

The Father of The

by Bill Mellberg

Jetliner



AVRO Canada

Among the ranks of the world's foremost aircraft designers are such familiar names as Northrop, Johnson, Mitchell, and Tupolev — to name but a few. These men have given us some of the most famous aircraft ever built. But not every great design is a great success. Those machines which fail to make their mark in the sales books usually fail to show up in the history books as well. One Canadian designer was associated with two such aircraft — designs which could have given his adopted country a tremendous lead in both civil and military aviation. Sadly, the Canadian government cancelled both projects, earning them only footnotes when they should have been whole chapters in the story of flight.

The man behind those airplanes is now retired and living in a Toronto suburb just down the road from Malton where much of his greatest work was done. Leroy Simpson, a former colleague, describes him as "one of

the foremost, and probably least recognized, aircraft designers from the era when one guy could really contribute the innovative ideas." His name is JAMES C. FLOYD. And *AIRLINERS* recently enjoyed an interview with this fascinating man at his Toronto home.

Jim Floyd is a quiet and unassuming fellow with a quick wit and charming manners. His white hair and neatly-trimmed beard and moustache give him a kindly appearance which closely matches his personality. Born in England in 1914, Floyd grew up in North Manchester. As a youngster his main ambition was to get involved with airplanes, and the historic flights of Lindbergh and others in the Twenties only heightened that enthusiasm. Nearby his home was the Newton Heath plant of the A.V. Roe Company — more commonly known as AVRO.

With the help of a relative, young Jim Floyd was given an interview with Avro's general

manager, Roy Dobson. 'Dobbie' offered him a job in the machine shop. The work was somewhat tedious, but Floyd was soon involved with a special engineering apprenticeship program which exposed him to nearly every department at Avro, and every facet of the 'aviation game'. In 1934 he graduated from the Manchester College of Technology and went to work in the Avro design office. Later he spent some time at Hawker Aircraft under the great Sydney Camm. Back at Avro in 1937, he worked under another famous designer, Roy Chadwick, on the Anson and the Manchester bomber.

The Manchester was a failure because of its untried engines, but Floyd was a part of the small team that turned that twin-engined aircraft into the four-engined Lancaster bomber. The Lancaster, of course, became one of the most famous and vital aircraft of World War II, and also holds a somewhat special significance for Jim Floyd as he met his wife, Irene, in the same design office. Thus it is not surprising to find a magnificent painting of a Lancaster proudly on display in the Floyd's living room.

After the war, Avro established a Canadian subsidiary in Malton which is also the site of Toronto International Airport. Jim Floyd came to Avro Canada in 1946, and was put in charge of the Avro C-102 Jetliner design effort. Later, as Vice President and Director of Engineering for Avro Canada, he was also responsible for the successful CF-100 Canuck program as well as the fabulous CF-105 Arrow. The Jetliner was a short-to-medium-haul jet transport which first flew in 1949, just days after the Comet 1 took to the air. The Arrow was a supersonic fighter which made its maiden flight in 1958. Although its performance was nothing less than phenomenal, the following year the Canadian government dropped the axe on the Arrow as it had on the Jetliner several years earlier. With the demise of the Arrow, Avro Canada ceased to exist, and with it died Canada's lead in advanced aviation technology.

Jim Floyd returned to England in 1959 and became Chief Engineer of Hawker Siddeley Aviation's Advanced Project Group at Kingston. In 1962 he established his own aviation and transport consulting firm, J.C. Floyd & Associates, located in England. Among his various projects was an eight year retainer with the British government on the development of the Concorde. Following his retirement in 1980, Floyd moved back to Toronto.

Many people welcomed Jim Floyd's authoritative and exhaustive book, *The Avro Canada C-102 Jetliner*, when it was published in 1985.* It recalls many aspects of his colorful career. His work on the Jetliner, for example, earned him the Wright Brothers Gold Medal in 1950, the first time that award was ever given to a non-American.

