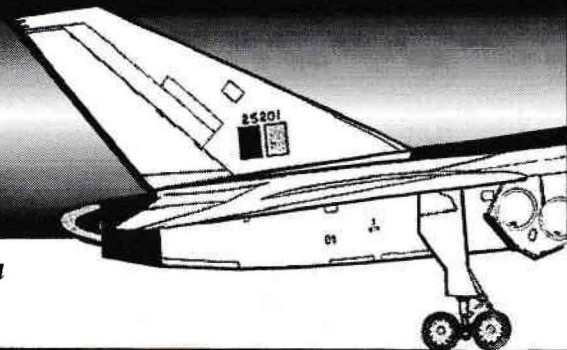


Pre-Flight



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The Concorde

Jim Floyd's article "The Concorde" appeared in
"AIRPORT NEWS" on June 5th, 1990

"British Airways brings the Concorde to Pearson International Airport
on scheduled flights, during Summer of 1990".

The Concorde
by James C. Floyd

Torontonians are in for a special treat this summer when the Concorde supersonic airliner will grace our skies on the introduction of scheduled services from London into Lester B. Pearson International Airport. It has taken fourteen years since Concorde started flying commercially with British Airways and Air France, for scheduled supersonic flights to be available into Toronto.

Concorde flying overhead is an impressive sight, and sound even after a decade and a half of operation, the town folk and villagers under Concorde's flight-path into Heathrow Airport in England, can still be seen popping out of their homes to watch the graceful, birdlike shape pass over them. I predict many Canadians will catch the same bug when she comes in on the approach to Malton. By the same token, they will probably rush indoors to pacify the dog if Concorde comes too close. Those engines generate about the same power as 2,000 Cadillacs and you don't get that much push without the noise that goes with it!

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From the President

On May 30th., I attended the Annual Review of 845 Avro Arrow Squadron, Canadian Air Cadets. I had the honour of once again presenting the winners of the James C. Floyd Award and the Jan Zurakowski Award. The Floyd Award was won by W. O. E. Li and the Zurakowski Award was won by Sgt. A. Sridhar.

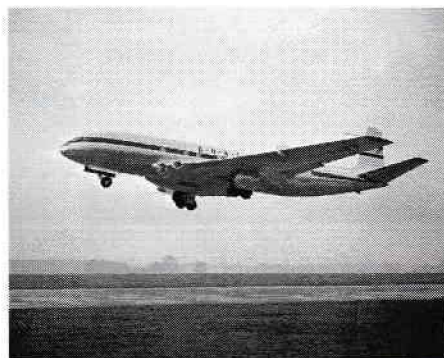
At our June meeting the Board set a time schedule on the work identification on the crash site of CF-100, (18102) second proto type. A large stone will be purchased and a plaque prepared for mounting on it. The Crash was on April 5th., 1951 near Komolka, Ontario, with Flt. Lt Bruce Warren at the controls and Robert Ostrander Engineering Observer.

I trust you are looking forward, as I am, to further issues of Pre-Flight and items regarding James C. Floyd.

Frank Harvey

Continued from page 1...

Concorde is a unique aircraft, difficult to compare with other civil transports since it flies at more than twice the speed of any other passenger aircraft in use today. In some ways, it brings to mind a similar milestone period over forty years ago,



when the DH Comet and our own Avro Canada Jetliner were flying at twice the speed of contemporary transports, leading us into the jet age and mass air travel at reasonable cost.

Over that forty year period, while thousands of civil jets now carry millions of passengers all over the planet, the cruising speed has only increased by some 20% to 30%. Concorde stands out as the only civil transport that has again cut travel time in less than half in comparison to all other passenger jets.

The relatively trouble-free operation over the past fourteen years is a tribute to Concorde's designers and producers, British Aerospace and Aerospatiale of France. Unfortunately, the Concorde has been relegated to an elite clientele and put out of the reach of all but the wealthy or business subsidized passenger. This is caused by flying restrictions due to the sonic boom, and the enormous increase in aircraft fuel prices over the past decade or so, particularly devastating in the case of that

aircraft, which carries more than its empty weight in fuel. Because of these considerations, operations have been confined mainly to the two flags of the countries that invented it.

I had my first flight in Concorde in the Spring of 1978, soon after supersonic trans-Atlantic services were inaugurated and experienced the glamour and VIP treatment meted out to all fortunate enough to fly in that state-of-the-art airplane. I also experienced the frustration of having paid three or four times the economy fare for the special treatment and the saving in time, only to find out that I did not like caviar or the particular brand of champagne offered; on top of that, we were subjected to an aborted take-off on the outbound flight to New York. A slight malfunction in one of the systems caused the pilot to abandon the take-off at a fair clip, resulting in rapid deceleration, a return to the terminal and a long stop-over in special Concorde lounge at Heathrow. This episode inspired one of the passengers to become very drunk and smelly on the abundant champagne and caviar, while we waited for crews to carry out the necessary maintenance and checks on the aircraft. We finally took off almost three hours late, eliminating any saving in time over the subsonic equipment in which I usually flew and – guess who my seat-mate was for the rest of the journey?

However, the return flight to London the next day went without a hitch, New York to London in a little over three hours, some of which was spent in the flight compartment. It was one of the fastest Eastbound flights that had been made up to that time, helped by a good tailwind. It was the only occasion on which I had not suffered the frustrating jet-lag usually associated with a trans-Atlantic flight.

