



(written by Canadian Aviation artist RL Whitcomb after spending several hours with Jan and Anna Zurakowski in the spring of 1998)

Jan (Zura) Zurakowski was born in 1914 to an ethnically Polish family in what was then part of Russia. His father was a doctor and once the Soviets seized power, he feared for his well-being, and that of his family since the Communists were eradicating the "intelligentsia". Thus in 1921 the Zurakowskis, posing as peasants, managed to escape to the newly independent Poland.



**Jan Zurakowski while at Avro Canada**



**Jan & Anna Zurakowski at the Arrow 40th Anniversary dinner. At 83 he drove from**

Jan learned to fly Gliders in High School and later joined the Polish Air Force. While in flying school, he met Anna. She must have made quite an impression on him (and visa-versa!) since despite the history that was shortly to unfold, they would eventually re-unite and marry once she was able to escape Soviet Poland.

Six months before the Nazi invasion of Poland, and the beginning of WW II, Janusz was posted to a training Squadron on PzI-7's as an instructor.

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The PzI-11. This was Poland's front line fighter at the time of Jan's combat in the earlier PzI-7. Jan still asserts that the PzI's were some of the finest aerobatic aircraft he ever flew. While testing potential trainers for the RAF at Boscombe down in England after the war, Jan evaluated the Dehavilland Canada Chipmunk. Jan much preferred the Chipmunk to the competing British designs and was surprised to learn that it, like the PzI's had been designed by the Polish designer Jaki Jakimiuk. The Chipmunk served the RAF well for many years. Another famous Jaki design is the Dehavilland Beaver!

When the Germans attacked, Jan was part of a 3 aircraft formation of the out-moded PzI-7's trying to shoot down the very fast Dornier DO-17's engaged in bombing operations. The Dorniers simply edged up the power when the PzI's were spotted and outpaced them. On a third solo attempt, Jan managed to close unseen on a formation. He opened fire but the return fire was accurate and he broke off his attack. The PzI-7, being a trainer, used 2 WW I vintage Vickers machine guns with poor (time-expired) ammunition. By the time he was under fire both guns had jammed. While evading the German fire, he cleared both guns (the breeches were inside the cockpit) and managed to again get into a position to fire. He managed to score hits on the last German aircraft and the smoke trail left by the Dornier indicated he had damaged it. This would be Jan's first score of the War.

Jan and a good deal more Polish pilots escaped from Poland when the Nazi victory was apparent, to France. Still later, this nucleus of pilots arrived in Britain.

## The Battle of Britain

Jan would fly with several Polish Spitfire Squadrons and command 316 Squadron. His intelligence, dedication and skill also meant that he would be used as a valuable liason and staff officer. This certainly undercut his flying. Despite these demands, Jan would be credited with 3 destroyed, and 1 probable during the Battle of Britain.



Spitfire Mk 2 similar to that flown by Jan Zurkowski during the Battle of Britain. From the author's painting "Grizzlies Cut Their Teeth".

Janusz commented to the author that the early Spitfire was a very specifically designed aircraft leaving little allowance for other roles, or indeed comfort. An example he gave of this was its lack of windshield defrost. On one engagement, he had been chasing an Me-109. The usual German tactic when faced by a British fighter was to dive since the early British Merlin engine carburetors would cut out under zero "G". The Messerschmidt was also somewhat faster at least in the initial portion of the dive. As Jan dived after the German, his windshield iced up completely due to the temperature and humidity differential at altitude compared to lower down. Despite this, he

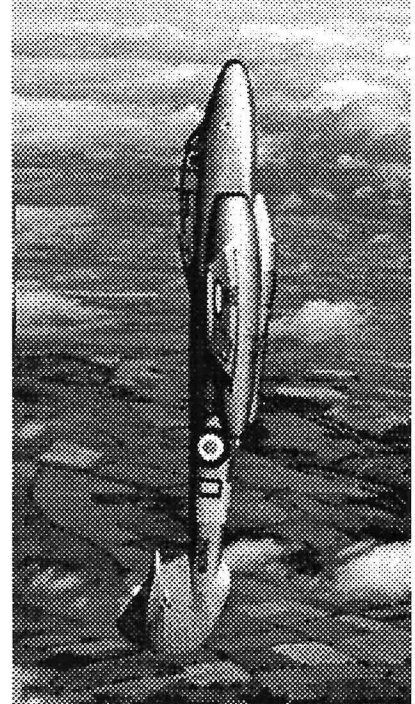
closed on the German, and being able only to see the wing-tips through the side panels of his canopy, (VERY CLOSE!) opened fire. The 109 crashed into the sea close to shore.

While serving with 316 (Polish) Squadron as a Flight Commander, Jan met Spud Potocki. Jan mentioned thinking at the time that Spud was easily the best pilot on the Squadron and remembered him later.

