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**Updated** 5 Sept 2012

# Timeline

This timeline marks events of the AVRO Arrow programme, prior, during, and after, including those events that might have had an influence for or against the Arrow and those events that the Arrow influenced.

It has been compiled from references and there may be some inconsistency in the dates etc.

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<b>1950</b>	
17 March 1950	Conservative Defence Critic Maj. Gen. Pearkes, in a general condemnation of Canada's choice of the F-86 Sabre fighter: " <i>I am tempted to ask whether the strategic technical, and economic factors concerning the F-86 have not been overridden by political consideration...the F-86 does not measure up to Canadian requirements...for interception of bomber aircraft.</i> " [Aircraft & Airport, May 1950]
June 1950	Korean War starts
21 June 1950	Canadian Liberal Defence Minister, Brooke Claxton, commenting on the Korean Declaration of War: "... <i>We believe our Air Force is adequate for the defence of North America at the present time, in cooperation with forces of the U.S. that would be employed in that task, particularly in Alaska in the Northwest and in Newfoundland in the Northeast.</i> " [Aircraft & Airport, August 1950]
1 Oct 1950	Dept of National Defence orders \$100 milion worth of F-86 Sabre fighter aircraft from Canadair - although engines are expected to come from Avro Canada. [Aircraft & Airport, October 1950]

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<b>1951</b>	
5 Feb 1951	Avro (Fred Smye), on orders of Minister C.D. Howe issued a stop work order on the Jetliner project, to preserve the contract to produce 720 Canucks at a rate of 25 per month. Avro advised National Airlines the deal was off with the hope that Avro might reopen negotiations at a future date. Note: C.D. Howe, in response to Dixon Speas, Sales Manager for Avro: "... <i>Avro has too much on their plate in trying to do both the fighter program (Canuck) and the Jetliner program. We are committed to the fighter program and the Jetliner must go on the shelf.</i> "
1 April 1951	Velvet Glove Missile program started by Canadian Armament and Research Development Establishment (CARDE)
1 Sept 1951	First delta configuration used for the Arrow. [Avro CF105 Engineering Chronology Sept 1955]
12 Oct 1951	Crawford Gordon Jr. replaces outgoing VP & General Manager Walter N. Deisher with title of President & General Manager. [Aircraft & Airport, November 1951]

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<b>1952</b>	
	AVRO designs and submits to the RCAF their design for the C104/1 Single-engine, all

	weather supersonic fighter
1 June 1952	Canadian Defence Research Board announced development of an air-to-air missile at its Armament Research and Development Centre at Valcartier, Quebec. [Aircraft & Airport, June 1952]
Nov 1952	RCAF issues Operational Requirement OR 1/1-63 "Supersonic All-Weather Interceptor Aircraft"

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<b>1953</b>	
4 Jan 1953	Avro final design submitted to RCAF was C-105/1200, delta wing aircraft.
27 Feb 1953	W/C Richard Rohmer, Commanding Officer, 411(F) Squadron (Auxiliary) wrote a letter to Crawford Gordon after a tour of the Malton facilities. <i>"The progress of the fighter is of special significance to us, as much as the plans of the Air Force to date to provide for our use your aircraft at the earliest possible moment"</i> (CF-100 and it's planned successor - the Arrow)
1 Mar 1953	Avro's design work on the new CF-104 delta wing fighter is delayed while federal government wrestles with question of whether or not to proceed with fostering original designs in Canada, as opposed to simply modifying other nation's designs to meet Canadian requirements. [Aircraft & Airport, March 1953]
14 Mar 1953	Introduction of intake ramp boundary layer bleed on the Arrow. [Avro CF105 Engineering Chronology Sept 1955]
April 1953	The RCAF issues Air 7-3: Design Studies of Prototype Supersonic, All-weather, Interceptor Aircraft
? 1953	AVRO responds with Report No P/C-105/1, "Design Study of Supersonic All-Weather Interceptor Aircraft"
1 Sept 1953	First CF-105 wind tunnel tests were conducted. [Avro Car - Canada's Flying Saucer by Bill Zuk]
14 Sept 1953	AVRO Gas Turbine Division (Orenda Engines) initial design of engine Project Study - 13 (Iroquois) commences
14 Oct 1953	Hawker Siddeley's Design Council approves design of the PS13 Iroquois
14 Oct 1953	Orenda engineers make two day presentation to Hawker-Siddeley Group to underwrite cost of developing their newly-designed Project Study 13 (PS13 Iroquois turbojet engine).
Oct 1953?	Ministerial Directive stops all work on the project (1st cancellation)

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<b>1954</b>	
5 Jan 1954	The Liberal government authorizes 2 million dollars for the development of two prototype supersonic interceptors - 600 to be considered for service by late 1961 (CF-105)
13 Jan 1954	Hawker-Siddeley authorizes private venture of \$3.5 million for Orenda to proceed with the design and manufacture of three Iroquois engines. Orenda hoped to secure RCAF contracts by demonstrating a prototype engine.
Spring 1954	Project re-instated with contract for 2 prototypes and 1 airframe for static tests purposes
1 May 1954	Iroquois final detailed design completed

