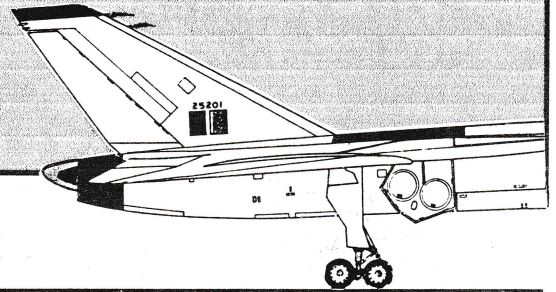


Pre-Flight



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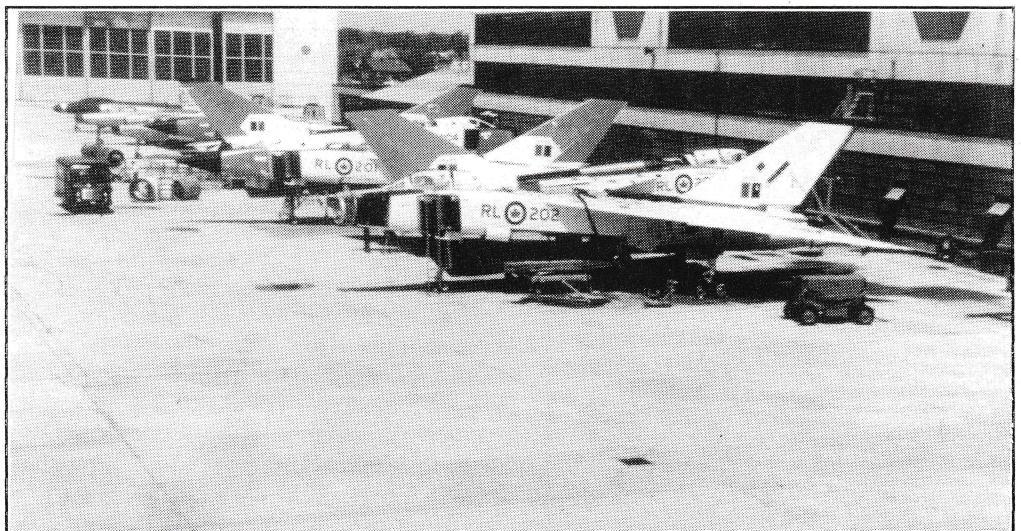
Vol. 11, No. 2

Commemorative Issue

March - April 2000

What Really Cancelled and Destroyed the Arrow? Now it can be told!

W. L. (Bill) Turner is a founding member and director of the Aerospace Heritage Foundation of Canada (AHFC) and the Canadian Astronomical Society, now part of the Canadian Aeronautics and Space Institute (CASI). He is also an early member and past director of the Canadian Aviation Historical Society (CAHS), the U.S. National Space Society, the Association of Old Crows (military intelligence) and the Air Force Association of Canada and is a founding member of the Toronto Aerospace Museum. Bill joined the RCAF in 1943 and after a year, and 3 weeks before his parade to receive 'Wireless Navigator Wings' in Mosquito crews, he was transferred into the Army. The RCAF was then overstrength and to reinforce Canadian losses in Europe, the government automatically moved 11,000 airmen trainees into the Army. In the Army, he spent another year in Military Intelligence at Camp Borden and Camp "X" near Whitby. In 1989, he retired from an engineering and marketing management career of 44 years in Canadian aerospace industries and is recognized as one of Canada's pioneers in space programs. Bill is also an aerospace archivist and historian participating with the Canadian Space Agency and many Canadian and American aerospace associations to present the history of Canada's unique aviation and space contributions to the general public and especially our children's education institutions.



Death Row - five completed Arrows await their fate.

Photo: AVRO, Verne Morse

We Who Were There

by William L. Turner

IN 1962, I COMPOSED A POEM "WE WHO WERE THERE" TO HIGHLIGHT THE FACTUAL RATIONALE FOR CANCELLING THE FAMOUS AVRO CANADA CF 105 "ARROW" AIRCRAFT.

A few weeks ago, I found the poem stuffed in the pages of a seldom-read book in my library. I then recalled writing the poem based on actual events that I had witnessed so long ago. At its time of writing, I could not show it to anyone due to military security and government sensitivity, so I placed it in a location I had forgotten. Reading the poem now rekindles my emotion and frustration of never having heard the truth or facts from government sources of the Arrow's demise and obviously, the genesis for the poem's composition. Today, some 40 years later, the facts in the poem are still hidden. In the interim, since the Arrow's cancellation on February 20, 1959, all Arrow technical information and correspondence has been declassified. All Arrow-associated documentation and artifacts were released into the public domain in the

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The Aerospace Foundation of Canada (AHFC) is a federally chartered non-for-profit organization. The current emphasis is on Avro and Orenda. The Foundation is actively trying to locate former employees of these companies.

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FROM THE PRESIDENT

As most people now know, the recovery of the Arrow models from Lake Ontario is a lot more complex than was originally thought. Finding the models and bringing them to the surface is only part of the project.

We need to have a conservation plan to deal with both the recovery, the preservation, and longterm storage. We have now contracted the Canadian Conservation Institute to create such a plan for AHFC.

The Department of National Defence, the original owners of the models, has agreed that it will, solely for AHFC, abandon any interest or claim to the models, provided the first two recovered go to the the National Air Museum in Ottawa and the RCAF Memorial Museum in Trenton.

