapon package required as payload, and the large amount of fuel carried for the range requirements, the size of the aircraft was obviously going to be such that there was no single engine large enough to power it.

Aerodynamic design was planned so that aerodynamic speed limits would not be less than the structural ones. The aluminium-alloy structure was good for speeds above Mach 2 and aerodynamic limits were set no lower.

Wing Thickness

To achieve this the thinnest possible t/c ratio was chosen. This was initially 3% over the whole span, but aileron reversal demanded a thicker and stiffer section; finally 3.5% was used at the wing root and 3.8% at the tip. Choice of the delta wing meant that a thin wing section was possible without a large weight penalty. An added advantage of the tailless delta was that the extensive experience of the Avro company at Manchester with delta research aircraft was available for the design.

Aeroelastics played a large part in the design; all types of aeroelastic and flutter problems were examined from first principles



Basically conventional in structure, the CF-105 has a multi-spar wing. Tapered skins are used over the outer panels and machined skins with integral stiffeners over the inner wing.