4 May 1954	Letter sent to Canadian Joint Chiefs of Staff Washington US. Ref CF105 Aircraft - Transition from Prototype to Production using Cooke-Craigie Method
June 1954	U.S. initiates a competition for a long range interceptor and is interested in the CF105 Arrow
26 Aug 1954	Briefing team of RCAF officers and AVRO officials visit ARDCHQ and give a presentation on the CF105 Arrow
16 Sept 1954	AVRO submits a cost analysis for 31 Mar 1955 to 1960 for \$118,253,435.00 for design and development, production tooling, and production of 40 CF-105 Arrows.
Nov 1954	Canada and the United States exchange notes for formalization of the Distant Early Warning (DEW) Line
17 Nov 1954	Introduction of the 5 per cent notch on the Arrow wing. [Avro CF105 Engineering Chronology Sept 1955]
5 Dec 1954	The first PS13 Iroquois was delivered for testing.
10 Dec 1954	Decided only 6, not 8, Falcon missiles to be installed. [Avro CF105 Engineering Chronology Sept 1955]
14 Dec 1954	Decision to revert to 8 Falcon missiles. [Avro CF105 Engineering Chronology Sept 1955]
15 Dec 1954	First light-up of an Iroquois engine
19 Dec 1954	Iroquois was started at 4:24 p.m. and run on its own power.
20 Dec 1954	AVRO/RCAF/NACA meeting in Washington - NACA regarded 'Area Rule' as useful. [Avro CF105 Engineering Chronology Sept 1955]
20 Dec 1954	NACA (National Advisory Committee for Aeronautics), on hearing from the RCAF, NAE, DRB(?) and AVRO, found that the C-105 design would meet RCAF specifications. [Avro Aircraft and Cold War Aviation by R. Whitcomb]

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<b>1955</b>	
1955	By 1955, the RCAF had reconsidered its assumption that the CF-100 and its successor would go to the Auxiliary Squadrons which were then assigned an air defence role. It was decided that the Auxiliary Squadrons could not maintain, on a part-time basis, a level of proficiency that would fully exploit the capability of an all-weather fighter. Only 9 regular squadrons would get the CF-100, effectively cutting in half production run requirements of its successor- the Arrow. ( <b>Note:</b> Today I think this has effectively been ruled out by the Air Reserve Squadrons of the United States!)
2 Jan 1955	Jim Floyd named Vice President and Director of Engineering of Avro Aircraft, leading the team that was responsible for the Avro Arrow.
5 Jan 1955	AVRO announces laying off 1,000 workers t the request of the Federal Government
21 Feb 1955	Plans were announced to construct the Distant Early Warning (DEW) Line across northern Canada. [Air Transport by L.D. Edwards in Canadian Aviation Magazine Anniversary 1978]
5 May 1955	Canada and the United States ratify the agreement on the Distant Early Warning (DEW) Line
June 1955	AVRO Brochure AD 15 Issue 2: Costs of the CF-105 Arrow has now risen to \$153,711,311.00for 40 aircraft versus \$118,253,435.00 quoted in Sept 1954
June 1955	AV ROE Canada offers \$30.00/share for all the stock of Canadian Car, It was accepted
18 June 1955	Introduction of leading edge droop on the Arrow wing. [Avro CF105 Engineering

	Chronology Sept 1955]
14 July 1955	Contract between the Government and Orenda for 11 PS-13 engines with authorization to build 3 engines.
31 Aug 1955	The RCAF issues Air 7-4 Issue 3: Specification for Supersonic All-weather Interceptor Aircraft Type CF105
1 Nov 1955	Following an inspection of AVRO's facility and projects, the USAF team stated that the CF-105 would be the optimum interceptor for the early 1960's (at least until the US F-108, which bore a remarkable resemblance to the CF-105, were to come into service). In the end, the design limits for the aircraft would be the thermal limits of the aluminum alloy structure. [Avro Aircraft and Cold War Aviation by R. Whitcomb]
24 Nov 1955	Ralph Campney, Minister of National Defence, sends C.D. Howe an aide memoire calling with a cost analysis and a call to slow production of the Arrow down. Cost so far for the Arrow airframe and engines was \$35,500,000.00 and cancellation would cost another \$17,700,000.00. ( <b>Note:</b> The Arrow could have been written off into history before it became the Legend it is!) His cost analysis for 40 aircraft was now \$198,369,688.00 and production of another 300 aircraft would cost another \$636,700,000.00.