We Who Were There, cont'd.

late 1980s, after the obligatory Freedom of Information Act 30 year statute of limitations expired. However, there is some information considered nationally sensitive that is still blocked from public access by government "Access to Information" exemptions. Specifically, the "Diefenbaker Notes" file may have undeclared information about the Arrow. This file requires special government Privy Council authorization to inspect.

This is a lengthy procedure requiring much tedious correspondence and representation. However, for the senescent, contemporary societies looking for interesting though frustrating struggles to view possibly the last vestige of truth from the Arrow saga, one must start with contacting the Privy Council's "Access to Information and Privacy" office at 613-957-5210 ... and lots of ruck.

No one has produced any government document disclosure regarding the factual cause for the Arrow's demise of which I am aware. To write "finis" to the sputtering discord of some 40 years of fallible bafflegab promoted by apparently well-intentioned but misinformed opined instant experts, I consider it timely to present information that repudiates much of the declared data for the Arrow's termination. I presently have more years behind me than ahead of me. Before I enter the Big Hangar in the Sky, I believe my knowledge of the true reasons for cancelling the Arrow should be revealed by one of "We Who Were There". I suggest that you stop here, go to the end of this article and read the poem I mentioned, "We Who Were There". (starting on p. 9)

I, like those alive who touched the Arrow, still feel bitter about how one of Canada's greatest technical achievements in the 20th century was demolished by a polemic government. I know that the suppressed facts indicate the government, contrary to the detrimental opinions generated by the media and the "We Who Were Not There" experts, was not callous in cancelling the Arrow. The government had no choice, especially when analyzing the then prevailing security situations. Similar conditions still pervade Canadian industries and government. However, what makes the cancellation much more difficult to accept is the flagrant hypocrisy of politics our inept government demonstrated in its attempts to cover up the truth. These actions forever have destroyed Canada's opportunity to be an international leader in aviation development. Sadly, historical truths are victims of political correctness and the egotistic

(cont'd on p. 3)

whims of instant expert authors, who desire to rewrite history to what they think it might have been. Those of "We Who Were There", endeavouring to support methods to complete the Arrow, chuckled at the stories our politicians

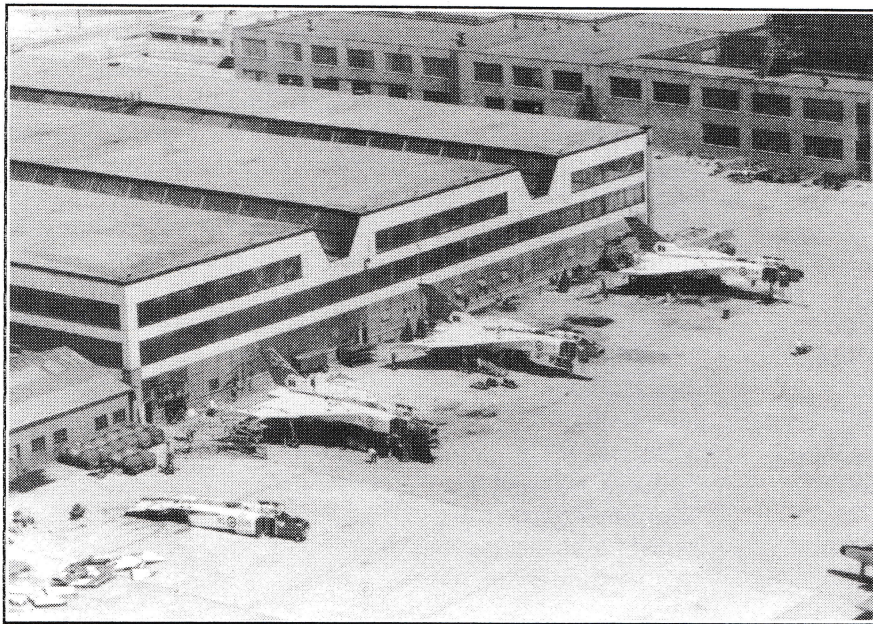


Photo: Herb Nott.

Start of 4 month destruction. RL202 is missing, getting Hughes Falcon weapons system removed in a separate hangar.

fictioned and the historians' explanations based on "Were Not There" whisperings and observations.

I must state that I am aware of only one Arrow author who definitively researched the Arrow data to come close to the truth in reporting the Arrow story - Palmiro "Paul" Compagna (Canadian Department of National Defense); his publications are accurate references. Especially note references to "Operation Keystone", the surreptitious U.S. OSS/CIA and the Soviet KGB. All true.

To my knowledge, all references and records of our small group in the poem were long ago destroyed by the government. This was done by the then-clandestine method of "shred and water mulch". I have, therefore, for many reasons, not identified group member names or the government staffs we reported to, mostly now deceased. For the few of us left, the covert world of being "nice" to Soviet industrial trade officers, actually KGB agents, at trade shows and the frustration of government classified briefings, interrogations, and the like, is gone forever.

To understand some segments of the poem and my interpretations of the Arrow's demise, readers need to know my association with the Arrow and also some aspects of aircraft construction. In the 1950s and '60s, I was one of a small unknown cadre of civilian aerospace designers with special military and civilian training. We were concerned with some diverse yet related classified systems, such as

telecommunications, cybernetics and rockets/missiles. Our contact was a senior RCAF officer of AVM rank. Our roles were the clandestine monitoring of "black box" developments, capable of improving our weapons technologies. I was directed into two locations:

1) DeHavilland Aircraft of Canada, Guided Weapons Division at Downsview Airport, Toronto. This new division, under the aegis of its parent and then world leader in missilery, DeHavilland England, was the major genesis for the short-lived Canadian guided missile industry. This division became known as the Guided Missile Division, then the Special Products Division, then the Special Products Applied Research (SPAR) Division, and finally the progenitor of Canada's space industry, Spar Aerospace.