*This beautiful book is available for U.S. \$25.00pp from Canav Books, 51 Balsam Avenue, Toronto, Canada, M4E 3B6

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Having discussed his biography in brief, the author proceeded to ask Jim Floyd a number of specific questions about the Avro C-102 Jetliner as well as some of the other projects he was involved with during a career that spanned half a century in aviation. What follows are some of the highlights from that *AIRLINERS* interview . . .

AIRLINERS: When the Jetliner was cancelled, Avro was close to finalizing contracts with National and TWA. In your book you quote a basic price of \$500,000 per aircraft based on 100 sales, and you said that Avro could have become a world leader in jet transport development. If the program had been allowed to continue, don't you think sales would have been much higher, and how would the Jetliner have affected the sale of medium-range Douglas DC-6s and Lockheed Constellations?

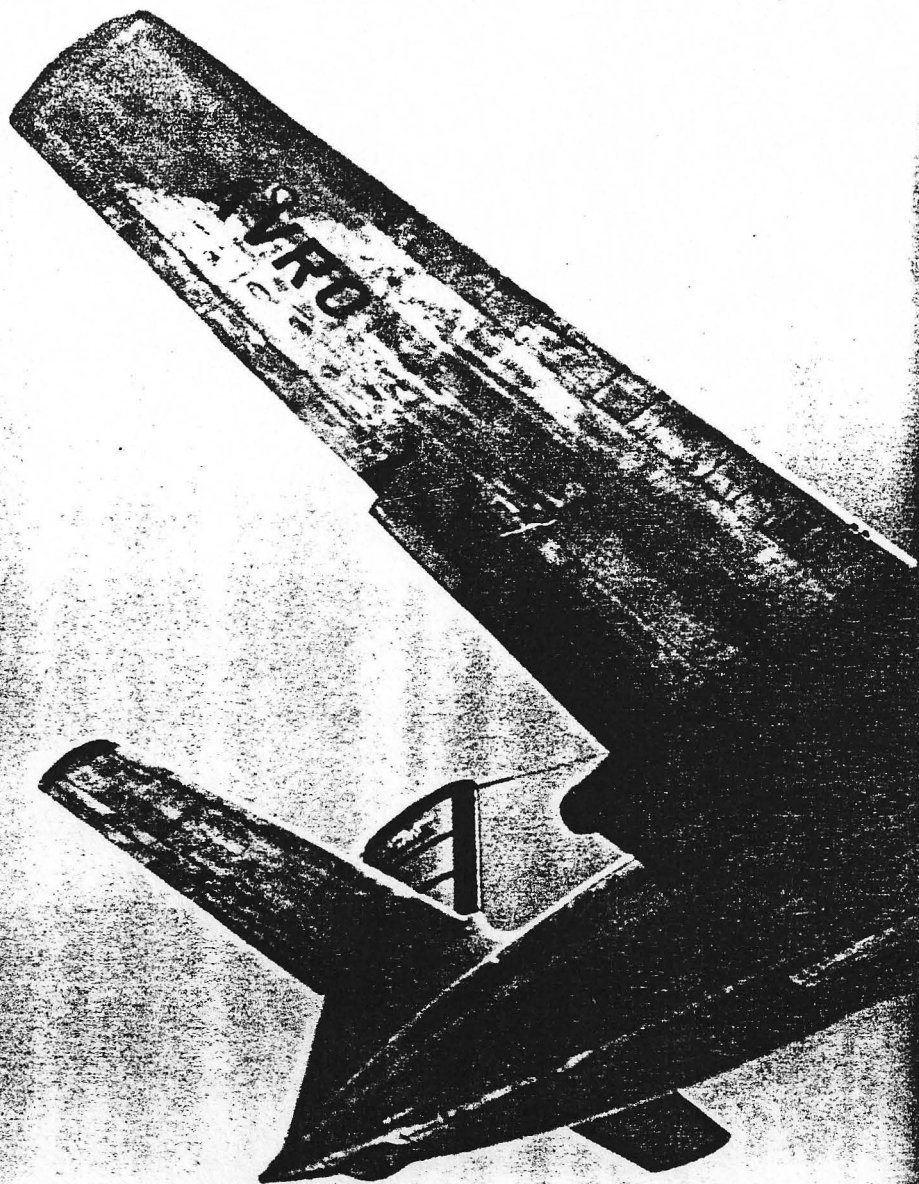
FLOYD: Dixon Speas (Avro's U.S. sales representative) did a study, and he came up with about 400-500 (sales) as a reasonable estimate. In a fleet you have a lot of different types, and I would think that those other aircraft still would have sold for certain routes. You never get an aircraft that is good for every single route on an airline, and the propeller types might have been preferable on some of them. They might have been phased out earlier, though they still would have been used. But there would probably not have been a Douglas DC-7 if the Jetliner had gone ahead because it was a competitor, if you like, though a much slower competitor!

