

In Part Two of his biography of legendary test- and display-pilot Janusz Zurakowski, **JOHN PAINTER** describes how Zura invented and perfected his unique and breathtaking "Zurabatic cartwheel" aerobatic manoeuvre

Zura

Turning cartwheels in the sky

JAN ZURAKOWSKI SPENT ABOUT 2½ years at the Aeroplane & Armament Experimental Establishment at Boscombe Down in 1945–47, starting with C Sqn (Fleet Air Arm aircraft) and moving later to A Sqn (fighters). According to his logbook he tested more than 30 FAA, RAF and American aircraft, among them the Fairey Swordfish, Firefly and Barracuda; Supermarine Sea Otter, Spitfire (11 different marks), Spiteful and Attacker; Hawker Typhoon, Tempest, Fury and Sea Fury; Blackburn Firebrand; Westland Welkin; Boulton Paul Defiant; Martin-Baker M.B.5 (designed and built by the company of ejection-seat fame); de Havilland Mosquito, Hornet and Vampire; Gloster Meteor; and the North American P-51 Mustang and F-86 Sabre, plus some miscellaneous types including the de Havilland Chipmunk, Percival Prentice and Reid & Sigrist Desford. A varied group indeed.

I asked him what was his favourite among these aircraft, and after quite a pause he replied: "I liked the M.B.5 very much". When asked why, he explained that it was easy to fly. It was "logical" in so many respects; perhaps, he thought, the result of it being designed by a company using a very small group of about 30 people, unlike those emanating from the much larger design and engineering teams of the major aircraft builders. He said that, because of its simplicity, all of the necessary tests on the M.B.5 were completed in three weeks instead of the usual period of several months for many

other types. The aircraft was never put into service because its protracted development took it into the advent of the jet age, and it was rendered obsolete.

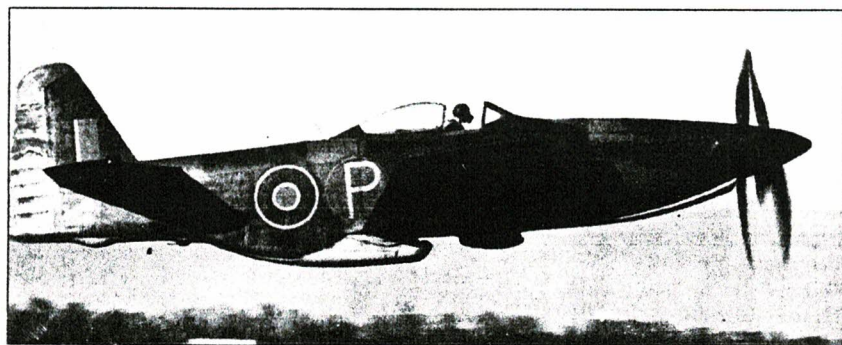
Jan had enjoyed aerobatics since his early gliding days in Poland, and he seldom missed an opportunity, when the working part of a flight was done, to "wring out" an aircraft or practise something new, sometimes in a private corner of the sky, before presenting it to an audience. Two of the many public occasions reported in some detail in the aviation press at that time are worth recording here because they show the extent to which Zura was being recognised for introducing new standards into the art of demonstration flying, an entirely different field from test and experimental work.

The first was the occasion of a grand display put on by the A&AEE in 1945. Some idea of the magnitude of this show is evidenced by the fact

