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## COMMENT

# UNMANNED ERA

**S**IGNING OFF the Northrop Grumman RQ-4A Global Hawk unmanned air vehicle (UAV) for engineering manufacturing development and low rate initial production has ushered in a new era of defence capabilities.

While there has been talk of handing dull and dirty jobs to unmanned platforms for years, the Global Hawk is one of the few vehicles that could potentially make this desire a reality.

Global Hawk was designed as a long-range, long-endurance asset able to gather intelligence over extended periods, something a manned-platform cannot do. Already, however, the US Air Force and the manufacturer are identifying other areas where the UAV could excel – for example, signals and other types of intelligence gathering, communications relay and acting in concert with assets such as the Northrop Grumman E-8 Joint Surveillance Target Attack Radar System and Boeing E-3 Airborne Warning and Control System.

Next month the RQ-4A is to cross the Pacific and the bulk of Australia to an air base near Adelaide, where it will spend a month participating in exercises and demonstrating its utility

as a surveillance asset able to monitor the country's vast land mass and sea approaches.

Having been given the green light by Washington and with a major effort such as the Australian deployment under its belt, it is time for NATO and others to consider what use they can make of such a platform. In recent years a constant lesson from operations has been a need for more and better intelligence and surveillance assets, the very capability Global Hawk delivers.

As well as military tasks, Global Hawk could be used to monitor no-go areas created by the UN between warring parties, for humanitarian missions, studying the migration of refugees in areas of famine or monitoring the effects of natural disasters. Manned aircraft have made significant contributions in these areas but have always been hamstrung by limited endurance and the duty time limits to which pilots must operate. Inevitably this has led to holes in the overall picture.

Even with tight defence budgets, the utility offered by high altitude, long endurance UAVs is such that many countries should be considering an acquisition, now, and not in five or 10 years. **See Headlines P6**

# COLLISION COURSE

**O**NCE AGAIN Europe's airborne collision avoidance system (ACAS II) programme is facing a setback, with many operators standing no chance of meeting this month's deadline.

As with earlier European equipment mandates, the ACAS II programme has faced delays. But unlike other programmes, it has been hit by adverse circumstances completely out of the control of operators and Eurocontrol, which was tasked by European states to implement it.

Europe's ACAS II problems began a long time ago with the later-than-expected release by the US Federal Aviation Administration of the technical standard order for the new generation Version 7 equipment. The reverberations from that have rippled through the whole programme. As hard as Eurocontrol, equipment manufacturers, operators, certification authorities and others have tried to catch up, they haven't quite made it.

Eurocontrol is not letting up though, and neither should it. Only those operators with genuine ACAS installation and certification issues will get a reprieve – and only a limited one at that

until the end of September this year.

ACAS II implementation needs to be viewed in a wider context to appreciate its significance. It is not an isolated programme, but one piece of a much larger jigsaw. Not only can it significantly reduce the risk of mid-air collision or near mid-air collision – by at least a factor of two – but it is also vital for new measures which are intended to ease Europe's capacity problems. Chief among these is the crucial capacity-enhancing reduced vertical separation minima (RVSM), the safety case for which is dependent on successful ACAS II implementation.

European states have long been calling for measures to reduce the continent's airspace problems and now it is up to them to ensure that ACAS II implementation is followed through to ensure that capacity-enhancing measures can be realised. All states need to be tough on those operators not meeting the ACAS II mandate.

Rogue operators beware, as the larger states are already planning to step up ramp inspections to ensure the ACAS programme is the success that it is intended to be. **See Air Transport P14**



## Sabena head is top candidate to take reigns at SAirLines

CHRIS JASPER/LONDON  
HERMAN DE WULF/BRUSSELS

**S**ABENA PRESIDENT and chief executive Christoph Müller has emerged as favourite to succeed Moritz Suter as CEO of SAirLines following the former Crossair chief's resignation.

Müller is seen as one of the few high calibre managers left within the Swissair family, with Suter's departure following the dismissal of former high-flyers Philippe Bruggisser and Paul Reutlinger.

German-born Müller was made head of Sabena by part-owner SAirGroup last year, having joined the Belgian carrier as chief operating officer a year earlier, when he was head-hunted from Lufthansa.

SAir will not comment on the succession to Suter, but senior SAir sources describe reports linking Müller to the post as "valuable speculation", and say a decision should be taken this week.

Suter took over as head of SAirLines, the division encompassing SAir's airline interests, at the end of January. He resigned six weeks later with SAir saying he left "citing his inability to tackle the task with sufficient likelihood of success under the current SAirLines management structure". He continues as chairman of Crossair, at least in the short term.

Though Suter had been keen to sever SAir's costly links with Sabena and its loss-making French holdings, one SAir source says there was no great schism between him and SAirGroup chairman and acting CEO Eric Honegger, adding: "I don't think this will change the strategy."

The source says the real clash related to ill-feeling between Suter and senior SAir figures due to the uneasy Swissair-Crossair relationship. "There was a lot of opposition to Suter from within Swissair because of Crossair," says the source. "He found that because of that he could not run SAirLines in the way he wanted to." In a further twist, the bulk of SAir directors resigned last Friday, taking responsibility for the group's troubles. □

# CAAC to lose airline control as Chinese shake-up begins

NICHOLAS IONIDES/SINGAPORE

**A** LONG-PLANNED shake-up of China's aviation hierarchy is finally set to happen, with the Civil Aviation Administration of China (CAAC) to be ordered to give up ownership of the 10 airlines under its direct control, according to industry sources in China. It will instead be tasked solely with regulating the industry as a "technical entity".

The sources say China's cabinet or State Council has resolved to strip CAAC of equity ties to the 10 airlines. Though it is not clear whether the decision was taken formally or unofficially, the sources say "the resolve to change is finally there", and that - with China preparing for the membership of the World Trade Organization -

the changes will probably take place this year.

CAAC's stakes, held through unlisted airline parent companies such as China Southern's Southern Air Group and China Eastern's China Eastern Group, are to be transferred to a state-owned property management bureau under the State Council, which controls stakes in companies in other "strategic" sectors.

The ownership changes are likely to be carried out only after sweeping consolidation of the country's major carriers, although such a move may be imminent, with mergers on the agenda of a CAAC planning meeting later this month. Though opposed by some in the administration, the move should see the 10 carriers merged into three groups led by flag-carrier Air China and Hong Kong/New York-listed China Eastern Airlines and China Southern Airlines.

Under a draft plan already approved by CAAC, Air China will take over China Southwest Airlines and CNAC-Zhejiang Airlines; China Eastern will take over China Northwest Airlines, Great Wall Airlines and Yunnan Airlines; and China Southern will take over China Northern Airlines and China Xinjiang Airlines.

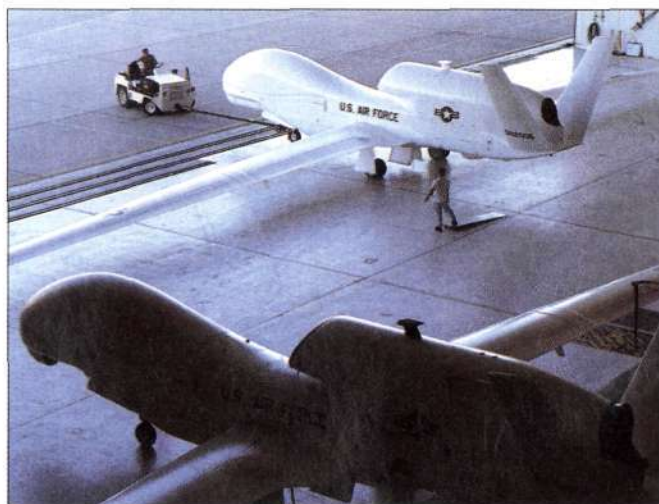
Questions remain over whether CAAC's commercial arm, China National Aviation (CNAC), will continue to control Air China, which is seeking a stock exchange listing. It also controls Air Macau and Zhejiang Airlines, and has effective control of China Southwest. Its Hong Kong-listed unit has the biggest stake in Dragonair. □

## Global Hawk gets initial EMD, production funds

**T**HE US DEPARTMENT OF Defense approved engineering and manufacturing development (EMD) and low-rate initial production of the Northrop Grumman RQ-4A Global Hawk unmanned air vehicle (UAV) on 6 March.