2) The Department of National Defense's Canadian Armament Research Development Establishment (CARDE), northwest of Quebec City. CARDE began as the Canadian Army munitions test centre in the mid 1940s. Then, in the early 1950s, in association with the National Research Council (NRC), CARDE became the purported centre of armament propellants and electronic "black box" technologies.

Actually, chemical technologies and formulations, and "black box" telecommunications / cybernetics especially associated with rockets/missiles were conceived and developed by private industries. However, the government traditionally assumes to be the knowledge centre for all high tech developments created by private capital, whether government support funded or not.

I became the Liaison Officer, Weapons Systems, between deHavilland and AVRO and in this role I was required to travel to many international locations where I gained technical experiences unavailable in Canada.

Some knowledge of terminology used in aerospace descriptions needs to be explained. An aircraft is a member of a family of *things* that move materials from one place to another. All these things are delivery or transportation conveyances. And they are all comprised of three individually designed sub-components, each with special controls.

1. A *body*. A structure that contains items 2 and 3.
2. An *energy* source or *engine*. The power for moving item 1.
3. A *payload*. The object(s) item 1 is designed to move.

In humans:

1. Our *body* encloses all our systems.
2. Our *energy* sources are muscles that power our motions.
3. Our *payload* is hands, arms, feet and legs to perform functions.

(cont'd on p. 4)

We Who Were There, (cont'd from p. 3)

Our brain manages body, energy and *payload* control.

In vehicles:

1. The *body* encloses all the systems and includes an operator or driver when the vehicle is in motion.
2. The *engine* powers the *body* motion.
3. The *payload* is people, passengers and/or cargo. The driver manages *body*, *engine* and generally *payload* control.

In aircraft/spacecraft:

1. The *body* is known as the fuselage. It is the aerodynamic shape that determines the 'craft's' flight characteristics, its flight control systems, its operations systems, its crew and *payload* space volumes and weight capacities and its speed. The body also includes the crew of pilot and support members, hydraulic pneumatic, electro-mechanical/electronics/optics systems. All of these are necessary to control the craft in ground and flight operations.
2. The *engine(s)* that powers a propeller(s) or air/chemical jets that move the craft through the atmosphere and interstellar space and whose controls and fuel systems determine flight endurance times, weight lifting characteristics and especially the determination of the craft's speed.
3. The *payload* is passengers and/or cargo, (including weapons and munitions), furnishings, structures, electro-mechanical/electronics/optics systems and people. All these are necessary to manage the *payload* operations. A crew of pilot and flight support members control flight and *payload* operations.

About 50 years ago, following the terrible unpleasantness in Europe and the Pacific, Canada was riding high on well-deserved accolades for its contributions to international aviation - the British Commonwealth Air Training Plan (BCATP). Although seldom credited today in the U.S. and Europe, the BCATP demonstrated a tremendous Canadian war effort by successfully training some 131,160 Allied aircrew. Postwar, the Royal Canadian Air Force (RCAF) became involved with the North Atlantic Treaty Organization (NATO) and the North American Air Defense (NORAD) program, flying foreign designed Vampires, T-Birds, Mustangs and Sabres, and the internationally accepted AVRO Canada's CF100 Canuck, the first Canadian designed and built jet military fighter. The development of the CF100 placed Canada near the forefront in modern aircraft design. Then to supercede the CF100, the RCAF began plans for a new long-range, supersonic, all-weather jet fighter to counter possible aircraft and missile threats perceived to come over Canada's

arctic regions. This aircraft was named the AVRO Canada CF105 Arrow. The RCAF selected the name Arrow because the plan form of the aircraft resembled the pointed head of an arrow.

The Arrow was considered by world aviation experts to be a tremendous aerodynamic advancement, years ahead of any existing aircraft body design. Arrow flight tests began with substitute *engines*, P&W J75s that were some 5000 lbs. heavier than the AVRO Orenda PS-13 designed for the Arrow, and were unavailable as proven *engines* at the time of the Arrow flight testing. Orenda was selected due to its experience in successfully developing and producing jet engines for the RCAF's Sabres and Canucks. The engine for the Arrow was named "Iroquois" in keeping with Orenda's practice of aboriginal Indian names for its jet *engines*, such as 'Chinook', 'Orenda' ...

The Iroquois was never flight-tested in the Arrow. Conventional flight snags and especially fuselage modifications, necessitated by continuous changes in the burgeoning ASTRA -1 weapons control system, seriously affected Arrow flight test schedules. As a result, the Iroquois was initially and successfully flight-tested on a USAF loaned B47 aircraft. Its performance gave promise it would be as excellent as the Arrow *body*. The Arrow's flight test performance exceeded RCAF specifications with the lower power substitute *engines* proving it to be an extraordinary flying machine.

