Pre-Flight

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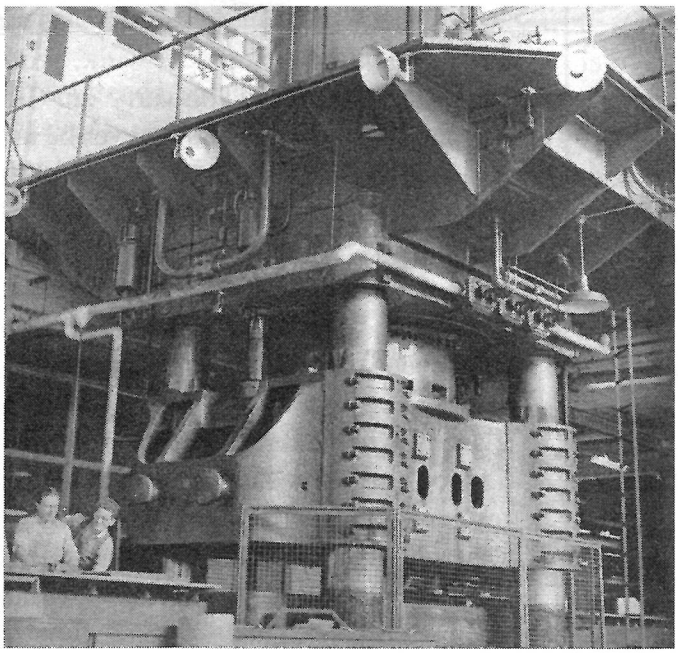
The Way Up



In declaring machinery surplus, here was a big question: Would fighters of the future need this 5,000-ton press, bought specifically for bombers? The answer was "yes"---a guess then, a godsend later. Remember Zoltan S. (Stan) Cyma actions from last issue. Zoltan S. (Stan) Cyma, chief plant engineer from the days when National Steel Car owned it, remained in that job, and had one of the hardest fights of all. Much machinery owned by the government had to be declared surplus. Included in the first surplus list was a 5,000 ton press which Stan Cyma had picked out and bought specifically for making bomber parts. Only he believed that the fighter of the future would be so big that it would need a press like that, and he fought like a tiger to have it taken off the surplus list. "Thank God he did," Fred Smye said later. "That press saved our lives." For it did turn out that the new fighters indeed needed a press of at least that size.

Continued from July - August Issue

In many respects, the projects were closely linked. Engineers who worked on the Jetliner later were important in the design and development of the CF-100. Men who worked on the experimental Chinook engine became the backbone of the production Orenda. Perhaps most important of all, all the varied phases were part of the original dream that went back to when Canadians in uniform and in government first determined that from now on, in aircraft as in most other aspects of a newly-adult nation, we would be our own men. And where previously other nations had added to their strength by the use of Canadian talent, A. V. Roe Canada now set out --- like some other Canadian companies --- to reverse the flow by creating jobs of challenge and future as high as any nation could offer.

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From the President

I would like to say, I hope everybody enjoyed the insert in the last Pre-Flight stating the Aerospace Heritage Foundation of Canada is dedicated in assisting Mark Matthys with Warren Field in any way we can, and that we will keep members up to date with any developments.
A memorial is currently in progress in tribute to the memories of late Flight-Lieutenant Bruce Warren of Toronto and Avro Engineer Bob Ostrander of Brampton both of whom died in the crash of the second prototype Avro CF-100 #18102. It crashed on Thursday April 5, 1951 at 10:50 am near Komoka Ontario.