The high altitude, long endurance aircraft is the largest UAV yet approved for production. The vehicle has already flown non-stop from the USA to Europe and back and is being prepared for a mission to Australia.

The Acquisition Defense Memorandum endorses an estimated 12 months of EMD and fabrication of an initial six Block 5 production RQ-4As for the US Air Force, two launch/recovery elements and two mission control elements (MCE). MCE procurement is limited to five units until the USAF has finished trade-off studies between additional MCEs or uses the funds to accelerate development of an improved Block 10 configuration and deployment of



Northrop Grumman wants to build at least 100 Global Hawks for the USAF

Global Hawk sensors and systems.

Two Global Hawks will be funded per year until 2008 when the production rate will double. Production of at least 60 RQ-4As is planned for basic surveillance missions, but additional units could be built for other assignments, including

signals intelligence and communications relay. Northrop Grumman is capable of building 10 RQ-4As annually, and would like to provide the USAF with at least 100. The RQ-4A will be available for limited operations in fiscal year 2003. □



# New line-up for Dassault bizjets

JULIAN MOXON/PARIS  
GUY NORRIS/LOS ANGELES

**D**ASSAULT AVIATION is to replace its business jet range with a new line-up. The initial model, which will eventually replace the Falcon 900, is due to be revealed at the June Paris Air Show.

The French manufacturer has already issued a request for proposals to engine manufacturers with responses sought by the end of this month. Dassault also has long-term plans to replace the smaller Falcon 2000 and Falcon 50, along with their longer-range 50EX and 2000EX derivatives, but declines to reveal in-service dates for the new aircraft.

The Falcon 900 replacement, which will become Dassault's flagship product, will be officially launched at September's National Business Aviation Association Convention in New Orleans.

The aircraft is being designed



*The Falcon 900 range will be the first in line for replacement by Dassault*

primarily as an ultra-long range jet, reminiscent of the Falcon 9000, planned in the early 1990s to compete with the ultra-long range Gulfstream GV and Bombardier Global Express but abandoned due to concerns about development costs and market overload. Dassault focused instead on the longer range versions of the Falcon 900 and 50 and the transcontinental Falcon 2000. All were successful. Dassault

sold a record 90 jets last year.

Industry sources say the new aircraft will feature "totally new, innovative aerodynamics" enabling increases in cruising speed from Mach 0.8 to "around" Mach 0.9 and a 45,000ft (13,700m) cruise altitude – equivalent to the Falcon 2000. All models will be equipped with the new Honeywell-developed EASy cockpit set for service entry on the Falcon 900EX in 2003.

While the number of passengers at up to 15 will not increase, the new aircraft will have a "slightly larger fuselage", say sources, to provide for a crew rest area and additional space for passengers on ultra-long range flights.

Gulfstream and Bombardier are considering repositioning their respective GIV and Challenger 604 offerings upmarket, each of which would compete directly with the Falcon 900 replacement.

Sources say Dassault is looking for an advanced derivative rather than an all-new engine. Honeywell is understood to be considering responding with a new design using the architecture of the newly developed AS900 as a template. GE says it is not responding and Rolls-Royce and Pratt & Whitney Canada would not comment.

The move comes as Dassault announced record year-end figures, with sales up 20%, to €3.5 billion (\$3.3 billion). □

## Cathay Pacific reports record profits after Asia-Pacific recovery

NICHOLAS IONIDES/SINGAPORE

**C**ATHAY PACIFIC Airways has reported a record net profit of HK\$5 billion (\$641 million) for 2000, with traffic growth on the back of the Asia-Pacific economic recovery more than compensating for higher fuel costs.

The result is more than double

1999's net profit of HK\$2.18 billion, which ranked Cathay as the second most profitable carrier in Asia and ninth in the world, and catapults the Hong Kong-based airline back into the echelons of the industry's best performers. These figures follow Cathay's first loss in 35 years in 1998, when it was hard hit by the Asian economic down-

turn, which began in mid-1997.

Cathay's sales rose 20% last year to HK\$34.52 billion, operating profit was up 88% to HK\$5.28 billion and passenger load factor rose 4.8 points to 76.2%, with yields also up – results in marked contrast to some posted by other airlines in the region over the past two months. Asiana Airlines, Korean

Air, Malaysia Airlines and Thai Airways all suffered due to higher fuel costs, while Air New Zealand and Qantas Airways also reported sharp profit falls.

Taiwan's EVA Airways also showed a strong net profit last year, the figure doubling to NT\$2.51 billion (\$77 million) on sales up 13% to NT\$54.53 billion. □

## Australian audit advances Popeye missiles sale

PETER LA FRANCHI/CANBERRA

**A**USTRALIAN DEFENCE Minister Peter Reith has confirmed that an internal Department of Defence audit has been carried out into the proposed sale of the Royal Australian Air Force's PGSUS AGM-142 Popeye missiles to a third nation, possibly Greece. The missile would be replaced by Lockheed Martin's AGM-158 Joint Air-to-Surface Stand-off Missile (JASSM).

The audit, carried out by the DoD's Management Branch over the past three weeks at the minister's request, has found the proposed deals do not exceed Australian due process requirements.

The minister ordered the audit after formal complaints about the legality of the proposed deals were made by a Canberra-based defence industry lobbyist acting on behalf of unidentified parties. The complaints followed disclosure of the plans by *Flight*

*International* (6-12 February).

According to Reith's office, "a preliminary draft audit finding is that the departmental process leading to the development of the [AGM-142 sale/JASSM acquisition] business case is transparent. Due process has occurred."

The preliminary findings are understood to provide the Australian DoD with enough leverage to resume efforts to secure a deal. The move was suspended in mid-February after the complaints. □

### NEWS IN BRIEF

#### ■ WINGS FOR MITSUBISHI

Boeing has confirmed its offer of 747X wing production to Mitsubishi Heavy Industries. The Japanese company says it is considering the offer "seriously", but has made no decision. Kawasaki Heavy Industries has been offered fuselage components and Fuji Heavy Industries the wing-body fairings. Both plan to accept the offers if the 747X is formally launched.



## Penalty item forces AgustaWestland into Air 87 bid rethink

PETER LA FRANCHI/CANBERRA

**A**GUSTAWESTLAND may withdraw from Australia's Air 87 armed reconnaissance helicopter competition amid concerns that penalty clauses in a draft contract released by the Australian Defence Material Organisation (DMO) in mid-December are excessive and unrealistic because of tight delivery timescales.

The manufacturer is understood to have informed DMO that an A129I Scorpion bid is unlikely to be submitted when the tender closes on 30 April. Australian team member Tenix Defence Systems was instructed to cease work on the tender on 23 February.

But AgustaWestland Australian bid director Mark Coughlan says: "AgustaWestland is still working on a request for tender [RFT] response."

The expected withdrawal is based on DMO requirements for the winner to pay liquidated damages of 25% of the contract price if initial operational aircraft are not delivered by 2004.

That deadline is unchanged since the tender began in mid-1998, despite a two-year delay in releasing the RFT after Bell Helicopter Textron protested against being left off the shortlist.

