

# The Little Boy and the Arrow

By Bill Zuk

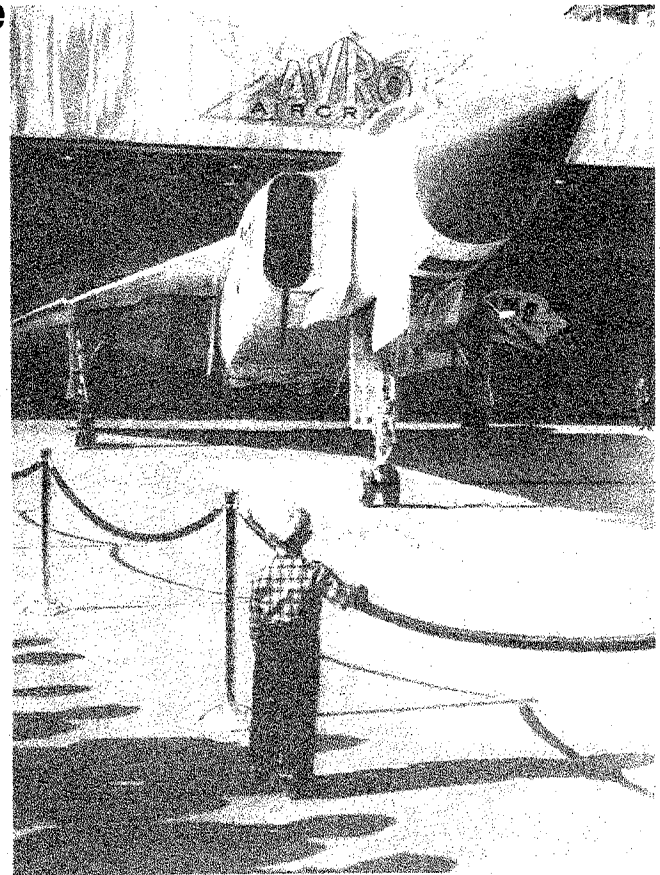


# CREDITS

# DEDICATION

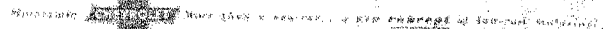
**to the little child in all of us...**

**and to George Foley, the little boy in the picture**



**The Future Looking at the Future**

**It was 1957 and for a young boy whose dreams were of airplanes and flying, this was a magic time.**



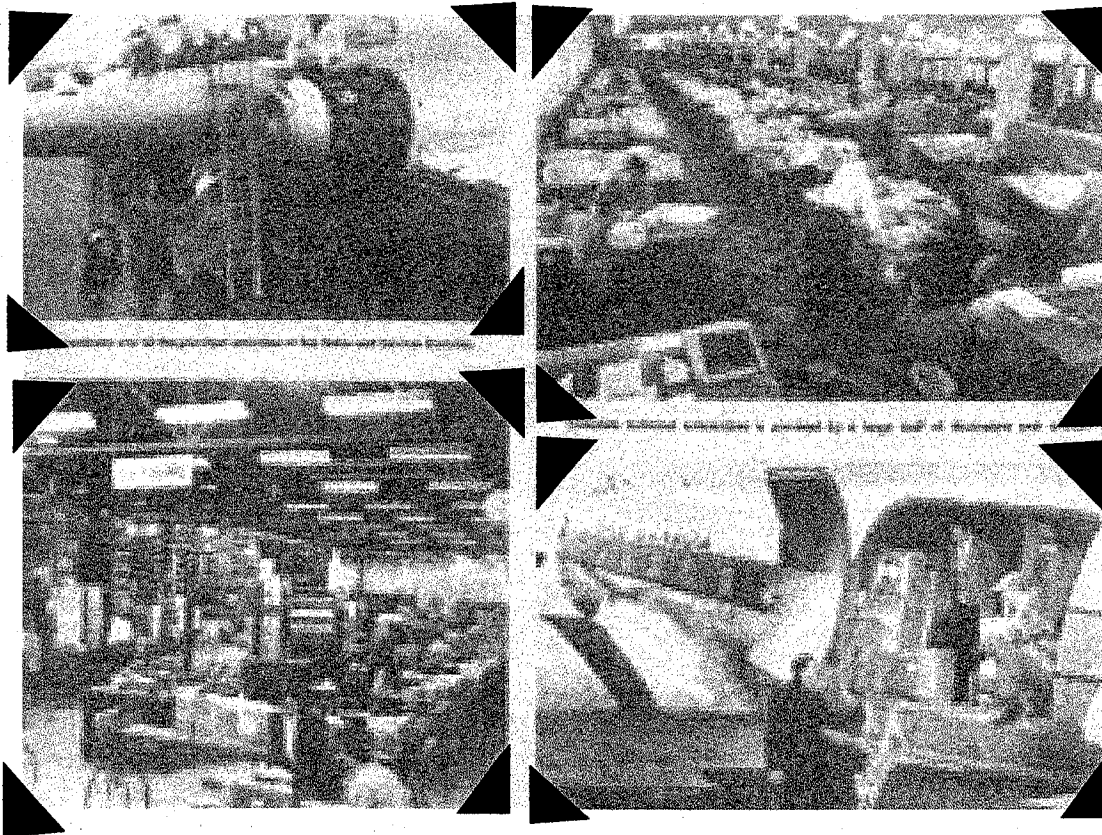


**We lived close to the Avro factory in Toronto in those years. Sometimes I went along with my mother when she picked up my father at work.**



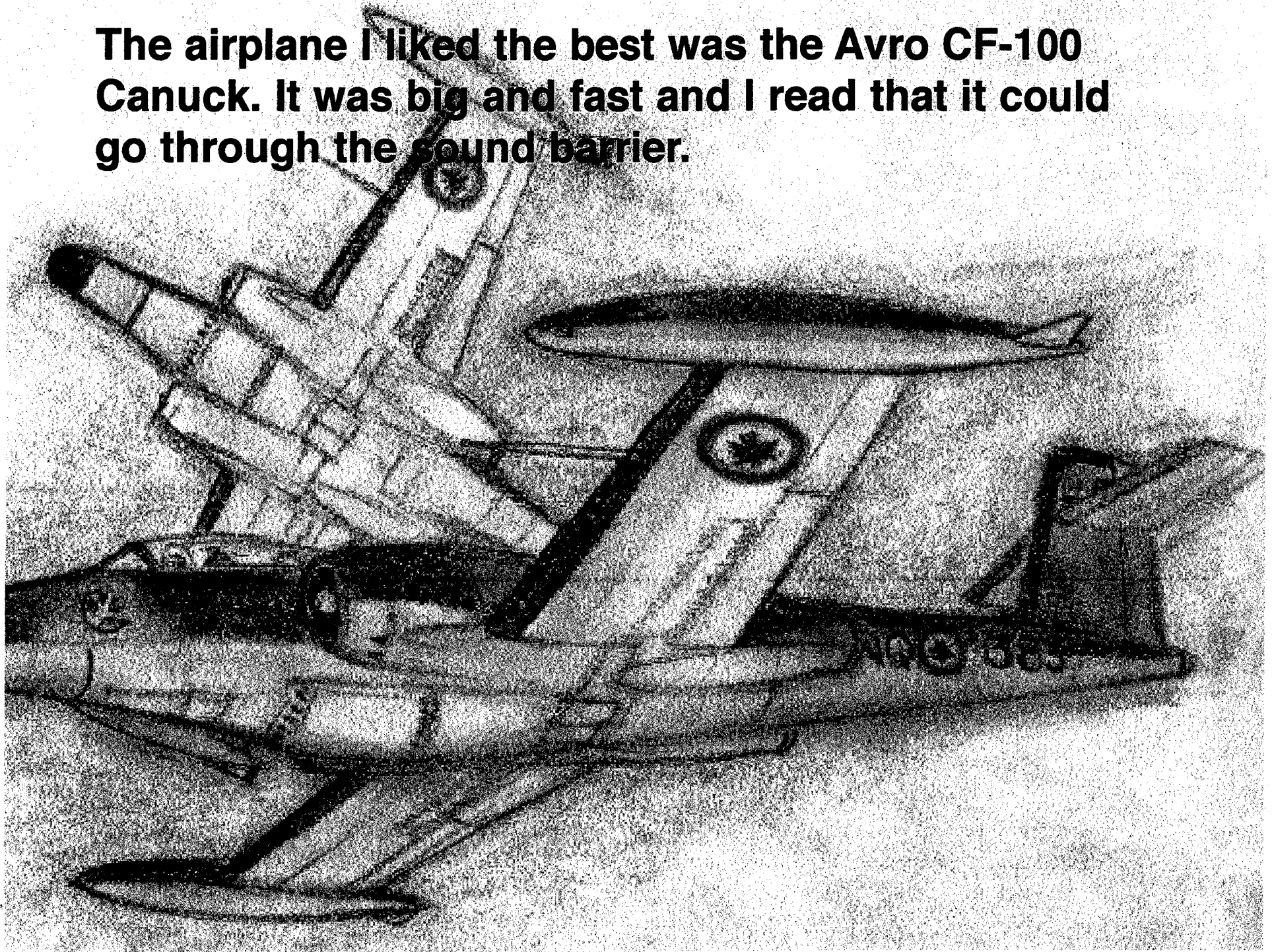
**I knew my father was working on airplanes- fast jet airplanes that would be used by the Air Force.**

