

## Memories of TSR2 at Warton.

From Derek Collins, 28 years old in April, 1965, employed by Elliott Brothers (London) Ltd.

I was based at Borehamwood and towards the end was to be transferred to be based at Rochester but never actually worked there. I was employed for two years on flight trials at Warton Airfield, Lancashire, during the time of the TSR2 Flight Trials. I was an engineer working from the Elliott House (Office) at Warton, there were two technical teams, one for the Lightning Fighter and one for TSR2.

I was working on the development of a Lightning full authority autopilot to track other aircraft using signals from the Ferranti AI 23b radar.

The relationship between the TSR2 technical team and the Lightning team within the Elliott environment was close and of goodwill, particularly at the Engineering level; we were "doing it" for Elliotts; this statement is pertinent to the reliability of later comments in this report (\*1).

For Practical Work, Instrument Adjustment/Testing and Experimental Work, Elliotts had a moderate size workshop in the corner of No 2 hanger, adjacent to the airfield apron and No3 hanger. The natural walking route from the Elliott Office to this said Workshop was through No.2 hanger, ducking under the TSR2, touching it often as you went.

We all stood on the apron outside No.2 hanger to see TSR2 arrive, a noticeable characteristic was that the jet pipes emitted a black exhaust stream instead of the usual clear or white of such as the Lightning.

In the hanger, our interest was general including the skin being white but also specific, regarding the avionics for which Elliotts (along with Ferranti) were to be responsible. A forward planning approach to design, had doors in the side of the aircraft which when opened revealed storage space (cupboards) to house the electronic boxes. We were awed and somewhat proud to be close to such a project.

(\*1). Back in the Elliott house, proud engineers confided to other proud engineers, insights that were new. Elliotts were responsible for the autopilot, as they had been for the Lightning (and VC 10). We were told by the TSR2 engineers that the Autostabs. were duplex, i.e. there were two auto-stabiliser electronic channels for each auto-stabiliser function; the reason being that in this advanced airframe design, the aircraft could not fly without autostabs, so the electronics of each channel had to be duplicated. Note: the Lightning had single channel electronics for autostabs.

Flight trials went ahead and were very encouraging, and increasingly were thought quite successful.

(\*1). On arriving in the Elliott Office at Warton after perhaps six flight tests, it was a bit like entering a mortuary. Gloom, gloom, gloom. The story among these top level engineers was that "U.K. Prime Minister, Harold Wilson, wanted a big dollar loan and the payback required by President Johnson was that Britain buy F111s instead of TSR2!" I have not checked these two names, Wilson and Johnson, I am simply debriefing my memory of that time.

The next shock discussed within the team was that they had been given a month to prove the viability of the TSR2 as an operational aircraft, including electronics. As I passed through the hanger to the Elliott workshop there was highly motivated activity. The task of proving viability in one month was unreasonable but it was already looking a good airframe and Elliott's expertise with military autopilots and Ferranti's expertise with fighter aircraft radar had been well established with the Lightning; success was feasible! As one flight trial concluded, the aircraft was pulled into the hanger and support teams were literally running to achieve turn around for the next flight in the shortest possible time.

(\*1) Again, on arriving in the Elliott Office at Warton after perhaps ten flights, it was a bit like entering a mortuary. Gloom, gloom, gloom. The story among these top level engineers was that the flight trials were successful, far beyond our hopes so far, viability proving had been imminent but now the pilot's licence to fly had been withdrawn. If they could not fly then viability of the system could not be proven in the month allowed.

Next, at a general level of conversation with BAC. Engineers and ourselves, it was understood that the airframes built so far had to be sawn up or otherwise destroyed beyond any recoverable state. It was understood that some aircraft went to firing ranges to be destroyed in target practice. I witnessed master drawings being withdrawn from BACs Electrical Systems Design Office (hanger), these to be burned or otherwise destroyed. The gloom of redundancy added injury to insult; but no one blamed the Companies, it was government.

Warton had an Open Day for the Public (in summer 1965) at which the TSR2 was on display. The TSR2 was then moved to hanger six, the general understanding being that it had been hidden.