Frank Harvey

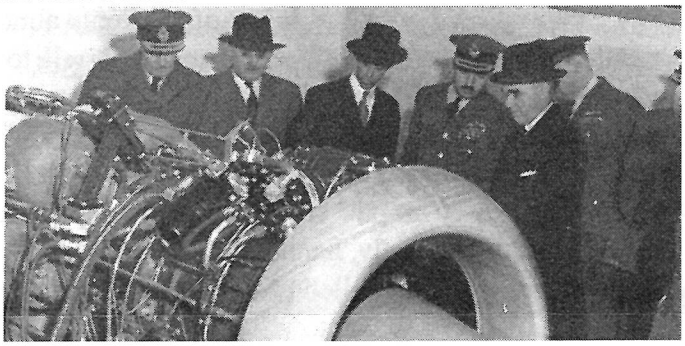
Continued from page 1

Sometimes, to be sure, the challenge came in very Spartan dress. In design and development work, proof of progress is always the key to getting the finances to carry on. In this sense, the pioneers in any one field do more than could ever be measured for the men who follow, and an example would be to compare the magnificent air-conditioned Orenda Engines plant of today with the walk-up where the child was born. This, for the 85 survivors of Turbo Research who in 1946 moved from their cold-test laboratory at Winnipeg and their design office in Leaside to become part of A. V. Roe Canada at Malton, was some bare floor space on the top floor of the details building. A few partitions were knocked up in a hurry. There were no blinds on the windows and the place was like a furnace in hot weather. They had a basic design for the Chinook ready at the time of the transfer, dug in on the Orenda, soon took over a plant at Nobel, 160 miles northwest, for testing --- and each year when the federal budget was drawn up faced the chance that unless they could prove their progress, government support suddenly would be chopped off.

Thus it was more than a coincidence that the first Chinook ran on March 17, 1948, two weeks before the end of the government's fiscal year. "Fred Smye practically ran from one machine to another picking up parts and delivering them to assembly to help get that engine off on time," one man said later.

They made it with a little more time to spare with the first Orenda --- on February 10, 1949. For that one, Winnett Boyd, now an engineering consultant --- it was largely "his" engine --- was so confident that he didn't even have a private test run before the official one. As a result, some of the biggest men in Canadian government and in the R.C.A.F. were standing in the control room beside the test cell a few minutes before the engine was to run for the first time --- when no one could be 100% sure it would go at all. As they looked through the control-room glass at the torpedo-like shape of the first Orenda, the personal involvement was almost greater than could be imagined. This was the company's first major project to reach this stage, the first public bid for the prestige that comes with success. Personal reputations of the gas

turbine engineers had been laid on the line, but success or failure also would have an inevitable bearing on the reputation of the company as a whole. Not the least of what was at stake were the hopes of the R.C.A.F. One bystander said, "You could hear knees knocking for half a mile."



A button was pushed. The first Orenda sprang to life. Men who were there say it was a moment they never will forget. This engine was to be proved one of the most successful prototype turbojets ever made. It ran for 477 hours before its first rebuilding job. Later it reached nearly a thousand hours. Perhaps it would have been running yet, but for an accident of almost stupendous simplicity. A technician entered the test-cell to top up the oil. He was wearing a loose white lab coat. In one pocket was a package of Schick injector razor blades. He got too close to the air intake and the coat was sucked in. When the razor blades hit the whirling blades of the compressor there was a grinding crash and Orenda Number 1, for all practical purposes, was no more. The technician lost only his coat and his razor blades.

The Orenda was almost entirely a Canadian effort, with the invaluable exception of aerodynamicist Harry Keast, a man who had worked with Whittle on the first jet engine. The team was made up largely of young Canadians, most of them fresh out of university. Their success had pointed up what can be done when a concept is big enough to keep men of high talent at home. The Jetliner was an example of how an exciting challenge can give a man a new home. Which brings us naturally to Jim Floyd.

Harry Keast

In England, when he was a schoolboy, the air was his romantic frontier, as it is now his scientific frontier. There was a family tradition involved, too. An uncle, Fred Wilkinson of Manchester, had built the first propeller - manufacturing machine for Roy Dobson. In 1930, when Jim Floyd was 16, Avro Manchester was getting together a group of bright schoolboys who wanted to be apprentices and also to be sent to university. He was one of the group. In the thirties, as well as taking university courses, he worked at various places in the Hawker Siddeley Group, usually in some stage of design. By September, 1946, when he began design on the Jetliner, his family had joined him, they had a home in Toronto's Kingsway, and he had an elderly Plymouth to get to and from his work.

His engineering staff of that time was less than 40 people. Today it is over 1,000. They worked on the second floor of the administration building, in sparsely furnished quarters. Projects under development didn't have quite the degree of scientific grandeur they have now, either. One of his associates of that time remembers one day when they had completed a full-scale wooden mockup of the Jetliner. Jim Floyd, after looking at it critically, said, "That nose just won't do." So they got a saw and sawed off the nose, and built on another within a week.

