

The C-130J has a reduced-workload two-crew cockpit based on head-up and flat-panel displays and integrated digital avionics.

Tanker, airborne-early warning and maritime-patrol variants of the C-130J are planned. The AEW version would have the Lockheed Martin APS-145 radar, with rotodome antenna.

Deliveries of the present C-130H/H-30 will end in September 1996, after which only the C-130J will be produced. All C-130Hs still to be produced have been sold and nine previously unsold "white tail" aircraft are to be delivered to Malaysia (five) and Taiwan (four).

Customers (including L-100 and secondhand aircraft): Abu Dhabi 6, Algeria 22, Angola 2, Argentina 8, Australia 36, Belgium 12, Bolivia 3, Brazil 19, Cameroon 3, Canada 44, Chad 2, Chile 2, China 2, Colombia 2, Curacao 1, Denmark 3, Dubai 2, Ecuador 4, Egypt 26, Ethiopia 2, France 14, Gabon 5, Germany 1, Greece 12, Indonesia 28, Iran 64, Israel 12, Italy 14, Japan 15, Jordan 4, Kuwait 6, Libya 16, **C-130H:** Malaysia 14, Mexico 1, Morocco 19, Netherlands 2, New Zealand 5, Niger 2, Nigeria 9, Norway 6, Oman 3, Pakistan 6, Peru 8, Philippines 5, Portugal 6, Saudi Arabia 59, Singapore 6, South Africa 7, Spain 13, Sudan 6, Sweden 8, Taiwan 16, Thailand 8, Tunisia 2, Turkey 8, UK 66, USA 1,282, Venezuela 8, Yemen 2, Zaire 6, Zambia 3, **C-130J:** UK 25, USA 2.

C-141 StarLifter Operating restrictions on the USAF's 244 C-141B airlifters were lifted at the end of 1994 following completion of wing repairs. Aircraft are to be upgraded by AlliedSignal and Chrysler Technologies Airborne Systems with new digital autopilot and flat-panel cockpit displays. The C-141 is scheduled to be replaced by the MDC C-17.

Customer: USA 244

F-111 The USAF began retiring its remaining F-111s in October 1995, and all 74 aircraft, F-111Es and Fs, will be withdrawn by October 1996. Rockwell is upgrading 18 F-111Cs and four RF-111Cs for Australia, which has also bought 15 ex-USAF F-111Gs (formerly FB-111As) to keep the fleet viable.

Customers: Australia 37, USA 74.

P-3 Orion Lockheed Martin will complete delivery of eight P-3C Orion Update III maritime-patrol aircraft to South Korea in 1995 and now has no further customers for the type. The company is working on an upgraded aircraft, the Orion 2000, which has been proposed to the UK to meet its Replacement Maritime Patrol Aircraft requirement.

The Orion 2000 is powered by 6,000shp Allison AE2100 engines driving six-blade composite propellers and giving increases of 27% in take-off power and 10% in payload. The aircraft would have a two-crew cockpit, new mission avionics connected by a fibre-optic digital data network, expanded weapons capability and system improvements.

The USN intends to keep 247 P-3Cs in service until 2015 and is upgrading the aircraft to tackle corrosion, standardise the communications suite and improve the P-3's ASW capabilities with new sensors and weapons. The US Customs Service operates four P-3 AEW&C aircraft equipped with Lockheed Martin APS-138 radars and rotodomes.

Customers: P-3 (all variants, including secondhand) Australia 20, Canada 21, Chile ?, Iran 6, Japan 100, Netherlands 13, New Zealand 6, Norway 6, Pakistan 3, Portugal 6, South Korea 8, Spain 7, USA 550.

S-3 Viking Production of the carrier-borne S-3 has ended, but the USN plans to keep the maritime-patrol aircraft in service to 2015. The Navy upgraded 121 S-3As to S-3B standard, with enhanced acoustic processing, expanded ESM coverage, improved radar, a new sonobuoy-reference system and Harpoon missiles. A further 16 S-3As have been extensively modified to ES-3A electronic-warfare/reconnaissance aircraft. Further upgrades are planned.

