

Russian forces, suggesting that the Mi-17 and its variants, the Mi-171/172, could find a ready international market, as could the Mi-24 upgrades developed for Russia.

Upgrading remains a popular means of maintaining capability without the expense of a new platform. With some fighters – for example the MiG-21, F-4, F-16 and Northrop F-5 – many suppliers provide upgrade packages, other types are less well supported. Upgrades are not, however, without problems and can be hampered by integration issues – not only in the merging of old and new systems, but also combining the mix of Russian, Soviet and Western avionics often used in these programmes. There are also problems with fitting the new equipment. This has arisen with the F-5, for instance, where the selected radar has been too big for the fighter's slimline nose and another unit has been selected, leading to delays.

Replacing the F-5, and similar light fighters, could be the key to the success of a number of in-development programmes. Projects such as the EADS Mako and Korean Aerospace Industries/Lockheed Martin T/A-50 advanced trainer/light attack aircraft are designed to be cheaper to operate than frontline fighters, yet offer multirole capability and combat survivability.

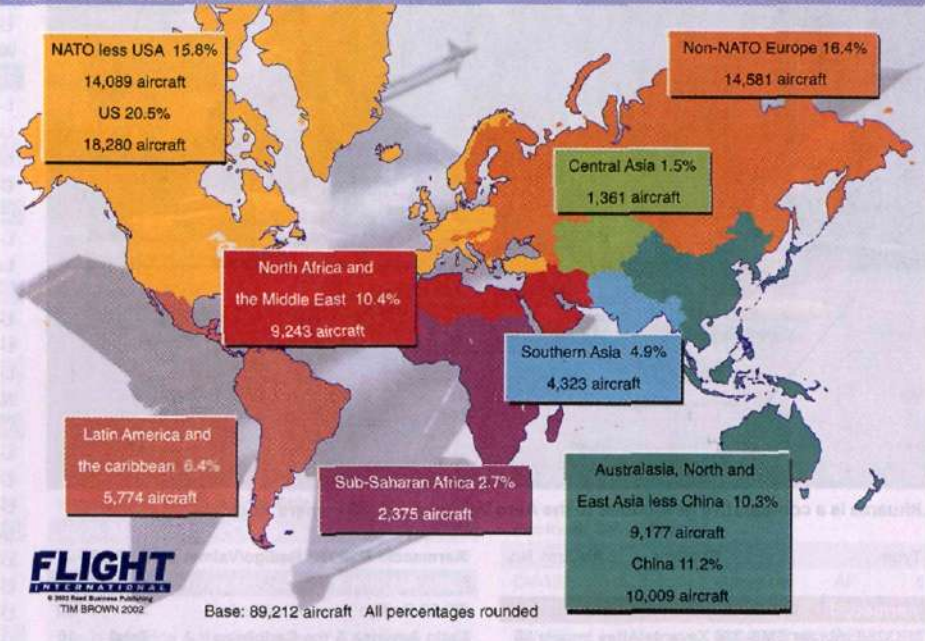
With more than 1,160 F-5s in service, (plus around 110 of the closely related T-38 advanced trainer that are in service, but for which no replacement has been selected) this market is an attractive proposition. The question is whether this advanced-trainer/light-attack market is large enough to justify developing the Mako, T/A-50, Aermacchi 346 and others. Over the next 20-30 years, Aermacchi predicts a market for 2,100 aircraft in this sector, EADS 2,500, and KAI 3,200 – each manufacturer forecasts taking a significant slice of this market – in some cases 50%.

Flight International's figures show there are 4,090 advanced-trainer/light-attack aircraft in-service. This includes Aermacchi MB326s, Aero Vodochody L-39s, BAE Systems Hawks, FMA Pucarás, PZL TS-11 Iskras and Rockwell OV-10s, but does not include F-5s or aircraft for which a replacement has been selected (such as US Air Force T-38s) or aircraft that are unlikely to be replaced by Western-built aircraft, such as Russian and Ukrainian L-39s.

Replacement ratios

Aircraft are rarely replaced one-for-one – and considering recent competitions, a rate of two-for-three for combat aircraft is generous but not unrealistic, which would mean a replacement market of slightly over 2,700. However, trainer replacements are at a much lower ratio because of the reduced requirement for aircrew in most

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air forces, an increased use of synthetic training and the growing use of schemes such as Bombardier's NATO Flying Training in Canada. This means that a one-for-five trainer replacement ratio is not unusual. New orders at this rate would cut the market to fewer than 820 aircraft.

These figures will also be reduced downwards as not all operators will replace aircraft – some have several types in each role that will be replaced with a single platform, others will eke out airframe life for many years to come, and some will transfer light-attack duties to heavier machines.

This makes replacing the F-5 and other light-strike aircraft, such as the McDonnell Douglas A-4 and Sukhoi Su-25, a key driver for these programmes. As well as the 2,270-odd F-5/T-38s, there are around 250 A-4s in service and perhaps 200 Su-25s operated by nations that would consider a Western-built aircraft, adding between 540 and 1,820 to the replacement market.

However, many operators of these types will be on the potential Joint Strike Fighter (JSF) buyers' list, further diluting the market. JSF sales campaigns will be backed by

"domestic orders" for 3,000 aircraft. Losing too many sales will require the amortisation of non-recurring costs of the new aircraft across a smaller fleet, which in-turn will increase unit costs. Logistics support for smaller fleets also tends to be more expensive, as the cost of maintaining spares provisioning has to be spread over fewer airframes. The size of the US F-16 fleet has often been pinpointed as one of the fighter's great export strengths by competitors over the last 20 years.

If air forces order new aircraft at a reasonable new-for-old ratio, and the light-attack capabilities of new designs are accepted, then the market could be around 4,500 aircraft, enough for all. But defence budgets are low and do not look set to grow much in many countries, despite the events of 11 September, and this will diminish the market still further, perhaps to as low as 800. The military aircraft market, therefore, stands poised for either radical change or deep disappointment. Light, low-cost but capable fighters have been marketed before, and the new crop may be as successful as previous generations. ■

NOTES

The Flight International Military Aircraft Census is based on data from the 2001 World Air Forces Directory (Flight International, 27 November - 3 December 2001) which was updated to 30 September last year. The chart above includes figures for every military aircraft in service, while the tables (P40-49) cover combat aircraft, and non-piston engine trainers. Types in one service are contained in the table on P48, and lists of the most significant transports and tankers (P41), combat helicopters (P49) and other helicopters (P42) are also provided. The figures within the tables include aircraft on order as well as in service. Options are not considered, but, where possible, additional information has been included. The Joint Strike Fighter is not included as no production aircraft have been ordered, and the 3,002 fighters due to be delivered have also been omitted. Afghanistan, Sierra Leone and Somalia are not included in the census, although they do appear in the World Air Forces Directory, as civil war has destroyed any vestige of a national air force. Aircraft which are closely related, such as the Dassault Mirage III, Mirage V, Mirage 50, and IAI's Neshar and Dagger, are grouped, whereas the IAI Kfir with a different powerplant and Israeli avionics, has a separate entry. Likewise Chinese copies/licence-produced versions of Mikoyan Fighters such as the J/F-5 (MiG-17) and J/F-6 (MiG-19) J/F-7 (MiG-21) are grouped with their Russian cousins. Abbreviations: AF: air force, N: navy, Ar: army, PG: presidential guard, RG: revolutionary guard, CG: coastguard, GR: royal gendarmierie