## Jet Age Test Pilot

Jan's exceptional flying ability ensured he was on the first ever Empire Test Pilot's course in Britain in 1944 and in 1945 he tested the Vampire Jet Fighter at Boscombe Down. Postwar he was hired by Gloster's as Chief Experimental pilot on the Gloster Meteor.

Always an enthusiastic aerobatic pilot, Jan was often called upon to do air show demonstrations of the new military hardware. Not all Jan's experiences were happy however. While demonstrating the DeHavilland Vampire for a Russian delegation (and in front of many RAF brass!) Jan experienced a phenomenon that plagued early jets especially referred to as the "box". At low speeds, the drag increased rapidly as the angle of attack is raised to provide enough lift. This can soon exceed the power of the engine and only putting the nose down to gain airspeed will prevent a stall. While doing a low speed and low pass, partly due to the slow rate of power increase on early jets, Jan entered the box. Quite gently the aircraft, howling at full power, settled the last few feet to the runway and came to an embarrassing and grinding halt. Jan walked away from not-badly damaged aircraft with an undoubtedly RUEFULL look on his face. Once can only imagine the grins of the Russians, and scowls of the British!



A Gloster Meteor of an earlier Mark to that used for the Zurabatic Cartwheel.

Jan also, while test flying the Meteor, developed the first new aerobatic manoeuvre in about 20 years termed the "Zurabatic Cartwheel". The story goes that sometimes during exceedingly tedious "lectures" and rangling meetings with the engineers, his mind would drift to aerobatics. A new test of the Meteor involved carrying 4 bombs far out on wings of the Meteor. Jan realized that with the engines far apart on the Meteor, that this would cause some interesting effects if one engine was cut while the other was at full power. Taking his slide rule from his pocket, he spun up some numbers and concluded that something unheard of could be accomplished.

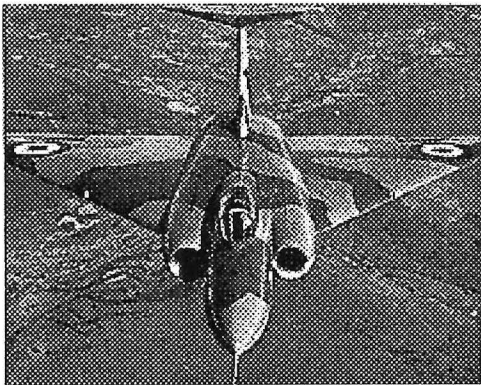
Soon he put his theory to practice. With a late model Meteor, loaded with these bombs, Jan put the nose down at full power, then pulled to the vertical. Nearing zero airspeed he simultaneously cut one engine, and kicked full rudder into the dead one, leaving the other at full howling power. The asymmetric thrust, coupled with the inertia provided by the bomb weight so far out on the wings, made the Meteor rotate on its side through a complete one and one-half turns, ending up doing a cartwheel laterally and pointing down at the ground. Later he met his old Squadron-Mate Spud Potocki who was still in the RAF as a test pilot at Boscombe Down. When he mentioned his new trick to Spud, Spud's reply was something of a reference to cattle excrement. Jan was thus forced to prove the point at the 1951 Farnborough Air Show. That particular display is one of the most legendary events ever to be witnessed at this world-renowned event. Jan commented to the author that Spud, as an RAF test pilot testing the Avro Vulcan Bomber alongside Avro's Chief Test Pilot, so impressed Avro's boss Sir Roy Dobson with his report on a near disaster, that Dobson worked to have Spud hired. Jan seemed to imply that it may very well have been Spud's skill and grace under pressure that saved the prototype. The loss of Avro's only Vulcan at this stage in its development may well have resulted in the cancellation of what became a fine aircraft, and the longest serving of the "Victory" series bombers. He also mentioned that test pilots were paid less than



Potocki was making as a new Squadron Leader, or even commercial pilots flying the larger airliners. Spud insisted on a decent wage and thereby did all the test pilots a favour by improving their salaries.

Both Jan and Jim Floyd mention that Spud has not received his share of credit on the development of the Arrow.

During his time test flying in England Jan flew most British types and many foreign aircraft. Spitfires of every Mark and configuration, most of the early jets and he did aircraft carrier landing with Seafires, Sea Furies, and most of the American types as well. He also investigated the puzzling fact that the Seafire, although superior aerodynamically to Hellcats and Corsairs, got worse fuel economy. They eventually attributed this to the fact that Rolls Royce had designed the Merlin with too long a piston stroke to bore ratio done by the engineers as a relic of practice brought on by a quirk in the British fuel taxation practice!