The DMO released the RFT to AgustaWestland, Bell, Boeing and Eurocopter last December. A shortlist of two is due in mid-June, with a selection by the end of the year, although this is widely expected to slide into 2002. The order is due to be for 20-24 helicopters.

AgustaWestland's withdrawal is a major set-back for Tenix, which is now without a role on the largest single DMO project expected to be contested over the next six years. Until late last year, AgustaWestland had planned to undertake local assembly at the then Tenix-owned Hawker de Havilland (HDH) plant.

Last October, without informing its partner, Tenix announced the sale of HDH to Boeing, denying AgustaWestland a support base in the lead up to RFT release. □

# GATX to appeal against 747 conversion damages award

GUY NORRIS/LOS ANGELES

**G**ATX CAPITAL says it will appeal against damages of \$47.5 million awarded by a California court to Kalitta Air for alleged breach of contract and non-disclosure of information over the grounding of Boeing 747-100Fs modified by GATX/Airlog between 1988 and 1994.

GATX recently settled out of court with Evergreen International Airlines.

The appeal is the latest move in a long-running legal wrangle over the troubled conversion programme. It ran into problems in 1996 when the US Federal Aviation Administration issued an airworthiness directive (AD) restricting the loads that the 10 converted aircraft could carry. In the AD, the FAA stated that the original supplemental type certificates covering the conversion had been

issued by the agency "in error".

Operators of the converted aircraft, unable to fly profitably, stored them and sought compensation for lost revenues, lost profits, associated costs and damages. These included American International Airways, later assigned to Kalitta Air, which owned two of the freighters, Tower Air and Evergreen, which had three. In its turn, Airlog sought \$8.3 million damages in 1998 from the FAA, accusing it of negligence for approving the conversion in the first place.

This case was dismissed in August 1999, seven months after the FAA accepted that a series of Airlog service bulletins could remove the limitations of the AD. One Evergreen aircraft was returned to service by March 1999.

Litigation continued over the remaining nine aircraft, and in the first phase of a trial in a California Federal District Court last month,

the jury found against GATX/Airlog on two counts of breach of contract and non-disclosure of information. Before the second phase could begin, GATX settled with Evergreen out of court. Although the terms have not been disclosed, Evergreen's original claim was for around \$160 million. GATX also says it is taking a \$100 million financial charge for its 2000 results, reducing year-end profits to around \$64 million.

In the subsequent second phase, Kalitta was awarded \$47.5 million plus interest, which GATX is now fighting. "We strongly believe that no GATX employee acted unlawfully, and that the jury came to the wrong conclusion. Throughout the entire experience, GATX felt its legal position was sound. It is also extremely difficult to sue the FAA, which admitted the initial approval was issued in error," the company says. □

## Assembly of first 728JETs start



Fairchild Dornier has begun assembly of the first three 728JET fuselages at its primary production plant in Oberpfaffenhofen, Germany. The first wing for the 70-seat regional jet is being assembled by EADS-CASA in Spain, while the forward fuselage is under construction at SABCA's plant in Belgium. MAN Technologie in Munich has completed the first tail cone, which has been dispatched to Honeywell in the USA for compatibility testing with the RE 220 auxiliary power unit. The first 728JET is scheduled to fly early next year and enter service in mid-2003.

## NEWS IN BRIEF

### HAZELTON VICTORY

Air New Zealand-owned Ansett has won a five-month battle with Qantas for control of regional carrier Hazelton Airlines after securing Australian Competition and Consumer Commission approval for the take-over on 9 March after Ansett agreed to concessions primarily relating to surrendering 80 slots at Sydney.

### ICAHN UPS TWA BID

An investor group led by former Trans World Airlines chairman Carl Icahn has raised its offer for the ailing carrier to \$1.1 billion from \$650 million. The bid tops one of \$772 million from American Airlines. With the details of Icahn's plan still unclear American's bid remains favourite. (See Business P26)



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## Fuel ingestion tests continue drive to get Concorde airborne

DAVID LEARMOUNT/LONDON

ENGINE failure caused by fuel ingestion is to be tested on a rig as a part of the continuing programme to win back airworthiness certificates (CofA) for the Aerospatiale/British Aerospace Concorde fleet. Rolls-Royce confirms that it will conduct the tests on an R-R/Snecma Olympus 593 engine at Shoeburyness, UK.

British Airways' chief Concorde pilot Capt Mike Bannister points out that in the second interim report from the Bureau Enquêtes-Accidents (BEA), it was made clear that ingestion of fuel from the ruptured wing tank was a prime cause of the loss of power in the No 1 engine in the 25 July 2000 crash.

High-speed taxi tests by an Air France Concorde at Istres, southern France, in late January, have confirmed the behaviour of vapour injected from underwing nozzles, making clear the need to test the rate that fuel can be ingested before engine performance is impaired. Bannister points out that this must be established to validate the effectiveness of the new Kevlar/rubber fuel tank lining, intended to reduce fuel leakage in the event of tank rupture to a rate which does not endanger the aircraft.

BA hopes for test results by early May, says Bannister, but R-R is reluctant to predict a schedule.

Both airlines are acting to ensure that they can get the fleet airborne again when the CofA is returned. BA has received the seats for the long-scheduled cabin refit, and has reopened its refurbished Concorde lounge at London Heathrow. BA pilots have begun to prepare for a test flight designed to confirm that the fuel tank liners have no adverse effects on the aircraft's operation.

Maintenance engineers have revealed that the failure to fit an undercarriage spacer, reported by the BEA after studying the wrecked port gear on the crash aircraft, skews the bogey by up to 3°. Skewing could cause the tyres to heat up, the engineers say. The BEA interim reports have not cited evidence of this. □

# Air France CF6 failure leads FAA to order modifications

GUY NORRIS/LOS ANGELES

THE US FEDERAL Aviation Administration has issued new airworthiness directives (AD) covering urgent inspections and modifications to General Electric CF6-50 engines following an uncontained failure on an Air France Boeing 747-300 on an engine that already complied with the current AD.

The failure on 4 February involved a CF6-50E2-powered 747-300 after the aircraft landed. The engine's second stage low pressure turbine (LPT) nozzle lock assemblies had been visually inspected and the borescope plug replaced with a new design.

The engine had not, however, been ultrasonically inspected or equipped with additional bolts on the LPT casing, as outlined in recommended actions contained in GE's service bulletins. These actions are mandated by the latest AD, and pave the way for the even-

tual replacement of a new CF6-80C2-based nozzle lock assembly design throughout the affected fleet of 1,600 engines, most dating from the 1970s and early 1980s.

The problems stem from three uncontained failures on CF6s which struck Continental Airlines McDonnell Douglas DC-10s from April to September 2000. The turbine break-ups were traced to failures of the second stage LPT nozzle lock studs which machined their way through the casing by the force of the gas exhaust.

Last October the FAA issued an AD ordering operators to inspect the locks on engines, and to replace missing or loose studs before the next flight. It also ordered that the new LPT borescope design be installed on the three rows of the affected LPT nozzle areas.

The latest AD embraces both earlier actions, GE's recommended service bulletin actions, and plans for longer-term corrective modifications. It includes installa-

tion of the solid borescope plug for engines that have not already complied with the earlier AD, initial and repetitive ultrasonic inspections of second stage LPT nozzle assembly lock studs made from Waspalloy. It also calls for lock assemblies to be replaced with the new design before further flight if they are found to be cracked, loose or have missing studs. Additional locks should also be bolted on "if no indications of nozzle rotation are found, as an interim action to allow time to arrange for a shop visit within 3,500 cycles in-service".