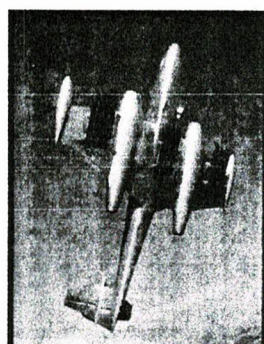
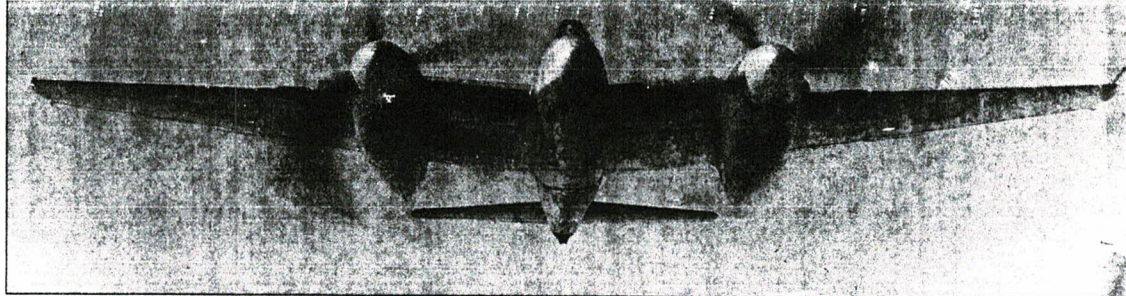
TOP Jan Zurakowski, now retired in Ontario, Canada, was photographed for Aeroplane by GERRY GARDINER in June 2001.

OPPOSITE The "Zurabatic Cartwheel" was executed on rocket- and tip-tank-equipped private-venture Meteor G-7-1, seen here in a superb Gloster company portrait by Russell Adams.

BELOW One of Zura's favourite aircraft was the excellent Martin-Baker M.B.5.



out his "cartwheel" on a de Havilland Hornet twin-piston-engined fighter, seen here in a more relaxed pose.



Zura Turning cartwheels in the sky

Although the Hornet's engines were quite far apart, he found that he did not have enough asymmetric power to get the aircraft round, even with one engine at full power and the other throttled right back

RIGHT Zura (middle) and Jim Cooksey (right) show Marshal of the Royal Air Force "Boom" Trenchard over Meteor T.7 WA690 at Moreton Valence.

that it included such events as a Lancaster III dropping a live 12,000lb high-explosive bomb, and aircraft firing a range of different live rockets at a target to one side of the viewing enclosure. This is how *The Aeroplane*, the weekly forerunner to this magazine, reported Jan's second appearance, in a de Havilland Vampire F.1:

"A faint echoing whistle gave the clue. Sqn Ldr Zurakowski then gave the most brilliant exhibition of high-speed aerobatics probably ever seen. We used to have a vocabulary with which to describe individual aerobatic performances. Words like power dive and rocket loop had a meaning and described more or less accurately, if not very imaginatively, what happened during a display. But one realises the inadequacy of this vocabulary to describe what happened here. One needs new eyes to see and totally new words to describe.

"Words like 'fast' and 'slow' as applied to aircraft mean nothing when a Vampire comes down to about 100ft, 'handsomely exceeding' 500 m.p.h., and then turns up vertically and continues to go up vertically until it disappears into the blue. A moment later it could be seen coming down with a faint whistle, vapour trails coming from the jetpipe at some altitudes. Then there is only the briefest glimpse of a smooth nose and two intakes and a sharp crack of a whip as it flashes past, followed by a shrill scream as the aeroplane goes up vertically, slowly rolling out of sight into the blue. Perhaps the most astonishing way of gaining altitude was when Zurakowski came down flat out

and then, from just above the tents, went up into a tight half-loop followed by a half-roll and at once went into another half-loop and half-roll, and so on until the aeroplane was lost to sight. He ended by giving a series of loops and rolls until it was hard to tell which way up he was. He exploded the myth that dogfights are not possible at nearly Mach 0.8."

