



LES WILKINSON COLLECTION

FALLEN ARROW

Canada's Mach 2,
delta-wing interceptor
was a hot airplane,
a technological marvel,
and destined to fail.

by Andrew Chaikin

In its broad outline, the story sounds like a fairy tale: Many years ago, in a not-so-far-away land, there was a beautiful airplane that could fly like no other of its kind. But before the airplane could prove itself to the world, its life was cut short. And ever since, the people who helped build it, those who saw its stunning white shape in the sky, and many more who heard its story have kept it alive in their hearts as a symbol of their land's lost chance for greatness.

Though it may sound like a fairy tale, the airplane is real. It flew, in Canada, for a brief period in the 1950s. Today, four decades after its first flight, it has become an object of cult worship. How good it was, why it was canceled, and the impact of its demise on Canada are the subject of an ongoing, emotional debate. It has been celebrated and criticized in books, documentaries, and even stage and television dramas. Yet few outside Canada have ever heard of the Avro Arrow.

The story begins in 1953, during the cold war. The Soviets had the Bomb, and soon, Western analysts predicted, they would have supersonic bombers. In a nuclear strike against the United States, the bombers would come speed-

ing over the pole and across the Canadian arctic. Faced with this threat, the Royal Canadian Air Force saw itself as North America's first line of defense.

Planners at the RCAF envisioned a two-seat supersonic airplane capable of intercepting and shooting down the attackers before they reached populated areas in southern Canada. Their vision, largely shaped by the nation's distinctive geography, translated into a set of requirements so demanding that no existing airplane could meet them. Canada's vast northern expanse had few and widely separated air defense bases and a climate ranging from temperate to arctic. The proposed interceptor would have to cover a lot of ground quickly, night or day, in any weather. The RCAF determined that

the aircraft would need a range of nearly 700 miles, including a fuel-gobbling five minutes of flight at Mach 1.5. And it was to have a top speed of Mach 2, a mark that had been

The Avro CF-105 Arrow was the first supersonic airplane—and the last—to be designed and built in Canada. There, its 1959 cancellation is still the subject of debate.

achieved only by an experimental U.S. rocket plane, the Douglas D-558-II Skyrocket.

In 1953 the project would have taxed the abilities of the top aircraft companies in the United States. The fact that it was being proposed in Canada, whose aviation industry was tiny in comparison, seems astonishing even in retrospect. But the conclusion of World War II had fired an extraordinary period of national confidence in Canada. Having helped to win the war, Canada "had arrived on the international stage," says historian Russell Isinger of the University of Saskatchewan. "There was an attitude in postwar Canada that there was nothing this country couldn't do, if we set our mind to it."

Canada was beginning to compete in the world market. Its largest aircraft manufacturer, A.V. Roe Canada (a subsidiary of a British aviation company), had established itself as an innovator with a jet transport called the C-102 Jetliner, which took to the air in 1949 only two weeks after the world's first jet transport, Britain's de Havilland Comet. And unlike the Comet, two of which crashed in early 1954 as a result of metal fatigue, the Canadian transport was problem-free. "Our massive but under-populated good neighbor to the north has a mechanical product that licks anything of ours," reported one New York newspaper after the Jetliner made a round-trip test flight from Toronto to New York in 1950. "Uncle Sam has no monopoly on genius." Indeed, with the Jetliner, the age of jet transport could have begun years before the

Optimism prevailed at the Arrow's October 4, 1957 rollout. One reporter attending proclaimed it "the biggest, most powerful, most expensive and potentially the fastest fighter that the world has yet seen."



DEPARTMENT OF NATIONAL DEFENCE/COURTESY PALMIRO CAMPAGNA

debut of the airplane that gets credit for starting it, the Boeing 707. But the Korean War had begun and the Canadian government directed A.V. Roe Canada to stop mass production of the Jetliner and start producing a subsonic, all-weather interceptor, the CF-100 Canuck.

