

From Arthur Boswell, a designer in the Warton Drawing Office.

I was never actually involved in design of the TSR2 as I had left the company (English Electric) in the days of the Lightning. When I returned I was put to work on other things pending the arrival of whatever new project might follow - my job was to head up that part of the Design Office dealing with engine installation, fuel system air conditioning, hydraulics etc, plus the associated engineering office (Aeromechanical).

However, when the time came for ground testing and preparation for flight at Boscombe Down, the chap who should have headed up our little design team on site refused to go and I was asked to take over even although I then knew nothing about the aeroplane. This, in itself, was not too worrying as my experience during the war as an engineer in the Fleet Air Arm had similarities.

We were, of course, under extreme pressure to get the job done but we had a good, dedicated team who worked hard and extremely long hours, not seeing our homes for weeks on end. It was a time of great strain. We had plenty of problems to solve. I could write a page or two on the origin of these problems and more on what some of them were and how we overcame them, but perhaps it is better to forget and let sleeping dogs lie.

My time at Boscombe was my only involvement with TSE.2. There we worked as a team - we knew what we had to do and how to do it and we had the trust of management who put us there. We did have visits from Directors like Freddie Page and Henry Gardner from time to time, but basically they let us get on with it. No doubt they were deeply involved in the political side. We weren't, apart from the inevitable pressure.

Perhaps my main claim to fame came after the first flights. A group of us were sitting round the fire at my house wondering what we could do to help avert disaster to our industry. (In those days, most of our friends were also work colleagues.) I came up with the suggestion that we should write a letter and get as many as possible to sign with their professional qualifications after their names.

This we duly did, obtaining some five hundred signatures. I still have a copy of this letter up in my loft. We presaged this with telegrams, then Ivan Yates and myself were delegated to travel down to London one evening to deliver copies to the Prime Minister and all the other Ministers and MPs involved. This was most interesting in itself since those were the days when you could personally go and knock on the door of No.10 Downing Street to make such a delivery, as we did. It was also quite awesome being led through the Great Hall at Westminster on our own to make some of the other deliveries.

Whilst the company knew what we were doing, this was entirely employee inspired, enacted and financed. It is perhaps of interest to note our expenditure on railway and other fares and hotel bills for this trip amounted to £17 2s 3d! Those were the days! The outcome of this exercise is recorded in Harold Wilson's autobiography – it gave him the one sleepless night of his career! It did not save the project, but it did make people think and perhaps helped to save our industry.

The cancellation and the subsequent order and later cancellation of American replacements were misguided and carried out in an aura of ignorance and incompetence. I see from other notes that there followed a period of discussion and action about a restructuring of industry relationships with the various Government agencies involved. Also, of course, we no doubt learned a lot, both positively and negatively about Design and Manufacture for the future. We did gain from the exercise.

It has always been a major problem to decide when to go ahead with a new weapon and how big a step to take. The ideal new weapon, for our country at least, is the one whose very presence helps to prevent it ever having to be used in anger. In the case of TSR2 we were fortunate that it was not actually needed and so there was some saving.

A batch of models of the aircraft were made, presumably to hand out to prospective customers and others and doubtless some survive. People often wonder whether any metal of significance remains. There were two lumps of scrap in use in our offices at Warton as door-stops. Originally they were test pieces for the front engine mounting. Roland Coles got one and I got the other. Mine has been in use in my workshop ever since and has been a most useful adjunct to my kit of tools!

You may wonder whether and how people like me make use of all we learned in our time at work. I spend a lot of time making up new gadgets and doing repairs for myself and various friends and neighbours. On at least one day a week I work as a volunteer with the Landscape Trust in the Area of Outstanding Natural Beauty where I live. Management seem to think that my experience on mighty jet engines and high performance aircraft ideally qualifies me to look after the 2.5 and 4.5 HP engines and other equipment on their motor scythe and cement mixer, etc. I don't disillusion them and get on with the job but we could do with more like help. We Engineers are a race in short supply!

I returned to Warton before the project was cancelled, and when it was, as we had the philosophy that we should keep the design team together, we soon moved on to other work, initially Lightning and Canberra, but very soon Jaguar appeared on the scene.

As an example of the sort of problem we encountered:

There was a requirement in the Ministry manual that fuel-carrying components should be in a compartment separated from surfaces on which fuel could ignite like the combustion chambers. This made sense in the earlier days of engines with centrifugal compressors where the temperature at the compressor outlet was about 200C. This then made sense to place a firewall there.

By the time of TSR.2, with engines having an axial compressor, this temperature could be more like 400C. The Ministry manual had been written quoting temperatures. It should have been rewritten to reflect the new conditions but the then Ministry official was incapable of appreciating this and insisted that the manual had to be followed verbatim. I was not present when this was discussed but I understand that the meeting involved so many people that no-one was able to say: 'Rubbish!'.

The outcome was the concept of double-walled pipes where every fuel pipe had to carry its own firewall. These were extremely costly, heavy and bulky and probably so complex that they were more dangerous than a single pipe would have been. (In contrast, when we came work on the Jaguar it was refreshing to see the French logical requirement that all fuel carrying pipes should, as far as possible, be located as near as possible to the bottom of the engine bay. (Not that I always agreed with their 'Logic'.)

During the test flying we had trouble with one of these pipes rubbing on something else and in risk of fracture. Late one night, we devised a repair scheme. I can't remember the material we actually used but it amounted to tying the pipe up with string! One of the Directors spotted this and congratulated us on a 'Brilliant' job. We had our fingers crossed.

A.C.B