The AD also calls for inspection of the area around the borescope plug for buckling or cracks, inspection for loose/missing nozzle locks and LPT case cracking around the added locks every 750 hours time-in-service. It also calls for replacement of the nozzle lock assembly with the new design before further flight if any LPT case buckling or cracks, or evidence of nozzle segment rotation, are found. □

## Bomb suspected in explosion on parked Thai 737



A Thai Airways International Boeing 737-400 has been destroyed, apparently by a bomb, while parked on a stand at Bangkok International Airport on 3 March. One of the cabin crew was killed and seven crew and ground staff were injured.

The explosion and subsequent fire occurred about 35 min before Thailand's Prime Minister Thaksin Shinawatra was due to board the domestic flight to Chiang Mai. Damage suggests the explosion took place somewhere forward of the port wing.

The auxiliary power unit was running to provide power and air conditioning to the aircraft. The motive is unknown but local speculation centres on an assassination attempt or a business conflict within Thai or the Airports Authority of Thailand.



# GE reveals high-pressure future

GUY NORRIS/LOS ANGELES

GENERAL Electric is studying a long-term strategic engine development plan to create a new family of scaleable powerplants combining the basic architecture of the CFM56 and CF34-10 engines with the very high pressure (HP) ratio of the GE90.

"I'd like to combine these and go to a lower number of stages, and have a pressure ratio in the order of 55 to 60 with a single-stage turbine. This is the vision," says GE advanced engineering general manager, Mike Benzakein. "We believe the technologies necessary to make this happen should be available by 2010, and the resulting products should become available in the following decade," he adds.

The strategy is aimed at lowering the overall cost of ownership, says Benzakein. "We've spent a lot of time over the last two years

looking at how to improve reliability and performance, increase simplicity, reduce emissions and lower noise." The answer, he says, is to combine the two-shaft, single-stage HP turbine configuration of the regional and narrow-body engines with the high overall pressure ratio (PR) levels of the GE90. The big engine, developed for the Boeing 777, has an overall PR of almost 43:1 compared to around 28:1 for the smaller engines.

The strategy hinges on two developments already under way: the TECH56 improvement effort for the CFM56 family and other spin-off GE applications, and NASA's Ultra Efficient Engine Technology (UEET) programme. Targets for TECH56, relative to the CFM56-7, include a 4% to 7% fuel burn improvement and 15% to 20% lower maintenance costs, a reduction of nitrous oxide (NOx) emissions to 50% below ICAO lev-

els and a cumulative 20dB noise level margin relative to FAR36 Stage 3. The UEET goals are sized against the GE90 and include a 10% fuel-burn reduction, a 10dB noise reduction and a further 20% cut in NOx as well as a 50% operating cost cut.

Under UEET, which also involves Pratt & Whitney, the PR is being raised from 42 to as much as 60, while compressor exit temperature (T3) will be raised by a relatively modest 38°C (100°F). Turbine inlet temperature will also be raised 93°C to boost performance, while stage count will be reduced from 22 to 15 to lower maintenance cost. "We intend to redefine the state of the art," says Benzakein.

Discrete enabling technologies being explored include high-swept fan blades with suction side-bleed, which increase PR but still maintain adequate stall margin, case

treatments by the compressor to improve stall margin, a 20:1 PR six-stage compressor and a new low emission combustor with a ceramic matrix composite liner.

The UEET programme is also targeting a single-stage 5.5 PR HP turbine versus the 4.5 PR unit being developed for TECH56. It will also include a counter-rotating, low-pressure turbine similar to military designs like the YF120. "It should give us a 1% improvement in overall turbine efficiency," says Benzakein.

GE also plans to introduce new technology features developed through these initiatives into current or near-term development engines, should the market warrant it. Chevron nozzles, for example, have been tested on TECH56 as a noise reduction feature, and will be baseline on the CF34-8C5 engine for the Bombardier CRJ900. □

## FAA orders 767 series elevator checks

BOEING 767 series operators are to examine their fleets for elevator system faults, according to a Federal Aviation Administration airworthiness directive.

The FAA is quick to point out that it has received "no factual information that indicates that this condition is related to an accident involving a Boeing 767 series aircraft that occurred off the coast of Massachusetts".

The cause of that accident – the 31 October 1999 EgyptAir crash killing all 217 people on board – is still under investigation, the FAA points out.

Operators must check the condition of the shear rivets in all six bellcrank assemblies for the elevator power control actuators within 90 days.

An earlier Boeing alert service bulletin had advised repetitive tests of the elevator rigging to ensure that it was rigged correctly, using one hydraulic system at a time and comparing the action of the control surfaces. □

## Material shortage holds up Mylar insulation replacement on MD-11s

TIM VAN BEVEREN/MIAMI

A SHORTAGE of the new insulation blanket material to replace the metallised Mylar in current use is holding up Swissair's Boeing MD-11 fuselage insulation modification programme, according to the airline's maintenance organisation SR Technics. The airline says it had planned to have three aircraft modified by now, but has only been able to complete two.

The replacement was directed by the US Federal Aviation Administration when it became apparent that the flammability of the Mylar may have contributed to the 2 September 1998 Swissair disaster near Halifax, Nova Scotia, Canada.



Shortage of insulation material has caused delay


Boeing says it is "adding capacity, though that's a process that takes time. We have a finite amount of capacity and are working with our customers to produce the

blankets in time for maintenance overhaul. It is working for people that ordered in time for their maintenance issues." SR Technics says that it is crucial to deliver on time for scheduled overhaul, or the aircraft have to be taken out of service again just for insulation work.

The FAA has confirmed that, with Boeing, the Canadian Transportation Safety Board and MD-11 operators, phase four of an MD-11 modification programme has begun with the publication of nine further Notices of Proposed

Rulemaking for circuit-breaker and wiring modification, and insulation replacement in cargo compartments. The deadline for comments is 6 April. □





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## MARKETPLACE

**++ China's Zhejiang Airlines** is to lease three new Airbus A319s from **CIT Aerospace** in early 2002 to replace three Bombardier Dash 8-300s. Meanwhile CIT has placed firm orders for 20 Boeing 737-700s and five 757-300s plus five options. The 737s will be delivered over three years beginning in March 2003, while the 757s will be delivered between early 2003 and early 2004. **++ Dutch** commuter airline **KLMmexel** will replace its four 30-seat Embraer EMB-120 Brasilias with up to three 46-seat ATR 42s for its 2001 summer season. **++ UK** charter airline **Air 2000** has completed fleet renewal deals for up to eight Rolls-Royce RB211-535E4-powered Boeing 757-200s. Four aircraft will be delivered in early 2003 on operating lease from **CIT**. Air 2000 will receive four more 757s through to 2005. The London Gatwick-based airline has conversion options for the larger 757-300 and longer range -200ERX, which it is currently evaluating. **++ Delta** Air Lines' low fare arm **Delta Express** is to acquire eight additional Boeing 737-200s over the next eight months. The airline is eyeing the 737-700 to cater for growth beyond 2002.

# Exemptions for operators who fail the ACAS deadline

EMMA KELLY/LONDON

EUROPEAN Civil Aviation Conference (ECAC) countries are being forced to implement an "exceptional exemption procedure" for the continent's airborne collision avoidance system (ACAS II) programme. The move is due to operators failing to meet the deadline at the end of this month as a result of technical and supply problems with some ACAS equipment.

The first stage of Europe's ACAS II mandate requiring all civil fixed-wing turbine-engined aircraft with a maximum take-off weight exceeding 15,000kg (33,000lb), or more than 30 seats, to be equipped with the latest Version 7 traffic collision and avoidance system (TCAS) equipment, came into effect on 1 January 2000. Phase two - affecting aircraft exceeding 5,700kg or more than 19 seats - follows in January 2005.