The Avro Arrow, designated the CF-105, was to be the Canuck's supersonic successor. By 1954, engineers at A.V. Roe Canada's aircraft division, newly incorporated as Avro Aircraft, were well into its design. Jim Floyd, Avro's vice president of engineering, led the effort. Floyd was an Englishman who had also been the chief engineer on the Jetliner and the CF-100. John Hodge, another émigré from England, was in his early 20s when the project began and calls it "a young engineer's dream." Hodge, who would go on to design the Arrow's engine intakes, recalls the atmosphere at Avro then as one of "absolute enthusiasm. The wives were always complaining, 'You guys think of nothing but work all the time.' That's exactly the way it was—but I think that's fairly normal when you're...breaking the barrier of one kind or another. We were doing something that hadn't been done before."

Of course, Floyd's team was not alone in that quest. In the 1950s *higher, farther, and faster* were the buzzwords of aviation, and engineers were obsessed with solving the problems of supersonic flight. "In the '50s everybody thought we had to keep creeping up the Mach scale," says Bill Gunston, a British historian of aviation.

Early in that decade in the United States, an aerodynamicist at the National Advisory Committee for Aeronautics' Langley Research Center, Richard T. Whitcomb, discovered a way of shaping an aircraft's fuselage to better enable it to achieve supersonic speeds. The intuitive approach was to give the fuselage the streamlined shape of a bullet. But Whit-

comb discovered that this ideal streamlined shape needed to be applied not just to the fuselage but to the total cross-sectional area of the fuselage, wings, and tail—a principle that came to be known as the Area Rule. Area ruling gave the fuselage of a U.S. delta-wing interceptor prototype, the YF-102A, a Coke-bottle shape—and enabled it, in December 1954, to go supersonic.

At the Avro plant at Toronto's Malton Airport, Floyd's team, including aerodynamicist Jim Chamberlain, took advantage of the NACA work when they chose delta wings and an area-ruled, tail-less fuselage for the CF-105. They also made use of other innovations to improve the airplane's supersonic performance. One was to add an extension to the wings' leading edges, as the



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NACA had done on at least two airplanes, including a Gruman F9F-9; another was to notch the leading edges, which had been tried by England's Royal Aeronautical Establishment. To increase the efficiency of the engine intakes, John Hodge picked the most applicable features from intake data derived from about a dozen U.S. X-planes. He says the CF-105 design effort was characterized less by invention than by a willingness to try available cutting-edge solutions.

When he talks about the challenges of building the CF-105 Jim Floyd zeros in on one particular RCAF requirement: the need for the interceptor to turn tightly enough while flying at Mach 1.5 and 50,000 feet to sustain a force of 2 Gs without losing speed or altitude—a situation it might encounter in a run-in with a Soviet bomber. “Almost any airplane can pull 2 Gs in a turn; that’s nothing special at all,” Floyd explains. “But to pull it at 50,000 feet at Mach 1.5 and not lose any speed or any altitude is almost an impossible job.” For example, the supersonic interceptor ultimately developed

A CF-105 awaits the installation of its delta wings and, later, its engines (above). The first five Arrows would use Pratt & Whitney J75s, but a new engine, the PS13 Iroquois, was the ultimate intent of Avro's top engineers (right; project leader Jim Floyd is second from left).

from the YF-102A, the F-106 Delta Dart—which entered service in 1959 and is widely considered the best operational interceptor ever built—could pull less than 1.3 Gs at that speed and altitude. The difficulty stemmed from the fact that when an airplane turns it loses energy, resulting in a loss of speed, altitude, or both. This effect is greatly magnified in the thin air at high altitudes.

To meet the requirement, the CF-105 would need to have extraordinarily powerful engines. Originally, the RCAF had intended to purchase an existing engine, but when none was found they turned to Orenda Engines (later a division of A.V. Roe Canada), which was already working on something called the PS13 Iroquois.