**I kept a scrapbook filled with pictures of fighters, bombers and airliners. The ones I liked most were the ones that my father built.**





**The airplane I liked the best was the Avro CF-100 Canuck. It was big and fast and I read that it could go through the sound barrier.**



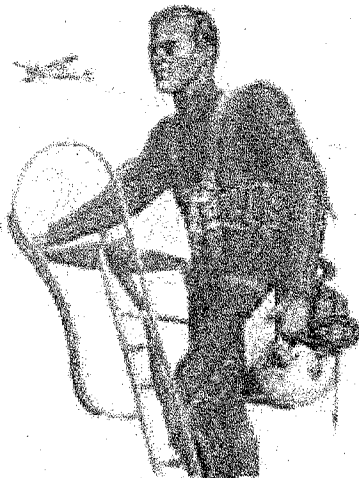
**What was most exciting was reading about the test pilots who flew the fast jets. They were brave and fearless. I wanted to be a pilot when I grew up.**

## SUPERIORITY...

The Royal Canadian Air Force  
continually exceeds a high standard of  
quality and performance.

The most competent, efficient,  
available.

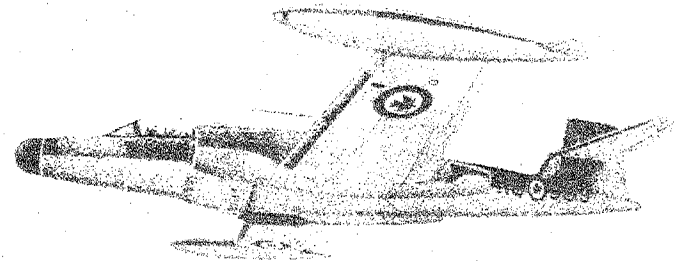
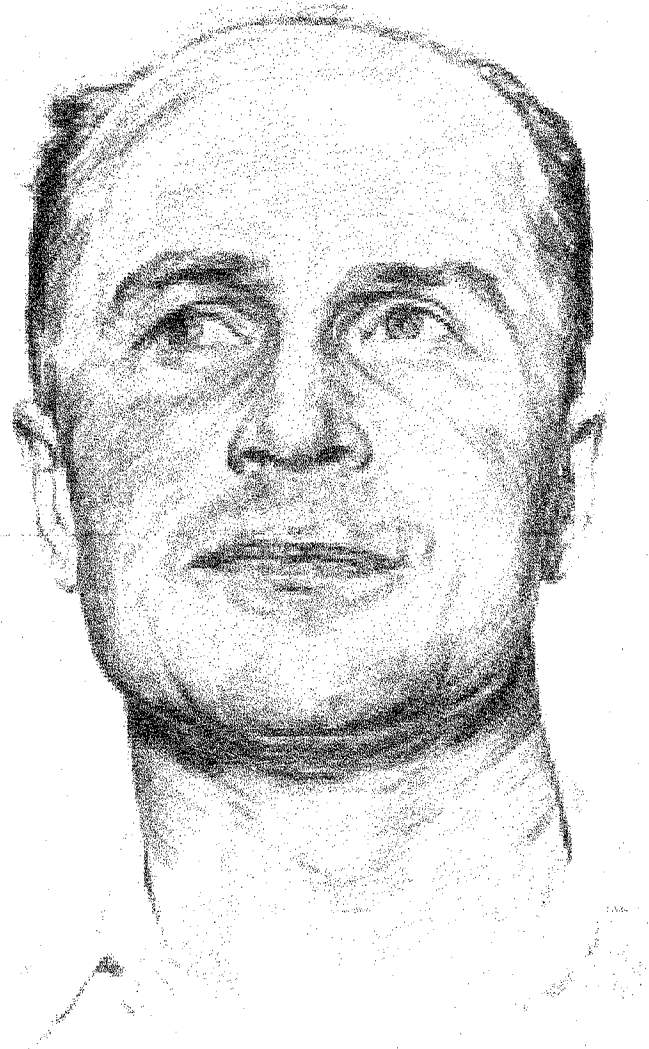
It's a lot of responsibility that comes with  
it. I know that's why... and  
when it comes to opportunity for growth  
and development, the RCNCF is there  
with you every step of the way.



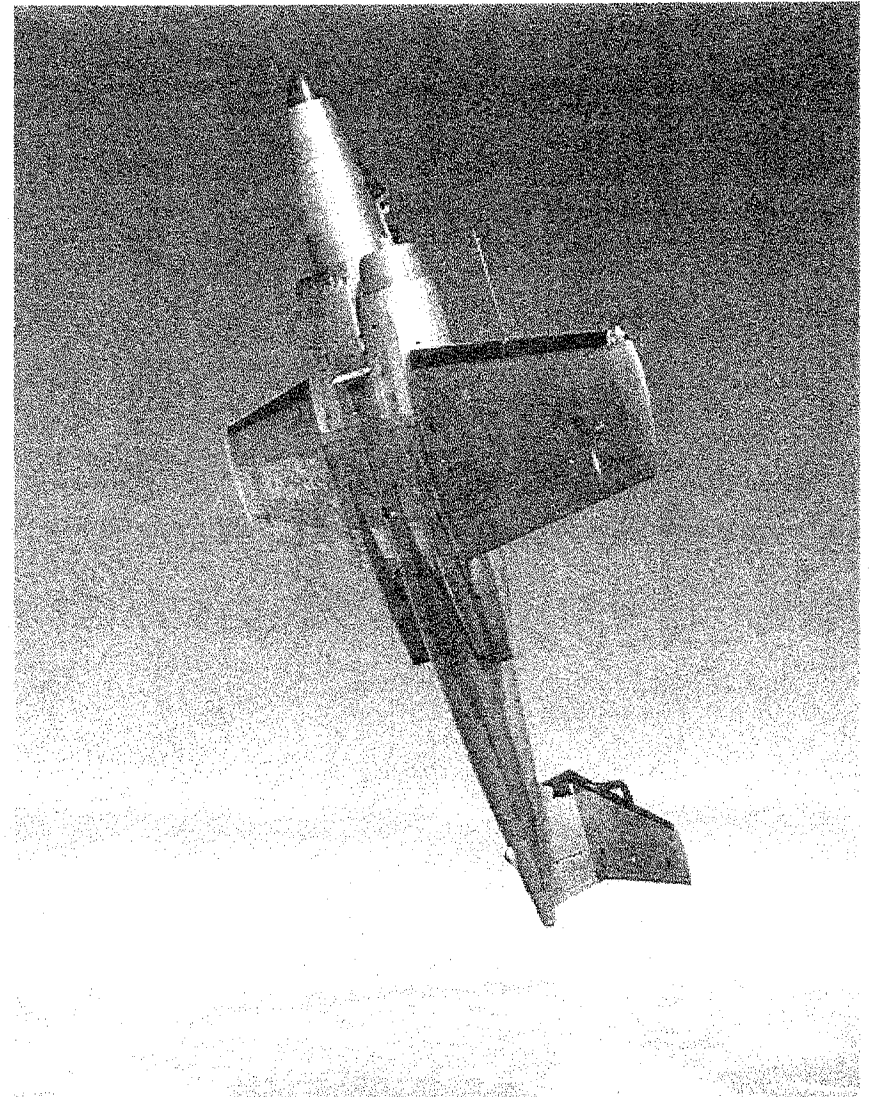
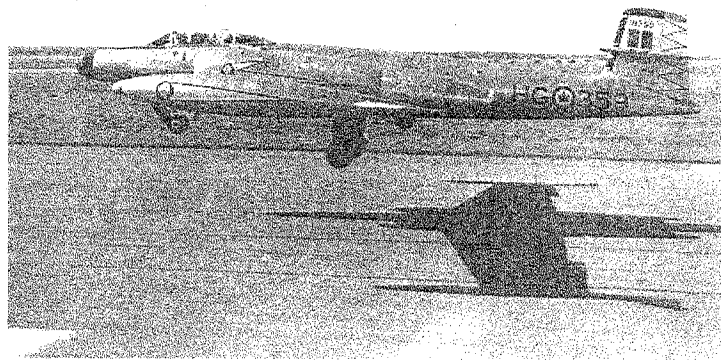
THE ROYAL CANADIAN AIR FORCE



