

Reflections on the Arrow

While the design and production of the Avro Arrow undoubtedly constituted an historic breakthrough for the Canadian aviation industry, as was noted in the article in the November/December issue of *Aviator*, there are still unanswered questions about the program.

During those fatal months of 1958 when the future of the aircraft was being decided, I was associate editor of *Canadian Aviation* magazine and my good friend Ernest Hemphill was the editor. We stoutly defended the continuation of the program. First, we believed that the Arrow was a valuable component of North American air defence and second we felt that if we had to spend money on defence it made sense to reap the benefits of that expenditure within Canada. The magazine also depended very largely on the advertising dollars that flowed into our coffers from Avro, and the many subcontractors involved, but I like to think that this did not unduly influence our faith in the program.

We had some minor reservations at the time, but we certainly favoured continued production of the Arrow as opposed to buying, or even being given, hardware from the United States. The subsequent failure of the Bomarc program certainly justified that thinking. At this range I am not so sure the cancellation was a mistake although the way it was done was unforgivable. My belief is that if anyone really knows the answer to the Arrow controversy and therefore should have the last word, it is Jan Zurakowski, world-renowned test pilot who led the Arrow test team.

My recollection is that Jan wiped off the landing gear of one of the Arrows following an early test flight, probably during a crosswind landing. We were not told about this at the time and so could not acquaint our readers of this disturbing fact, but it raises some interesting questions and reinforces

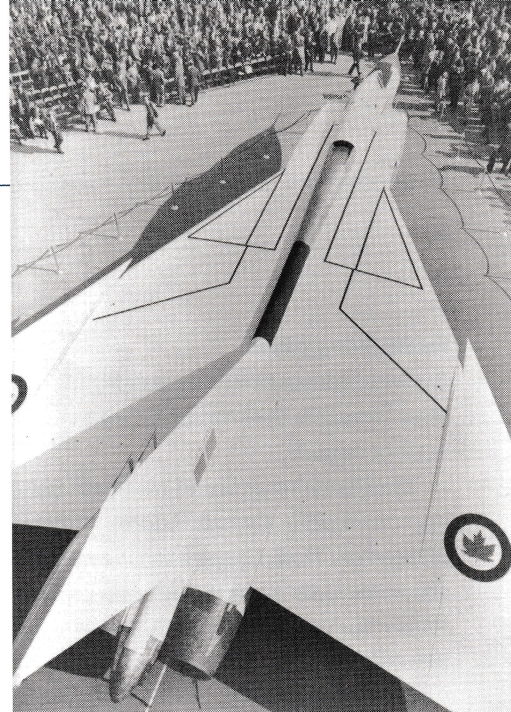
my concern about the reliability of the main landing gear geometry of the aircraft. If a thoroughly competent and experienced pilot like Jan could have trouble landing the Arrow, in any conditions, what chance would regular RCAF pilots have had in difficult crosswind landings?

Dowty Canada, the originators and constructors of the landing gear, were handed a difficult and tricky design task. The Arrow was a shoulder (high) wing airplane with an extremely thin wing section and in order to accommodate the mechanism, the gear had to rotate and shorten during retraction into the wing. This made the gear, although a triumph of engineering, unduly long and stalky when extended, and susceptible to any excessive side loads.

A better solution to the problem, though not an option that Dowty was offered, might have been to have the landing gear retract into the lower fuselage, much like that utilised in early Grumman fighter designs. Retraction of the Arrow's gear into the fuselage would have greatly shortened the travel required and provided a more stable geometry. Granted, the track of the gear would have had to be narrower, reminiscent of the Spitfire, with its outward retracting gear, versus the more stable Hurricane with its inward retracting wheels.

Interestingly, retraction of the gear into the lower fuselage was the solution utilised in the British TSR2 fighter aircraft which was roughly similar in appearance and contemporary with the Arrow and which, ironically, was cancelled by the British government soon after political power changed hands, just as the Arrow was.

Our understanding at the time was that there was some concern among RCAF brass about the effective range of the Arrow but that this was being addressed. There is no doubt that once aloft the aircraft was a delight to fly and was achieving expectations in terms of performance. We will never



know whether the Iroquois engine would have further enhanced that performance because it was not ready and there were rumours of problems with the new blade technology employed. Let's face it, there are problems in any advanced aircraft or engine design configuration and both Avro and Orenda were pushing the envelope.