The registration RL2XX markings on the body were not of RCAF origination for the use on the RCAF aircraft type assigned AVRO CF105 Arrow. They were the result of an AVRO Canada "Arrow familiarization" meeting with the USAF in the USA. When a senior USAF officer asked the AVRO members what the registration characters on a tabletop Arrow model represented, a prominent AVRO member, who had his initials followed by 201 placed on the model,

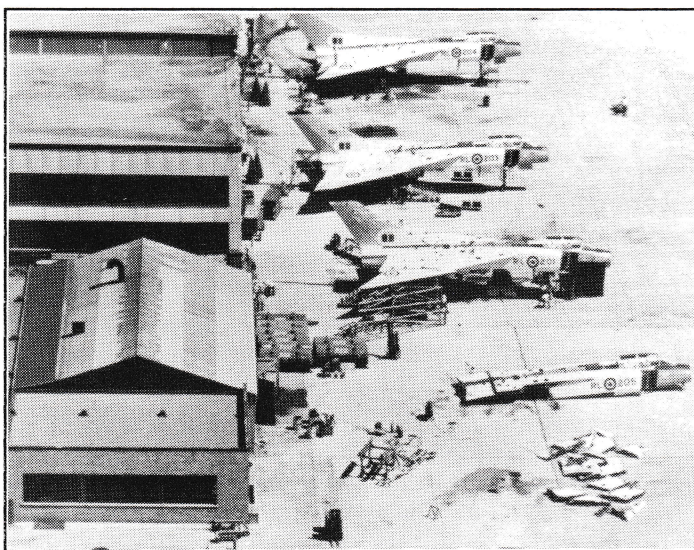


Photo: *Star Weekly* - Herb Nott
Sawn Arrows (aircraft structures burn & are difficult to extinguish)
(cont'd on p. 5)

We Who Were There, cont'd from p 4

stated the registration was arbitrary and used to enhance the realism of the model. Subsequently, in the life testing of the Arrow, these alpha numeric registrations became the permanent series for Arrow aircraft identification.

However, excepting the crew, life support systems and special navigation/communication systems, the Arrow had no *payload* to meet RCAF operation objectives.

The Arrow's mission payload was to be a govern-



Photo: Star Weekly - Herb Nott
Goodbye Arrows

ment supplied weapons system, consisting of guided missiles and associated "fire-control" or weapons management systems - electronics named "black boxes" that contained top secret gizmos designed to covertly detect and track military targets - and accordingly, dispatch munitions. At the time of the Arrow flight testing programs, there were a variety of suitable air-to-air missiles and their variants available to the RCAF. These were Hughes Super "Falcon", Douglas Raytheon "Sparrow", Douglas "Genie" (with a 1.5 kt nuclear warhead the RCAF really wanted) and deHavilland "Firestreak" and "Red Top" - all adaptable to the Arrow's weapon or armament bay (18'Lx3'Hx8'W).

Unfortunately, at this time, there were no RCAF fire control systems readily available in Canada. Paradoxically, at no time in the history of aviation, in any country, has such a small team of unique dedicated professionals ever conceived and produced to flying status a technically, world dominating, economical flying platform as Canada's AVRO Arrow. Yet the Arrow lacked a *payload*. It is sad that the Arrow *body* never flew its *engines* or *payload*. It is sadder that the lack of a *payload* caused the Arrow's demise.

The RCAF specifications for the *payload* recommended the use of the Hughes MX1179, or

equivalent, fire control system to manage the Arrow's munitions. It was a choice based on Hughes' world-leading expertise and the good liaison the RCAF had developed with Hughes since it supplied the MG2 fire control systems so successfully deployed in the RCAF's Canucks. The RCAF requested appropriate Canadian government authorities to explore with their U.S. counterparts the lengthy process of approval to access the highly classified MX1179 system then in final development. These requests were denied for incredibly absurd reasons, but at the same time channels were being secretly explored.

The Canadian government, however, with Quebec government and industry persuasion, reacted with typical frenzy to place monopolistic largesse in Quebec. A fire control industry would be developed in Quebec that would provide a system "better and more economical" than the existing Hughes/Falcon system offered to the RCAF. At the time of the Arrow cancellation, such a trial system was being installed in Arrow RL202. This new industry decision obviously chose patronage over logic. There were no fire control skills in Quebec! Canada did have some excellent expertise in radar technologies, mostly from the United Kingdom but residing outside Quebec. Canada also had some good experience in industrial control electronics in Ontario. But nowhere in Canada, other than a small core in Toronto and a few in CARDE, were there any guided missile management/ technology skills.

Nevertheless, the delusions of grandeur, expressed and promoted by the government and misinformed RCAF decision makers to establish another new home industry in Quebec, produced a situation of a commendable but impracticable, totally produced Canadian aircraft, the Arrow. Canadian aviation and electronics industry experts cautioned the government that a Canadian developed system would be much more expensive than an off-the-shelf system. And it would be ludicrous to initiate the development of another state-of-the-art (SOTA) program in addition to the existing Arrow *body* and Iroquois *engine* programs. It would be just too costly for Canada. Furthermore, the time required to develop a new system would greatly impact by years the Arrow's delivery to RCAF operation status.

In spite of these earnest caveats, the Canadian government, with usual lack of foresight and typically not to be outdone by good reason, blundered on by defying the critics and announced the introduction of a new Quebec industry development. There was to be a new Canadian fire control system for the Arrow and it was named ASTRA-1.

As the initial Program Manager, the RCAF, with government direction created an industry consortium consisting of:

1. Radio Corporation of America (RCA) in Montreal
(cont'd on p. 6)

We Who Were There, cont'd from p. 5

as technical program and radar manager. RCA had limited skills in management, avionics and radar, and depended on its parent RCA Cherry Hill NJ for engineering expertise.