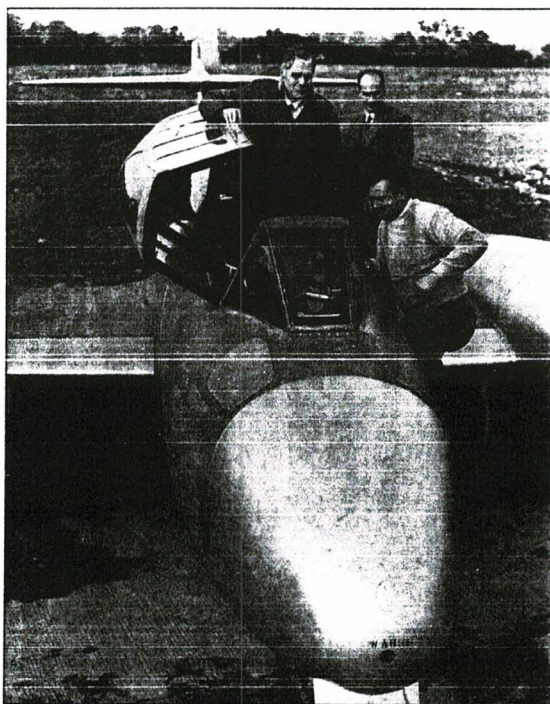
Another report of Zura's aerobatic prowess also comes from *The Aeroplane*. It refers to his appearance, at the controls of the M.B.5, before an audience at the Society of British Aircraft Constructors (SBAC) air show of 1946:

"Flt Lt (sic) Zurakowski can do almost anything with the Martin-Baker 5. He has an extraordinary act of flicking the aeroplane about at very slow speeds and so reproducing the old 'falling leaf' act. The aeroplane suddenly seems to tilt up sideways and is only saved from a spin because he puts the nose down just at the right moment as he does it. One cannot see him put the nose down, but after half a dozen of these manoeuvres he has lost 1,000ft or so of height and he is only some 500ft above the ground."

Another aircraft he obviously enjoyed was the twin-engined de Havilland Hornet fighter. Jan made many test flights in this aircraft, and on one occasion thought he would like to try a loop with both engines off! He says that he found he needed about 400kt for a good, round loop finishing at the starting point, and gradually perfected the aerobatic until he was able to do it successfully one day at Farnborough before some startled VIPs.

It was in a Hornet that Zura first tried another manoeuvre for which he was to become so well known. His first attempts were to make a 360° turn in a flat plane. Although the Hornet's engines were quite far apart, he found that he did not have enough asymmetric power to get the aircraft round, even with one engine at full power and the other throttled right back. However, when he tried the same thing in the vertical plane with the climb reduced to about half stalling speed, he could get a full rotation of the aircraft. The "Zurabatic Cartwheel" was born — but not yet perfected, as we shall see.

With the war at an end, Jan began to think of leaving the RAF. He was now a skilled test pilot, and there was growing recognition of his experience and talents. He must have felt that he had spent all of his adult life as an officer and military flyer, first in the Polish Air Force and then in the RAF, and he was beginning to receive overtures from the British aircraft industry. In fact he had come into contact with Eric Greenwood, then Gloster's chief test pilot, who suggested that he should consider joining his test flying team. In two of three large steps



at this stage of his life he was demobilised in June 1947 and then joined Gloster as experimental and development test pilot.

The third significant change in his personal circumstances was of a quite different nature. So far, the life of Janusz Zurakowski had had many elements that would not be out of place in the script of a Casablanca-type story. This might lead one to believe there must have been a girl in the background, and there is; Anna Alina Danielski. She first came into Jan's life in Poland, where their families were near neighbours. When Jan was forced to leave Poland, Anna, like the others in Jan's own family, had to be left behind. She lived first under the rigours of German occupation and then, at the end of the war, when she was attending university, in a communist regime. She and Jan wanted desperately to get together, but that was far from easy because travel out of Poland was not permitted. Finally, in 1948, Anna somehow managed to convince the authorities that their reputation would be enhanced if they permitted her to travel outside Poland to study French literature at the Sorbonne, in Paris. It was a great accomplishment on her part, given the international circumstances, when she was provided with travel papers.