In addition to getting to the destination twice as fast, probably the most unusual Concorde features from the passenger's point of view are the marked "nose-up" attitude of the aircraft during take-off and landing, and the size of the passenger compartment. With four abreast seating and overhead baggage storage so low it's knocked the hat off man a passenger getting into the window seat.

The cabin arrangement is more reminiscent of the early 1950s regional aircraft, than the wide-body "jumbos" to which we have now become accustomed.

This relatively cramped arrangement is required in order to keep the fuselage diameter down to the minimum, for supersonic performance. The shorter time in the seat makes this less of a problem than might be expected.

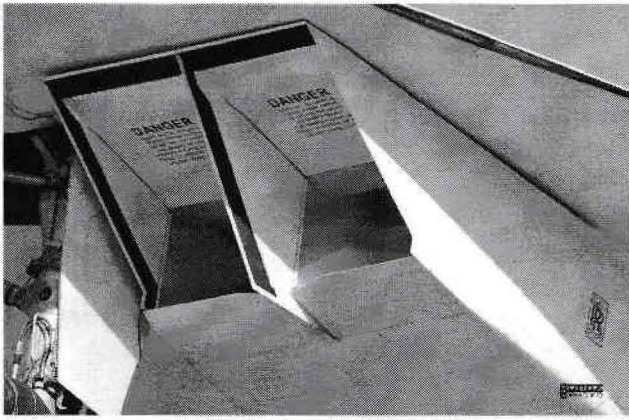


Oh yes, there is also the "magic Machmeter". This displays the speed of the aircraft at all times and is the centre of attention when it goes past Mach 1 and finally up to Mach 2, and the passengers sit back and enjoy their supersonic champagne and caviar, at least those who like the stuff!

Having been involved in the early design studies on the U.K. supersonic transport, I was more aware than most of my fellow passengers of just how many things have to work to perfection in order to push this aircraft along safely at twice the speed of sound, comparable to the muzzle velocity of a 0.303 rifle bullet, for a sustained period.

During cruise at Mach 2, the temperature on the outside skin of the aircraft would boil water, yet the passengers have to be kept in a normal, comfortable environment requiring an extremely sophisticated air conditioning and pressurization system. The fuel inside the wings must also be protected from excessive heat, and the aircraft structure has to withstand differential temperatures between the cruise portion of the flight and the subsonic sectors, of over 160 degrees Centigrade without adequate precautions, this could affect the resistance of the structure to metal fatigue; new aluminum alloys were developed for Concorde to overcome this potential problem.

A complex fuel management system is incorporated to move fuel rapidly forward or aft, in order to adjust the balance of the aircraft between the subsonic and supersonic portions of the flight. During acceleration to supersonic speed, the centre of lift on the wing moves aft, and the centre of gravity of the aircraft has to be moved aft at the same time, to "trim" the aircraft and reduce the drag.



The configuration of the air intakes to the engines in order to provide adequate engine efficiency at all speeds was also a special problem; this required an advanced system of variable-geometry ramps and air spill doors, similar to that we were to use on the Mk. 3 Arrow.

The fact that these and a thousand and one other problems have been successfully solved is a fitting tribute to the designers and builders of Concorde and the engines to power it, and justification for the thousands of hours of testing, on the ground and in the air before Concorde was cleared for airline service.

Few Canadians will be aware that, after the Arrow project was cancelled early in 1959, five of the senior ex-Arrow engineers went over to the United Kingdom with me, to set up a team of Hawker-Siddeley Aviation and ex-Avro Canada engineers to carry out design feasibility studies on the proposed United Kingdom supersonic transport, using the Mark 2 technology gained from the design and flight testing of the Arrows.

We latter carried out joint studies with the engineers in the British Aircraft Corporation (now British Aerospace) until late 1960, when BAC was awarded a design study contract to continue work on the project, later to be joined by Sud Aviation (now Aerospatiale), and the Anglo-French Concorde was born.



It was to be almost seventeen years from our initial design feasibility studies before the Concorde went into scheduled passenger service; there were many hurdles on the way, not the least of which was general animosity to the project and to rising costs, within political circles.

One can only admire the courage of the British and French "Concordians", who, the face of very strong opposition in the early days, continued with a project which has revolutionized business travel across the Atlantic and brought incalculable prestige to the nations involved. What a great shame that our own politicians and service chiefs did not have the same kind of courage and foresight, at a time when Canada was leading the world in aviation technology.

I have a feeling that, when Concorde comes in for a landing at Malton sometime this summer, that the ghost of the Arrow will be flying alongside. Perhaps we should give them both a wave in tribute to the dedicated teams that made it all happen.

James Charles (Jim) Floyd was the engineer in charge of the teams which designed and developed the Avro Canada civil Jetliner project, the CF-100 all weather fighter and the legendary Avro Arrow, CF-105 supersonic fighter. After the cancellation of the Arrow in early 1959, he went to the United Kingdom to lead a group of senior ex-Avro Canada and Hawker-Siddeley Aviation designers, studying leading-edge-of-technology aerospace projects. Their first project was a joint study with the British Aircraft Corporation on the design configuration and general feasibility of the proposed United Kingdom supersonic transport.

When this later became the Anglo-French Concorde project, designed and developed by BAC (now British Aerospace and Sud Aviation (now Aerospatiale) Jim Floyd was retained as consultant to the British government on Concorde operations and economics from 1965 to 1972.