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<b>1956</b>	
19 Jan 1956	Decision made not to build prototype aircraft - aircraft to be manufactured direct from production tooling. (Process known as the <a href="#">Cook-Craigie Method</a> . 🌐) [1999 Calendar published by Adlin Group]
8 Feb 1956	Contract for conversion of a USAF B-47 Stratojet to be used as a PS-13 (Iroquois) engine test vehicle
19 Jun 1956	Capital assistance for additions to the Nobel engine plant
23 Jun 1956	Maclean's article by Lieutenant-General Guy Simonds, who had just retired as Chief of the General Staff, " <i>Where We've Gone Wrong on Defence</i> " argued that the Arrow would be obsolete before coming operational because of advances in missile technology. He states that the Arrow programme was continuing because of vested interest in the Air Force, aircraft industry, defence research scientists along with the known desire of ministers to maintain a defence effort with a strict manpower ceiling.
12 or 24 Jun 1956	Iroquois first official 50 hour Pre-Flight Rating Test (P.F.R.T.) successfully carried out
28 Jun 1956	C.D. Howe tells the House of Commons that work will soon begin on the ASTRA
3 July 1956	PS-13 Iroquois afterburner first operation
3 July 1956	Arrow contract amended to build 11 aircraft vice 5 aircraft
7 Sept 1956	Main contract for development for the PS-13 engine issued
19 Sept 1956	PS-13 Iroquois engine 1,000 accumulated hours on one engine
28 Sept 1956	Radio Corporation of America (RCA) contracted for complete electronics weapon and navigation systems via the USAF
6 Oct 1956	The RCAF names the CF-105 the "Avro Arrow". However, doubts continued to mount at the highest military levels and even AVRO's greatest supporter, Minister C.D. Howe, now fretted over the role and cost of the Arrow. The government limited development of the CF-105 to eleven aircraft, subject to review after the first flight. [Avro Aircraft and Cold War Aviation by R. Whitcomb]
1 Dec 1956	Arrow design called for Astra 1 fire control (2731.5 lbs) and four Sparrow 11 missiles (431 lb each). Total 2850 lbs.



Late 1956	USN abandons development of the Sparrow II missile and the Canadian Government brings the Sparrow II to Canada for development
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<b>1957</b>	
1957 ??	C.D. Howe recommends cancellation of the Arrow to the Cabinet Defence Committee but it would be political suicide with an election coming in June
10 June 1957	The Conservatives led by John Deifenbaker won the election by a small margin. C.D. Howe, and Ralph Campney, both Liberals did not win their seats. George Pearkes becomes Minister of National Defence. Deifenbaker quickly approves the NORAD agreement that was held up by the election. He bypasses the Cabinet Defence Committee and External Affairs upset since they were hoping for a better deal for Canada. No one suggested that Canada try and get American support for the Arrow before conceding to NORAD
21 June 1957	Diefenbaker's Conservatives are sworn in as a minority government
22 July 1957	Official roll-out of the PS-13 Iroquois engine
27 July 1957	Canadian Minister of Defense Pearkes announces that Canada and the United States would link their continental air defences in a single "North American Air Defense Command."
27 July 1957	Iroquois engine passes the first official 100 hour endurance test at reduced thrust of 18,750 lbs.
Summer of 1957	Orenda learns that the French Air Ministry and Marcel Dassault Aircraft Company were interested in the Iroquois engine for the Mirage IV
1 Aug 1957	Joint announcement by the Minister of National Defence of Canada and the Secretary of Defense of the United States - integration of operational control of the air defence forces in the continental USA, Alaska and Canada under an integrated command responsible to the Chiefs of Staff of both Countries. North American Air Defence Command (NORAD)
Aug 1957	AV ROE Canada offers to buy controlling interest in Dominion Steel & Coal, the 3rd largest producer of steel in Canada
12 Sept 1957	Integrated HQ of North American Air Defence Command (NORAD) operational on an interim basis
17 Sept 1957	After a stormy meeting with AVRO President, Crawford Gordon, Diefenbaker informs his close confidant, Gratton O'Leary that: <i>"I have just told him (Gordon) the thing (Arrow) is off."</i> Attending a meeting with 50 RCAF officers at the newly constituted "Arrow Project Office", Zurkowski was shocked to learn that those present were under strict orders not to ask questions about the Arrow. [Avro Aircraft and Cold War Aviation by R. Whitcomb]
30 Sept 1957	Orenda sells manufacturing rights for the Iroquois engine to Curtis-Wright Corp. of the U.S. along with permission to sell and further develop the engine
4 Oct 1957	AVRO Arrow Rollout Ceremony with RL201. Canadian Minister of Defense, George Pearkes commented: <i>"the symbol of a new era for Canada in the air"</i> . Canadian Chief of Air Staff, Air Marshall Hugh Campbell commented: <i>"The planned performance of this aircraft is such that it can effectively meet and deal with any likely bomber threat to this continent over the next decade"</i>
4 Oct 1957	Sputnik launched at Baikonur and overshadows Arrow rollout
29 Oct 1957	On the advice of the Chiefs of Staff, and influenced by employment conditions, the

	Conservative Cabinet authorized the procurement of 20 "pre-production" Arrow aircraft, but served notice that the program was under careful examination. The new Conservative Diefenbaker government had made up its mind to cancel the Arrow. [Avro Aircraft and Cold War Aviation by R. Whitcomb]
1 Nov 1957	Iroquois engine run at over 19,000 lbs dry thrust for (no afterburner) Canadian Government representatives
13 Nov 1957	Iroquois engine runs at altitude in the B-47 for the first time
22 Nov 1957	G/C Footit accuses AVRO and Orenda of mismanaging the Arrow program. Follow up letter sent 4 Dec 1957
4 Dec 1957	J-75 Engines ground running begins with RL201. Arrow 201 used Pratt & Whitney J75P3 engines (6,175 lbs each).
18 Dec 1957	Both engines run at the same time on RL201
25 Dec 1957	AVRO Canada test pilot, Janus Zurakowski, began taxi trials with the Arrow. [Avro Aircraft and Cold War Aviation by R. Whitcomb]