Delays by the US Federal Aviation Administration releasing the technical standard order for Version 7 equipment and hold-ups

in system availability, installation and certification, forced Eurocontrol to introduce a transition period to provide operators unable to equip their fleets by January 2000 with exemptions. That period ends on 31 March.

Now, however, due to technical, maintenance and interface issues affecting some systems, ECAC states have agreed to an exceptional exemption procedure. The problems are unforeseen "minor issues" which have delayed system certification and prevented some operators from meeting this month's deadline, says John Law, Eurocontrol's ACAS programme manager. So far, Eurocontrol has been informed of problems by 53 operators involving 190 aircraft, says Law.

To qualify for the exceptional exemption operators must prove that they have an order for Version 7 equipment and an installation date. The latter must not be beyond 30 September - after which there will be no "further respite".

There will be no extension to the

transition period, stresses Law, and those unable to show they intend to meet the ACAS mandate will not qualify for an exemption. Non-compliance on economic grounds will not qualify. Eurocontrol has been approached by operators of about 124 older aircraft requesting exemptions, but "we are not authorised to give exemptions on that basis", says Law. Enforcement of the ACAS mandate is the responsibility of individual states, a number of which intend to aggressively increase ramp inspections to ensure compliance. Despite the problems, Law says operators, TCAS equipment suppliers, service centres and certification authorities have made "quite extraordinary efforts to achieve compliance".

The ACAS programme is being closely monitored by Eurocontrol's reduced vertical separation minima (RVSM) programme office, with any further slippage likely to jeopardise the introduction of capacity-enhancing RVSM in Europe next January. □

## Cypriot liberalisation gives carriers green light for expansion

GERALD BUTT/NICOSIA

THE CYPRUS Government has for the first time granted licences to private Cypriot carriers to operate scheduled as well as charter flights from the island.

In the first stage of a liberalisation programme designed to enable Cyprus to meet European Union requirements ahead of accession to the union, the government has granted licences to Cyprus Airways' charter arm Eurocypria to operate weekly flights to Rhodes, and to Helios Airways to introduce weekly services to Belfast, Dublin and Sofia. Both operators say they will be inaugurating the new routes before their summer 2001 season begins at the end of this month. A third



Liberalisation in Cyprus allows Eurocypria to take off to new destinations

licence has been issued to Aerotrans, but details about the carrier's plans have not been announced.

Licences for other operators and more destinations are expected to be announced in time for services

to begin next year. But there are no signs yet that the national carrier, Cyprus Airways, is about to give up its monopoly on the lucrative scheduled routes between Larnaca and destinations in the UK.

In a further move towards

greater liberalisation, the Cyprus Government has invited expressions of interest for the development and operation of Larnaca and Paphos airports at a total cost of around \$320 million. As part of the concessions, offered on a build-operate-transfer style contract, the successful bidder will be required to construct passenger terminals at both airports, increasing annual passenger handling capacity at Larnaca from 4.9 million to 7.5 million, and at Paphos from 1.4 million to over 2 million.

Most major European airport operators had shown interest in the projects, prompting the government to establish a prequalification phase closing on 23 March, with a view to awarding tenders at the end of this year. □



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# HAL/Ilyushin link on new twinjet

PAUL DUFFY/MOSCOW

**H**INDUSTAN Aeronautics (HAL), the Ilyushin Aviation Complex and Aviaexport have agreed to jointly develop a twinjet multi-role transport dubbed the Il-214.

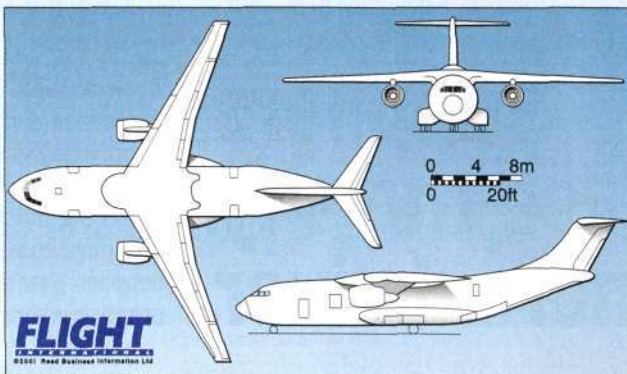
The agreement, signed recently, calls for the creation of a high winged, twin-engined aircraft for passenger, cargo and tactical roles.

Ilyushin says that the \$300 million development cost will be met by India. The programme's timetable has not yet been defined.

Under the current proposal, the aircraft will have a maximum take-off weight of 55t, and will be powered by a turbofan engine with 21-23,000lb thrust (93-102kN). Candidates include the Rolls-Royce BR710 or Russian-built Progress D436T.

The Il-214 will be able to carry a maximum payload of 18.5t in a cabin which is 3m high, 17.8m long

## ILYUSHIN II-214 SPECIFICATIONS



Dimensions		Powerplant	
Length	33.2m	2 x 21-23,000lb-thrust (102kN) turbofans	
Span	30.1m	Performance	
Height	10m	Range	5,000km
Cabin length	17.8m	(with optional auxiliary fuel)	6,000km
Cabin height	3m	Cruise speed	432kt (800km/h)
Weights		Maximum speed	460kt (850km/h)
Maximum take-off	55t	Maximum altitude	36,000ft
Maximum landing	49.5t	Take-off distance	1,300m
Maximum payload	18.5t	Landing distance	1,200m

and has a floor width of 3.15m. Non-passenger versions will feature a tail loading ramp.

Although the requirement for a new generation light tactical transport comes from the Indian air force, the cargo version will be the first to be developed, followed by a 100-seat passenger model and then the tactical airlifter.

The Indian air force needs a replacement for the more than 110 Antonov An-32 turboprops which it currently operates.

The Russian and Indian aerospace industries' most recent civil collaboration is the Saras 14-seat turboprop, which has been in development for over a decade. Russia's Myasishchev design bureau had been involved in the project, but India is now pursuing the project alone, and aims to begin test flying a prototype later this year (*Flight International*, 20-26 February). □

## NEWS IN BRIEF

### ■ SURVIVABLE CRASHES

Around 53,000 passengers and crew survived US commercial airline accidents over an 18-year period ending last December, according to a study on crash survivability by the US National Transportation Safety Board. Of the 2,700 people involved in the serious crashes, 57% perished in the crash, five times more of them from impact rather than fire.

### ■ AIR SICILIA RESTARTS

Air Sicilia has been granted clearance from Italy's civil aviation body ENAC to restart operations with its Boeing 737s after re-organising its technical support and maintenance department. The authority had given Air Sicilia two months to comply after the discovery of maintenance shortcomings (*Flight International*, 6 - 12 March).

## US IFE systems under scrutiny

**T**HE US FEDERAL Aviation Administration has released for comment 14 airworthiness directives (AD) affecting in-flight entertainment (IFE) and telephone systems which could result in IFE systems being de-activated, removed or modified on at least 74 US-registered aircraft.

The FAA stresses that the ADs are unrelated to the crash of the Swissair Boeing MD-11 off Nova Scotia, Canada, in September 1998, although the body did embark on a detailed study of IFE systems after the crash.

The Interactive Flight Technologies In-Flight Entertainment Network (IFEN) system installed on the Swissair MD-11 was subject to investigation due to heat damage found on IFE wiring recovered from the crash. Although the IFEN has never been identified as the cause of the crash, installation problems involving that specific system prompted a wider FAA review of IFE systems.