**The greatest test pilot was one who flew for my father's company. He was Jan Zurakowski, an "ace" from the war who had come from England to fly Avro Canada airplanes.**

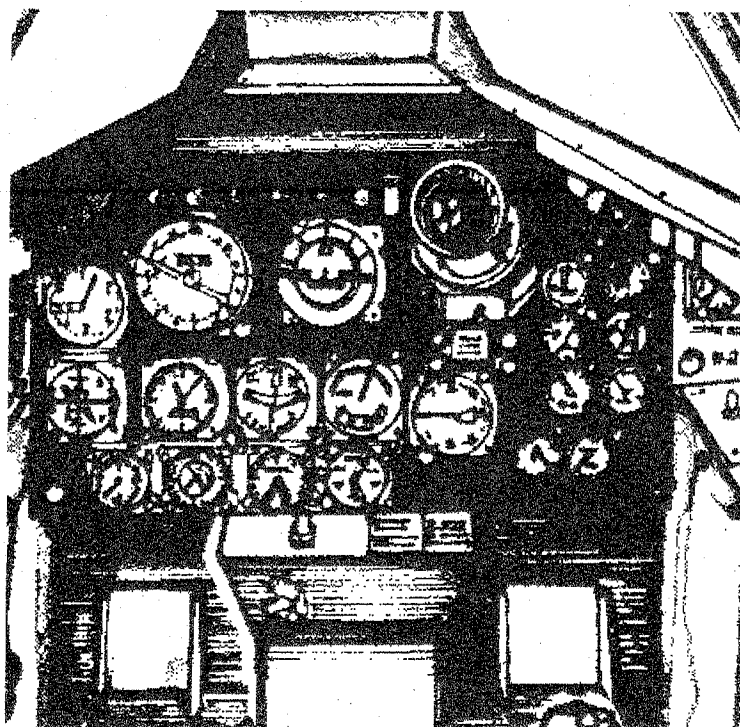


**Zurakowski flew the fastest Avro Canada jets- the fighters. He could do wonderful things with them. Dad said he could make them fall out of the sky like a leaf in the wind. Just before coming to the ground he would roar up again.**



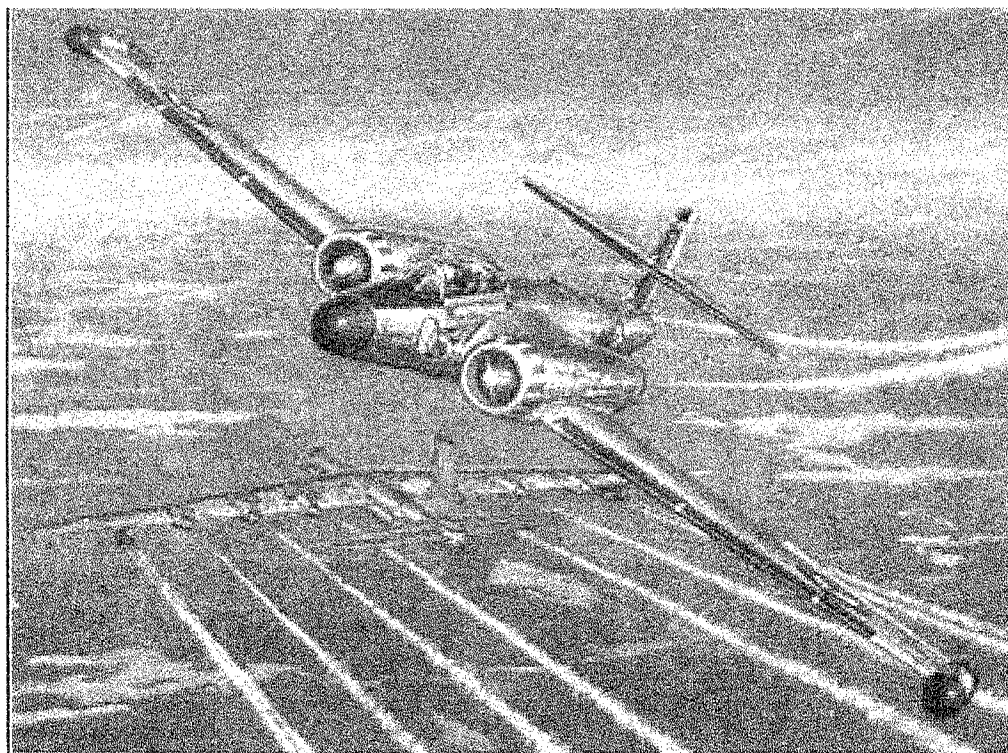
**On lazy days, I gazed at my scrapbook and daydreamed what it would be like to fly with my hero, Jan Zurakowski, on a flight to the clouds.**

**I imagined what it be like to fly the Avro CF-100, his favourite airplane. I stared ahead to see the instruments in front of me.**



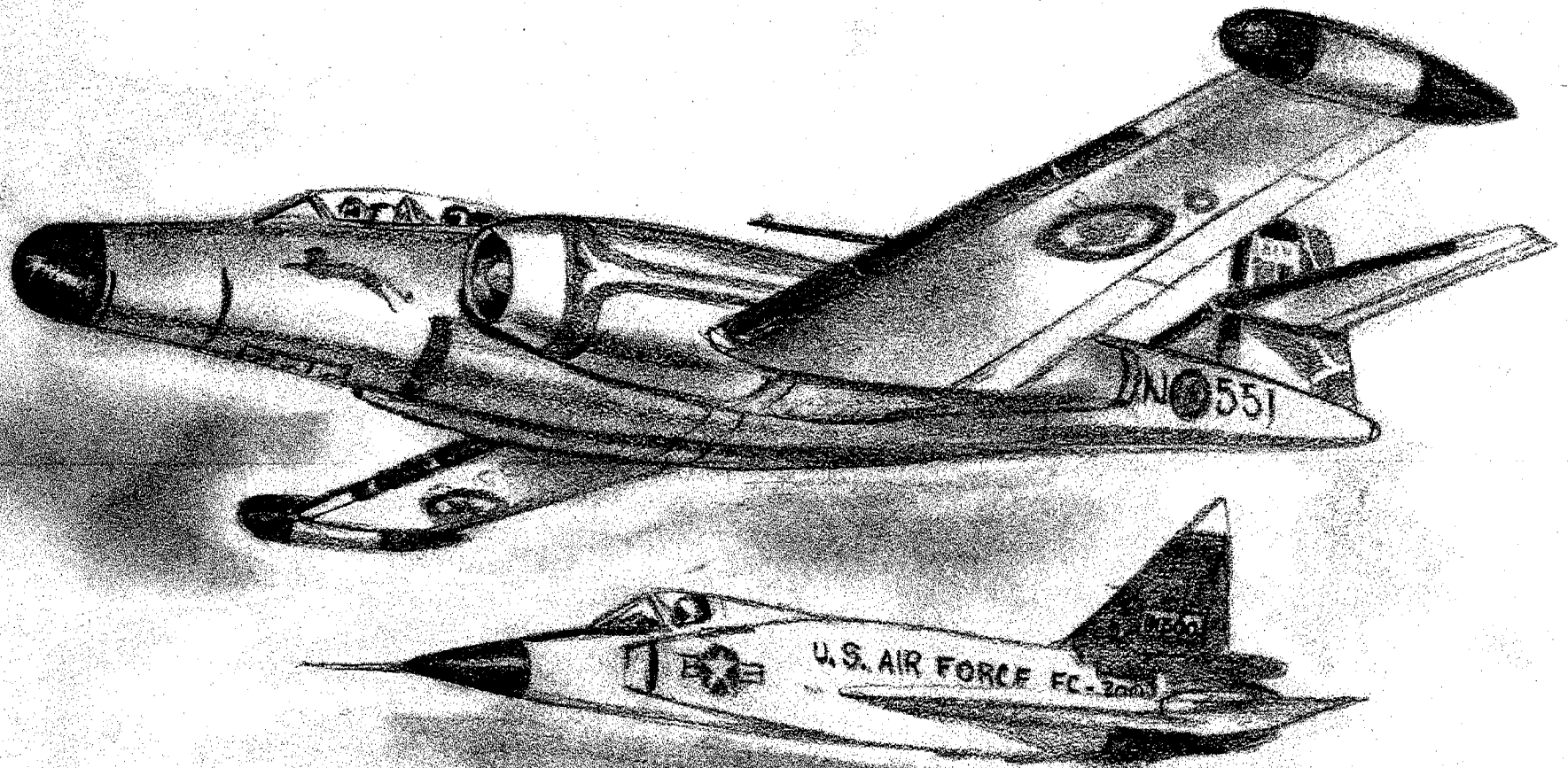
**Everything rushed by at a terrific speed. The jet fighter was going as fast as it could- nearly supersonic speeds. Below I could see a big jet bomber. I pushed the nose down to see it closer.**