AIRLINERS: How quickly do you suppose the rest of the industry could have caught up with Avro, and how 'elastic' was the Jetliner design?

FLOYD: Well, the average time to develop an airliner is about seven years. So if you take 1953 (the estimated starting date of Jetliner operations), it would have been 1960 before any similar medium-range aircraft could have been sufficiently developed to be put into service. In fact, the DC-9 arrived in 1965, and it wasn't on the boards before 1958. None of our competitors had such an aircraft on the boards in 1953 and certainly not in 1949 when the Jetliner first flew.* The DC-9 was 100 m.p.h. (160 km/h) faster and would have been a replacement aircraft for the Jetliner. But, as I say, it came on the scene years later!

With respect to 'elasticity', we had already put a second generation Jetliner on paper with a swept wing. The straight wing was basically to meet TCA's requirement for a 3,000 foot (1,200 m) runway — which, incidentally, would have made the aircraft suitable

*Editor's note: The Sud Caravelle medium-range design was approved in 1952, and entered service seven years later.



The Avro C-102 Jetliner on final approach

AVRO Canada

for such airports as Midway, National, and La Guardia. But you couldn't do that with a swept wing because we didn't have the other things you need, such as reverse thrust, then.

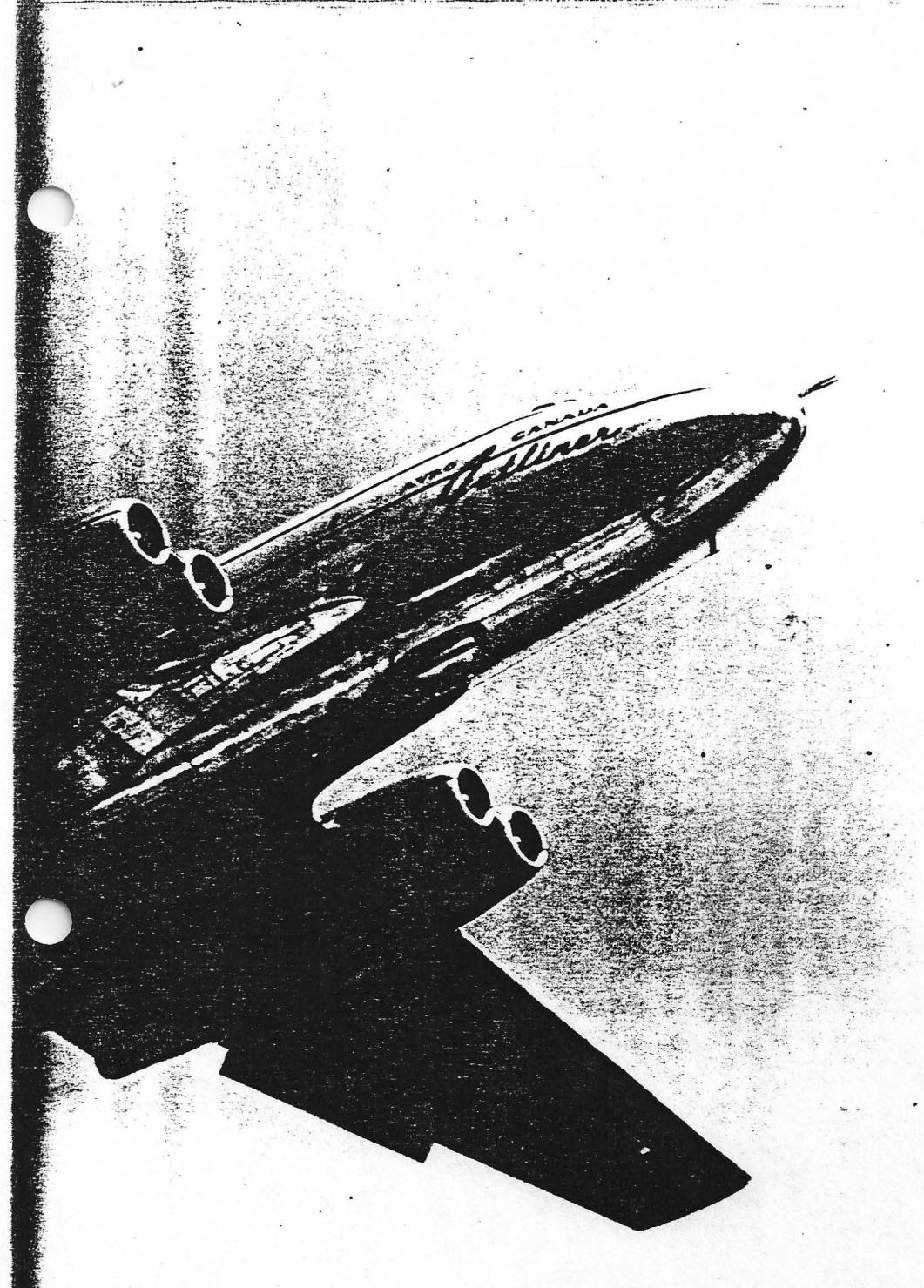
Since most aircraft have about a 20-year service life, the Mark 1 would probably have gone that long. Later, it would gradually have been replaced by further developments and entirely new designs which we were studying even then. Avro was so far ahead of the game that we had the time advantage to stay ahead. Which is why I say we could have been a world leader in civil aviation, and we could have kept that lead.

