AVIATION WEEK PILOT REPORT: Su-27

PAGE 32
Aviation Week Editor Flies Top Soviet Interceptor

DAVID M. NORTH/FARNSBOROUGH

Prior to flying the Sukhoi Su-27, Aviation Week & Space Technology's Managing Editor David M. North made flights in the McDonnell Douglas F-15 and the F/A-18 with the U.S. Air Force and Navy, respectively. The flights were to prepare him to better evaluate the top Soviet interceptor aircraft. North flew the F-15 with Air Force Lt. Col. Don Klain, commanding officer of the 27th Tactical Fighter Squadron at Langley AFB. The F/A-18 was flown with Navy Lt. Tom Gurley of the Strike Warfare test squadron at NAS Patuxent River, Md. North was impressed with the flying skills of both those pilots and the professionalism displayed by their units. The Su-27 flight from Farnborough was facilitated by the assistance of Reuben Johnson, a translator and staff analyst in Soviet Studies with General Electric Aircraft Engines.

The Sukhoi Design Bureau Su-27 and the Mikoyan MiG-29 represent the most advanced Soviet fighters in operational use, and both of them exhibit a superb blend of aerodynamic design with high-thrust, reliable engines.

This Aviation Week & Space Technology editor became the first American pilot to fly the Su-27 earlier this month during a late afternoon flight from the Farnborough air show flight line. At the same time, I became one of a handful of pilots outside the Soviet Union to have flown both the Su-27 and the MiG-29. I flew the MiG-29 from Kubinka Air Base, USSR, in January with Valery Menitsky, chief Mikoyan Design Bureau test pilot (AWST Feb. 26, p. 36).

The path that led to the Su-27 flight was long and circuitous. It started in May, 1989, with interviews with Mikhail Simonov, general designer of the Sukhoi Design Bureau. This interview was followed by another one in January after I completed the flight in the MiG-29. At that time, Simonov promised a flight in the Su-27 by the end of 1990. He almost was able to keep that promise in Oklahoma City in June. Following a 3-hr. discussion on flying and my aviation background, plus review of appropriate medical certificates, he cleared me to fly the Su-27 during the Oklahoma air show. That flight was canceled by a Soviet bureaucrat just before I entered the Su-27 cockpit with Sukhoi chief test pilot Viktor Pougachev (AWST July 16, p. 9). The invitation from Simonov to fly the Su-27 came at the Farnborough air show a week before the beginning of the eight-day event.

Since the beginning of the year, the Soviets have exercised glassout at its fullest in aviation circles by allowing numerous pilots to fly the MiG-29 with Valery Menitsky, both in the Soviet Union and dur-
Su-27 has an operational maximum sustained g-loading of -9. With full afterburner power, the Soviet aircraft has better than a 1.0 thrust-to-weight ratio at mid takeoff gross weights. The MiG-29 cockpit layout and instrumentation (right) is very similar to that of the Su-27 (below). The fuel quantity gauge in the Su-27 is below the radar display and to the left of the aircraft test equipment panel. There is no fuel flow indicator in the Su-27 front cockpit. The Sirena 3 passive radar warning system is in the same lower right side of the cockpit in both aircraft. The attitude indicator, horizontal situation indicator and rate of climb indicator seem to be the same for both aircraft. The Su-27 angle-of-attack indicator is on the far left of the round instrument in the upper left side of the instrument panel. The g-force indicator is on the right side of the same instrument. Below the landing gear handle in the Su-27 is a VHF radio installed for flying outside the U.S. The ratchet type dials for changing frequencies were difficult to reach while flying. The control buttons for the four-channel analog fly-by-wire flight control system are mounted in front of the throttles in the Su-27. The small latches mounted on the throttles in the Su-27 have to be depressed going into and out of afterburner. The red handle to the inboard side of the left console is for emergency hydraulic braking. The large head-up display mounting in the Su-27 does restrict some of the forward visibility in the Su-27. The Su-27 has infrared search/track sensors and a helmet-mounted sight capability.
ing air show tours in Canada and the U.S. Only two other non-Soviet pilots had been allowed to fly the Su-27 prior to my Sept. 4 flight, Pougachev said. A Singapore air force general and Ray Furnell, chief of the Australian air force air staff, flew the Su-27 during the Singapore air show in February.

Following my flight, Sir Peter Harding, air chief marshal and chief of the Air Staff of the Royal Air Force, flew the Su-27 with Pougachev on Sept. 7.

SHORT BRITISH ATC FORM

The day of the flight, Pougachev gave me another checkout in the front seat of the Su-27UB two-seat fighter. Following the cockpit familiarization, we went to the air show control room next to the tower to request permission for the flight. Expecting some bureaucratic opposition over flying a Soviet fighter in British airspace, we were pleased when the only question was whether this was a customer demonstration flight. An affirmative answer was followed by the filling out of a short form listing the pilots and the flight request. The time of the flight was dictated by the air show routine ending at 5:30 p.m.

I was fitted with a g-suit underneath a two-piece flight line outfit. The helmet, oxygen mask and throat microphone were put on in the front cockpit. Pougachev then manned the rear cockpit of the Su-27UB. The attachments for the parachute and seat restraints were similar to those found in other fighters. The flight gear was comfortable, and the seat was relatively hard. The seat would be fine for 1 hr., but could become uncomfortable after a 3-hr. flight.

The Lyulka Engine Design Bureau AL-31F engines are started by momentarily pressing a start button on the right console, after placing the throttle into the flight idle position. An external 26-v.

power cart was used to start the two engines, but the aircraft is equipped with batteries for internal engine start. The engine start sequence appeared slow prior to reaching the idle thrust setting of 660 lb. Outside air temperature was close to 75°F, slowing the engine start. A small torch-off occurred in the left engine on start, something that is unusual in the Lyulka engines, Pougachev said later. Both engines settled at a 400°C reading at idle, and the peak temperature at start was not much greater than that. The engine temperature is measured from behind the turbine, Pougachev said.

Fuel load at the blocks was close to 5 tons, or 10,000 lb. The maximum internal fuel load of the Su-27 is close to 19,000 lb. of fuel, which is considerably more than the standard F-15, but approxi-}

mately 3,000 lb. less than the F-15C with conformal fuel tanks. The Su-27 is not equipped to carry external fuel tanks on the wing, but the naval version of the fighter is configured to carry one on the centerline station. The standard Su-27 also is not equipped with an in-flight refueling system, but the naval version has a refueling capability similar to the hose-and-drogue system used by the U.S. Navy (AWST Feb. 12, p. 28).

TAKEOFF PREPARATIONS

Once both engines were at idle power and taxi clearance to Runway 25 was granted by Farnborough tower, the throttles were advanced for taxi. The ability of the Su-27 to get airborne quickly without multiple ground checks is a definite asset for an intercepter. Nose wheel steering is through the rudder pedals and is very positive, with the ability to make sharp turns without much effort.

The Su-27 has two separate 4,000-psi hydraulic systems used for the nose wheel steering and landing gear and flap retraction. The braking system pressure is reduced to approximately 1,400 psi.

I requested clearance from the tower to line up on the runway. A Soviet translator was in the tower to smooth any communication problems I might have with Pougachev during the flight and to help resolve any emergencies. The Soviet pilot has a limited English vocabulary, and I do not speak Russian.

Once cleared to take the runway, I depressed a small trigger on the front of the stick which provides approximately twice the braking power of the standard hydraulic system. This braking system allows more engine power to be applied at a standstill for short takeoffs. The trigger was released after passing into afterburner power, but before maximum afterburner