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<b>1958</b>	
Jan 1958	Engineering Department at AVRO reorganized
Jan 1958	Low Speed Taxi Trials begin
3 Jan 1958	Completion of engine and first phase taxi trials - total engine time - 9 hours.
18 Jan 1958	The Calgary Herald quotes Minister Pearkes: " <i>I do not share the opinion that the Arrow will be obsolete before it is operational. When Russia stops building bombers it will be time for us to start thinking of some other defense.</i> "
20 Jan 1958	Leader of the Liberal Party, Mike "Lester" Pearson called on the Conservatives to resign, to return the country to the Liberals without the formality of an election
1 Feb 1958	Diefenbaker dissolves Parliament and the federal election process begins
18 March 1958	First high speed run of the Arrow
25 March 1958	First flight of the Arrow - RL201 - Jan Zurakowski, pilot
25 March 1958	The story is told, that at dawn on Tuesday, an AVRO soothsayer had examined the entrails of a freshly-killed chicken and, finding no sign of portentous events, declared the day auspicious for the Arrow to take to the air. As the Arrow landed for the first time and AVRO test pilot Potocki in the chase Canuck turned off to land, RCAF pilot Jack Woodman in the Sabre followed him after executing an exuberant victory roll. [Aircraft Magazine - April 1958]
31 Mar 1958	The Conservatives win 208 of the 265 seats, winning the election with a clear majority
31 Mar 1958	Expenditures to AVRO for Arrow development, tooling and production was \$103,237,634.00 which did not include ASTRA, the Sparrow or the Iroquois engine. Air Marshall Hugh Campbell was becoming isolated in his support of the Arrow as the projected costs were threatening the budgets of the Army and Navy.
3 April 1958	RL201 flies supersonic Mach 1.4
17 April 1958	Department of Defense Production contracted Canadair to manufacture Sparrow 2 air-to-air missiles for the AVRO Arrow "bomber destroyer". The approval for Canada to build the Sparrow 2 came as the development program was terminated by the US Navy. [Aircraft Magazine - May 1958]
22 April 1958	RL201 flown by F/Lt Jack Woodman, RCAF Acceptance Pilot, the only RCAF pilot to fly an Arrow



12 May 1958	The original North American Air Defence Command (NORAD) agreement is signed
30 May 1958	Prime Minister Diefenbaker tells the House of Commons of receiving a letter from Russian Premier Nikita Khrushchev concerning flights of nuclear-armed SAC bombers over Canada, saying they pose a grave danger to Canada. "Parliament shrugged its shoulders and that was that." [Aircraft Magazine - July 1958]
3 June 1958	Government makes public the figures on the total cost of the Arrow Program: " <i>The total cost to the Government of the complete Arrow aircraft project including design, development, tooling and preproduction costs of the airframe, engine programs, and weapons systems up to May 1, 1958 is \$233 million. This cost also covered two complete aircraft, three in final assembly, and 32 others within the present order in various stages of manufacture.</i> " [Aircraft Magazine - July 1958]
11 June 1958	RL201 veers off the runway during landing due to port landing gear turned out of position, collapsing all landing gear
16 June 1958	Toronto Telegram: " <i>United States defense officials said today the main reason for the continued refusal of the United States to buy Canada's AVRO CF105 fighter plane is that the Arrow cannot fly at top speed long enough.</i> "
30 Jun 1958	CAS Air Marshall Hugh Campbell reports on cost overruns and AVRO
4 July 1958	Canadian Minister of Nation Defense: " <i>There are important factors necessitating the use of manned interceptors in the air defense system for many years; indeed, as far as we can see into the future.</i> "
Aug 1958	George Pearkes flies to Washington to talk to Secretary of Defense Neil McElroy. U.S. assures it could fill its own interceptor requirements and sell some to Canada at a lower price than that of the Arrow. If the Arrow is cancelled, U.S. could assist in guarding Canadian airspace in the event of an emergency.
1 Aug 1958	RL202 flies for first time. Arrow 202 to 205 used lighter P5 (modified P3's) weighing 5,950 lbs each.
25 Aug 1958	Canada's Military Chiefs of Staff and Chairman Gen Charles Foulkes unofficially cancel the CF105 Arrow programme
28 Aug 1958	Minister of Defense, George Pearkes, presented Diefenbaker cabinet with Bomarc proposal and recommended cancellation of the Arrow. (The Arrow's future was never debated outside of Cabinet prior to its cancellation.) [The Legend of the Arrow by George Shaw - June 1994]
Sept 1958	Orenda notices that since the end of Aug 1957, the letters of authorization had been altered to include (in bold) " <i>The liability of Her Majesty shall in no event exceed the last mentioned amount unless an increase is authorized in writing by or on behalf of the Minister <b>regardless of work performed and expenditures incurred by your company.</b></i> " In the event of cancellation of the Iroquois engine, this could leave the company wholly liable for termination costs!
Sept 1958	Orenda's P.Y. Dauord wrote to a Defence Production official for assurance from the Department that the company financial position would be fully protected was essential to the continued success of he Iroquois programme. Financial limitations on the four main contracts for the PS-13 (development, tooling, prototype, pre-production) was \$116,976,614.00 to 31 Mar 1959. To cover termination would cost another \$150,646,745.00, a large amount to Orenda to allow for ambiguity in the contract.
1 Sept 1958	Jettisonable tail cone plugs to retract exhaust area as a means to increase long range mission. Concept evolved into modern day variable geometry tail cone technology. [Avro weight & Balance Report 7-0400-34 Issue 13]
1 Sept 1958	Sparrow II missiles deleted for one nuclear Genie (812 lbs) plus four Falcon missiles