**The Gloster Javelin. An elegant but potentially dangerous design.**

While test flying at Gloster's Jan was involved in the development of the Gloster Javelin. By this time he was becoming increasingly frustrated with the propensity of some engineers to specify test-flights designed NOT to show the shortcomings of their design, and to assume that test-pilots were something of glamour seeking dullards with little to offer the design process. The Javelin brought the danger of this line of reasoning into sharp focus. Jan knew from flying this aircraft that it was unstable in pitch at certain speeds and angles of attack. He also knew that in service, this could easily cost lives. He requested permission to prove this point and was flatly refused. All the test flights were designed to show the plane to be a smooth handling speedy wonder. During one flight with a Javelin equipped with flight recorders and cameras,

Jan disobeyed his orders and took the aircraft to 400 Kts, and eased back the stick increasing "G" force and angle of attack (alpha). Quite soon the tail was completely blanked by the large fuselage and wing becoming entirely unaffactive in pitch or yaw control due to the turbulence and disturbed airflow. He pushed the stick full forward and the aircraft would not respond, continuing its climb right to the stall and resultant spin. As the aircraft continued to spin and fall from the sky, finally, at lower altitude where the air is denser, he was able to recover it. The cameras, and flight recorders and indeed his detailed test flight report clearly illustrated the problem. To Jan's horror and disgust, the engineers re-wrote his report claiming it was a successful test flight, and that Jan had also "investigated the weather" (!!!). Jan mentioned to the author his having suggested to the company President, that a few hundred pounds more a year would hire them a competent aerodynamicist. Apparently the President felt the expenditure was not worth the benefit! Jan soon handed in his resignation and in 1952, secured employment at what was then the talk of the aerospace community, Avro Canada.

## To Canada

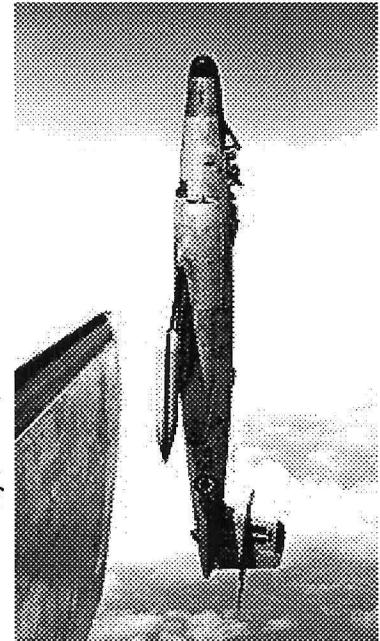
Contrary to the impression left by the CBC mini-series on the Avro Arrow, Jan Zurkowski was a part of the Avro team long in advance of either the Arrow, or Jack Woodman (who was a fine man and excellent pilot). Jan did a great deal of the experimental test flying of the CF-100, Avro's second indigenous design to fly after the impressive C-102 Jetliner (the first jet passenger aircraft to fly in North America by 8 years!!).

Jan considered the CF-100 a fine design, as have most all RCAF pilots who have spoken to the author. It did however have its share of teething problems, partly because of it being such an enormous undertaking

for not only Avro, but for the subcontractors who supplied parts for it. As a case in point, of the early CF-100s, over 50% of the parts were produced outside Canada, at the end of the project, about 95% were made here.

The aircraft was also exploring new frontiers in many areas of science and technology. Jan and the other test's pilots job was to explore the aerodynamic and performance regions.

Jan knew this aircraft was capable of exceeding its design "limiting speed" of Mach .85. He asked the engineers what would happen if this speed was exceeded to which the reply was a curt "it would become uncontrollable, and besides, the pilot's manual CLEARLY states not to exceed Mach .85". Jan knew with the high thrust of Avro's Orenda engines, and the sleekness of the aircraft, that eventually a service pilot would exceed this limit. He considered it his duty to investigate the possible result (and probably to find out if Avro engineers suffered from the same problem as Gloster's!). At altitude and full power he nosed it into a dive. Soon he was supersonic with the proof being the sonic boom on the ground. He was able to fight the stiff controls and recover the aircraft from the dive. Evidence suggests that the tail was overstressed by this however the aircraft held together in a region where so many aircraft had disintegrated (including some designed to go supersonic!). (Jan mentioned having flown a Meteor at Gloster's with a specific shaped bomb that induced such turbulence at normal speed that the control surfaces disintegrated!) Obviously this was a bonus for pilots of the CF-100 and the company by showing the integrity of the design although Avro executives did not see it that way at the time.