Bill Gunston has called the Iroquois “the most advanced airbreathing engine of its day.” Extensive use of titanium, which was still relatively new in engines, caused development headaches (in the words of one aircraft manufacturer, “it broke tools and spirits”) but afforded both strength and lightness and gave the Iroquois remarkable performance for its size. For testing, one of the engines was mounted near the tail of a B-47 bomber on loan from the U.S. Air Force. When the Iroquois was run at 100 percent thrust, it was so powerful that the pilots could reduce the bomber’s six engines to idle. On the CF-105, two Iroquois would provide 52,000 pounds of thrust on after-



burner. (For comparison, the single General Electric J79-GE-3 engine that powered the F-104 Starfighter, a U.S. interceptor of the mid-1950s capable of sustaining Mach 2, produced 14,800 pounds of thrust on afterburner.) Two Iroquois would give the airplane (at reduced weights) an overall thrust-to-weight ratio of nearly 1:1, meaning that the thrust equalled the weight of the aircraft. Floyd's team believed this would enable the CF-105 to meet its 2-G turn requirement. But it would not be an early milestone; for safety's sake, the first five CF-105s would fly with Pratt & Whitney J75 engines, which were heavier and less powerful but at least proven performers.

Meanwhile, Avro had to contend with the RCAF's demand that the interceptor be put into service as soon as possible. This required a move that was not only expensive but risky: Instead of hand-building a prototype and using it to iron out design flaws before going into production, the company would go directly to production tooling. Floyd's team hedged its bets with what he calls one of the most extensive aircraft testing programs undertaken at that time. "We had 4,000 wind tunnel hours," he says, "and I would say at least that [amount] in testing of equipment, fuel system, electrical system, and so on."

One major component, the weapons system, couldn't be

The ground crew at Avro readies an Arrow for flight. Orange paint had been added to aid flight test observations and make the aircraft easier to locate should it crash in snow.

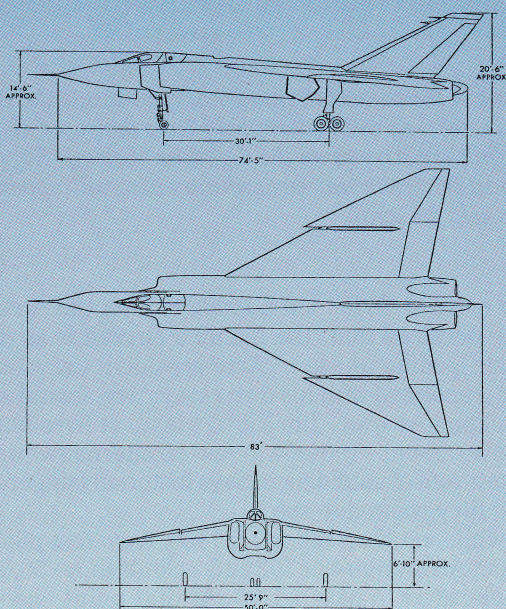
tested—it wasn't ready. Faced with RCAF indecision over how to arm the interceptor, Floyd's team had designed a removable weapons pack that could be outfitted with a variety of armament. To eliminate drag it would be housed in the interceptor's belly, in a weapons bay roughly the size of that in a B-29. When the RCAF finally decided what to put in the bay, it ignored Avro's request for an off-the-shelf system and instead decided to develop its own components: the Sparrow II missile—originally a U.S. Navy project that Canada took over after it was cancelled—and a state-of-the-art weapons control system called ASTRA I, which was designed to steer an aircraft to its targets automatically, deploy the missiles, and bring the airplane home. By taking on their development, the RCAF added two projects to the program's already mammoth technical burden. Sparrow II, for example, contained an active radar system that would make it one of the most sophisticated air-to-air missiles yet envisioned. "We had never developed anything like that," Russell Isinger says. "We were really going into uncharted territory."

Still, the path looked clear at Malton on October 4, 1957, when the first CF-105 was rolled out before an audience of VIPs, Avro employees, and reporters. With a 50-foot wingspan and a fully loaded weight of 31 tons, the Arrow dwarfed its contemporaries. A writer for the British journal *Flight* described the scene as a giant curtain was parted: "Through the opening came a lowly tractor; and behind it appeared the biggest, most powerful, most expensive and potentially the fastest fighter that the world has yet seen—the CF-105 Arrow."