Anna says that the whole sequence of events, particularly her journey by train, first across Czechoslovakia and then immediate-postwar Germany, where she never knew from one moment to the next when some spiteful official would take her passport from her, would make a book in itself. But she did make it safely into France and then to sanctuary in Paris, where she had relatives and friends.

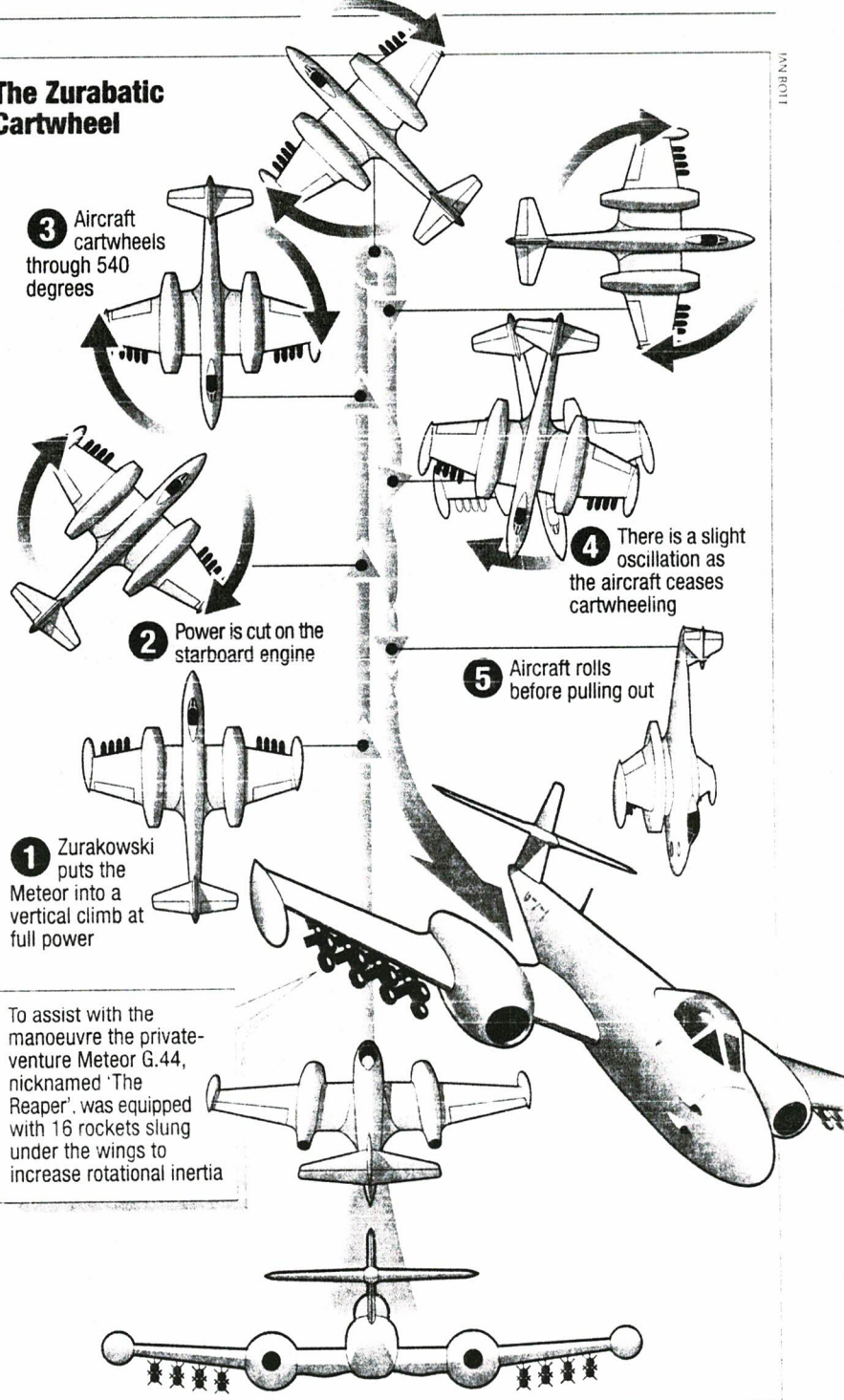
Reunion at last

It was here that Jan was able to join her from his base at Boscombe Down, and the long wait for them both finally came to an end. They were married in a civil ceremony and then in a Polish church before Jan had to return to England to continue his work. Then a battle with officialdom started for Anna to get permission to enter the UK. It took six weeks to obtain it. Only then was she able to make the last segment of her arduous journey and link up with Jan in Cheltenham, where he had moved on taking up his new job with Gloster Aircraft. He found life considerably changed, having moved from a Service to a civilian job and become a married man, to say nothing of having to switch from a wartime to a peacetime environment in a country not his own.

At Gloster he at once became deeply involved in the development of the Meteor, Britain's first production jet fighter, flying first the Mk 4, then on the assembly lines, and later the Mk 8. Gloster built a special version of the Mk 4 and powered it with Beryl engines built by Metropolitan-Vickers. They had more power than the standard Rolls-Royce Derwents and gave the Meteor quite a spectacular rate of climb. Zura demonstrated the aircraft at the 1948 SBAC Display. In the following January this Meteor's performance was revealed to the press, producing headlines such as: *7½ miles up in 7½ minutes*. And all of them added: "... by unnamed Polish pilot", which Zura thought very funny.

At the end of 1948, on December 21, he

The Zurabatic Cartwheel



made the maiden flight of the Meteor Mk 8. This version embodied many of the lessons learned from the Mk 4, which had some initial instability problems. An enlarged tail section and improved streamlining greatly improved flying characteristics as well as top speed. At the SBAC show in September the following year he was showing off the Mk 8 to many thousands of people. *The Aeroplane* gave him another accolade with the words: "Zurakowski, in the Meteor 8, gave one of his perfect demos. Anyone who has watched him at the armament demonstrations [to one of which I referred earlier] will recognise his pattern of flying. The whole show is planned to the second. Several of his upward sweeps carry him to 6,000ft and at this height he did several turns of a horizontal spin. He then plummets down vertically and leaves the pull-out to the last possible moment, clearing the runway at 40ft."