**It was a lumbering American B-36 bomber called the “Peacemaker”. It was no match for the Avro CF-100. I closed in and waved to the crew and turned away.**





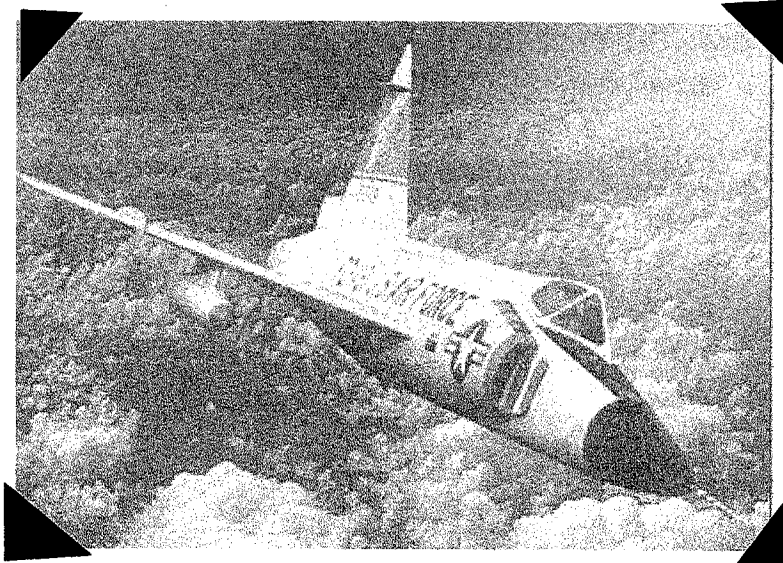
**I saw another plane below- it was a fighter like mine. I recognized the fighter immediately. It was the Convair F-102 "Delta Dagger". It looked sleek and modern, making my fighter look old-fashioned.**



*20th*

**Mom called for supper. I said I was coming. When I closed my scrapbook, I took one more look at the delta-winged fighter. It sure did look like the future.**

**I was still thinking about the fighter planes when we sat down to supper. I told Dad about the new shapes that the American fighters were taking. He didn't say anything but he looked at me and smiled.**

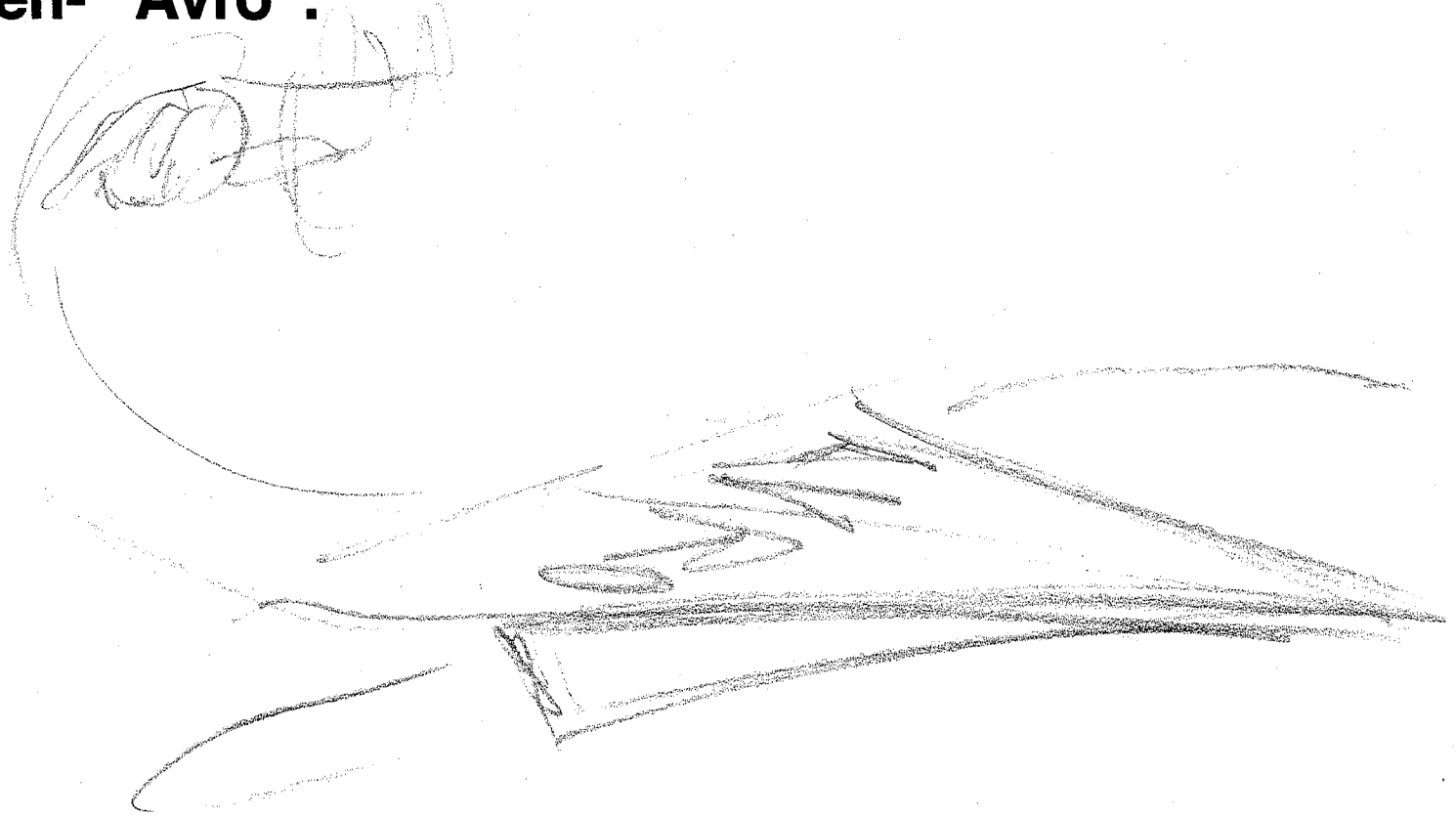


**Dad tucked me into bed that night and told me he had a surprise for me soon. "Remember when we were at the company picnic last year and someone said there was something new coming" he said.**

**"I remember Dad, and the foreman told him not to talk about it."**



**Well, it's something really big. Everyone will know about it soon. You showed me your scrapbook just now and the picture of that delta-wing fighter..." He stopped for a second at the door, and gently tossed a small paper airplane onto my bed. It was shaped like a delta-dart. On the wings he had written- "Avro".**