A list of the Arrow's innovations, which went well beyond its aerodynamics, engines, and weapons, seemed to back up such exorbitant appraisal: For control, there was a fly-by-wire system that electronically transmitted the pilot's stick movements to the control surfaces—one of the first used in an operational aircraft. Its actuators, the part of the hydraulic system that translates fluid pressure into movement, were powered by hydraulic pumps with an operating pressure of 4,000 pounds per square inch—all but unheard of at the time. Even the main landing gear were a design *tour de force*: To fit into the thin delta wings they retracted like contortionists, rotating and shortening by eight and a half inches. Avro engineers spoke confidently about reaching speeds beyond Mach 2 and an altitude of 70,000 feet. Flying Mach .92 at sea level, they said, the aircraft would be able to go straight up. "Even the U.S.A. has nothing like the Arrow," *Flight*

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CF-105 Avro Arrow

Canada's big supersonic interceptor accommodated a pilot and a weapons control officer. The five Arrows that flew contained no armament; all Arrows were intended to eventually carry six Falcon guided missiles—the replacement for the canceled Sparrow II missiles.

exulted. In the States, *Aviation Week* was only slightly more restrained; its cover story on the rollout said that the Arrow “has given Canada a serious contender for the top military aircraft of the next several years.” It was a remarkable reception—especially since the Arrow had yet to fly.

Even as these accolades were being written, however, the Arrow's future was in doubt. For several years the burgeoning cost of the program had troubled its supporters in Canada's Liberal government. Speaking in the House of Commons in 1955, minister of defense production C.D. Howe said of the Arrow, “We have embarked on a program of development that frankly gives me the shudders.” Then, in June 1957, an election shattered the Liberals' 22-year reign and Conservative John Diefenbaker—a prairie native who promised more money for social programs and for Canada's farmers—became prime minister. Now he and his minority government inherited the single most expensive defense project in the country's history. Pressed by the RCAF for a commitment to put the Arrow into production, Diefenbaker and his ministers put off the decision until the following fiscal year.

But the Arrow's survival was becoming more than a matter of cost.

The United States and the Soviet Union were engaged in a race to build intercontinental ballistic missiles, and some influential observers, including British minister of defense Duncan Sandys, were saying that ICBMs would soon replace bombers as the greatest cold war threat. Ironically, the world awakened to the reality of this potential threat the very day of the Arrow's rollout, when the Soviets used an ICBM to launch Sputnik. At the same time, U-2 spyplane flights were revealing that the Soviet bomber threat had been greatly overestimated. Suddenly, the question being asked was not only whether Canada could afford the Arrow but whether the aircraft would be obsolete by the time it entered service.

At Avro, Floyd's team paid little attention to the storm clouds on their horizon; they were busy readying the first Arrow, number 201, for its test flights. When the moment of truth arrived, on March, 25, 1958, the Arrow team's confidence in the airplane appeared justified. The airplane proved airworthy and remarkably problem-free. Floyd discovered how much so when Avro test pilot Jan Zurakowski turned in his post-flight list of problems, known as the snag sheet. “That snag sheet was the most amazing thing I've ever seen,” Floyd says. “There were only three items on it. I've seen prototypes that have gone up for the first time and there were 13 pages of things that had to be put right.” Subsequent flights turned up a few bugs, such as in the fly-by-wire system. But on the whole the Arrow's systems—with the exception of the Sparrow II missiles and ASTRA I weapons control system, which were still in development—performed as well as or better than designed.