Jan had a very busy year in 1950. On March



ABOVE Cartoonist Wren's "wrendition" of the 1951 Farnborough Air Show included a salute to Zura.

At 6,000ft the fighter slowly started a hammerhead until the nose pointed vertically earthward. But it didn't stop there: the aircraft continued its rotation...

23 he took the Meteor 9 into the air for its first flight, and two months later, on May 24, he made the maiden flight of the PR.10 photographic reconnaissance version. In between, on April 4, he broke an international speed record between London and Copenhagen and return, set only two weeks earlier in a D.H. Comet airliner by John Cunningham. The Royal Aero Club, the official timekeepers, issued a certificate to the effect that "Gloster Meteor F.8 VZ468, powered by two Derwent V engines and piloted by Janusz Zurakowski, flew the official record distance from the centre of London to the centre of Copenhagen in 1hr 5min 55sec at a speed of 871.344km/h or 541.438 m.p.h." Much of the trip had been flown at 34,000ft. After 8½min on the ground for refuelling, the aircraft completed the return trip against a headwind in 1hr 11min 17sec at a speed of 805.752km/h or 500.721 m.p.h. Once again, Jan's photograph appeared in just about every daily newspaper: a jet aircraft event in that era was still a major news story. To round off the

year he appeared again at the SBAC Show, this time in a Sapphire-engined Meteor.

Zura's next major public appearance was at the SBAC Show at Farnborough in 1951. His mount was a ground-attack version of the Meteor, developed by Gloster as a private venture to fill a quite different role from the fighter model. This version, with a strengthened wing, carried a 180gal tank at each wingtip as well as sixteen 2.75in rockets on rails under the wings. It is not difficult to imagine the elation with which Zura viewed this aircraft in terms of aerobatic capabilities. He must have worked his slide rule particularly hard. He knew that with the extra weight spread out along the wings it should, in theory, be able to generate more lateral inertia than any other type he had flown. What would it do for his "cartwheel"?