The ADs, which are open to

comment until 16 April, will allow flight crews to switch off the IFE/telephone systems, which can currently remain powered. They affect Boeing 737-300s and -700s, 747-100s, -200s, -400s and -SPs, 757-200s, 767-200s, -300s and -300ERs, McDonnell Douglas DC-9-51s, DC-10-30s and MD-83s, and Airbus A340-200s. The main airlines affected are American Airlines, Continental Airlines and Hawaiian Airlines, with modifications to cost up to \$170,533 per aircraft. Operators will have 18 months from the date of the ruling to comply.

The FAA's IFE investigation revealed that some entertainment systems cannot be turned off without removing the power from other required systems; some systems can only be deactivated by pulling circuit breakers; and in some cases procedures for deactivating the entertainment system are not available to flight crew. The agency is developing four similar IFE ADs affecting different aircraft. □

## EVA to fly over Siberia after years of talks

**E**VA AIRWAYS has become the first Taiwanese carrier to operate flights over Siberia after seven years of discussions between the Taiwanese and Russian authorities.

The carrier launched non-stop services to Paris from Taipei on 2 March soon after securing the overflight rights, replacing services operated since 1993 via Dubai. Paris flights now take 14h and 10min, it says, compared with 18h and 20min previously.

In September 1997 the Taiwanese and Russian authorities said a bilateral agreement had been signed that would lead to the launch of the first flights in March 1998 but no services were ever inaugurated, partly because China Airlines wanted rights to operate beyond Moscow to other European cities, starting with Frankfurt.

Russia refused to initial any sort of air accord with Taiwan until 1997 for fear that it would upset China, which regards the island as a renegade province. □



# Boston Logan to get tough with below-par carriers

RAMON LOPEZ/WASHINGTON DC

**B**OSTON LOGAN International is the first US airport to threaten sanctions against its airline tenants for shortfalls in performance.

The Guaranteed Passenger Standards programme, which went into effect on 26 February, could, however, face a legal challenge should the Massachusetts Port Authority ("Massport"), which oversees Boston Logan International, carry out its threat against airlines.

Increasingly, airport operators are taking a stand against airline delays and customer complaints over poor airline services.

Earlier this year, The Port Authority of New York and New Jersey pressured the US Federal Aviation Administration to impose a slot lottery at New York's LaGuardia Airport in an effort to relieve major service delays. San

Francisco International has also threatened to slash flights in a bid to cut delays.

Massport has initiated a precedent-setting initiative to penalise airlines for poor performance. Yet to be resolved is whether the airports have the legal rights to carry out such sanctions.

Logan International has set criteria for airline performance. The monitoring is ongoing and Massport will levy penalties against airlines that fail to meet the service standards for baggage delivery, ticket issuing and flight information updates. "At Logan our passengers will have rights and Massport will defend those rights," says Mark Robinson, Massport's chairman.

If the problems are not resolved after several warnings, Massport will impose penalties against offending carriers, including the loss of gates, waiting areas, ticket counters and administrative

offices. "We will provide lots of notifications. We hope and expect not to assess any penalties," says Massport, adding that its lawyers blessed the programme. "We're comfortable with the programme as it stands," says Massport, which says that no airline to date has launched a legal challenge.

The US Department of Transportation has yet to take a position on the matter. It does not plan to become involved unless a complaint is filed.

Affected airlines say the action is neither adequate nor legal. They say it fails to address airport-related headaches such as road and parking congestion: "It is not lawful because it is pre-empted by the Airline Deregulation Act, which prohibits a state or local agency such as Massport from exceeding its proprietary powers as an airport operator by attempting to regulate airline prices, routes or services," the airlines contend in a letter. □

## WORKSHOP

**++ Alitalia's** maintenance company **Atitech** expects to start operating from a new plant in Grottaglie-Taranto by October. The former Alenia Aeronautica plant was built for assembly of the Boeing/BAE Systems Harrier II but was never used in this role. Atitech has purchased the plant, which will initially perform "heavy" maintenance work on Boeing MD-80s and later expand to include the Boeing 737. **++ Dresden,** Germany-based **EADS EFW** has obtained a supplemental type-certificate from the US Federal Aviation Administration and Germany's LBA for its Airbus A310-300 freighter conversion, clearing the way for deliveries to initial customer **FedEx**. **++ Aero-navall** is converting a further three Boeing MD-11s to cargo for **FedEx**. Two aircraft have been bought from China Airlines, and one from GATX. Deliveries are due in late April, July and August. **++ Ansett Australia & Air New Zealand Engineering Services** has won a six-year A\$150 million (\$80 million) contract for maintenance support on 50 "aero-derivative" gas turbines for natural gas producer El Paso Corp. The engines will be shipped to Auckland from North and South America. **++ GB Airways** has signed a 10-year "fly-by-the-hour" maintenance contract with **MTU** for the International Aero Engines V2500s on its Airbus A320/A321 fleet. **++ AAR Aircraft Services** has won contracts from **Dynair** and **Lear Siegler** for repair and overhaul support of over 400 propellers on US Army Raytheon C-12 (King Air) and Fairchild C-26 (Metro) aircraft. The contracts are for 10 and five-year terms, respectively. AAR's Oklahoma division has won a contract to do end-of-lease "exit checks" on 25 Boeing MD-80s and -90s acquired by **American Airlines** when it bought Reno Air in 1999. **++ London Gatwick-based** charter airline **Excel Airways** has signed a long-term maintenance deal with **FLS Aerospace** for its 737-800s.

## Nordeste benefits from Rio Sul ERJ order boost

MARIO FONSECA/RIO DE JANEIRO

**R**IO SUL, the São Paulo-based Regional affiliate of Varig, has converted options on 15 Embraer ERJ-145LRs in a deal worth \$250 million.

Deliveries of the new aircraft will begin in June, and continue until December 2003. Rio Sul will take six of the new 50-seaters, while nine will be operated by the airline's Salvador, Brazil-based subsidiary Nordeste, which has been operating a trio of ERJ-145s since last year under an agreement with Rio Sul. The results garnered from this lease spurred inclusion of Nordeste in this latest order for the ERJ-145.

"Conversion of the ERJ-145 options allows us not only to replace our turboprop fleet, but further enhance Rio Sul's and Nordeste's services over the entire



Some of Rio Sul's new ERJ-145s will be operated by its affiliate Nordeste

scope of their route network", says Rio Sul chief executive Dr Percy Rodrigues.

Rio Sul operates seven Embraer EMB-120 Brasília turboprops, at least three of which are expected to be retired this year. Nordeste has six Fokker 50 turboprops and three Brasília.

Rio Sul has 15 ERJ-145s, and the addition of further examples will

allow the carrier to expand its route network.

The airline is seeking approval for more regional routes, some of which are earmarked for ERJ-145s operating from the airline's hub at São Paulo's Congonhas Airport. But with few slots available and stand availability at a premium, no permit has yet been granted for these additional services. □





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## V-22 Osprey tiltrotor programme review nears completion

THE INDEPENDENT panel of experts brought in to review the Bell Boeing V-22 Osprey tiltrotor programme is expected to complete its examination of the troubled project and make recommendations to US Defense Secretary Donald Rumsfeld next month. Meanwhile, Gen James Jones, the US Marine Corps commandant, is denying that the USMC is considering alternatives to the Osprey.

The four panel members, including retired USMC Gen John Dailey and former Lockheed Martin chairman Norman Augustine, were selected to consider the \$40 billion programme in the wake of fatal crashes in April and December last year.

The MV-22 Osprey production decision has been delayed pending the outcome of several ongoing investigations, including the independent probe. At stake is USMC procurement of 360 MV-22Bs and US Air Force purchase of 50 special operations CV-22As.