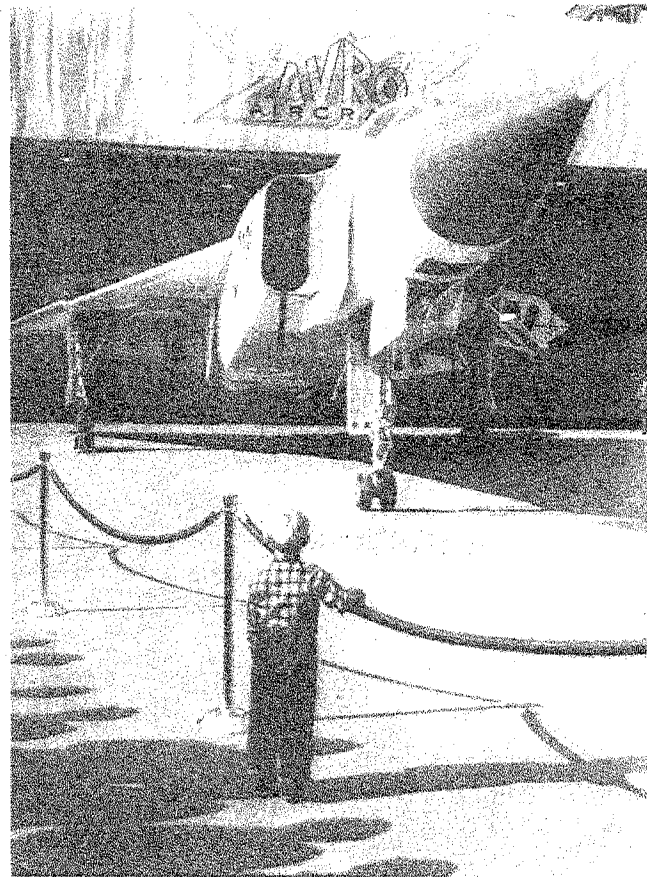




**The next day was a special occasion. Dad took me and the whole family to the factory. There were lots of people there already.**



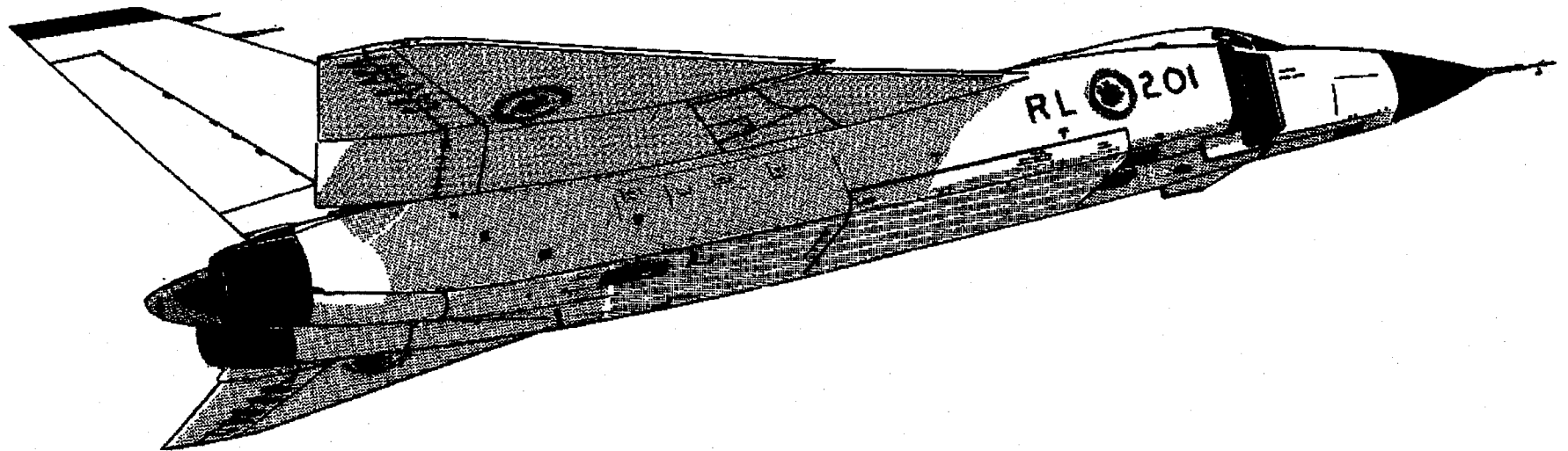
**With the sound of music, the curtains parted and a gleaming white dart-shaped airplane rolled out. It was the new Avro Arrow.**



**I wanted to get closer but a voice said. "You will have to wait a little while to fly it. It's my turn first." It was Jan Zurakowski.**

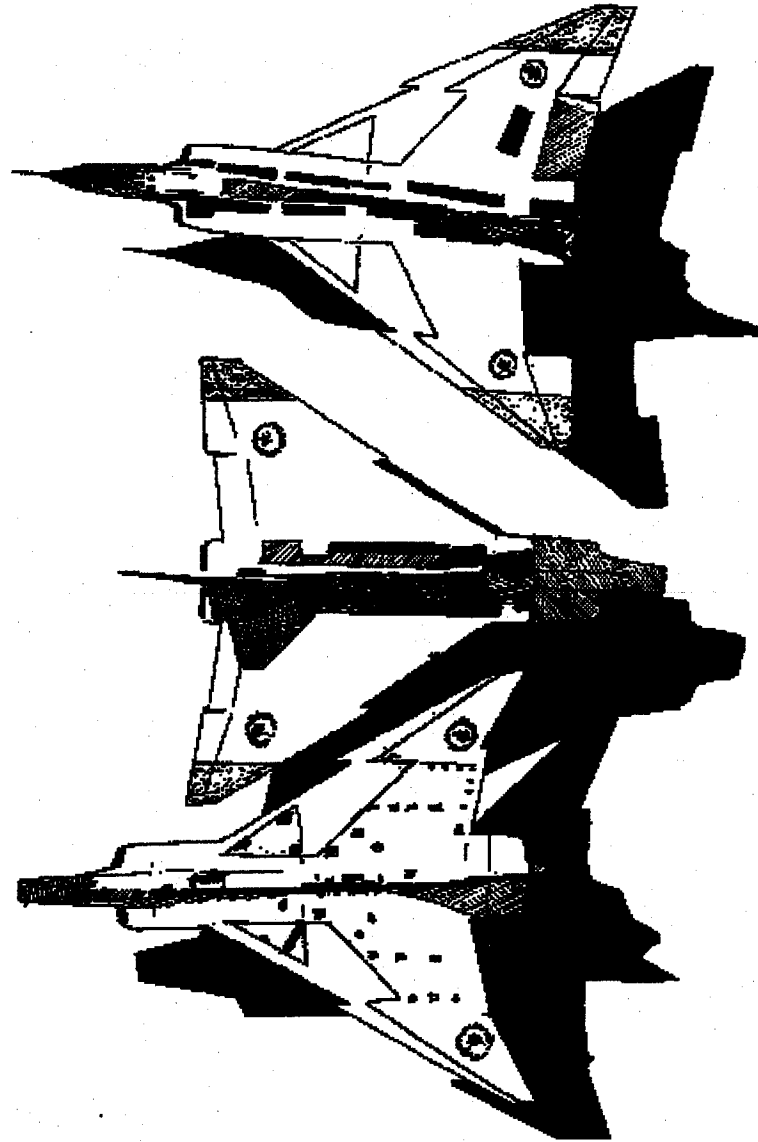


**The Avro Arrow did fly soon. Dad said Jan Zurakowski flew it as easily as he flew the other jet fighters. He said it was wonderful- the best thing in the air.**