AIRLINERS: The Jetliner's first flight took place shortly after the de Havilland Comet's. Would the Jetliner have been at all competitive with the Comet? In your book you men-

tion that Howard Hughes wanted to put it on TWA's Los Angeles—Chicago run, which was about equal to the Comet 1's range.

FLOYD: No. They were designed for different roles, the Comet being a long-range aircraft. TWA, for example, would have had to make a stop in Denver along the route you mentioned. So the Comet and the Jetliner were really complimentary designs. In many respects the market for the Jetliner would have been much larger in that it was tailored to short and medium-range routes. For that reason I would reckon that the Jetliner would have sold well and remained in production for about twelve years.

AIRLINERS: The Jetliner program was killed by the Canadian government right at the brink of success so that Avro could concentrate on



CF-100 production for the R.C.A.F. This stemmed, in part, from the Korean War and the 'Red Scare'. But couldn't you have continued both programs concurrently?

FLOYD: Yes. Absolutely. And it would have kept us in business after the fall of the Arrow in 1959 if we had been building civil jet transports. The capability was there, but not the will, and that was a tragedy for Canada. Avro had the technology and the expertise to be a world leader. Remember that we were building our own power plants as well. In 1953, the Hawker-Siddeley Group Design Council toured our facilities at Malton. The group was described as "the greatest single collection of aeronautical design and research brains in the world." Among them was Hawker Aircraft's Chief Designer, Sir Sydney Camm, who said:

"Imagine a young company in eight years designing a successful airliner, a successful fighter now in operational service, and an engine to power it. No one in England has done anything like that and I doubt if anyone in the world has. It's remarkable — really amazing."