Customer: USA 187 (S-3B 118; ES-3A 16).

LOCKHEED MARTIN SKUNK WORKS

F-117A Nighthawk Lockheed Martin continues to offer the USN a carrier-based variant of the F-117, the F-

117N, following cancellation of the A/F-X naval strike aircraft. The F-117N would have a new wing, added horizontal tail, afterburning GE F414 engines and would be capable of carrying external stores.

The F-117A was first flown in June 1981 and entered service with the USAF in October 1983. The last of 59 F-117A stealth fighters was delivered in July 1990. The F-117A is a single-seat, subsonic, aircraft powered by two non-afterburning GE F404 turbofans. A weapon-system improvement programme will be completed in 1995 and will include upgrading the cockpit and the aircraft's dual FLIR/laser designation systems.

Customer: USA 59.

U-2 The Lockheed Martin U-2 is a high-altitude, long-endurance reconnaissance and surveillance aircraft carrying sensors able to operate in all weather and light conditions. Collected data are distributed in real-time over high-capacity digital links.

The USAF's fleet of U2-Rs are being retrofitted with the GE-F118 85kN thrust turbofan for improved range, altitude and payload. The new engine avoids rising costs associated with operating the P&W J75 engine. Other upgrades include a new emergency-start and electrical generator systems now expected to increase the service life to 2020 and beyond. The upgraded aircraft is designated U-2S.

Customer: USA 29.

SR-71 Blackbird The USAF's Strategic Air Command first deployed the SR-71 on reconnaissance missions in 1966. It was the first operational aircraft capable of achieving speeds above Mach 3.

The USAF now has two operational SR-71 aircraft in active service. These were refurbished and returned to operational status during 1995, after retirement in 1990.

LOCKHEED MARTIN TACTICAL AIRCRAFT SYSTEMS

F-16 Fighting Falcon Although the last F-16 on order for the USAF will be delivered in 1997, the service has a stated requirement for an additional 120 aircraft. Deliveries could resume as early as 1998. The additional aircraft would be Block 50-standard F-16C single-seaters.

Firm orders in hand will keep the F-16 production line open until 1999 and includes 150 Block 20 F-16A/Bs for Taiwan, delivery of which begins in 1997, and a follow-on purchase of 18 F-16Cs for Singapore. Several F-16 customers are considering follow-on purchases.

Lockheed Martin has flight-tested an extended-range F-16ES (Enhanced Strategic) with conformal fuel tanks and internal FLIR targeting system. The company is also proposing a long-range F-16, with stretched fuselage and delta wing, which has been offered to the United Arab Emirates as the F-16U.

Four European F-16 operators — Belgium, Denmark, the Netherlands and Norway — plan to upgrade the avionics in 301 F-16A/Bs under the mid-life update (MLU) programme. Flight testing is under way and MLU kit installation will get begun in Europe in 1996. Taiwan's F-16s will incorporate some of the improvements.

The USAF plans a fourth multi-stage improvement programme for the F-16, beginning around the year 2000, which would introduce synthetic-aperture radar, flat-panel displays, internal targeting system, datalink communications and new precision-guided munitions. F-16As being retired from the USAF are being offered to several foreign customers, including former Warsaw Pact countries Poland and the Czech Republic. No sales have been made yet.

The YF-16 prototype was flown on 2 February, 1974, followed by the first production aircraft in August 1978. The initial F-16A single-seater and F-16B two-seat operational trainer were powered by a P&W F100. The improved F-16C/D was first flown in December 1982 and can accommodate either the P&W F100 or the GE F110. More than 3,300 F-16s in service with 16 countries passed 5 million hours in late 1993.

Customers: Bahrain 12, Belgium 160, Denmark 70, Egypt 175, Greece 40, Indonesia 12, Israel 260, Netherlands 214, Norway 74, Pakistan 111, Portugal 20, Singapore 26, South Korea 160, Taiwan 150, Thailand 36, Turkey 240, USA 2,189, Venezuela 24.