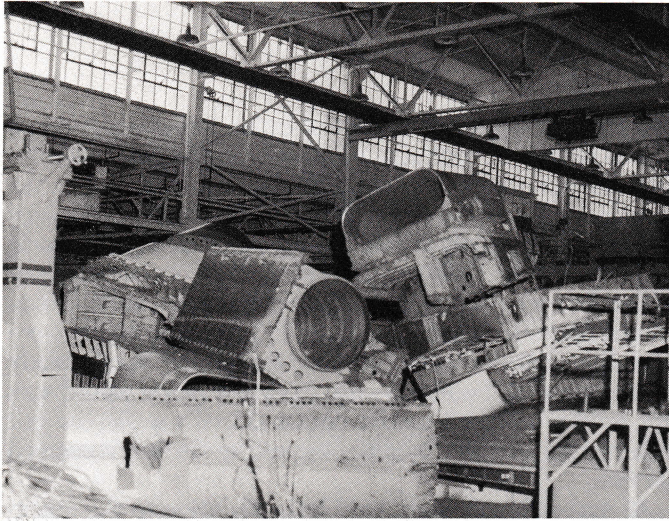
But could the interceptor meet the RCAF specs? The question would have to wait until flights by the sixth Arrow, number 206, which would be the first equipped with Iroquois engines. For the time being, the flights of the big white delta-wing aircraft over the Toronto area were already generating public excitement. One Arrow engineer told an interviewer a decade later, “You go home at night and people want to hear about it. ... It was something they could look at and say, ‘Hey, that's what we did in this country.’”

COURTESY JAN ZURAKOWSKI



To the Conservative government in Ottawa, however, the Arrow was anything but inspiring. John Diefenbaker was a man who, in the words of one government official, “hoped that postponements might beget miracles.” But by the fall of 1958, as the one-year deferral neared its end and the Conservatives returned to the Arrow question, the situation had only worsened. The economic boom Canada had enjoyed at

Avro employees jubilantly greeted test pilot Jan Zurakowski after the Arrow's first flight; only 11 months later, they were shocked by the program's cancellation.



the time of the Arrow's inception had given way to recession and rising unemployment. To a government looking for ways to cut deficits and finance social programs, the Arrow was an obvious target. It was also political quicksand: Canceling the project would mean endangering thousands of jobs at Avro and its subcontractors, of which there were more than 650 across Canada. Up to now, the Canadian Army and Navy had gone along with the RCAF's assertion that it needed the Arrow, providing the consensus that was essential for any big defense program in Canada to continue. But the consensus was breaking down. Shrinking military budgets made it impossible for the other services to accept the huge share of the pie being consumed by the interceptor. If the RCAF wanted the Arrow, it would have to justify it.

For Air Marshal Hugh Campbell, that was becoming increasingly difficult. In 1952 the RCAF had forecast a need for 500 to 600 CF-105s; now the number was down to 100 or 150, largely because of the diminished perception of the Soviet bomber threat. Furthermore, during a visit to the United States in August, Canadian officials had been unsuccessful in their effort to sell the Arrow to the U.S. Air Force, frustrating hopes that foreign sales might help defray the Arrow's cost. Instead, on the same trip, they received a pitch for the BOMARC, an anti-aircraft missile Boeing was building. Campbell let it be known that even with the BOMARC his wish list still included the Arrow—but the reality was, there wasn't enough money for both. Reluctantly, he informed Minister of National Defence George Pearkes that although he could not recommend canceling the Arrow, he would accept the measure if the government promised to pay for an alternate supersonic interceptor.

Now it was up to Diefenbaker's cabinet to act. Through September, the members met several times. Once again they deferred, opting only to cancel the expensive Sparrow/ASTRA weapons system in favor of a cheaper, off-the-shelf alternative. With winter coming on, they extended the Arrow program for another six months in what one Cabinet member would later call "the most expensive unemployment relief measure in Canadian history." Diefenbaker announced that BOMARC missile bases would be installed in Canada and promised a reappraisal of the Arrow in the spring.

Some in the Canadian press sensed what Diefenbaker could not yet say: The Arrow was doomed. The editor of the popular weekly *Macleans*, long critical of the project, wrote

At the time of the cancellation, two Arrows inside the Avro plant were nearing completion; both were destroyed (left), as were all finished Arrows on the flightline (below). Supporters were aghast that such an extraordinary aircraft (opposite) was to be sold for scrap.

an essay entitled "What led Canada to junk the Arrow?" in which he declared that "the manned aircraft is as dead as the muzzle-loading musket." Avro president Crawford Gordon later responded with his own essay: "We should and will go on building Arrows." Jim Floyd's team at Avro interpreted the government's request to find an alternative weapons system as a vote of confidence. Says historian Isinger, "They saw what they wanted to see."