	and Hughes fire control system (2,406 lbs) total 3,742 lbs, altering balance by +892 lbs over Sparrow II system. [AVRO Weight & Balance Report 7-0400-34 Issue 25]
14 Sept 1958	Zurakowski flies RL202 to Mach 1.86 at 50,000 ft, his highest speed prior to retirement from test flying
16 Sept 1958	Diefenbaker's vast debt roll-over, the so-called Conversion Loan of 1958 was causing anxiety in the financial community - a selling wave caused a protracted slide in the price of government bonds. The declining economic situation resulted in government officials expressing concern over the Arrow and Iroquois programs.
17 Sept 1958	The Prime Minister, John Deifenbaker tells Crawford Gordon the Arrow is gone. Deifenbaker tells Grattan O'Leary of the Ottawa Journal " <i>I have just told him that the thing is off, look, this is going to cost a billion dollars. We have no market for them we can't sell them.... We don't need enough of them We have no export market and no domestic market for these planes. They are costing too much, and I had to tell him no</i> "
22 Sept 1958	RL203 flies for first time and sustains Mach 1.2
23 Sept 1958	Deifenbaker makes a statment to the press. " <i>The Prime Minister, the Right Honourable John Deifenbaker, announces today that in recent weeks the Government has fully reviewed the Canada Air Defence Programme in light of rapid development that has taken place during the past year in missiles should be introduced into the Canadian Air Defence System and that the number of supersonic interceptor aircraft required for the RCAF.... will be substantially less than could have been foreseen a few years ago, if in fact such aircraft will be required at all in the 1960s.... ... negotiating to acquire Bomarc, to make it effective Pine Tree radar line equipped with SAGE.... In view of the introduction of missiles into the Canadian Air Defence System and the reduction in the expected need for manned, supersonic, interceptor aircraft, the Government has decided it would not be advisable at this time to put the CF-105 into production. The Government believes, however, that to discontinue abruptly the development of this aircraft and its engine, with its consequent effects upon the industry, would not be prudent with the international outlook as uncertain and tense as it is... therefore, The Government has decided that the development programme for the Arrow aircraft and the Iroquois engine should be continued until next March, when the situation will be reviewed again in light of all existing circumstances at that time.</i> "
23 Sept 1958	Astra fire-control radar and Sparrow missile programs for the Arrow cancelled. [The Legend of the Arrow by George Shaw - June 1994]
24 Sept 1958	Prime Minister Diefenbaker orders US BOEMA IM-99 BOMARC anti-aircraft missile. [Flypast by John Gellener in Canadian Aviation Magazine Anniversary 1978]
24 Oct 1958	Deputy Commander of NORAD, Canadian Air Marshall Roy Slemon issued a public statement: " <i>For as long as we can see we must have manned interceptors and missiles to meet the manned bomber threat.</i> "
25 Oct 1958	Blair Fraser, a political analyst writes " <b><i>What Led Canada To Junk The Arrow</i></b> " in Macleans. Although the Arrow was not canceled, Frasier applauded the Government for its courage in discontinuing the project. This article was based on instinct from his knowledge of life on Parliament Hill. Fred Syme went to Frasier and was assured that Frasier did not have insider knowledge.
25 Oct 1958	Minister Pearkes in a press conference confirmed the point that the RCAF would require a manned interceptor for some years to come. In reference to the Prime Minister's September 23 statement he said: " <i>What we decided last September was not to produce the Arrow under condidtions that surrounded Arrow production at that time. Let the makers re-examine the cost and then we will know where we are going.</i> "