What it did was shown to thousands of stunned onlookers at the 1951 SBAC Display. Many years later, Peter Cope, no mean test pilot himself, wrote a vivid description of that event, complete with a splendid diagram of the manoeuvre, in the May 1966 issue of *Flying*. In part, he said:

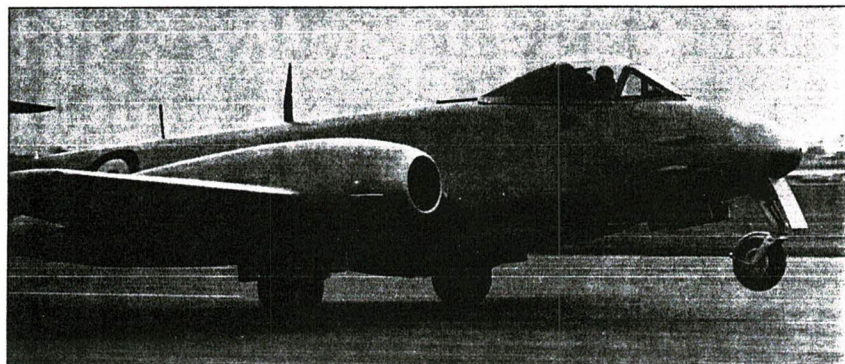
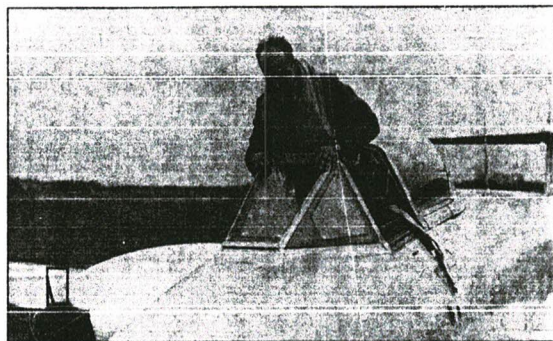
"Tense and silent, they watched as he swept past in a gleaming red Meteor and climbed vertically into the sky. As speed fell off, the fighter seemed suspended in space; then at 6,000ft it slowly started a hammerhead until the nose pointed vertically earthward. But it didn't stop there: the aircraft continued its rotation in the vertical plane with the nose edging up slowly until it was again pointing straight up, having completed a 360° flat vertical rotation at near-zero speed. The rotation continued, down came the nose, then a slight pendulum oscillation set in, and the aeroplane flicked into a spin. As control was regained, Jan checked the spin and pulled out into a high-speed run past the awe-struck spectators."

A "Zurabatic Cartwheel" of 1½ rotations had been achieved. Peter made a good point at the end of his piece: few pilots can claim a personally named aerobatic manoeuvre, the only other in the preceding 25 years being the Lomcevak.

Peter Cope remembered the scene that afternoon in detail when he wrote about it 15 years later. So do I today, for I was among those "awe-struck" spectators at Farnborough. I am sure that Peter did not know at that point that, two years hence, he and Zura would be in the same flight test department at Avro Canada. And I did not know either, as I watched his performance, that in a mere four years I would be strapping Zura into his demonstration aircraft on the same flightline at the 1955 SBAC Display (see *Showing off the CF-100*, January & February 1998 *Aeroplane*).