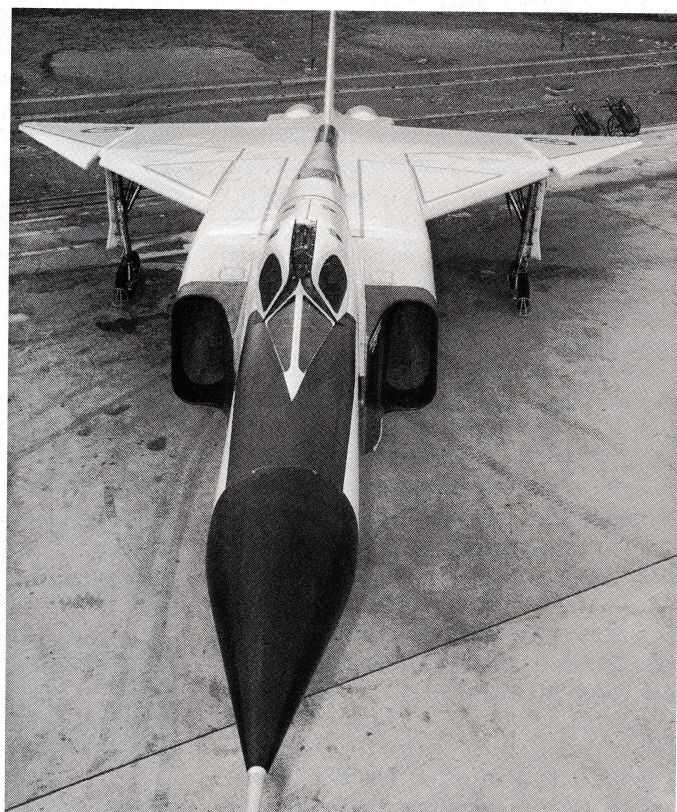
Meanwhile, on November 11, 1958, Avro test pilot Spud Potocki put Arrow number 202 into a climb above 50,000 feet and accelerated to Mach 1.98. At that point, says Fred Matthews, who supervised flight test engineering at Avro, the test conductors halted the run. The program's emphasis was still on checking systems rather than pushing the performance envelope. "When we cut him off, he was still accelerating and still climbing," Matthews recalls. "We never did find out how fast [the Arrow] would go, even with the



J75s." Still, the interceptor had nearly reached its target for maximum speed, and in the process it demonstrated extraordinary performance. Floyd and his team felt certain that Arrow number 206, the first to fly with Iroquois engines, would not only meet the RCAF specs but exceed them. Unofficially, they planned to use 206 to steal the world speed and altitude records set in the spring of 1958 by the YF-104A. They never got the chance.

On the morning of February 20, 1959, the day known to Arrow veterans as Black Friday, John Diefenbaker addressed the House of Commons in what he called "a somewhat lengthy statement on the subject of one facet of national defense of Canada.... The government has carefully examined and re-examined the probable need for the Arrow aircraft and Iroquois engine known as the CF-105.... The conclusion arrived at is that the development of the Arrow aircraft and Iroquois engine should be terminated now." He went on to praise the new airplane and its engine but added, "Unfortunately, these outstanding achievements have been overtaken by events." Diefenbaker blamed the cancellation on the changing assessment of the Soviet threat. His use of a military argument infuriated the RCAF. But Isinger says the real reason for the cancellation—that Canadians *couldn't* do

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anything they chose because they couldn't afford to—would have been far more dangerous politically. "Psychologically," Isinger says, Diefenbaker "wasn't prepared to stand up and say [that]. He just couldn't do it."

The news reached Avro employees early in the afternoon. "We were all busy doing our jobs," John Hodge recalls. "The PA system came on and said 'The government's canceled the contract. We have to cease all work. Go home. Don't call us, we'll call you.'" Arrow number 206 had been only two weeks away from its first flight. Now, in one blow, 14,000 workers at Avro and Orenda, including most of Floyd's 1,500 engineers, were unemployed; so were thousands more who worked for contractors. Over 20,000 people—a quarter of Canada's aerospace workforce—lost their jobs.