Fact-finding visits were conducted last week to facilities associated with the project including the USMC V-22 training unit, US Special Operations Command headquarters, the Amarillo, Texas, final assembly plant as well as Bell and Boeing engineering and production centres. An open meeting on 9 March gathered information from the public.

Jones stands behind the V-22, stating that the Osprey remains the USMC's aircraft of choice. "There has been no watershed event that has prompted me to ask for a search of options or a study of alternatives to the Osprey. Nor do I have any information that would lead me to believe that this important programme is in peril," he adds.

Meanwhile, the DoD's Office of Inspector General has widened its separate V-22 probe. Investigators have taken data from computers of two USMC generals to see if they aided alleged falsification of Osprey maintenance records. The training squadron commanding officer was relieved of his duties pending the investigation's conclusion. □

# Europeans sign up to begin targeting pod development

STEWART PENNEY/LONDON

A GROUP OF European Nations is poised to begin development of a common targeting pod to replace the host of systems currently in service.

France, Italy, Spain and the UK were due to sign a statement of intent to develop a next generation electro-optical, day/night targeting pod as *Flight International* went to press. Germany may join later.

A technology demonstrator is to be produced as a result of work already completed on the UK-French Joint Airborne Navigation and Attack (JOANNA) system.

David Lascelles, sensor, avionics and navigation systems integrated project team leader at the UK Defence Procurement Agency (DPA), says a JOANNA contract is soon to be signed with a BAE Systems/Thales team.

JOANNA is a risk-reduction exercise developing technology for a fourth-generation pod known as ASTRID (Airborne System for Target Recognition, Identification and Designation). Work on the new pod will be expanded to include Italy and Spain.

ASTRID will be designed to provide improved platform survivability by allowing greater stand-off ranges and will be better suited to today's operational environment, which has strict rules of engagement and demands for zero collateral damage.

Because of the increased number of single-seat fighters entering service, ASTRID will have greater automation, including target recognition and non co-operative target identification using laser illumination techniques. As with JOANNA, the UK will be ASTRID programme leader.

Lascelles hopes the statement of intent covering ASTRID and the related Four Nation JOANNA technology demonstrator will become a firm memorandum of understanding by the end of this year.

Meanwhile, the UK is negotiating to upgrade its BAE Systems TIALD targeting pods to incorporate lessons from Operation Allied Force against Yugoslavia in 1999.

Lascelles says the resulting TIALD 500 will have a second generation thermal imager to improve stand-off ranges, target identification and recognition and to allow some battle damage assessment.

The upgrade will also have an inertial measurement unit within the pod to counter some of the latency problems caused by the transfer of navigation data from aircraft systems to the pod. □

## Sukhoi fighter updates make debut appearance

RUSSIA HAS unveiled an upgraded version of the Sukhoi Su-27 Flanker and an improved variant of the Su-30. Meanwhile, Russian state arms export agency Oboronexport has granted an export licence for the Su-27M (Su-35).

The Su-27UBM, an upgrade of the two-seat Su-27UB, was displayed at the Zhukovski test airfield outside Moscow last week.

The upgrade was developed by at Sukhoi design bureau, the Irkutsk factory in Siberia - where the Flanker is built - says the Russian air force, and includes colour multi-function cockpit displays, a datalink and a phased array radar. The Su-30KN, meanwhile, is an update of the Su-30 long-range fighter.

According to Itar-Tass, air force commander Gen Anatoli Kornukov six Su-27IBMs and six Su-30KNs have been ordered while 20 could be upgraded this year. Clearance of the Su-27M for



Russia is upgrading its Su-27UBs to UBM standards with new avionics

foreign sales is seen as part of the campaign to sell the fighter to South Korea for its 40-aircraft F-X requirement. The Boeing F-15K Eagle, Dassault Rafale and Eurofighter Typhoon are also contenders.

Russia has a \$1.9 billion debt to South Korea, and Seoul has exchanged BMP armoured per-

sonnel carriers and Kamov Ka-32 Helix helicopters for earlier debt.

Meanwhile, Sukhoi is considering the creation of a maintenance centre in Vietnam as part of a bid to sell more Su-27s or Su-30MKs to Hanoi. According to the local *Lao Dong* newspaper, the maintenance facility could upgrade Vietnam's Sukhoi Su-22M4 Fitters. □



# Bell/Honeywell to support Huey

GRAHAM WARWICK/WASHINGTON DC

AS THE ORIGINAL manufacturers of the UH-1 'Huey' and its T53 engine, Bell Helicopter Textron and Honeywell have joined forces to support foreign operators of the helicopter after it is withdrawn from US military service in 2004.

The US Army plans to transfer support of foreign-operated aircraft to the commercial market, and the Bell/Honeywell team is bidding to become the US Government's chosen contractor for the more than 3,700 UH-1s and single-engined AH-1 Cobras still in service worldwide.

The US Army announced in October last year that it will discontinue support for UH-1s after 30 September, 2004 and for AH-1s after 31 December, 2002. More than 3,000 Hueys and an estimated 700 single-engined Cobras are still flying, and the two helicopter types are expected to remain in service for at least another 20 years.

Under the commercial concept, operators will have the option of obtaining support from the chosen contractor either directly or through the existing US Government Foreign Military Sales system. The US Army plans to consign its spares inventory to the commercial contractor.

In addition to providing repair and overhaul services to operators,

the Bell/Honeywell team proposes to refurbish aircraft to a configuration that is commercially sustainable. Bell already offers the Huey II upgrade, which incorporates airframe and dynamic components from the commercial Bell 212. The helicopter's Honeywell T53 turboshaft can also be brought up to commercial standard.

Transferring Huey support to

the commercial market could stimulate demand for re-engining and other upgrades. Including the Huey II, no fewer than four re-engining options have already been developed for the UH-1, but there have been few takers so far.

Pratt & Whitney Canada announced in February it is to offer a fifth re-engining option, with its PT6C-67D. Arlington, Texas-based Global Helicopter Technology (GHTI) will develop and certificate the installation and has begun modification of an aircraft for flight testing beginning in July.

GHTI previously developed re-engining installations for the Honeywell T53-703 and LHTEC T800 in the Huey, but says these programmes are essentially dormant as is the General Electric T700 upgrade developed by US Helicopter. The PT6 flight test aircraft is, in fact, one of several T800-powered UH-1s evaluated by the US Border Patrol. The PT6-powered UH-1 is set to be certificated early in 2002. □



Support of the venerable Huey is to be handed to industry

## Dutch join European EHUD operators club

ISRAEL AIRCRAFT Industries' MLM division has won a further contract for its EHUD autonomous air combat manoeuvring Instrumentation (ACMI) systems from a European NATO air force.

The Royal Netherlands Air Force (RNLAf), which has ordered 24 units, follows the air forces of Belgium, France, Germany, Italy, Portugal and the UK in signing up for the EHUD pod. The common procurement of the pod provides interoperability throughout Europe and allows untethered air combat training anywhere in Europe. Previously air forces have been forced to use fixed-position ACMI ranges for such training.

Cubic Defence Systems is the prime contractor for the Dutch programme, worth \$9 million with MLM's share worth \$7 million. MLM is working with contractors such as Germany's BGT and Matra BAe Dynamics in the UK. □

## Sea King 7 nears service trials

STEWART PENNEY/  
BOSCOMBE DOWN

THE FIRST production standard Westland Sea King AEW7 airborne early warning and control helicopter is due to be handed over to the UK Royal Navy next month for ground and air trials.

Lt Cdr Stan Hargreaves, Sea King AEW7 trials officer at the Defence Evaluation and Research Agency, Boscombe Down, says 54-60 sorties are planned from RAF St Mawgan in Cornwall, chosen because it is near the sea. Initial trials will be ground-based radio environment tests before flying starts in the third quarter.