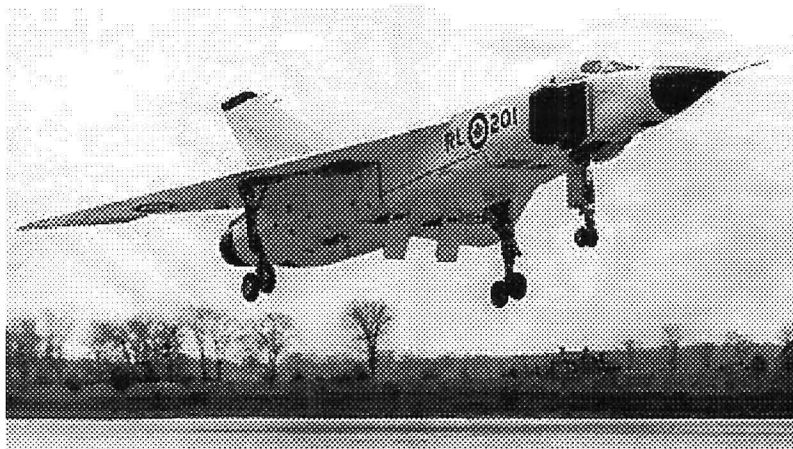
**Zura vertically testing the CF-100 Mk 4 prototype.**

Jan did have the sad occasion to fly an early test CF-100 that failed in flight. Due to a buffet problem his back-seater was unable to reach his ejection handle and died in the crash. After frustrating attempts to find the cause, and some mysterious identical losses of RCAF back-seaters, a brave soul at Avro flew in the back with no canopy and discovered the buffet. A simple plexiglass shroud cured the problem.

Jan also demonstrated the CF-100 at Farnborough Air Show in 1955. The CF-100 was the first foreign designed aircraft demonstration invited to display at Farnborough. The CF-100 was incapable of the Zurabatic Cartwheel due to the close spacing of its engines however a spectacular falling leaf display, and tight aerobatics at low level within the confines of the airfield dazzled the audience. In part because of this performance, Belgium would end up buying CF-100's. Jan mentioned having spoken to the Belgian delegation at the show and their mentioning that they had been displeased with an American, and a British design they had bought earlier and thought they might have better luck in dealing with the Canadian manufacturer. By the time Belgium aquired the CF-100 (1958) the design was almost obsolete however Jan says the Belgians were very pleased with both the performance, and reliability of the CF-100. RCAF pilots insist it was easily the best (if not only) true all weather/day-night interceptor in Europe in the 1950's and indeed superior in flying performance to most day fighters (except the Sabre!).

## **The CF-105 Arrow**

Jan's name is indelibly attached to the Arrow and indeed was the first aircraft Jan flew on its maiden flight. Shown above is the landing after this first flight. Although technically too old for "high performance" flying, (the limit then was 40 yrs of age) Jan continued flying on the Arrow till he was 44. Spud then took over most test flights.



Bringing Arrow Mk 1 in for its first landing after a successful maiden flight.

Jan stated the aircraft handled beautifully. He also mentioned (corroborated by an Avro aerodynamicist) that the Arrow could maintain an angle of attack

(alpha) of 45 degrees. Considering the low wing loading, and extremely high thrust to weight ratio and extremely low drag of the airframe, even when loaded, this indicates that the Arrow would have been an exceptionally manoeuvrable aircraft contrary to the opinion of many so called experts. Almost all current front line aircraft with the notable exceptions of the F-18, Sukhoi Su-27 and Mig Fulcrum, are limited to considerably less alpha. Even these last mentioned exceptions suffer in speed, and acceleration when loaded (as Jan says "like Christmas trees") with fuel and armament dangling in the slipstream under wings and fuselages. Jan mentioned the Arrow was also very sensitive to the controls especially in pitch (which bodes well for manoeuvrability) and that it had a fast roll rate of 270 degrees per second. That the Iroquois engined Marks would have broken and held world speed, climb and altitude records is beyond reasonable doubt.

What seems to bother him most to this day is how the flying aircraft were cut up to scrap. He seems to feel that this was ordered personally by John Diefenbaker but done verbally through "hatchet men" cronies who made it appear he knew nothing about it. Indeed the defence minister of the day denied the Arrows were being cut up even while the destruction was in progress.

The author was surprised by the fondness Jan showed for his time at Avro considering his impressive career, and the way the program was deceitfully and brutally terminated. Mr. Zurakowski, despite all the ridiculous slanders of the aircraft, company, and employees, plus all the intrusions into his privacy of often somewhat inconsiderate autograph seekers and aficionados, still selflessly offers his time and energy to ensure the legacy is portrayed in the proper light. He stated to the effect that he felt Canada, had to a large degree, handed not only its military, but economic, and indeed political autonomy to a foreign power with this single move of cancellation and destruction of the company. The author, from his own independent research could not agree more. Jan, despite not having been born here, and probably having been treated better elsewhere, (and in common with Jim Floyd) loves Canada and hopes that Canadians of all ages will realize what this country has to offer and what it can do if it has the confidence and leadership to embrace the challenge.

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