

CHENGDU AIRCRAFT (CAIC)

CAIC, Chengdu Aircraft Industrial Corporation, PO Box 800, Chengdu 610092, Sichuan, China; tel: +86 (28) 669 629; fax: +86 (28) 669 816

J-7/F-7

CHENGDU continues to develop upgraded variants of the F-7, the export version of China's J-7, which is in turn a development of the MiG-21. The F-7MG is the latest variant to enter service. Pakistan ordered a batch of 50 aircraft in early 1999, although no deliveries are thought to have been made yet. Chengdu updated the F-7MG by fitting the BAE Super Skyraider multimode radar and Western avionics.

Current F-7s differ from earlier versions, and from the MiG-21, because they feature a double-delta wing.

Alenia is proposing a $\pm 20^\circ$ -scan version of the Fiar Grifo 7 radar for the F-7MG as an alternative to the BAE unit. The new version would address the $\pm 10^\circ$ azimuth limitation of the Grifo 7 in the basic F-7. Pakistan plans to upgrade 100 of its F-7Ps with the new radar.

At the 2000 Zuhai air show, Chengdu revealed the export-version F-7MF. It is believed the development, which has replaced the nose intake with a chin intake, is intended as an insurance against the FC-1 (below) failing.

F-7MF development is supported by the J-7FS testbed, which emerged in 1998 and was used to test the chin air intake and engine. The F-7MF, however, has a shorter inlet. The J-7MF's powerplant will be a variant of the 14,600lb-thrust Liyang WP13F. The double-delta wing developed for the J-7E/F-7MG is also used on the F-7MF, but two small canards have been added to the forward fuselage.

The cockpit will include a HUD and two head-down displays, while the aircraft will be equipped with an 80km (45nm) range multimode pulse-Doppler radar, and seven pylons with a 3t load. Chengdu predicts a 2,600km range, Mach 1.8 maximum speed, 52,500ft (16,000m) ceiling and a 650m take-off run.

FC-1

THE FC-1 programme superseded Chengdu's Super-7 light fighter project, intended for the Chinese and Pakistan air forces. Pakistan and China signed a joint development and production deal for the FC-1 in July 1999, consolidating a two-year-old memorandum of understanding.

The FC-1 is due to fly in 2001 – although this appears highly unlikely – and could be in service by 2005. It is being developed in a 50:50 partnership between the two countries, to meet a Pakistani light fighter requirement for 150 aircraft.

Selection of avionics and systems has been delayed by political concerns about supplying arms to China and by the military coup in Pakistan. Avionics are likely to be supplied by Galileo or Thales. The winner will have to share development costs with China and Pakistan,

recouping its expenditure during production. Fiar has proposed an avionics suite based around the Grifo S7 radar, developed for the Super 7, while Thales is offering a system built around the RC400 multimode radar. Power will be provided by the Russian Klimov RD-93, a variant of the MiG-29's RD-33.

Chengdu has received design assistance from MAPO on the FC-1. A single-engined aircraft, it will have a shoulder-mounted delta wing and a conventional horizontal tail. The engine will be fed by intakes on either side of the fuselage.

J-10/F-10

CHENGDU'S J-10 fighter flew for the first time in March 1998. The design draws heavily on that of Israel's cancelled Lavi fighter, with Israel Aircraft Industries providing design assistance. The fighter is powered by a single Klimov RD-93 afterburning turbofan, a version of the MiG-29's RD-33.

It is unclear whether the Chinese air force has yet selected a multimode radar. The choice is between the Israeli Elta EL/M 2035, with an enlarged 680mm-diameter antenna, Russian Phazotron Zhemchoug (Zhuk derivative), or the China 14th Technical Research Institute's JL-10A pulse-Doppler radar, which may also include Phazotron components. Israeli and Russian companies are competing to provide the air-to-air and air-to-surface weapons.

It is believed that four or five prototypes have flown, but one crashed after an FBW failure.