Incidentally, that was high praise indeed coming from Camm. Sydney was a real eccentric, and he would almost certainly damn anything that wasn't designed by Hawkers! (laughing) Everyone else was considered to be close to a half-wit. He is reputed to have said that anyone from north of the Thames (Hawkers was located south of it) was sub-human! So it was very satisfying for a young Canadian company to impress Camm with what we were doing at Malton.

But politicians didn't understand or appreciate what we were doing and what it could have meant to Canada in the long run. Like I said, it's a tragedy.

AIRLINERS: A few years later you added the incredible, supersonic CF-105 Arrow to that list of achievements. How *did* Avro Canada achieve so much in so little time?

FLOYD: Well, it was a brand new company. It wasn't inhibited by all the traditions of a big company — seniority, and so on. You could gather together a number of people and get them to work as a team...a brand new team. There's always enthusiasm in a new team. And as time went on, Avro became a 'Mecca' for all aviation engineers — there were so many exciting things going on there. It was like an implosion — people all coming to Malton from Europe and the States.

AIRLINERS: Describe some of your experience before coming to Avro Canada, and, in particular, how well did you know another of England's great aircraft designers, Roy Chadwick?

FLOYD: Do you recognize that airplane hanging on the wall? (pointing to his Lancaster painting). I did the very first drawings for turning a Manchester into a Lancaster. I was in the Projects Office then under Roy Chadwick. I worked for Roy for ten years. I was his 'whipping boy' for many things — very junior. Our job was to transfer his thoughts onto paper. And my wife worked in the engineering office at Avro as well. In fact, she did the very first tracings for the Lancaster. That's why that picture is there... we bow to it every morning!

Yes, I knew Chadwick very well...to my cost at times! He was a difficult man to work with. We would show him a bending moment diagram, and it would be obvious that he had little idea what it was all about. He wasn't a technical man by today's standards, but he was one of the best 'eye designers' I've ever seen. He would come up to your drafting board, and he would spot something questionable just due to sheer experience. And when you went through your calculations you'd find he was right. He was the complete eye designer. Sydney Camm was very similar. Sydney didn't have too many technical qualifications, but, again, he was a wonderful designer. His designs spanned the early Hawker biplanes to the Harrier 'jump jet'. Of course Camm and Chadwick had a lot of detail engineers to work their ideas out. But they would know if it was right or if it was wrong. They threw away the mold when those people died.

AIRLINERS: Times have certainly changed! You spent thirteen years at Avro Canada. What

did you do after you returned to England?

FLOYD: Well, the Arrow was cancelled in February 1959, and I went back to England in May. I was commissioned to set up Hawker Siddeley Aviation's Advanced Projects Group with a handful of carefully chosen engineers, which later developed into a team of 100 top engineers, to study various aircraft and space projects. Among the various ideas we looked at were V/STOL transports, atomic-powered aircraft, supersonic transports, and a Mach 1.15 variable geometry airliner which I think is still a good idea, even today.

AIRLINERS: Can you describe that last project in a little more detail?

FLOYD: The main problem with supersonic airliners then, as now, is the sonic boom. This restricts you from flying supersonically over land. So we addressed ourselves very much to that problem. It seemed to me that if you had an airplane which was supersonic, but wouldn't make a sonic boom — this would be the thing to go for. And we found from our research that going to Mach 1.15 would be the way to do it. You wouldn't make a boom, but you'd still have a 30-40% increase in speed over present-day transports. We called it Project 1011, and it had a variable-sweep wing for approach and landing, as well reduced ground noise during those phases of flight. It would have carried 160 passengers and 5,000 pounds (2,270 kg) of freight over 3,000 miles (4,830 km) without any exotic structures or materials. This aircraft could fly anywhere on any routes without making a sonic boom. The fuselage would have been area-ruled. However, in three years this was only one of 14 projects we worked on.

AIRLINERS: And then you started your consulting firm?