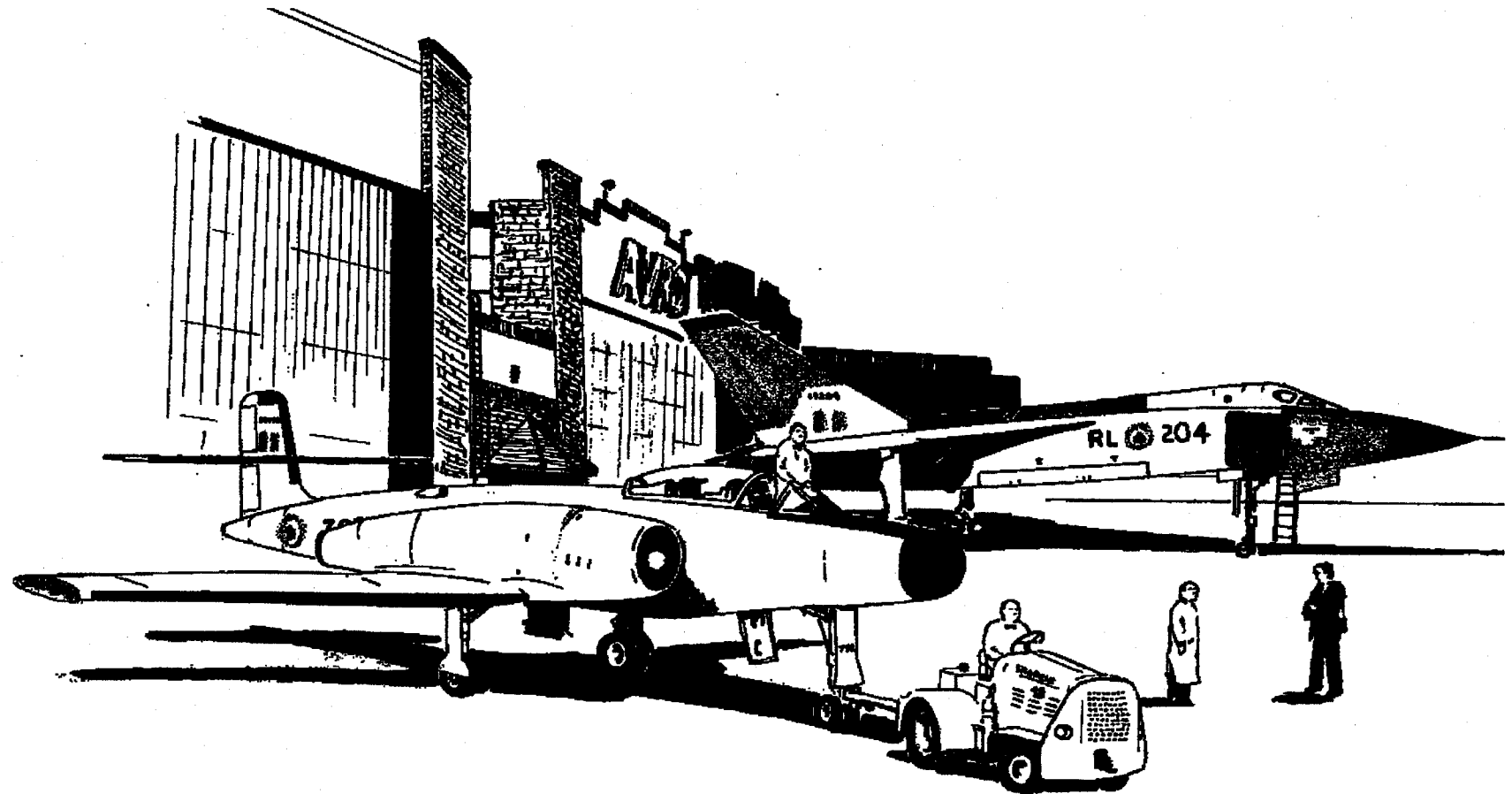




**Five Avro CF-105 Arrows flew for nearly two years before the government cancelled the project. Everyone at the company lost their jobs. All the Arrows were cut up.**



**My father never went back to work building airplanes. After a while, our family moved to other places as jobs came and went. Finally, we settled down in Winnipeg, a prairie city far from Toronto. I grew up there but I never forgot the Avro factory and the Avro Arrow.**



## That Day

On October 4, 1957, the same day as Sputnik I was revealed to the world, another important event was taking place in Toronto, Ontario at the Avro Canada plant. After years of design and construction, the Avro CF-105 Arrow roll-out took place in front of an estimated 12,000 guests who had joined the Avro employees who had proudly built the aircraft. Almost 40 years later, an Avro Arrow was again on centre stage in front of the people who brought it to life- this time, a life size replica of the Arrow was used as its stand-in for a film shot in Winnipeg.

*The Arrow* was a four-hour CBC mini-series, starring Dan Aykroyd as Crawford Gordon, the controversial head of Avro Canada. Winnipeg and Manitoba was featured prominently in the Arrow mini-series. *The Arrow* featured a working model of the real aircraft built by Allan Jackson, of Wetaskawin, Alberta. Jackson had created a wood and metal framework that was accurate to within centimeters of the original aircraft's dimensions.

On that fateful day in 1957, a small boy, George Foley had come along with his mother and father to see the unveiling of the Arrow. He was excited as all little boys could be on a special day- one where he could go to see where his father, a tool and die maker worked and of course to see the Avro Arrow.

As the music surged and the crowd cheered, Foley gazed at the wondrous sight of the

glistening white interceptor. Sometime that day, a photographer spotted him at the red rope barrier and took a photograph that became legend- a little boy gazing out at the giant fighter. The photograph appeared in several magazines and books- labelled "the future, looking at the future".

It was not to be, unfortunately. After the roll-out ceremony and an impressive test flying schedule, the entire Arrow project was cancelled and nearly all the Avro employees were fired. George's father continued his work as a tool and die maker but no longer in the aviation industry. George's family drifted to Newmarket, Ontario and years later, he began a new life in Winnipeg.

Fast forward to July 4, 1996; Foley returned to see the Arrow once again. There it was, being rolled out into the sunlight in the midst of hundreds of cheering people. He had been drawn to the set of *The Arrow* movie and he was not the only person to have been at the original ceremony. (Elwy Yost, the famous Canadian broadcaster and one-time Avro Company publicist, Sylvia and Derek Wooley (former Avro flight-test engineer) were also there. The little boy was there as well. George had returned that afternoon with his four year old son- a blond haired, spitting image of himself in 1957. "I don't know what brought me here but I just wanted to see it again" said Foley.

## The Avro Arrow Story

When Avro Canada was finally able to showcase their remarkable new interceptor, the Hon. George Pearkes, Minister of National Defence announced "I now have the pleasure of unveiling the Avro Arrow, Canada's first supersonic aircraft, a symbol of a new era for Canada in the air".

This was merely the official ceremony, as for most military aviation experts, the CF-105 Avro Arrow had already been an object of much attention. Avro Arrow RL-201 was the first of a planned series of 100 aircraft built by Avro Canada. Construction of "201" would take only 28 months from the release of the first blueprints to its roll-out, but the story of the Arrow had begun much earlier.

A.V. Roe (Avro) Canada was an industrial giant by 1955, consisting of not only jet aircraft and engine production but also shipping, steel products, trucks and buses, iron and coal mining, railway rolling stock, computers and electronic equipment.

Avro Canada had invested heavily in the new Arrow program not only in money but also in expertise. The over 13,000 people working in the aviation division were some of the most skilled and creative team of designers, engineers and production staff ever assembled in Canada. They had been involved in the design of Canada's first jet engine, first jet fighter, first jet airliner in North America and soon, Canada's first supersonic jet interceptor.

Designed to RCAF specifications in 1953 that called for a twin-engine, two seat interceptor capable of protecting the Arctic frontier of Canada, the Avro Arrow was remarkable.

The Avro CF-105 Arrow was one of the world's most advanced fighter aircraft during the 1950s. The developed Arrow Mk. II powered by Canadian-designed Iroquois engines would have been capable of Mach 2.4 (twice the speed of sound)- remarkable for 1959! RL-201 was the first of five Arrow Mk.I's that would fly (RL-201-205). Using Pratt and Whitney J-75's, the first production aircraft still were fascinating hints of the future. Utilizing a complex "fly-by-wire" control, an advanced weapons system and remote ground-controlled operation, the Arrow was, arguably, the most advanced fighter aircraft of its day.

An earlier design from the Avro Company was the Avro C-102 Jetliner, North America's first jet airliner, was one of the outstanding aviation achievements of its day. It never saw production as the Canadian government insisted that Avro Canada concentrate on their other jet program, the CF-100 fighter. Avro's main jet programs in the 1950s were based on the CF-100 Canuck, the first military aircraft wholly designed and built in Canada and one of its first jet fighters. The Avro CF-100 was a long-range, all-weather interceptor equipped with 2 Avro- designed and built Orenda engines. The CF-100 became operational in April 1953 and served

10 years in NORAD and NATO squadrons (692 were built with 53 sold to Belgium).

The potential of the CF-105 Avro Arrow was realized by Avro's chief test pilot, Janusz Zurakowski. He piloted the Arrow on its first flight on March 25, 1958 and exceeded 1600 km/h on the seventh flight of RL-201. Zurakowski was awarded the McKee Trophy in 1958 mainly for his work on the CF-105 program. In all, 66 test flights totalling 70 hours and 30 minutes were completed by four test pilots flying five aircraft between March 25, 1958 and February 20, 1959.