Looking at other factors, this was a cost-plus contract with the somewhat unorthodox and possibly risky concept of going straight to production without first producing a prototype. The whole idea of having a prototype is so that modifications can be made as flight-testing indicates any problems, before full-scale production begins.

Avro didn't enjoy that luxury, although they didn't have to worry about excessive overtime or any other wasteful measures either. I'm not knocking the excellent design and production teams that Avro and Orenda assembled, but there is no doubt that cost-plus can be a dicey business, as I discovered when I agreed to put an extension on my house using this accounting method.

Politics played their part, as always. Crawford Gordon, Avro's admittedly dynamic, if impulsive, chief, was a protégé of C.D. Howe, Diefenbaker's arch-rival, and "Dief" inherited the Arrow program from his Liberal predecessors. At the same time he had fiscal problems and had to find ways of trimming the budget. He and Gordon almost came to blows over the controversy. In that

respect the CBC version of the story was painfully accurate despite some other flights of fancy.

Although the impression is often given that the Arrow cancellation was a sudden, overnight decision there was actually a period of several months during which the program was under review. Vital weapons components of the program had already been cancelled, somewhat gutting the Arrow's usefulness. The final cancellation really came as no surprise to most people, although the way it was done was unforgivable. Perhaps Crawford Gordon had some responsibility in this regard. He went full-steam-ahead right up to the last minute and then slammed on the brakes. He must have known that some staff would be required

for the wind-down and that this would not have cost Avro anything in the final reckoning, but he fired everyone on the spot for increased political impact.

The most heinous aspect of the whole affair was the wholesale destruction of the existing aircraft and the documents and drawings pertaining to the program. That the Americans and the British parent company were interested in obtaining some of the completed aircraft is almost certainly a fact, and there would have been no security problem involved. It would also have been nice to have one of those beautiful and impressive looking machines on display in the Canada Aviation Museum.

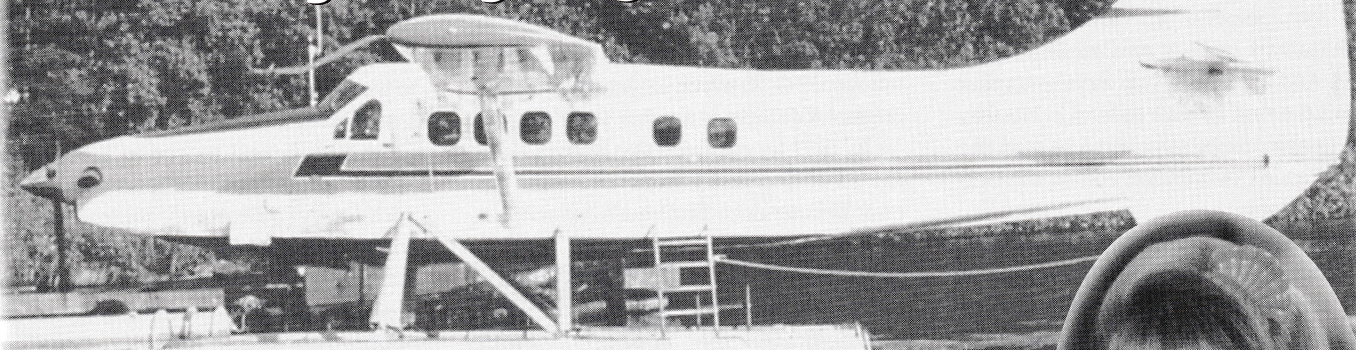
So, who was really responsible for this terrible and senseless destruction? Diefen-

baker seemed the most likely suspect, given his relations with Gordon, but this has been questioned in recent times. One thing is for sure — the effect upon Canada's technological expertise through the loss of the program, and the trickle-down benefits of the program being experienced throughout Canadian industry, is incalculable. We have probably never quite recovered from this single horrendous industrial blow. The only silver lining to this dark cloud is that the brilliant people who originated and nurtured this great Canadian dream went on to equal, if not greater, satisfaction and rewards in NASA programs south of the border. We salute them still.

— Peter Brannan
Scarborough, Ont

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