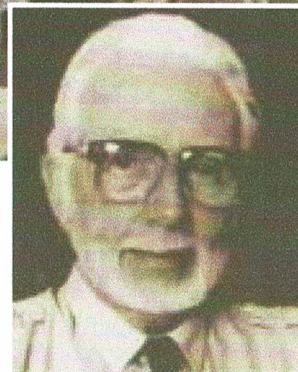




## Jim Floyd, P.Eng. One straight arrow

by Dwight Hamilton

Back on December 14, 1948, James C. (Jim) Floyd entered 350 Bay St. in downtown Toronto, which at the time housed PEO's offices, and formally registered as a professional engineer here. In less than a decade he would spearhead the development of the most famous aircraft in Canadian history—the Avro Arrow.



**Golden Era:** At the height of the Cold War, Floyd led one of Canada's top engineering teams.

Numerous articles, books and documentaries have appeared over the years about the aircraft. In fact, the Arrow's legacy continues today with dedicated fans searching the bottom of Lake Ontario for abandoned test models and some even planning to build flying replicas.

Floyd is an aeronautical engineer of international stature, with numerous awards and citations, including the Wright Brothers Medal in 1950 for his work on jet transport technology. He is the first non-American to have this honour. He was a leading consultant to the British government on the SST Concorde project from 1965 to 1972, and his 1961 technical paper, *Some Current Problems Facing the Aircraft Designer*, is still referenced today.

But Floyd will always be famous for one particular bird: "Jim was the Arrow," says Palmiro Campagna, P.Eng., author of *Storms of Controversy*, a bestselling book on the subject. Speaking to the press for the

first time in many years, the engineer behind the legend talks to *Engineering Dimensions* close to the 45th anniversary of the Arrow's first flight.

*ED: There was a plaque that hung behind your desk at Avro's plant that read: "If it's worthwhile but obviously impossible—do it anyway." Was there some event or reason that inspired you to become a professional engineer, especially in the aviation field?*

**Floyd:** As a 14-year-old in England I was fascinated by the activities of aviation record-makers. Lindbergh's solo flight across the Atlantic and the long flights of Amelia Earhart and Kingsford Smith, all in the same year, raised my adrenaline level and I was anxious to one day become "part of the action."

My chance to turn the dream into a reality came in 1930 when I heard about a special apprentice scheme that was being introduced at the main Avro plant in North Manchester. The company was recruiting bright young schoolboys to be

put through an intensive training program and at the same time continue their education to university standard.

I applied, was accepted, left school and joined as a "special apprentice." I was all set for the glamorous life of an aviator. Unfortunately it didn't turn out that way, at least for the first few months spent in the noisy machine shop covered in whale-oil lubricant, turning out thousands of small bolts for the equivalent of one dollar a week. But my next job was a little more exciting: I installed an electrical system in a new biplane from a layout handed to me by my foreman on a postcard!

Looking back, I'd have to say that Avro's special training program was the best that anyone could possibly receive. The time spent in every department of the company and the special education arrangement resulted in a better understanding of the essential interface between design and production than what would be received by graduates coming directly out of university.





**ED:** Many to whom I spoke think the cancellation of the C102 Jetliner, the world's first regional jet to fly, was a greater tragedy than scrapping the Arrow. Do you agree?

**Floyd:** This is a subject on which I get very angry. I know of no military aircraft in service today that would fully meet the specifications laid down for the Arrow in 1953. But while the complexity, and therefore, the cost of the Arrow program, based on the almost unheard-of performance specified by the RCAF requirements team, was probably the cause of its demise, there was no such reason for the abandonment of the Jetliner. It was cancelled when we were negotiating a contract with National Airlines for an initial fleet; when Howard Hughes had offered to fund 30 of them for TWA; and when the American airforce had set aside funds for 20 to be used for pilot and navigator training for the crews of their proposed jet bombers. The cancellation was stupid, unconscionable and without merit of any kind.

**ED:** After the Jetliner, you took charge of the development of Avro's CF-100 (the only Canadian-designed fighter aircraft to see service) and finally you fathered the Arrow. This era is often referred to as Canada's "golden years" of aviation technology. What do you remember most?