If reading reports of this and other such events creates the impression that a test pilot of Zura's stature was really the aviation industry equivalent of a star theatrical or film performer, one must hasten to point out that only very occasionally was this the case. Much of the work, on a day-to-day basis, was often any combination of hard, tiring, exacting, tedious and sometimes dangerous. During his time with Gloster, Jan made more than 1,000 flights in various marks of Meteors, 50 in the E.1/44 (a Rolls-Royce Nene-powered fighter which followed Britain's first jet aircraft, the Whittle-

RIGHT Zura entering the cockpit of Meteor F.8 VZ478 at Northolt before establishing a London-Copenhagen—London record on April 4, 1950. BELOW Meteor VZ468 takes off at Northolt for the Copenhagen record flight.



engined E.28/39) and 14 in the delta-winged, T-tailed Javelin all-weather fighter. So the demonstration and record-breaking flights which attracted public attention were a very small proportion of the total he had made.

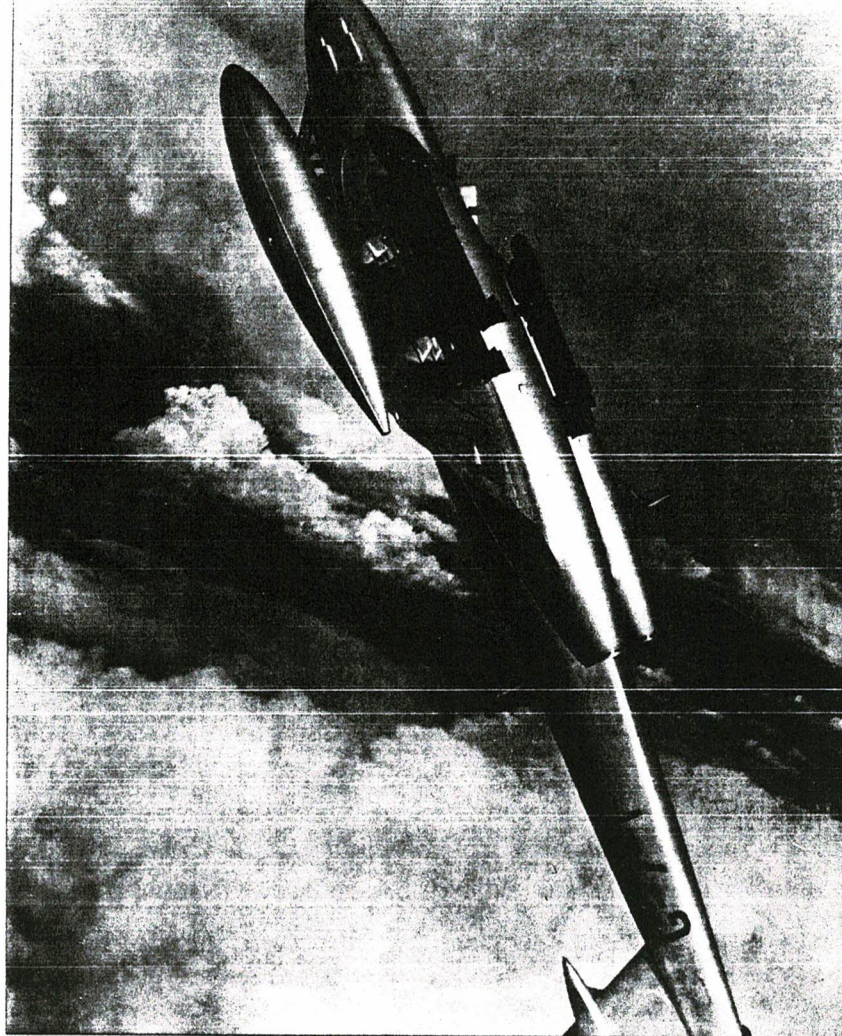
We cannot move Zura from the Gloster scene without paying tribute to the contribution he made to the advancement of air-to-air photography techniques. The company was home to one of the leading aerial photographers of the day, Russell Adams, whose photographs were well-known to a very wide audience. In the realm of test flying, one test pilot would often fly alongside another to observe changes in physical conditions on the test aircraft, particularly in high-speed flight. While anything of note could be described and recorded in words, there was no pictorial record to aid memory or post-flight discussion. When the Meteor T.7 two-seat trainer came into being, Zura and other test pilots at Gloster quickly recognised its possibilities as a camera platform. Russell Adams was quick to ask if he could try photographing aircraft under test from the T.7's back seat when the need arose.