27 Oct 1958	RL204 flies for the first time
27 Oct 1958	Two Orenda engineers were sent to Paris. Quote on ten engines at \$395,000 each with delivery to begin 15 months from the go ahead.
31 Oct 1958	Officials of the French Air Ministry and Marcel Dassault expressed the opinion that the Iroquois had ceased to exist or would do so in the near future and they could not afford to embark on a program using the Iroquois engine
11 Nov 1958	Waldek "Spud" Potoki pilots RL203 to Mach 1.96, the fastest an Arrow flew. During landing run all four wheels skidded and the tires burst. Right undercarriage leg damaged when aircraft ran off the runway.
????	Fred Syme and his assistant went to Washington to see the Assistant Secretary of the US Air Force, (McDonald), to ask the USAF for a contribution to the project to get the costs down. Mr Douglas' assistant authorized Syme on behalf of Mr Douglas to inform the Government that the USAF would be happy to provide the firing control system, missile and other components for free. The next day Syme gave Mr O'Hurley the letter who read it in front of Syme and that was the last of that.
30 Nov 1958	AVRO claimed \$151,623,067.00 for work completed on six different contracts related to the Arrow airframe development. Total cash for continuation to 31 Mar 1959 came to \$184,317,170.00 or \$205,567,170.00 if commitments past 31 Mar considered, exceeding Government financial limitations by \$17 million.
Dec 1958	NATO Conference in Paris. US Secretary of Defense tells Pearkes " <i>was told finally and definitively that the United States would not purchase the Arrow.</i> "
4 Dec 1958	CF-100 Aircraft 18792, the last CF-100 rolls off the assembly line at Malton under the nose of an Arrow
17 Dec 1958	First pre-production Iroquois engine delivered to AVRO from Orenda
20 Dec 1958	Gordon Crawford in the Macleans' article " <b><i>We Should And Will Go On Building Arrows</i></b> " angrily responded to Blair Frasier's article: " <i>The day of the manned interceptor is NOT over... The United States department of Defense is NOT 'jubilant' over the premature and erroneous conclusion that the Arrow has been abandoned in favour of the Bomarc ground-to-air missile. The Bomarc is NOT a substitute for the manned interceptor.... The Arrow will NOT cost twice as much to produce as buying American substitutes.</i> " Gordon then outlined the offer his company was making to the Government: " <i>The realistic approach is to eliminate what has been spent and consider only those costs which would be incurred from now on actually producing Arrows for combat use. On this basis, we estimate the fly away cost per aircraft, complete in every respect, including Iroquois engines and fire-control system, would be \$3.5 million for the first hundred and \$2.6 million for the next hundred. These costs do not include spares or ground-handling equipment or development and tooling costs.</i> "
21 Dec 1958	Second pre-production Iroquois engine delivered to AVRO from Orenda
22 Dec 1958	Cabinet told of United States' refusal to purchase Arrow aircraft. [The Legend of the Arrow by George Shaw - June 1994]
30 Dec 1958	Morley of AVRO wrote to D.L. Thompson, Director of the Aircraft Branch, DPP, confirming a fixed price of \$346,282,015.00 for 100 aircraft, (25221 to 252320), including Iroquois engines and Hughes MA-1C electronics systems. Adding applicable sales tax of \$28,717,985.00 brought the price per aircraft to \$3.75 million. The contract proposals attached to the letter covered design, development, tooling and tool maintenance, manufacture of 20 development and 100 squadron aircraft (thus adding 83 to the 37 aircraft programme) and technical support for the squadron aircraft. No contract proposal was submitted for the Hughes systems but \$50 million - \$500,000 per aircraft was allocated. AVRO personnel had no security clearance to visit Hughes, all

the info was through the back door. AVRO also made no reference to the letter of America's offer that Syme had passed to O'Hurley on any amount for missiles.

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<b>1959</b>	
Jan/Feb 1959	Reply received from Great Britain that they would not purchase the Arrow
11 Jan 1959	RL205 flies for the first and last time by "Spud" Potocki.
21 Jan 1959	Mike "Lester" Pearson, Leader of the Opposition, sends a letter to C.D. Howe: <i>"Would it be too much to ask you to send me a note of your views on the CF-105 question? So far, although I have said a good deal about it, I have been completely non-committal as to the decision which the Government should make and have confined my remarks to attacking them for their tactics and fumbling words."</i>
22 Jan 1959	<p>C.D. Howe responded to Pearson: <i>"There is no doubt in my mind that the CF-105 should be terminated - costs are completely out of hand, the electronics equipment, which is an essential part of the project, has never been ordered... It seems to me that the proper line of attack should be directed to the Government's temporizing and fumbling with this decision. You will recall that when the matter was last discussed by our Defence Committee in 1957; it was decided to continue the project for the time being, and have a complete review of the matter in September 1957. I had then recommended that the project be terminated due to runaway costs, but there were obvious reasons then why the decision should be deferred until autumn. Since then, costs have continued to mount, and results of test flights have been far from conclusive, both as to the aircraft and its jet engine, which is also a development project.</i></p> <p><i>Subsequent expenditures on both aircraft and engine were definitely an unemployment relief measure, and an expensive one. Should the final decision be to terminate, the best political strategy would be to expose the cost of the Conservatives' delay by having expenditures on the project tabled on the order paper."</i></p>
26 Jan 1959	John Bassett, a prominent Toronto Tory, sent a letter to Diefenbaker outlining that after the 37 CF-105s were completed, AVRO could build under license the aircraft that the Blackburn Aircraft Company, the NA39, if chosen for Europe, which would be good for Canada/UK relations, and impact politically for cancellation of the Arrow programme
27 Jan 1959	Fed Syme sends a letter to David Golden, Deputy Minister DPP, that <i>"We are faced with a very different set of circumstances."</i> Syme was looking for assurance that the commitments for past 31 Mar 1959 would be recognized and reimbursed. The reply from Golden's assistant Gordon nnnnnn was not reassuring: <i>"If, in the event of termination, expenditures authorized by the respective contracts should prove insufficient to meet claims which this department considered reasonable, the department would be willing to recommend to treasury board that sufficient funds be authorized for that purpose. I must emphasize, however, that this letter is not intended to be a contractual document...."</i>
Feb 1959	Chief of Staff are convinced that the CF-105 had to be dropped. Chief of Air Staff dissented because he feared no substitute would be ordered when the requirement for an interceptor remained strong.
2 Feb 1959	Peter Cope lands RL204 at RCAF Station Trenton, due to a Viscount retracting its gear at the intersection of Malton's two main runways. Only time an Arrow lands at an airfield other than Malton
5 Feb 1959	John Tory met with the Minister of National Defence and outlined the company's plans for the period after the Arrow, about 5 years down the road and suggested the Arrow be