FLOYD: Yes. That's right. I should first point out, however, that I went to Hawker Siddeley to work on the supersonic transport. We did a lot of work on that. And I think we had the better design. But the final contract went to BAC, and that's about the time I left

Hawker Siddeley and started J.C. Floyd & Associates. It ran for 18 years in England until I retired in 1980. Because of the work I had done on the supersonic transport, I had a call from the Ministry of Technology about three months after starting the firm. I was asked to be a consultant on Concorde from 1965 to 1973, and my firm did all sorts of studies regarding the operation of the plane—market studies, economic studies, and so forth. There were only two outside consultants under government contract used on Concorde — my firm and another one in France. We studied flight schedules, operating costs, airport facilities, and carried out endless sonic boom investigations. Our work was one of the major factors in the Concorde going ahead. We also did several studies on the impact of the proposed American SST. In addition to the Concorde work we did route analyses and various studies for airline customers in Europe and North America, and we were involved in other studies for the British government and private industry.

In 1968 I designed a small business jet which, although never built, had many unique features and would fit into today's picture at a fraction of the cost of current designs. Another interesting project was an automobile navigation system with a moving map that tells you where you are and where you're going. I sold that development to a Canadian company which had designed and developed a system of their own, but which cost about ten times as much as mine. They bought the project and patents but never completed the development. So that never went anywhere. We were the European consultants for Litton Systems Canada and other Canadian high-tech companies for many years, so I never lost touch with Canada.

AIRLINERS: Of all the projects you've been involved with over the years, which has been your favorite?

FLOYD: That's a difficult question to answer. But the Jetliner was my first, major,

full-responsibility aircraft for which 'the buck stopped here'. So naturally the Jetliner has a very special place in my thoughts. The Arrow, on the other hand, was at the peak of my technical career. It was a time when you had to give everything you had plus some more. On the Jetliner we had a design team of about 100 people. On the Arrow we had over 1,500 engineers. There was a lot more pressure and we were dealing with things that nobody had ever done before.

Above all I was lucky in my life — very, very lucky — to know and work with some really wonderful people.

No doubt a lot of Jim Floyd's colleagues and co-workers over the years would say that they were lucky to know and work with him. And the industry could use a few more Jim Floyds today.

Good ideas sometimes get lost, but they have a way of coming back again. The Wright Brothers were the first to use canard wings which are being employed on so many of the newest fighter planes. Jack Northrop promoted the use of the flying wing which seems to be the shape of the new B-2 'stealth' bomber. And Jim Floyd's concept of a Mach 1.15 airliner makes sense today. After all, with the exception of the Concorde there hasn't been a significant increase in the speed of transport aircraft since the 707 was introduced 30 years ago.

Of course if Jim Floyd has proven anything over the years, it is that there is no substitute for good people. Today, aircraft are designed with computers, not by men sitting over drafting boards with pencils, erasers, and slide rules. But as Floyd pointed out in describing Camm and Chadwick, it is the creative mind of man that uses perspiration and inspiration to create innovation. Perhaps that is what is missing in the aircraft industry today. It could explain why so many 'new' aircraft are simply derivatives of old ones. The search for new ideas and new solutions to problems has been replaced by an overwhelming concern for the 'bottom line'.

As Jim Floyd put it, "If you're a designer you look at *everything*... it's an insatiable curiosity that all *proper* aircraft designers have. I don't have much time for the so-called 'specialists' who are basically accountants, more or less, who run the country and the companies nowadays." He speaks with authority. It was just those sorts of 'specialists' who tore down the technological lead that Jim Floyd helped to build for Canada, and which could have shaped the world. Though his airplane was an orphan, the 'Father of the Jetliner' was an aviation thoroughbred!

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Bill Mellberg is a nationally-known political satirist and speaker based in Park Ridge, IL. A lifelong aviation enthusiast, he once worked in public relations for Fokker Aircraft and now writes regularly on aviation subjects. He recently started a historical series that appears in Midway Airlines' in-flight magazine and Bill will be a regular contributor to AIRLINERS.

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