2. Computing Devices of Canada (CDC), in Ottawa/Montreal, as systems integrationists. CDC was a small professional company which had good experience working with the RCAF's Central Experimental Proving Establishment (CEPE) avionics testing programs.
3. Minneapolis Honeywell Controls (MHC), in Minneapolis MN for flight, navigation and target acquisition electronics and the only team member with experience in their task.
4. Canadair, in Montreal, for aircraft installation. Canadair had no skill or understanding of fire control concepts, the Arrow or weapons systems. AVRO and Ontario industries, the obvious choices were unacceptable, since they were not in Quebec. Canadair's experience consisted of making and installing launch pylons on the CF100 for 'Velvet Glove' guided missile tests, some missile training and the manufacture of some missile structures.

Over the past 45 years, where I have experienced middle and senior Canadian aerospace industry roles, I have had considerable associations with Canadair. They are recognized as a good aircraft license builder - construction according to other company's design - but have gained an incredibly poor international name for any original design. Their expertise is gained, even today, by government supported acquisitions of off-shore industries. Note that government support of any type is unavailable even now to the few existing or any new aerospace industries outside of Quebec. I have attended many high level aerospace meetings where government Ministers have glibly reminded attendees that, unofficially stated, Quebec must have no challenge to its government patronized role as Canada's centre for transportation and communication technologies, especially in fields of aviation and space. This is a publicly recognized existence of blatant favouritism that has domestically and internationally embarrassed Canada for over 40 years and preserves Quebec's predatory behaviour in our aerospace and communication industries. To maintain its self-proclaimed, yet unearned, image of excellence, Canadair still relies upon quietly hidden partisan politics. Bombardier, Canadair's parent, bred and sustained by government patronage, is another unbelievable tale of controlling over 75% of Canadian aviation industries. But that is another story being prepared by some major media, who will exacerbate and expose these inequities.

Immediately after the ASTRA-1 program began, the government assumed full responsibility for ASTRA-1 development and proclaimed itself the Program Manager. It

then proceeded to pompously declare itself the Program Manager over the Arrow program. The ASTRA-1 Consortium specifications required technologies in a variety of new SOTA sciences, demanding unavailable components and untried manufacturing processes. Its hit-and-miss Arrow installation engineering decisions created havoc at AVRO. Modifications to the Arrow's *body* were in constant development to meet ever-changing specifications. These changes required considerable structural stress and aerodynamic engineering, manufacturing documentation amendments, tooling redesign, part fabrication alterations, additional inspections and re-scheduled flight trials. Soon the inexperienced government gurus and their chosen industry specialists realized the ASTRA 1 critics were correct. Arrow schedules were slipping and costs were spiralling. They realized that ASTRA-1 would be impossible to develop with present staff and within the conventional norms of specification, cost and schedule.

ASTRA-1 became an incredible runaway cost program.

ASTRA-1 became the DISASTRA program and was terminated in September 1958.

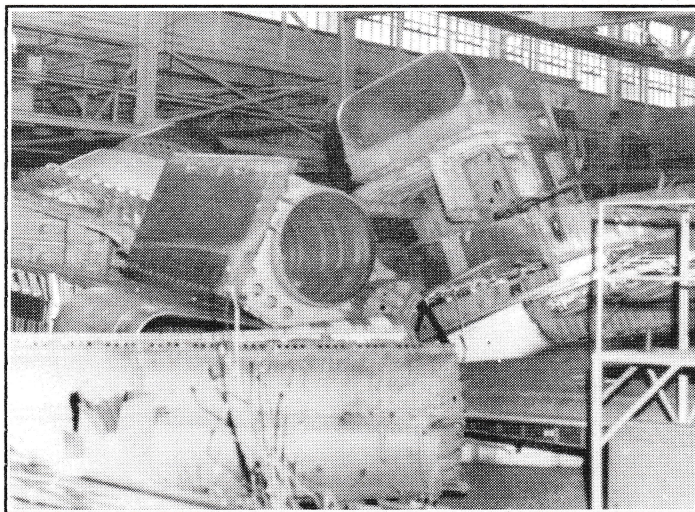


Photo: AVRO - Verne Morse

Awaiting Sam Lax scrap pickup (\$500 million Arrows sell for \$300)

Soon the news media began fabricating stories based on government fictioned "informed sources", of the Arrow's high costs and production delays. Politicians began releasing declarations of various unauthorized "facts" to substantiate their folklore of the Arrow's status. This was premeditated for two reasons - to hide the truth of the tremendous taxpayers dollar expenditures, mainly generated by ASTRA-1 and, most importantly, to allay the public ire that the government had goofed big time. Someone had to be blamed, but not the Diefenbaker Conservative government of the day.

So, since AVRO incurred the costs to adapt ASTRA-1 to the Arrow, the government (*cont'd on p. 7*)

instigated media leaks and releases that the current and potential high costs of the Arrow program were the result of AVRO production faults. The truth was quite different. Prior to the government takeover of the ASTRA-1 fiasco and the Arrow program, AVRO had the Arrow production costs reasonably within budget, especially for a new aircraft development. According to international aviation convention, costs were not considered high. There were unexpected yet explainable cost overruns as in any new product development. However, when the government became Program Manager of everything, costs began to predictably escalate and the ASTRA-1 disaster sent costs into a ballistic trajectory. Its development and production was speculated to be near 100 million dollars.

A government hold was imposed on the release of the true facts and AVRO was left with no choice but to accept the blame for government ineptitude. Meanwhile, due to the ASTRA-1 termination, the RCAF and DND were in a panic mode. They had the best flying machine in the world - but no *payload*. The government staff, who had been quietly exploring access to U.S. weapons systems, were placed on urgent priorities to find a suitable system. Due to U.S. and Canadian government sensitivities, these meetings, locations, agendas, discussion minutes, and attendees' names are still subject to Secrecy Acts and similar to the Privy Council bans - cannot be disclosed.