Other events were soon to overtake the Arrow project. A change in governments and a sudden reevaluation of defence needs led to the collapse of the Avro Arrow program and the eventual dismissal of "just about the best team anywhere". In Oct. 1958, to cut costs, the newly elected government ended the Canadian fire-control and missile development, and renewed efforts to sell the aircraft to the United States. The American Bomarc missile was also chosen as a way to protect Canada.

The Arrow project was officially cancelled by Prime Minister Diefenbaker on 20 Feb. 1959 (known as "Black Friday" at Avro). A.V. Roe Company directors led by Gordon fired nearly 14,000 employees. The Diefenbaker government, named high costs and its new commitment to missile rather than manned aircraft defence, as the reasons for the program cancellation. Three months later, the

government also ordered that RL-206, the first Arrow Mk. II, and all partially completed Arrows on the assembly line, be destroyed. All evidence of the Avro Arrow's existence, including tools, dyes, drawings and photographs was also destroyed. The resulting departure of scientists and engineers to many people meant the end of Canada's military aviation industry.

Today, the Avro Arrow only remains as a memory although there are some sections of Arrow Mk.II RL-206 (nose, front landing gear and definitive Avro Iroquois engine) preserved in the National Aeronautical Collection in Ottawa. In a quirk of fate, the Avro Arrow sits near the chopped up nose section of the Avro Jetliner, another unrealized dream of Canadian aeronautics.

## The Author

Bill Zuk is an amateur aviation historian and writer whose interest in the Avro Arrow is long-standing. Currently a Teacher in St. Vital School Division, he is also an active member of a number of associations involved in literature, modelling and aviation history.

He is presently writing "Canada's Flying Saucer Projects: the Story of Avro Canada's Secret Projects".



# Glossary of Flying Words

**aerodynamics:** area of study concerned with the forces of flight acting on bodies in motion through the air

**aeronautics:** the science of flight

**ailerons:** hinged sections of the wings which can move up or down to control roll

**airfoil:** an object (such as a wing or propeller) whose curved shape is designed to provide maximum lift when in motion through the air

**airliner:** an air transport for people or cargo

**air pressure:** the amount of force air exerts on an object

**airspeed:** the speed of an aircraft compared to the air around it

**angle of attack:** the deflection of moving air on a wing angled upward

**Archimedes' principle:** any object placed in a fluid (liquid or gas) is buoyed upward by a force equal to the weight of the fluid it displaces

**Bernoulli's principle:** moving air creates a low pressure area or partial vacuum

**buoyancy:** the tendency of a body to float or rise when placed in a fluid

**bomber:** a military airplane used to deliver bombs and missiles

**control surfaces:** the rudder, ailerons, and elevator which work together to provide directional control for the airplane by altering the airflow around the surfaces of the airplane

**delta:** a wing that has a sharply swept front edge and a squared off trailing edge

**drag:** the resistance air puts on a flying object

**elevator:** the horizontal part of an airplane's stabilizer which is hinged to control pitch

**equilibrium:** when all the forces of nature are in balance

**fighter:** a military airplane used to fight other bombers or fighters

**fin:** the vertical surface of an airplane's tail

**flight forces:** the opposing forces of lift and weight, thrust and drag

**fuselage:** the main body of the airplane

**gravity:** the force of attraction which pulls objects toward the earth

**groundspeed:** the speed an airplane travels in relationship to the earth

**high pressure area:** the area where there is relatively more pressure than the surrounding air

**interceptor:** a military point-defence fighter that intercepts other bombers or fighters

**jet engine:** an engine that burns air and expels the burnt gas to propel an airplane forward

**lift:** the force which counteracts gravity and lifts an airfoil

**low pressure area:** an area where there is relatively less pressure than the surrounding air

**Mach:** the speed of sound (approximately 1000 kmh.)

**pitch:** movement up or down of the nose of an airplane

**propeller:** an airfoil designed to either bite or push through the air

**relative speed:** the wind speed and direction relative to an airplane's speed and direction

**rocket:** any machine or device propelled by the ejection of matter

**roll:** fuselage rotation

**rotor:** a propellor used for lift and as a control surface

**rudder:** the hinged section of the fin of an airplane's tail which help the airplane move left or right; used to control yaw

**spin:** the twisting turning of an airplane about more than one axes

**stability:** the ability of an airplane to control movement (pitch, roll, and yaw) in order to maintain altitude despite air turbulence

**stability:** the horizontal surface of an airplane's tail

**stall:** the sudden loss of lift

**supersonic:** faster than the speed of sound

**thrust:** the force produced by an aircraft engine which pushes the airplane forward

**vacuum:** an area where there is no air pressure; outer space is a vacuum

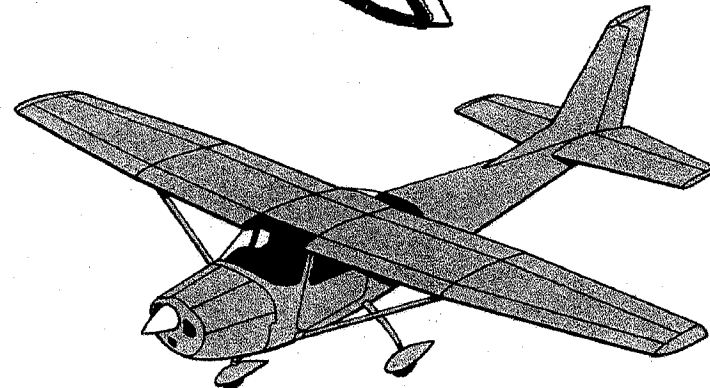
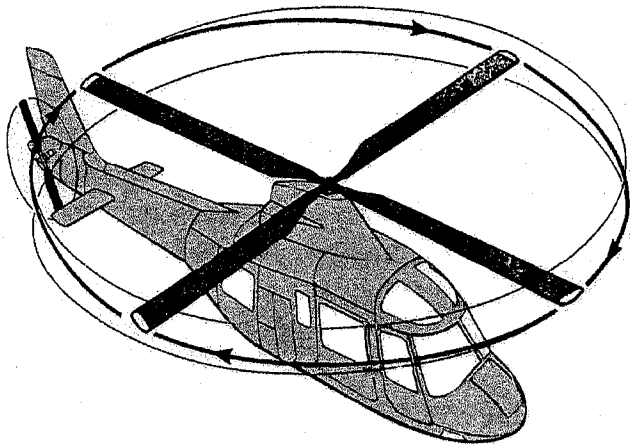
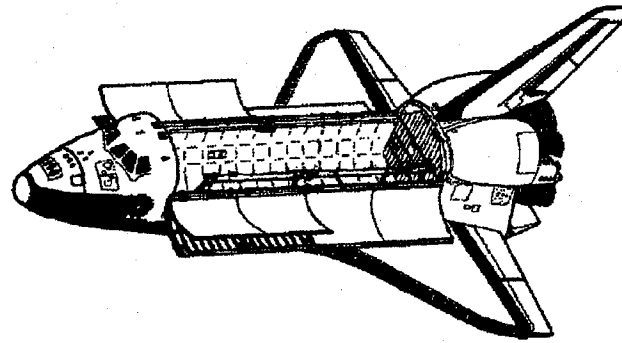
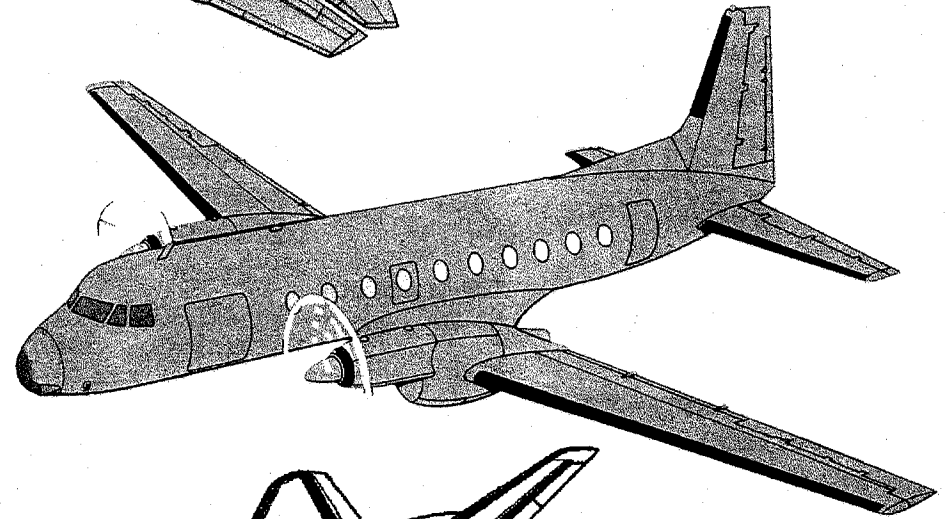
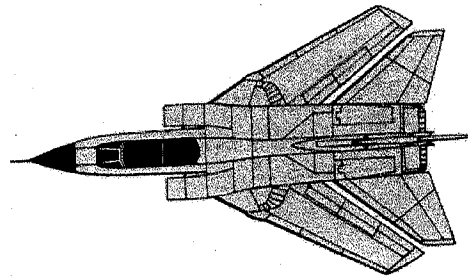
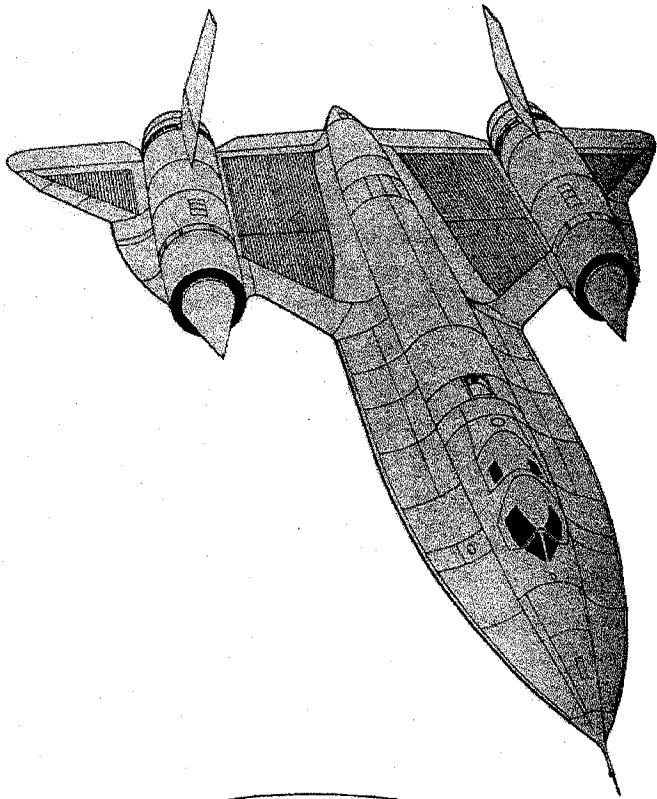
**velocity:** the speed at which a flying machine travels through the air