XXJ

IN EARLY 1997, the US Office of Naval Intelligence (ONI) revealed that China was in the preliminary design stage of a twin-engined multi-role fighter project. Dubbed the XXJ by the ONI, the programme may be referred to as the J-12 in China. It is not clear whether the aircraft is being built by Chengdu or Shenyang.

The US believes the XXJ could enter service as early as 2010. It is a canard-and-tail configuration with twin, thrust vectoring equipped, engines. Engines are likely to be a version of the Wopen WP15 in the 26,000lb-thrust class, possibly with thrust-vectoring nozzles as displayed at last year's Zuhai aerospace show.

The fighter is expected to have a 20,000kg (44,000lb) empty weight and incorporate an FBW control system similar to that developed by Shenyang and tested in the J-8IIACT.

DASSAULT AVIATION

Dassault Aviation, 9 Rond-Point des Champs-Élysées, Marcel Dassault, Paris F-75008, France; tel: +33 (1) 58 76 93 00; fax: +33 (1) 53 76 93 20; www.dassault-aviation.fr

ATLANTIQUE/ATLANTIC

INTEREST in an improved Atlantique ATL3 was rekindled by the decision of Germany and Italy to proceed with a competition to replace their earlier Atlantic Is. France remains the sole operator of the Atlantique ATL2.

The ATL3 would be re-engined with R-R AE2100 turboprops with six-bladed Dowty propellers. Other changes include a two-crew cockpit and new navigation and weapons systems. Sensors include a SAR/ISAR radar, FLIR, TV, ESM and datalinks.

The R-R Tyne-powered ATL2 first flew in May 1981, entered service with the French navy in October 1989 and 28 were delivered. The mission system includes Thomson-CSF Iguane search radar, Sadang acoustic processor, Arar ESM and Tango FLIR chin turret. There is an outline proposal to update the ATL2 to ATL3.

MIRAGE 2000

THE CURRENT export version of the Mirage 2000 is the -5Mk2, which is essentially the same as the 2000-9 developed for the United Arab Emirates (UAE). The company has orders for 30 -9s and will upgrade the UAE's earlier Mirage 2000s to the same standard.

Like the Mirage 2000-5, the -5Mk2 has the Thales RDY multimode pulse-Doppler radar in place of the original RDM unit. The -5Mk2 also has full air-to-air and air-to-ground capabilities. A HOTAS and colour MFD-equipped cockpit, integrated countermeasures suite and multifunction datalink are also part of the package. UAE -9s will have larger cockpit displays and new INS.

MBDA Mica air-to-air missiles can be carried under the fuselage, allowing the underwing hardpoints to be used for more fuel. This, in turn, can double the type's mission range.

Mirage 2000-5Mk2s have a night attack capability using a Thales Nahar navigation FLIR coupled with the Damocles targeting pod. The UAE has also paid for the development of new weapons during the last decade, including the MBDA Al Hakim LGB and Black Shaheen 250km-range cruise missile.

Earlier versions of the aircraft developed for the French air force include the 2000C fighter, the 2000B (a two-seat equivalent to the 2000C), nuclear-strike 2000N and conventional strike 2000D. Earlier export multirole versions were designated 2000Es.

MIRAGE F1

PRODUCTION of the Mirage F1 ended in 1989, but upgrades continue. Dassault is refurbishing Morocco's F1s, while other companies also offer upgrades for the only non-delta Mirage in service. Before retiring the type, the South African air force fitted two test aircraft with Russian Klimov RD-33 engines.

RAFALE

DASSAULT made the first flight of a production Rafale – for the French navy – in July 1999. On the same day, a prototype Rafale M landed on France's new nuclear-powered carrier, the *Charles de Gaulle*. The first Rafale M unit will form with 12 aircraft in 2001 and embark the following year. The French navy requires 60 Rafales, 25 of which have been ordered under a