LOCKHEED/BOEING

F-22 Re-phasing of the USAF's F-22 Advanced Tactical Fighter programme to cope with budget cuts has delayed the first flight of a development aircraft from the mid-1996 to the first quarter of 1997. The number of development aircraft has been cut from 11 to nine (seven single-seat F-22As and two F-22B two-seat operational trainers).

Budget cuts have also reduced the number of aircraft planned to 442, from an originally envisaged 750, and delayed initial operational capability to 2004. The F-22 design will be frozen in February 1995 and four pre-production verification aircraft will be built in 1997.

The first of two YF-22 prototypes was flown on 29 September, 1990. In April 1991, the F-22 was selected over the competing Northrop/MDC F-23 to replace the USAF's MDC F-15 air-superiority fighter. Lockheed/Boeing was awarded a \$9.95 billion engineering and manufacturing development contract in August 1991. P&W was awarded a \$1.5 billion contract to develop the F119 afterburning turbofan.

The F-22's design combines stealth, supercruise and thrust vectoring to provide survivability, persistence and agility exceeding that of the F-15. All weapons and fuel for the air-superiority mission are carried internally, to minimise drag and radar signature. The F-22's integrated digital avionics-suite includes quadruplex fly-by-wire flight controls, flat-panel cockpit displays and a Westinghouse/Texas Instruments APG-77 active-element phased-array radar.

The principal armament for the air-superiority mission is an internal 20mm cannon, two short-range missiles in fuselage-side bays and four AIM-120A, or six compressed-carriage AIM-120C, medium-range missiles in the underfuselage bay. The F-22 will have limited ground-attack capability, carrying two Joint Direct Attack Munitions in the underfuselage bay and two Joint Service Stand-Off Attack Missiles under the wing.

MCDONNELL DOUGLAS

C-17 Globemaster III The US Department of Defense will decide in November 1995 whether to procure more than the 40 C-17 transports now planned. The USAF has a requirement for at least 120 C-17s, but a decision to proceed beyond 40 will be depend on several issues including the successful reliability, maintainability and availability demonstration concluded in August 1995 and involving the first squadron of 12 aircraft.

In February the C-17 was awarded the prestigious Collier Trophy for being the "most versatile airlift aircraft in aviation history". The C-17 was selected in 1981 to meet the USAF's C-X transport requirement, but the go-ahead for full-scale development was not given until December 1985. The prototype C-17 was first flown on 15 September, 1991. The C-17 entered service in June 1993 with delivery of the sixth production aircraft.

Powered by four 165kN P&W F117 (PW2000) turbofans, the C-17 is similar in size to the Lockheed Martin C-141 Starlifter, but carries twice the payload. The C-17 has the same fuselage diameter as the Lockheed C-5 Galaxy, which enables it to carry the M-1 tank and other outside cargo over strategic distances to land on 900m unimproved airstrips.

Customer: USA 120 planned.

F-15 Eagle The last of 209 F-15E strike aircraft for USAF was delivered in July 1994, but production was resumed to fulfil orders from Saudi Arabia for 72 F-15Ss and from Israel for 21 F-15Is. The first Saudi aircraft was delivered in September 1995. MDC has submitted a proposal to restart F-15E production for the USAF, at a cost of \$50m or less per aircraft. The USAF has stated a requirement for additional aircraft.

The two-seat F-15E was selected over the arrow-wing Lockheed F-16XL in February 1984, and the first production aircraft was flown on 11 December, 1986. The rear cockpit has displays for radar, FLIR, digital map and threat warning, while the front cockpit has a wide-angle head-up display. Weapons are carried on low-drag tangential racks fitted to intake-mounted conformal fuel tanks and the F-15E retains full air-to-air capability. The conformal tanks accommodate more than 4,000kg of fuel, and up to 11,000kg of ordnance may be carried. The F-15E carries Lockheed Martin LANTIRN night navigation and targeting pods and the Hughes APG-70 radar is capable of high-resolution synthetic-aperture ground