**weight:** the relative heaviness; the force with which a body is attracted toward the earth

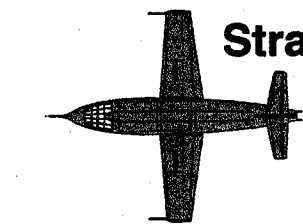
**wind speed:** the velocity of wind

**yaw:** movement left or right of the nose of an airplane

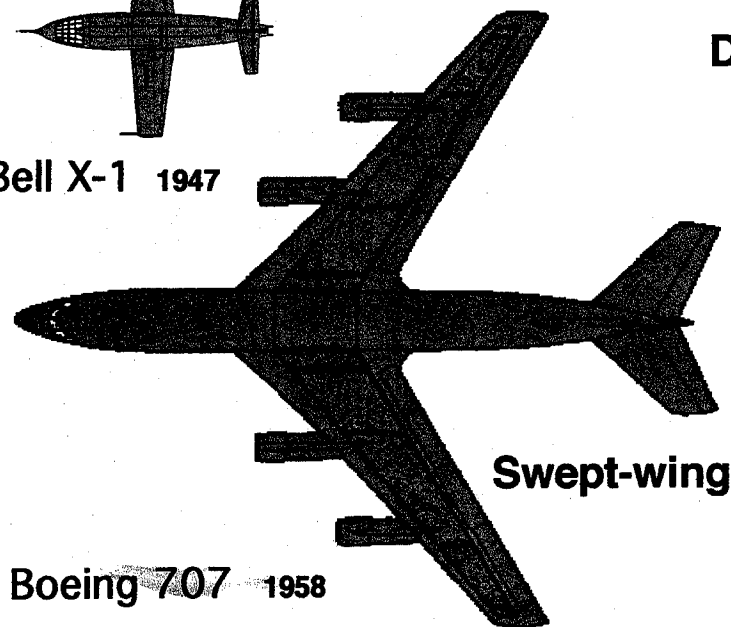
# Airplane Types



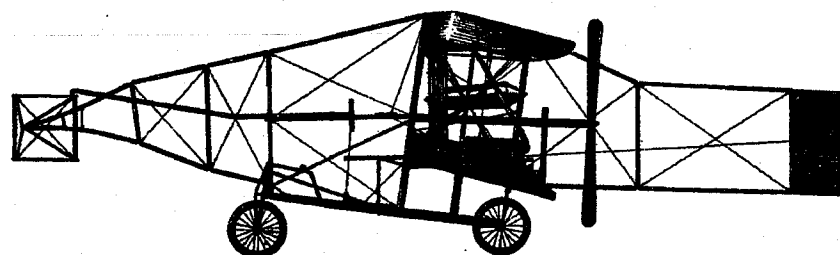
# The Shape of Flight



Bell X-1 1947

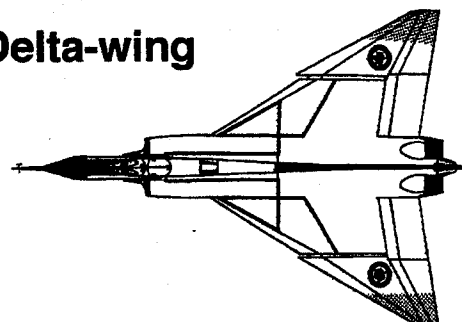


Boeing 707 1958

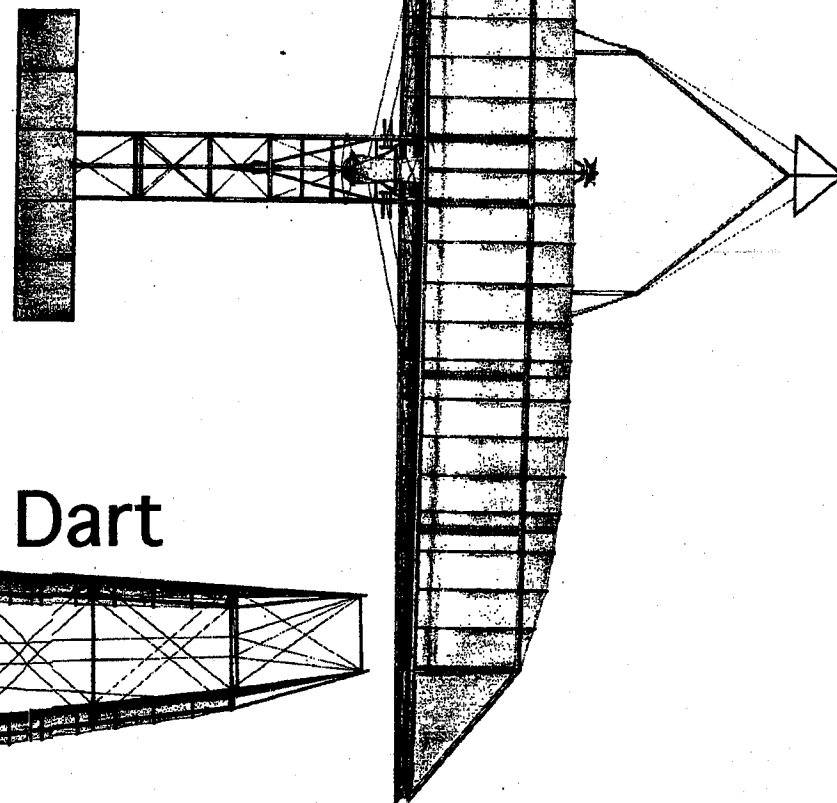


Silver Dart

Delta-wing



Avro CF-105 Arrow  
1959





AVRO CANADA CF105 ARROW