	used as a quid pro quo for Canadian purchase of a British aircraft for use in Europe and suggested the Hawker Siddeley Group's Hawker P-1127.
9 Feb 1959	Fred Syme writes to Howard Green, acting Minister of Defence Production, wanting to discuss a most serious problem facing AVRO Aircraft Limited with respect to the present circumstances surrounding the Arrow programme. <i>"We are proceeding with the Arrow and Iroquios programmes in accordance with our understanding with Department of Defence Production, and in accordance with estimates proposed by the Department, notwithstanding the fact that we are exceeding some of the financial limitations, which have not increased, as we are led to believe, for reasons of Government procedure. Our only alternative would be to cease work, but we are reluctant to take this action in view of certain other provisions contained in the pertinent contracts, and primarily because we do not believe this would be in accordance with the wishes of the Government."</i>
12 Feb 1959	John Douglas, AVRO Contracts Manager, in a letter to D.L. Thompson, DPP, revealed concern for the effects of cancellation of the company's work: <i>"Where Government cancellation has the effect of directly increasing over-head cost allocation to commercial work and thereby rendering the pricing inequitable, the Company feel that the increased overhead charges should be considered a cost of the Government's cancellation action."</i>
Mid Feb 1959	Iroquois engines being readied for RL206
18 Feb 1959	John Plant tells David Golden, Deputy Minister DPP, that the company had no plans for termination: <i>"That in the event we received the summary telegram saying 'Cease all work' we would have no choice but to lay everybody off."</i>
19 Feb 1959	Spud Potocki flies RL203 with D.E. "Red" Darrah, the first and only time an Arrow flew with a passenger. Red was tuning the fly-by-wire system
19 Feb 1959	RL201 makes the last flight of the Arrow program
20 Feb 1959	<b>"Black Friday"</b> - The Government announces the Arrow and Iroquois engine programs are shut down. Diefenbaker in the House of Commons:  <i>"Mr. Speaker, with the leave of the House I should like to make a somewhat lengthy statement on the subject of one facet on the national defence of Canada. The announcement I wish to make has to do with the decision regarding our air defence which was foreshadowed in the statement made by me to the press on September 23 last.</i>  <i>The Government has carefully examined and re-examined the probable need for the Arrow aircraft and the Iroquois engine know as the CF-105, the development of which has continued pending a final decision.</i>  <i>The conclusion arrived at is that the development of the Arrow aircraft and Iroquois engines should be terminated now.</i>  <i>Formal notice of termination is being given now to the contractors."</i>
20 Feb 1959	By 9:30 the news was reaching the plant floor by wives, friends and brokers. Just after 10:00 am Morley tells John Plant that the Arrow is cancelled.
20 Feb 1959	The telegram to AVRO sent at 11:42 am, with a confirmation telegram to Orenda at 12:36 pm.  <b>TO AVRO ATTN J.L. PLANT MALTON (TCO VIA CN TELEGRAM)</b> <b>FROM D.L. THOMPSON DPP OTTAWA</b> <b>TAKE NOTICE THAT YOUR CONTRACTS BEARING THE REFERENCE</b>

	<p><b>NUMBERS SET OUT BELOW INCLUDING ALL AMENDMENTS THERETO ARE HEREBY TERMINATED AS REGARDS ALL SUPPLIES AND SERVICES WHICH HAVE NOT BEEN COMPLETED AND SHIPPED OR PERFORMED THERE UNDER PRIOR TO THE RECEIPT BY YOU THIS NOTICE STOP YOU SHALL CEASE ALL WORK IMMEDIATELY, TERMINATE SUBCONTRACTS AND ORDERS, PLACE NO FURTHER SUBCONTRACTS OR ORDERS AND INSTRUCT YOUR SUBCONTRACTORS AND SUPPLIERS TO TAKE SIMILAR ACTION STOP...</b></p> <p><b>FEB 20/59      12:30 pm      BC</b></p>
20 Feb 1959	Plant tells the workers that the aircraft had been cancelled, that there would be no further work done on the programme but was in no position to comment until he received official information
20 Feb 1959	2 pm: J.L. Plant tells the workers " <i>That there was no further work and they would not come to work anymore until they were called for.</i> "
20 Feb 1959	AVRO and Orenda employees given termination notices by their respective companies
22 Feb 1959	Paul Hellyer comments on the 50th Anniversary of Flight in Canada and the death of the Arrow in Parliament
23 Feb 1959	50th Anniversary of Flight in Canada
????	Within days of cancellation, top engineers were heading elsewhere - many to the United States and their aerospace programs.
????	<p>AVRO puts forth six proposals:</p> <ul style="list-style-type: none"> <li>- continuation of the Arrow</li> <li>- production of an aircraft to replace the RCAF Sabres in Europe</li> <li>- design of a jet transport for TCA and the RCAF (They had cut up the Jetliner two years earlier)</li> <li>- acceleration of work on the Avrocar</li> <li>- design and production of equipment for the nuclear power industry</li> <li>- participation in an expanded Commonwealth space program or U.S. projects</li> </ul>
????	In Europe 1 Canadian Air Division (1 CAD) was being asked to switch to a strike-reconnaissance role where Canadian pilots would carry nuclear warheads against targets in the Soviet Union. More than twenty aircraft were being considered
????	The Republic Aviation Corporation, an American company contender was the Republic F-105 Thunderchief. In discussions with AVRO, announced that they would have AVRO produce the Thunderchief for the RCAF and the Iroquois engine could be used in some USAF aircraft.
????	The Lockheed F-14G Starfighter was chosen, Canadair would build the airframe under license and Orenda would assemble the General Electric J-79 engine.
Mar 1959	Marcel Dassault sent an agent to Canada to discover the status of the Iroquois project. They might still use it on the Mirage IV. If the federal government had been prepared to write off development costs of \$100 million, costs that would be lost in any event by termination, then the Iroquois certainly would be a marketable item.
9 Mar 1959	<p>Diefenbaker was convinced the spectacular layoff of workers at Malton was done to embarrass his Government. In a televised address "<i>The sudden, immediate, and precipitate and unfair action of the AVRO Company in dismissing everybody on the the the decision was announced I didn't expect.</i>"</p> <p>(<b>Note:</b> Apparently DPP did not inform the P.M. of Plant's action that would have to be taken if the programme was cancelled.)</p>
13 Mar 1959	Hugh Campbell, Chief of Air Staff (CAS), recommends disposal of the Arrow