It didn't take long for the government to know that any U.S. classified system would not be directed to Canada. The U.S. claimed it had hard evidence of a wide Soviet espionage network in Canada, and this claim was substantiated by U.S. industries, which had constantly complained to their security agencies that their engineering, manufacturing processes and proprietary data was in the hands of the Soviets (and often actually seen by U.S. agents in the USSR) almost as quickly as the materials and parts were given to Canadians. *We Who Were There* knew of these complaints and saw only a few proofs of espionage. RCMP briefings alerted us to investigation programs like "Operation Keystone", a post-war RCMP program extending into the Arrow era with concerns of Soviet (NKVD/OGPU, GRU, GKNIIIR, KGB et al. - moles in Canadian government and industries. The U.S. was also watching us with many agents from their OSS/CIA, ASSA, NSA, FBI ...

U.S. military contracts in Canada provided opportunities for "service and trade representatives?, liaison experts?". The U.S. agencies claimed there was evidence of Soviet moles in Canada's DND, NRC and AVRO Canada. I was aware of "captured" AVRO Canada documents by Keystone operatives. The Soviet moles had access to Arrow flight test status, manufacturing processes and weapons systems evaluations. The few of us at CARDE and the places we visited, often found our conversation included topics of Soviet confrontations. However, we had

excellent guidance and direction from the RCMP in how to handle these 'KGB' meetings with appropriate taciturnity.

The U.S. government, directed by the FBI et al and U.S. industries, officially and adamantly refused Canada access to their secret systems. It was final. The Canadian government then had no alternative but to terminate the Arrow program to save the Canadian public from further program costs. But instead of telling the truth of the U.S. security violation concerns that created the rejection of Canada's requests for U.S. equipment, the associated Canadian government embarrassments and the logical necessity for cost saving closure of the Arrow program, difficult issues the public could understand and accept, the government chose to cloak the truth. Honesty would have saved Canada millions of dollars in media and government disinformation.

Diefenbaker, a gifted orator and outspoken politician, had no sense of technologies. Nevertheless, Arrow archives indicate he was concerned with his government having to cancel the Arrow. Defense Minister George Pearkes and Air Marshall Foulkes promoted cancelling the Arrow in the fall of 1958, but Diefenbaker delayed the decision until there was absolute proof the Arrow program could not be completed. To validate the basis for his government's "Cancel the Arrow", Diefenbaker was counselled to use the British Defense Minister Duncan Sandy's statement that "manned military aircraft were obsolete and bombers would soon be replaced by missiles and rockets". Having both the Bomarc and the Arrow programs was just too expensive for Canada, and one of these had to go. The government technocrats leaned toward their misinformed technologists and selected the Bomarc.

Many industries, domestic and foreign and including Canada's NRC, expressed interest in leasing one or more flying Arrows for high altitude research. The government insisted a flyable Arrow would cost too much to maintain. Yet according to aviation experts at the time, it would entail about two million dollars per year. This would include hangarage, tooling and support equipment, maintenance, spare parts and storage, operations checkouts, crew and administration. User fees would be charged accordingly. International aviation industries considered this a reasonable investment to maintain world leadership in aviation. But the government would not consider these options, as they contradicted its covert mentality. But most notably, an Arrow presence, even in a museum, would be a public reminder of a great Canadian achievement the government had destroyed. In the U.K., the BAC English Electric TSR 2, similar in role but not performance to the Arrow, was cancelled about this time. But at least four of the eight aircraft built are in museums.

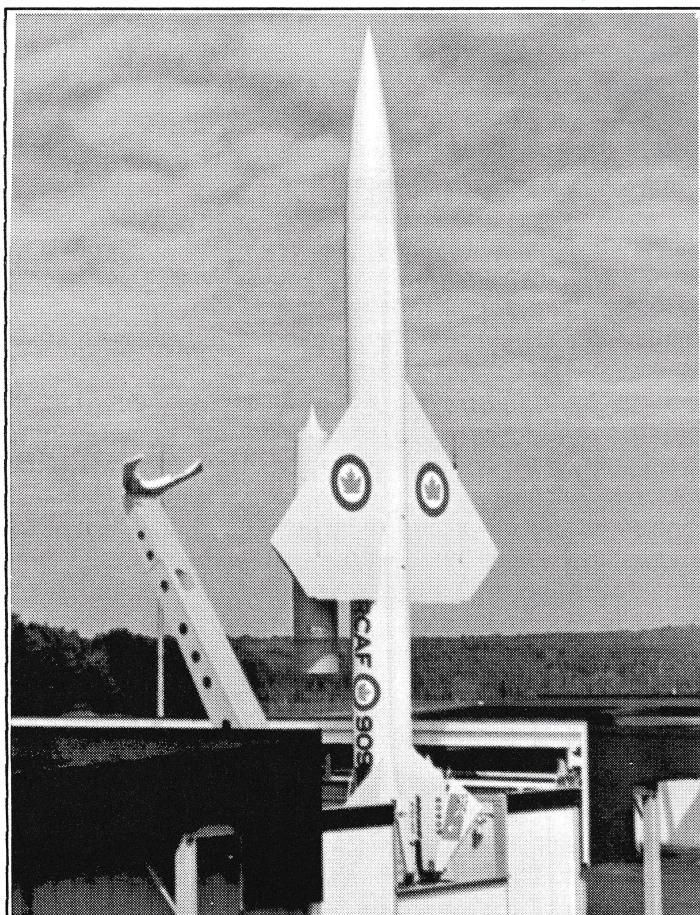
The Canadian government, which still owned all the components of the Arrow program, since the Arrow had not been accepted by the RCAF, stubbornly refused the use of flyable Arrows for any purpose. *(cont'd on p. 8)*

We Who Were There, cont'd from p. 7

In its pique, the government ordered the immediate destruction of all Arrows, parts, associated tooling and documentation.

