The Chief of the Air Staff, Marshal of the Royal Air Force Sir Thomas Pike, in the right-hand seat of a Lightning T.5, with Wg Cdr Beamont

FLYING THE LIGHTNING...

all-moving-tailplane longitudinal control has been so devised as to provide the required response characteristics throughout the whole speed range, while at the same time achieving control-limited conditions at design speed in the normal acceleration sense. In other words, at design limiting speed the pilot has just sufficient tailplane control to achieve the design g flight limits and no more.

On cutting reheat at high speed, the sudden loss of thrust is very marked, the pilot being thrown quite forcibly forward against his harness.

On the performance side, it is interesting to note that the Lightning has genuine supersonic performance capability in unreheated thrust, with stabilized level performance at the tropopause in the neighbourhood of Mach 1.2, the precise value depending on the temperature of the day. It is worthy of mention here that the P.1 prototype WG760, which was the first British aircraft to achieve level supersonic performance, did so without reheat at all, and that its fighter successor is still the only operational aircraft with this capability.

Continuous attention to navigation is essential at the speeds involved, and test flights must be closely controlled in relation to the airways, control zones, avoidance of other military traffic, and effects of supersonic booming.

After an interception, or the completion of a test, return to base is carried out at subsonic cruise at the tropopause for maximum range/economy. The ability of the aircraft under these conditions to be trimmed accurately to fly hands—and feet-off (as it can also be at supersonic speeds) is pleasant for the pilot.

The fuel system is automatically controlled, transfer from the ventral tank into the main wing tanks taking place under pressure. The pilot merely has to monitor the ventral tank transfer indicator against total contents indication during the early part of the flight to ensure that transfer has been completed satisfactory.

With its light and responsive controls and inherent stability, the Lightning is a good instrument platform, although before autostabilizers were introduced the rolling moment due to yaw resulting from the highly swept wing gave a noticeable Dutch-roll effect in rough air in the landing configuration. This is characteristic of all swept-wing aircraft, and autostabilization reduces Dutch roll to negligible proportions.

The approach coupler facility of the autopilot is a refinement which gives a most satisfactory and effective aid in instrument weather at the end of the flight. The system has a high degree of accuracy and relieves the pilot of much of the work-load associated with flying an ILS approach.

In a normal manual circuit under visual conditions the Lightning behaves in the approach pattern in much the same way as all the better aircraft in the same performance category. It settles on finals as if on rails, and is very easy to land; but if the turns on to base leg and finals are made too steeply, the rapid increase in induced drag of the highly swept wing necessitates use of up to 90 per cent cold thrust to maintain the correct approach speed.

The tail parachute is streamed after the nosewheel has touched and, with this and Maxaret wheel braking, the landing run can be as low as 850yd from the threshold.

The power available from the two Avons is such that overshoots must be made with only a small initial increase in power, while the single-engine overshoot case is pleasantly uncritical. Twin-engine reliability without asymmetric-powered trim penalties is a feature very well appreciated by all-weather pilots.

So much for the main operational features. Although a densely equipped radar fighter, the Lightning is fully aerobatic and all normal aerobatic manœuvres can be carried out smoothly and easily. In the roll axis particularly, the crispness and power of the ailerons allow rates of roll to be achieved far in excess of the maximum normally tolerated by the pilot. During a loop, although care has to be taken to avoid losing speed on approaching the top of the loop as the induced drag takes effect, the large increase in power available from reheat is always there if needed.

This, then, is the Lightning in flight: an aircraft of considerable complexity, designed to meet—and fulfilling—a vital and highly technological defence task; yet at the same time a pilot's aeroplane, and a fighter pilot's aeroplane at that.