14 Apr 1959	RCAF G/C Abe Lieff sends DDP orders to cut up and dispose of Arrow airframe and engines
18 Apr 1959	The Globe and Mail breaks the story of the destruction and that newsmen are restricted from photographing the the scrapping.
21 Apr 1959	Raymond O'Hurley, Minister of DPP, in the House said all but one aircraft was intact and photographs were restricted because the secret Hughes electronic system was being removed
22 Apr 1959	O'Hurley rose in the House to correct his statement and confirmed that the process of scrapping the Arrows had begun. Outside of the House he stated the Hughes system had actually been installed in one aircraft.
7 May 1959	Bid Tenders went out to scrap the Arrows and clean up within a 90 day period
11 May 1959	Bids are opened
12 May 1959	All tooling jigs, parts in pieces and four MKIIs in various stages of completion being reduced to scrap.
15 May 1959	Sam Lax of Samco Steel wins the Bid and the deal is closed. \$300,000 performance bond is put up by Sam Lax
18 May 1959	Scrapping of the Arrow begins
5 Jun 1959	M.S. (Mac) Kuhring, Head of engineering Lab, NRC and Interim Curator National Aeronautical Museum sends a letter to DDP asking for parts he has isolated in a cage at Malton. 26 pages of items showing the development of the Arrow and its power plant
June 1959	Four months after canceling the Arrow program, the Government orders 214 F-104G Starfighter aircraft for \$420 million.
24 June 1959	Herb Knott, a photographer, takes an unauthorized flight over Malton and takes pictures of the "Death Row". Photos could not be published until the photo ban lifted by the Government
2 Jul 1959	George Pearkes, MND, in the House of Commons, announces that the Starfighter would replace the aging Canadian Sabre fleet in squadron use with NATO
27 July 1959	UK Ministry asks for 14 Arrow Reports to help with their development of the TSR2. The TSR 2 program was eventually cancelled
Aug 1959	It was announced that the Starfighter airframe contract would go to Canadair Ltd., owned by U.S. General Electric), under licence, and Engines to Orenda, to assemble the General Electric J-79. Dual seat versions, CF104D, to be built by :Lockheed
28 Aug 1959	Arrow engines are removed from RCAF roll
31 Aug 1959	Approval to give the UK the Arrow Reports by G/C Ed P. Bridgland for the CAS

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<b>1960</b>	
2 Sept 1960	19 J-75 engines bought originally from Pratt & Whitney U.S. via the USAF for \$8,568,00 are sold back to the USAF for \$2,050,640 USD, approx 25% of original cost
20 Nov 1960	Iroquois engines, and parts - DDP passes them to Crown Assets Disposal Corporation

<b>1961</b>	
12 Jun 1961	Canada acquires 66 used McDonnell F101B Voodoos to perform the role the CF-105 had been designed, a role that Diefenbaker said would not be performed by manned interceptors in an age of missiles

## 1962

??? 1962	AVRO plant at Malton sold to de Havilland Aircraft for \$13,590,971.00
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## 1984

3 Feb 1984	A plaque with citation and the name of J.C. Floyd was carried into space on US Challenger Shuttle Mission 41B. [1999 Calendar published by Adlin Group]
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## 1997

18 Jan 1997	CBC televises a 2-part mini-series "The Arrow" which loosely told the story of the Avro Arrow
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## 1998

1998	Volunteers at the Toronto Aerospace Museum begin construction of a full size Arrow replica
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## 2001

15 March 2001	The "Arrow Technical Advisory Council" (ATAC) meets to discuss rebuilding a flying Arrow. Meeting held at old AVRO Plant in Malton.
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## 2004

9 Feb 2004	Janus Zurkowski passed away
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## 2006

6 Oct 2006	Rollout Ceremony for the Toronto Aerospace Museum's Arrow Replica numbered RL203
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## 2009

23 Feb 2009	100th Anniversary of flight in Canada and scheduled First Flight of the rebuilt Arrow by the Arrow Alliance. <b>(2005 - What has happened to this Arrow Alliance project?)</b>
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