Following the Arrow termination in 1959, the government created yet another incredibly hushed-up blunder, more dangerous and costly to Canada than the Arrow program. The Canadian government permitted the unbelievable international mandate of another country, the USA, to plan and dictate Canadian defense policy by imposing the installation of Bomarc missiles in Canada to replace the Arrow. The Bomarc was a U.S. "learning curve", surface-to-air missile the USAF had rejected as unreliable. Bomarcs had nuclear warheads which were kept under USAF storage and control. Locations of the warheads is another interesting story.

A Bomarc launch was at the sole discretion of the U.S. government, with no Canadian input. They were supposed to complement the U.S. Semi-Automated Ground Environment (SAGE) early warning radar system. The U.S. had built this system across northern Canada to replace the aging Distant Early Warning (DEW) line and the associated "McGill Fence" and "Pinetree" lines. The obsolete Bomarc looked good and gave Canada the appearance of being missile literate.



With the Arrow out of the way, the U.S. realized Canada had no effective high speed aircraft interceptors that could carry nuclear weapons. The canny U.S. immediately promoted an agreement to provide Canada with surplus aging F101 "Voodoo" aircraft from the U.S. Air National Guard, which was waiting for modern replacements. The Voodoos were capable of launching nuclear warhead Genie missiles. The agreement also included the freedom to overfly Canadian territory with nuclear armed aircraft without prior Canadian permission, which was internationally required, unless when at war. Imagine the chaos at Canadian Air Traffic Control!

These are among many untold stories whose disclosure is suppressed by the Canadian government. Available information regarding the politics of the Bomarc and Voodoo programs is just as vague as the Arrow story.

The AVRO Arrow, a world-best aerodynamic marvel that has no peer in aviation development, has been the subject of much unworthy derision created to conceal the Canadian government's embarrassments and misjudgments. Yet the Arrow continues to be an enduring topic of discussion and argument. The Arrow retains an aura of wonderment, and for me - unforgettable moments in a time when Canada was aeronautically remarkable and outstanding.

Hopefully, the poem I wrote so long ago and mislaid until late 1999, will clear some air at aviation gatherings and "hangar flying" meetings.

The poem tells it the way it was.

Succinctly, it says it all.

Arrow's inferior replacement:

Boeing & Michigan Aeronautical Research Centre
BOMARC CIM.BIO

Photo: RCAF Sqdn, North Bay

THE POEM

We Who Were There

by

William L. Turner, 1962

We Who Were There • helped put an Arrow in the air
An achievement • Canada won't see • again
Developed with skill • its flights gave us a thrill
Why it ended • is how • I'll begin.

We Who Were There • knew the Arrow would share
Top honours • throughout the world's • aviation
But it had one deficiency • that proved a big inefficiency
It had no controls • for its payload • munitions.

We Who Were There • could bring no talent to bear
To develop ASTRA • the Arrow's weapons • control
A Canadian government program • with no credible stratagem
"Can't build it • don't know how" • we were told.

We Who Were There • were often sent where
For months • we'd work • on national secrets
To world and Canadian Labs • where expert boffins had
Weapon systems • but they always • eluded us.

We Who Were There • knew the U.S. had a flair
For developing • weapon systems • black boxes
So we who were there • went there unprepared
To learn our requests • to use their boxes • obnoxious.

We Who Were There • were told the U.S. was scared
Of sensitive info • leaving Canada • for the Soviet
U.S. industries determined • CIA/F.B.I. were certain
Secret data • to Canada • can't be kept quiet.

We Who Were There • knew spies were at any affair
Where black box folks • were expected • to attend
These spies worked as a pair • so they could later compare
Info 'bout facts • to their chiefs • they could send.

We Who Were There • knew Soviet questioners would swear
They would never • compromise • Canadian integrity
But their compulsive interrogations • 'bout classified information
Caused us • remarkable • taciturnity.

We Who Were There • Mountie primed, that one of the pair
Would ask questions • about Canada's • "machinery"
The other speechless would retain • all answers gained
With photo cameras • tape recordings • and memory.

We Who Were There • were used to handling black stuff with care
We'd signed documents • to keep secrets • amongst us
But We Who Were There • couldn't challenge true affairs
The U.S. government • operations like "Keystone" • had against us.

To We Who Were There • our U.S. friends wouldn't share
A transfer • of their stealth systems • we wanted
Yet none of We Who Were There • that I'm aware
Would disclose secrets • no matter • how taunted.

We Who Were There • were aware of the Bear
The KGB • who were covertly • around us
Their surreptitious surveillance • to determine the conveyance
Of Arrow weapons • was furtive • atrocious.

We Who Were There • heard of folks without care
Who would disclose • a Canada • U.S. secret
Making We Who Were There • our government and AVRO despair
'Cause we had an airplane • with no payload • and no market.

We Who Were There • knew schedules allowed no time to prepare
A weapons system • we shouldn't make • but should buy
MX1179 gear existed • but with our requests for its use resisted
Our Arrow dream • looked like • "pie in the sky".

We Who Were There • at CARDE • maybe 15 or more
In a meeting re fire control • for the Arrow
All the known facts were explored • then we secretly swore
Knowing no payload • doubtful funding • no Arrow.