In the spring of 1947 (total A. V. Roe Canada staff 800 now), TCA accepted his design for the Jetliner and he became project designer. In the terminology of the profession, this made the Jetliner "his" airplane. Its general specifications were those of a medium-range transport, tailored specifically to the inter-city needs of TCA. His general concept was that since building a jet transport was itself revolutionary, the design its elf should stay as close as possible to the conventional and proved. Even so, one major hitch developed early. He had planned his aircraft to be powered by two Rolls Royce Avons, then being developed. It became apparent that he'd have his aircraft ready long before Rolls Royce had the engines. He'd have to change - but since there were no other jet engines of the Avon size on the horizon, he had to switch to four Rolls Royce Derwents. This meant a complete re design of the centre section --- but the change, he said later, was a good one. It increased the safety factor by lessening the effect of one engine failing.

For two years he worked seven days a week. The aircraft was being built during the daytime, all the varied tests were going on at night, and he had to be

there for all of it. Sometimes he grabbed a nap on a cot in the plant hospital. During testing of controls, his mother-in-law came to visit from England. She stayed several months. He saw her four times. His working hours, he says, weren't at all unusual. "Other people worked until midnight or later without even caring whether anyone else knew about it." In that sense, "it wasn't only my airplane, it belonged to everybody who worked on it. I've worked on a few airplanes and I've never before seen such an emotional involvement of everybody concerned. They were going to make it fly, make it a good one, and they did."

The men who had built the first experimental Orendas --- or anyone, for that matter, who ever has carried through a tough, long project in any field --- could realize how Jim Floyd felt on July 25, 1949, when the Jetliner was ready for final inspection. That meant flight was only days away and less than three years from when pencil was laid to paper, a record people since have called phenomenal.

On July 27 the De Havilland Comet, under test in England, hopped a few feet into the air. Missing by days the honor of having the first jet transport in the world to fly disappointed the Jetliner group, but more substantial trouble drove that out of everyone's mind quickly. At Malton airport, where the Jetliner was to be tested, work on runways suddenly began, leaving only one short strip for engine runs and taxi trials and a short runway for take-off and landing. The weather took a hand, too, with hot sun and temperatures ranging between 90 and 100 each day.

On the day of the first taxi trials, the temperature was 103. Early taxiing went all right under test pilot Jim Orrell. Then he had a consultation with Jim Floyd and his tense companions. Should he take it into the air, the same sort of hop the Comet had made, a few feet and then down again, short runway and all? He'd try.

At 90 m.p.h. the nose wheel came up. Then there were four loud bangs. The aircraft ground to a stop. Floyd and the others raced over. Orrell had decided he didn't have enough room to hop up and get down safely, had applied the brakes, and in the heat and strain all four tires had blown. But there was something encouraging even there --- even with blown tires, the aircraft had come to a stop easily and under full control. After more taxi runs the next day, the pilot tried again to get the Jetliner into the air for the same sort of brief hop. This time, as all hands watched with thumping hearts, two tires blew when the brakes had to go on again.

On August 10, 1949, a Wednesday, just after lunch, Orrell said, "This time I'll take her right up, all the way." Jim Floyd was the heart of a silent, almost breathless group as she left the ground. Orrell took her to 500 feet and tested controls. They were fine. He took her to 8,000. He radioed down, "Everything feels wonderful." Jim Floyd's aeroplane flew that time for an hour. A 35-m.p.h. cross wind came up. Orrell brought her down easily, handling beautifully even on the short runway. She rolled to a stop. Jim Floyd went over into a corner and wept.

The third of Avro Canada's first Big Three projects to become operational, the CF-100, perhaps can be described best in terms of the thinking behind it. At the base was the concept of the kind of first line air force Canada should have. First, it should be defensive. That meant fighters. What kind of fighters? Fighters which could operate in the vast, frigid ranges of the Canadian north, day or night, all-weather, longrange, heavily armored. An air force officer who was in on the planning for the CF-100 said, "First we had a look at the specifications for the best bombers in the world --- how high they could fly, and how fast. Then we asked for a fighter which would fly higher, and fly faster." In the House of Commons Mr. Howe, discussing the matter, once said, "There was no plane in existence which, in the estimate of competent military authorities, would be suitable as an all-weather fighter that could be used in the defence of northern Canada. The only alternative was to produce one." Which meant: design one.

It was late in 1946 when preliminary design began on the CF-100. In general terms, it was under Edgar Atkin, as chief engineer but in June of 1947 the company made an important addition to its design staff. John Frost, a tall and thoughtful young man who had been on the design team of the revolutionary tailless De Havilland 108 (the Swallow) became project engineer on the CF-100.


John Frost

(Continued November December issue)