In the days and weeks that followed, many Arrow veterans found jobs in the United States. Some of them, including John Hodge, were hired by the newly created NASA for a program that would prove even more challenging: sending astronauts into space and, eventually, to the moon. Jim Floyd went back to England, where he applied his Arrow experience to design studies of the Concorde supersonic transport.

Their aircraft at Avro were not so fortunate. As the Arrow team dispersed, the six completed Arrows were cut into pieces and sold for scrap. A newsman flew overhead and snapped pictures, which Arrow engineer Rod Rose later saw. "It's sickening," he recalls. "Like looking at a morgue."

Today the Arrow is very much alive, not only in the memories of those who worked on it but among a new generation of enthusiasts and authors. One is Greig Stewart, who grew up in the Avro neighborhood. "My friends' fathers worked on [the Arrow]," he says. "I saw it every day—from the first flight on." Stewart's 1988 book, *Shutting Down the*

National Dream, chronicled the rise and fall of Avro Aircraft, which folded in 1962. Stewart wrote it, he says, “not because I’m an Arrow buff but because I wanted to know what went on down the street from me.” The interviews he conducted with Avro employees often ended with them in tears.

Stewart soon learned of the Arrow’s hold on the Canadian psyche. “Here I thought I was just writing a story of a plane and a love story,” he says. “I didn’t realize what a cult impact it has.” To understand what Stewart is talking about, you need only to peruse the Internet. One Web site promises to satisfy “Terminal Avro Arrow Obsession Syndrome,” with everything from original stories and poems to cartoons (for the addresses of this and other Arrow-related Web sites, see Credits and Further Reading, p. 82). In online discussion groups, devotees debate the facts behind the Arrow’s demise and its impact. “I believe the Arrow was scrapped to stop Canadians from believing in themselves,” wrote one participant. “The cancellation of the Arrow program may be the single most defining moment in Canadian history,” wrote another, adding that if the CF-105 had kept flying successfully “Canada would be the aerospace leader today and the Americans would [have been] answering to us.” These sentiments reveal that the story of the Arrow touches on the Canadian sense of national identity.

The same passion was behind a 1997 Canadian Broadcasting Corporation mini-series, “The Arrow,” which had a cast headed by Dan Aykroyd as Crawford Gordon. The movie, which included both real and fictional characters and events, gave voice to two of the enduring myths about the Arrow: that John Diefenbaker ordered the destruction of the Arrows out of spite and, most seductive of all, that one of the airplanes escaped destruction and remains hidden in a barn somewhere in the Canadian countryside. Neither claim is true, says Greig Stewart. He calls the Arrow “Canada’s first conspiracy theory,” but he recognizes that it’s hard to dispel myths.

That’s a phenomenon Russell Isinger has experienced himself. “I had more or less accepted the myth of the Arrow—this wonderfully sophisticated plane shot down by a visionless government that didn’t have the courage or intelligence to see it through,” he says. “But I found out the exact opposite.” Noting that decisions were made early on that allowed the project’s costs to balloon out of control, he says, “The project was doomed practically from the beginning. The cancellation was inevitable.”

U.S. Air Force historian Richard Hallion agrees. “It’s more than just money,” he points out. “It’s mission supportability: The number of people you’re going to need to maintain this thing, the operational readiness rate, the problems you’re



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Arrow 205 had flown just once before the program’s end (above); Arrow 206—the would-be record-breaker with the Iroquois engines—never flew. In their stead, Canada purchased the Boeing-built BOMARC missile (opposite).

going to have with all these complex systems—complex hydraulics, complex electronics, the fly-by-wire, complex engines.

“You think: What would the future have been if the Royal Canadian Air Force had a bunch of CF-105s?” Hallion says. “And I don’t know.... But my feeling is, if history is any guide, that this airplane would have buried them in red ink until they got this thing operational.