We Who Were There • knew a big chief somewhere
Would inform government • of the Arrow's predicament
Who it was - we weren't told • and the Mounties we polled
Would say nothing • but wait • for a statement

We Who Were There • soon heard our government declare
"It was timely • to cancel • the Arrow
Due to high cost overruns • and production tool sums
The country • couldn't afford • the Arrow."

We Who Were There • knew the government wouldn't dare
State the truth • for cancelling • the Arrow
To admit national security • was easily penetrated and untrustworthy
The public • would hold our inept government • responsible..

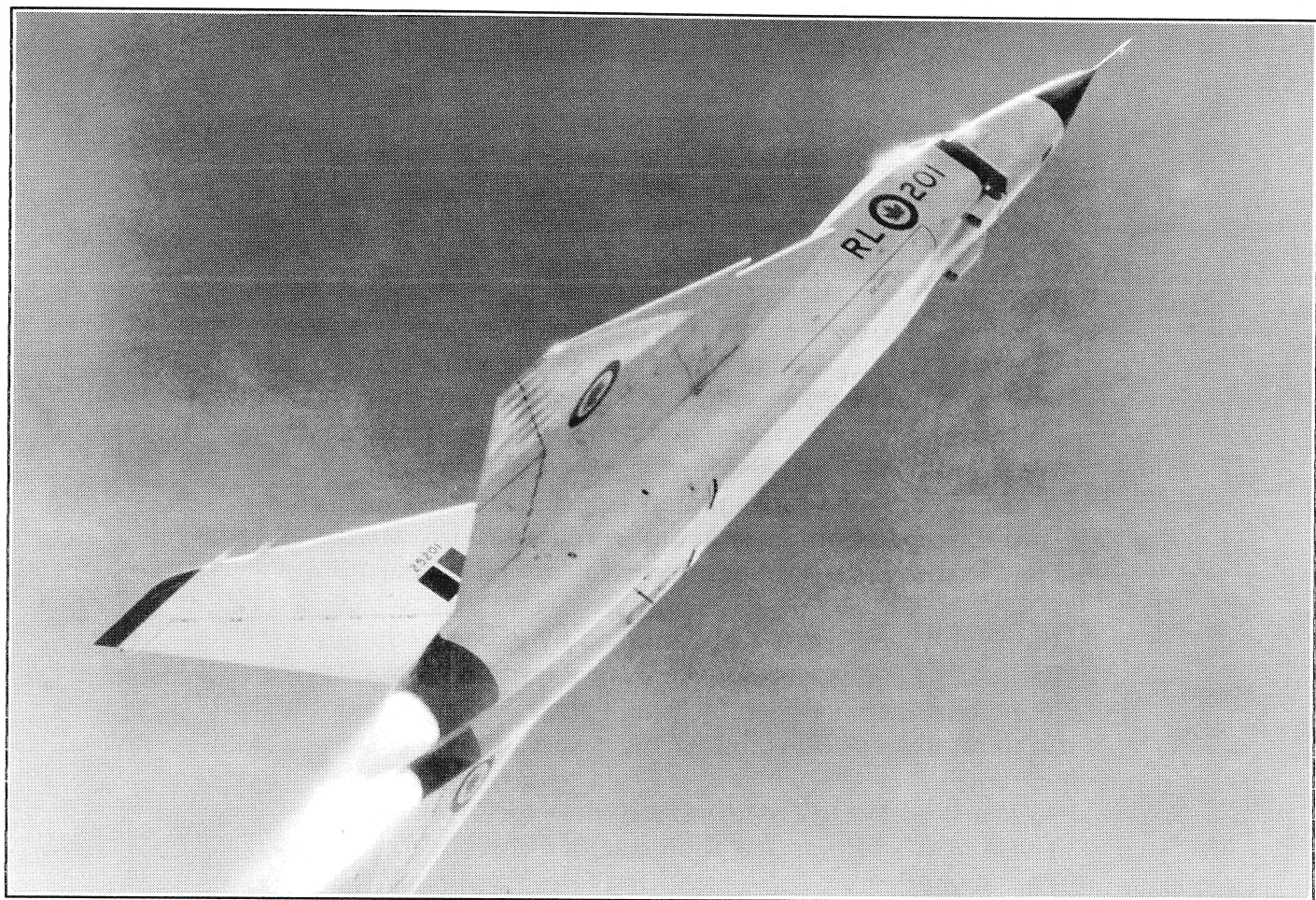
We Who Were There • knew government deceit was fanfare
Sieve-security and treason • the cancel reason • we know
And our government through the years • will always have fears
One day • truth re the Arrow • will show.

We Who Were There • thought cancellation processes unfair
Vindictive orders • to destroy all tooling • parts and documents
We had 7 Arrows flying grade • 30 more being made
Storage costs • to keep one of them • Where's the argument?

We Who Were There • know the Arrow was rare
A proud symbol • of Canadian • perfection
And though ignominious avarice • changed careers for all of us
Note that AVRO workers • were a credible • selection.

We Who Were There • are amused by experts who air
Bafflegab • 'bout why the Arrow's • termination
None to date have been factual • their sources are not factual
So fairey tales • 'bout the Arrow • spread our nation.

So We Who Were There • know the glory we share
The Arrow's brilliance • the pride of TO • our town
The memories we hold • and the tales passionately told
Of our Arrow • that'll never • lie down.



PER ARDUA AD ASTRA

The last Arrow flight, flown by 'Spud' Potocki

February 19, 1959

Photo: AVRO - Hugh Mackecknie