**Floyd:** While that work amounted to not much more than a quarter of my professional life, it was certainly the most exciting, demanding, frustrating and formative time. There are two events that are indelibly etched on my mind. One is the first flight of the Jetliner on August 10, 1949, a hot, humid day when you could have fried an egg on the tarmac, and the other is the Arrow's first flight on the morning of March 25, 1958, a raw and overcast day, with a

relief when the flights were over is equally difficult to put into words.

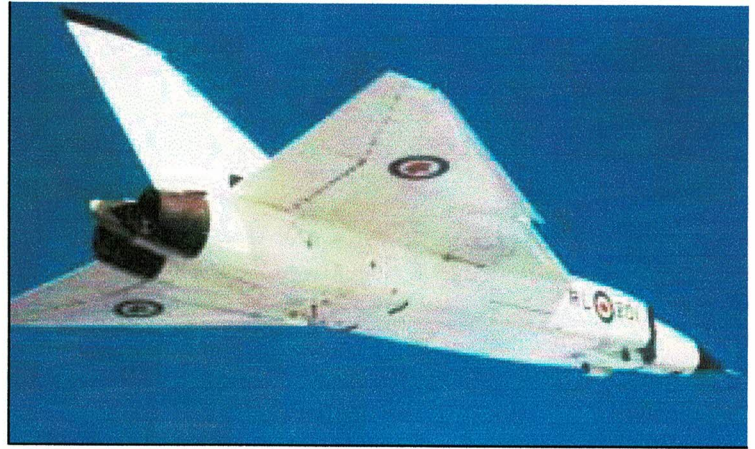
While the Jetliner was a particularly docile aircraft, the Arrow was incredibly complex.

Despite the fact that we had "hedged our bets" with an enormous amount of ground and wind-tunnel testing, I was thinking about the 38,000 parts that had to behave as we expected them to. Luckily, they did.

**ED:** One of the things in the 1997 CBC miniseries that would concern P.Engs from an ethical standpoint is a scene in the control tower. Your character is asked by Avro's president, Crawford Gordon, to falsify the Arrow's test results in order to ultimately market the still-developing Iroquois engine to foreign countries. Can you set the record straight?

**Floyd:** The miniseries on the Arrow is widely acknowledged as a fantasy, and as the authors point out, based loosely on a true story. In the film, some characters are invented or changed beyond recognition, some mouthing innuendo that bears no relationship to the real facts of the story. All in the cause of producing a sensational film, which it certainly is, and brings into focus some remarkable things that were happening in our country so many years ago.

But engineers don't design aircraft using Coke bottles, paper darts and home grinding machines as depicted by the whimsical characters in the film. The scriptwriters pointed out in a letter to me that the facts were "manipulated for dramatic purposes." I objected strongly to real names being used for the characters, resulting in



**Breathtaking: some things fans and critics agree on—the Arrow was big, bold, beautiful and short-lived.**

Now to your specific question of Gordon attempting to coerce the film character—in fact, the truth was exactly the opposite. Because of the criticism and sniping that was going on from certain government organizations questioning the aircraft's performance, everyone at Avro was delighted, none more than I, when our test pilots reported that our performance figures were being vindicated. RCAF flight evaluation pilot Jack Woodman has stated that "the Arrow was performing as predicted and meeting all guarantees."

Whatever else Gordon was or was not, he was no fool and would not have jeopardized the continuation of the Arrow program by asking us to downplay the performance. There is no way we would have agreed to that nonsense in any case.

**ED:** There aren't many events in our history that have created a controversy like the Avro Arrow. Do you feel there is any lesson that can be learned?

**Floyd:** I was so privileged to have the support of a team of incredibly talented and dedicated professional engineers and technicians at Avro Canada. After the

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wintery wind hanging over the scene. Since I had been in charge of these projects from inception to takeoff, the responsibility for the results and the safety of the crews was firmly planted at my feet. That is a feeling that is almost impossible to describe, and the

copious correspondence between me and the writers for a considerable length of time, since I felt that some of their presentations come very close to libel. But I lost that battle and bailed out of any further discussion of the project.

Arrow's cancellation, many went on to groundbreaking activities all over the world. As a result, that integrated and highly trained team was lost to this country. I think that was the real tragedy of the Arrow story. ♦