“For me,” he adds, “the bottom line on the Arrow is simply this: Aviation history is replete with examples of technologically fine, evocative aircraft that were canceled for one reason or another.” Witness, he says, the U.S. YF-12 inter-

COURTESY WILLIAM ZUK



ceptor, a cousin of the SR-71 spyplane, and Britain's TSR-2: both highly sophisticated aircraft that never entered service because the world changed before they were ready.

To Isinger, the most troubling claim made by Arrow veterans, writers, and enthusiasts is that the United States sought to kill the program by pressuring Canada to buy BOMARC missiles, knowing the country couldn't afford both. The rumor was fueled in part by Canada's purchase of 66 surplus F-101 Voodoos from the United States shortly after the Arrow program collapsed. "There's not a shred of believable evidence," Isinger says. "Quite the contrary. [The Americans] were always supportive." In fact, Isinger points out, months before the cancellation, the United States had offered to buy Arrows for the RCAF to fly in their North America Aerospace Defense Command squadrons. (The Canadians declined, in part because the offer wouldn't have saved the troubled project.) The United States also offered to donate the Arrow's weapons control system, which would have allowed Avro to offer the Diefenbaker government a deal on 100 airplanes for \$3.5 million each. The Americans declined to buy the Arrow for themselves, Isinger says, for the same reasons Canada started its own aviation industry: They had their own specialized requirements and their own aircraft companies to protect. Still, the theory survives, he says, because Canada harbors a certain apprehension about its neighbor to the south. "At the back of every Canadian's mind," Isinger adds wryly, "is a sort of ancestral idea that you're going to annex us."

The nose section of Arrow 206—the one Jim Floyd's team had hoped would break records—is today displayed in Canada's National Aviation Museum in Ottawa, along with an Iroquois engine and two delta-shaped wingtips.

Bill Gunston has called the Arrow "in almost every way the most advanced of all the fighters of the 1950s...as impressive and successful as any airplane in history." Today, citing the Arrow's intended speed and range, he says, "If I had to

The Arrow has been the object of a resurgence of interest in Canada lately, partially fueled by a 1997 TV movie (left). The only known remains of the aircraft—portions of 206—are in an Ottawa museum (right). The artifacts were more recently added to an exhibit of Canada's aviation achievements.



defend Canada against manned aircraft attack, I still can't think of anything flying today that I would prefer.... If I was a Russian bomber, I'd have been scared stiff."

But Tom Alison, military aviation curator at the National Air and Space Museum, points out that the Arrow never fired a missile. "If you can't shoot the weapon, then all you are is a spectator," he says. "If you say, 'Anybody who hasn't actually done that shut up and sit down,' they're going to have to shut up and sit down. Having said that," the former SR-71 pilot adds, "I wish I'd had a chance to fly it." Of course, the Arrow/Iroquois combination that wins the highest praise never flew. "It's a paper airplane," says Richard Hallion. "And paper airplanes are always wonderful."

Isinger wonders whether the Arrow would have been so romanticized had it continued flying. "Because the Arrow failed so publicly and so spectacularly, everybody can remember it the way they want to remember it," he says. "I think its reputation is going to be preserved a lot longer because it didn't succeed than if it had been built. And," he adds, "if it hadn't been so damn beautiful."

For program manager Jim Floyd, who eventually returned to Canada, the Arrow remains a source of mixed feelings. He maintains that even now, four decades later, no airplane has matched it. "There are faster airplanes, like the SR-71; there are very maneuverable planes. But I can't think of one single airplane today that would meet that RCAF specification." Floyd, who was besieged for interviews after the CBC film aired, has been surprised and somewhat dismayed to see the Arrow receive so much publicity so long after it ceased to exist. "I'd like to see the Arrow story buried with the dignity that the people who worked on it deserve," he says. It was appropriate when one RCAF cadet squadron renamed itself after the plane, Floyd says; "I thought, this is a very good, fitting epitaph to the Arrow." Bill Gunston offers another: "It's one of the greatest of the might-have-beens." —

COURTESY WILLIAM ZUK