Zura was Adams's pilot for his first assignment, and the two of them brought back photos of a high-speed flight which the design department found very useful. This success rapidly expanded into more requests for photographic evidence, and was soon followed by attempts at "pretty" pictures of aircraft in flight in unusual attitudes and against various backgrounds. These, too, were an instant success and always in demand by the technical press. Although other Gloster pilots were involved in developing this type of aerial photography, Jan is given credit for pioneering many aspects of the techniques involved, and he and Russell Adams seemed to make a natural combination.

Jan spent just under five years with Gloster. He and Anna had continued to live in Cheltenham, where she gave birth to two sons and did all the usual jobs of a housewife and mother. One gains the impression, though, that this was not a particularly satisfying time for the young family. Jan was having difficulties with aspects of the Javelin flight tests, and Anna recalls that he often returned home tired and grumpy. Apparently he and the design office could not agree about the aircraft's longitudinal instability. Although the initial flight of Javelin prototype WD804 was made by Bill Waterton, Jan did make 14 subsequent test flights in it.

On the home front, too, there was some unhappiness. Jan says now, some 50 years later, that living in the town at that time was not too easy when one had a foreign accent and a name ending in 'ski. So, with the boys nearing school age, conditions seemed to be pointing to the need for another change in the family's life. Their thoughts were turning to Canada.

On April 21, 1952, Jan arrived in Canada, having left Gloster. In the *Gloster Bulletin* that month a company statement said: "It is a great loss to Glosters that he is moving to Canada, and he will be missed by everyone who has come into regular contact with him and been privileged to see his work at close quarters and, sometimes, low altitudes". His reputation preceded him. A headline in the *Toronto Telegram* soon after his arrival trumpeted: *Inventor*



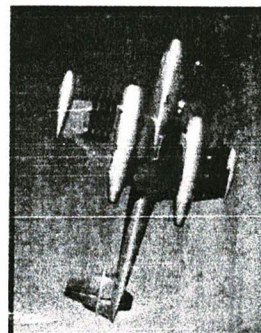
of Zurabatic Cartwheel Joins AVRO as Test Pilot.

A.V. Roe Canada Ltd had been a brainchild of Sir Roy Dobson, chairman of the board of the Hawker Siddeley Group. During the war, as the boss of A.V. Roe Manchester, he went to Canada to visit the Victory Aircraft plant at Toronto's Malton Airport. He had come to see how this Canadian operation was getting along with building his Lancaster bomber. He was impressed, and when the war ended he made a deal with the Canadian government to take over the factory, provide some seed money, and start not only building aircraft but designing them as well. He firmly believed that Canada was quite capable of doing this, rather than building other countries' designs under licence.

Very quickly, three major projects were got under way, a jet-powered commercial aircraft; a two-jet, two-seat all-weather interceptor; and the first Canadian-designed and built jet engine, the Orenda, which would power it.

The commercial aircraft was the first of its kind in North America. Named Jetliner, it made its maiden flight on August 10, 1949, only ten days after the world's first commercial jet, the de Havilland Comet, and years before America's entry into the field with the Boeing 707. The interceptor programme, which would produce the CF-100, was not without its problems, but the prototype flew successfully on January 19, 1950, in the hands of Bill Waterton from Gloster, who was "imported" for the occasion.

RIGHT "A Gloster Meteor caught in the act of performing a Zurabatic Cartwheel", reads the breathless news-agency caption on the back of this picture from *Aeroplane's* archive. Actually it is just part-way round a loop — doubtless quite enough excitement for the camera-aircraft pilot.



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IN THE FINAL PART, NEXT MONTH: The CF-100 and Arrow