New 'Fulcrum' family

MiG-29K, KUB, M1, M2 and OVT

During MAKS’2001 at Zhukovskiy, the Russian Aircraft Corporation MiG presented its new family of MiG-29 variants, based on work performed for the imminent contract for about 50 shipborne MiG-29K fighters for India. This builds on earlier development of the MiG-29M (type 9-15, six prototypes) and MiG-29K (type 9-31, two prototypes).

MiG intends to manufacture at the same time four variants of the same universal multi-role fighter aircraft: the carrierborne MiG-29K (single-seater) and MiG-29KUB (two-seater), as well as the land-based MiG-29M1 (single-seater) and MiG-29M2 (two-seater). They feature maximum commonality between airframes, as well as the same fire-control systems and avionics. According to Nikolay Buntin, manager of the MiG-29K/M development programme, the reduction of differences between the four versions is the key to cheaper production and operation.

Both MiG-29K aircraft on display at MAKS were the prototypes originating from the 1980s. The 9-41 aircraft now being prepared for India will be very similar, but will be equipped with a digital fly-by-wire flight control system, extended wing flaps and with refined local aerodynamics (for example, a slotted flap). The aluminium-lithium alloy 0420, used previously for structural parts of the MiG-29K and MiG-29M (almost 10 per cent of the airframe weight) and saving about 80 kg (176 lb) of the total weight, turned out to be a difficult material from an engineering point of view, and will be replaced by traditional materials.

New avionics made by the Ramenskoye PKB, based on those developed for the Su-30MKK, will be installed around a Mil Std 1553 databus with a T909 central computer. The fire-control system will include the Phazotron Zhuk-M radar, an electro-optical unit, helmet target indication system, as well as a radar homing and warning receiver system. The preceding NO10 Zhuk radar undertook about 700 test flights in MiG-29M/K aircraft; the new Zhuk-M has a new processor, but other hardware is left almost unchanged. Specific versions of the installed equipment may differ depending on customer requirements.

Indian aircraft, in particular, will be equipped with a French INS (as in the upgraded Indian MiG-21bis); also,IFF, electronic warfare and RWR systems will be of non-Russian origin. Thanks to new (smaller and lighter) avionics, the new MiG-29K/Ms will be capable of holding 5100 kg (11,243 lb) of internal fuel, compared with 4500 kg (9,920 lb) in the 1980s MiG-29M/K and 3400 kg (7,495 lb) in the basic MiG-29.

Power for the new MiG-29s will come from the Klimov RD-33 series 3 turbofan (already installed in Malaysian aircraft). At 2000 hours, these engines have the longest service life of any Russian fighter engines. The RD-33 series 3M ’maritimised’ version will have an additional anti-corrosive coating of the internal duct, smokeless burning and extra afterburner range with the thrust increased from 81.4 kN (18,292 lb) to 86.3 kN (19,393 lb). At the same time, the aircraft will have larger air intakes to cater for future thrust increases. At MAKS’2001 the engine design bureau Klimov from St Petersburg presented the RD-33-10M, a major upgrade of the RD-33 with thrust increased to 105 kN (23,146 lb) and with a vectoring nozzle. This engine may be installed in the MiG-29, and will be the prototype for the 117.7-kN (26,450 lb) VK-10M engine intended for the next-generation MiG fighter.

Currently under development from the MiG-29K (type 9-41) is the two-seat MiG-29KUB (type 9-47). The external geometry of the aircraft, as well as its internal structure, will remain essentially unchanged apart from the rear cockpit section. Moreover, the fire-control system is unchanged. Thus, the MiG-29KUB will be a full-value combat aircraft.

The land-based MiG-29M1 single-seater and MiG-29M2 two-seater will be similar to the K and KUB. They feature lighter landing gear, front wheel brakes and a braking parachute instead of an arrester hook. Other structure remains unchanged, including the folding wing - which may be useful for customers with small hangars. The wing-fold mechanism can easily be locked shut if not required.

Development of the two-seat MiG-29M2 is considered pressing. The prototype, having been presented at MAKS’2001 for only a few days, was returned quickly to the hangar to be prepared for its maiden flight on 26 September. The haste is a result of an imminent tender request by Malaysia for a two-seat multi-role fighter. MiG expects to continue its successes from 1995, when 18 MiG-29s were sold to Malaysia. This time, however, it will have a strong rival - Sukhoi’s Su-30MKM.

Also at Zhukovskiy was the MiG-290VT (otklanyaemyi vektor tyagi, deflected thrust vector) with movable engine nozzles. The Klimov-made nozzles can be deflected to 15° in any direction (up/down and left/right) and at any range of engine operation, including full afterburning. For now, the MiG-290VT demonstrator (156) is equipped with mock-up nozzles. Working nozzles will be fitted for a first flight in late 2001/early 2002. The same aircraft will be used for tests of new attachments for air-to-air missiles at the wing tips. The vectoring nozzles will be installed in MiG-29M1 and M2 aircraft, but not in the MiG-29K and KUB - the requirements for reliability during carrier operations are too strict.

Piotr Butowski

Above and right: The MiG-290VT is a demonstrator for Klimov’s 15° thrust-vectoring RD-33 engine, although only dummy nozzles were fitted for display at MAKS. It also introduces wingtip launch rails for light AAMs.