Flight testing on the production helicopter follows trials at Boscombe Down using a surplus Sea King equipped with the new radar and man-machine interface (MMI). Hargreaves says around 50h have been flown in the aircraft since last October and it is planned

to fly a further 70h on the machine.

As with the in-service Sea King AEW2A, the AEW7 uses a Thales Defence Searchwater radar, although the new sensor has a 30-40% range improvement as well as a pulse-Doppler mode in addition to the pulse envelope and maritime surveillance capabilities of the earlier system.

Pulse Doppler gives the helicopter improved lookdown and overland capabilities. Together these improve operational performance and better suit the system for the littoral environment, says Hargreaves. It is also possible to interleave the radar modes to suit the operational environment.

The AEW7 upgrade introduces the Link 16 datalink to the Sea King, improving its interoperability with other airborne control assets such as UK Royal Air Force and NATO Boeing E-3 Sentrys, and improving the link between the helicopter and fighters. □

## NEWS IN BRIEF

### ■ CO-OP ENGAGEMENT

US Navy TECHEVAL testing of its Co-operative Engagement Capability (CEC) in February and earlier this month was successful, paving the way for OPEVAL in April and May. CEC links ships, aircraft and shore-based systems, allowing engagement by a number of systems.

### ■ USMC BORESCOPE

The US Marine Corps expects to save \$10 million in annual maintenance costs by using a device developed by Pratt & Whitney for commercial engine repairs. Blendable borescope technology allows the repair of Boeing/BAE AV-8B engine blades without removing the powerplant. The grinding tool is inserted into the engine through servicing ports.



# Bell sets sights on Australia to boost Eagle Eye chances

PETER LA FRANCHI/CANBERRA

**B**ELL HELICOPTER Textron has unveiled plans to transfer development of its TR911 Eagle Eye tiltrotor unmanned air vehicle (UAV) to an Australian consortia. The move is part of local offset requirements linked to the Australian Army's Air87 armed reconnaissance helicopter requirement.

The new company, to be known as UAV Australia (UVAL), would be majority owned by Australian investors, including Bell's Australian representatives Helitech Industries, but with the US helicopter manufacturer retaining a minority shareholding.

UVAL would hold all licences to the TR911 series, and take over final development, test, evaluation and production of the UAV, with Bell providing marketing support. The deal depends, however, on Bell winning Air87.

A complication could arise as BAE Systems is also seeking to have final development of the UAV transferred to the UK. BAE is one of four consortia funded for Watchkeeper studies from the UK Ministry of Defence. Bell is part of the BAE Watchkeeper team, along with Cobham subsidiary Flight Refuelling, which is expected to build the tiltrotor UAV if it is selected.

Helitech last week claimed that the Eagle Eye has a market potential of 80 export sales a year between 2004-2010 based on a basic airframe costing under \$1 million per unit without sensors or ground control station. If fulfilled, this would achieve revenues in the order of \$100-120 million per annum over the period. However, according to Helitech group general manager, Joe Moharich, "a difficulty we have is in generating hard data on the size of the market

for a tilt rotor UAV". Eagle Eye was a losing submission in the US Navy's vertical take-off tactical UAV competition, won by the Northrop Grumman Firescout.

Moharich says Helitech will release bid packages for the TR911 production programme to Australian companies within the next two months. Firms selected would be invited to participate in the construction of two pre-production air vehicles to support international marketing efforts.

The Australia Army's JP129 UAV programme could require a vertical take-off system to be able to operate from unprepared strips. The army has not written a specification but it is likely to need a 150km (80nm) range, able to remain on station for 4-6h and be equipped with electro-optical and infrared sensors, a laser designator and potentially an electronic support measures payload. □

## CIA report identifies Iraq UAV programme

**I**RAQ IS continuing to develop an unmanned air vehicle (UAV) based on the Aero Vodochody L-29 jet trainer, according to the Central Intelligence Agency's (CIA) latest report to the US Congress.

A UN Special Commission (UNSCOM) inspecting Iraq's weapons of mass destruction developments in the mid- and late-1990s identified the L-29 UAV programme. UNSCOM suggested the UAV was intended to release chemical and biological warfare agents. Talil, the airbase where the work was performed, was subsequently targeted during Operation Desert Fox in December 1998.

In the report, which covers January-June last year, the CIA says that Iraq was believed to have been flying the L-29 UAV for training purposes and possibly to test system developments.

As well as the L-29 UAV, the CIA says that Iraq continues to develop short-range ballistic missiles, including solid-propellant fuels and new weapons, and it suggests this work could be extended to include longer range systems. □

## U-2 upgrade replaces 1960s cockpit



Lockheed Martin has started flight testing the U-2 reconnaissance avionics maintainability programme (RAMP). The avionics replace the 1960s-era cockpit with modern systems including three 150mm x 200mm (6in x 8in) multifunction displays, an upfront control and display unit and an independent secondary flight display system. The fleet of 31 U-2S and four U-2STs will be retrofitted by 2007. Bryan Swords, Lockheed Martin Aeronautics project manager, says six flights have been made and another 11 are scheduled over the next four months. Six aircraft a year will be modified, a rate determined by the U-2 depot maintenance cycle. RAMP uses commercial off-the-shelf equipment, some of which needs modification for use in the high-altitude reconnaissance platform.

## US joint operations under fire

**A** US GENERAL Accounting Office (GAO) study of Task Force Hawk's performance during Operation Allied Force in 1999 reveals shortcomings in the extent to which the US Army and the US Air Force were able to operate together as a joint force.

Twenty-four Boeing AH-64A Apache attack helicopters, 31 support helicopters, a Multiple Launch Rocket System battalion and ground troops were deployed to Albania to conduct deep attacks against Yugoslav forces in Kosovo.

The attack helicopters, however, were not used because the Apache pilots were undertrained and ill-equipped to go to war. The GAO says: "The army and air force experienced significant problems in their ability to work together and in the interoperability of the command, control, communications, computers, and intelligence equipment used during the operation."

The GAO report says the USAF had difficulty in integrating the attack helicopters into the air tasking order (ATO). There were no formalised procedures for how to include army aviation into the battle planning system. The US Army and USAF are developing joint procedures for integrating the US Army into the joint ATO.

The attack helicopters were used to locate targets for USAF tactical aircraft, but US Army analysts had little or no training in joint targeting operations. Initially, criteria required by the USAF for attacking mobile targets were not reached. As the operation progressed, the two services worked better together. They are now refining the joint process that is used.

The report also says the army requires a self-contained lethal and non-lethal suppression of enemy air defences capability. □



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# UK tanker financing sparks fresh international interest

STEWART PENNEY/BRISTOL

THE UK's FUTURE Strategic Tanker Aircraft (FSTA) competition is generating interest among a host of countries interested in a similar private financing initiative (PFI) to fund a procurement or use of the in-flight refuelling capability.

Andy Kershaw, Defence Procurement Agency (DPA) head of the FSTA, says the UK will buy only an in-flight refuelling service and not the aircraft. Three teams are competing for the deal – BAE Systems, the AirTanker consortium and Strategic Support Management (SSM).

Kershaw says that Australia, Canada, France, Germany, Italy, New Zealand, Norway, Portugal, the USA and "a few others" have been briefed on the programme. Australia has been considering a PFI deal to replace its elderly Boeing 707 tankers for some time.

He adds that some countries

could use the service as third parties while others are reviewing PFI-like means of financing their own deal. The UK believes that the winning bidder will make significant third party revenues by leasing spare capacity to other air forces or commercial operators.

Kershaw says that "we're well on the way to solving the regulatory problems" of operating aircraft modified with air-to-air refuelling equipment for commercial operations. He says it is likely the aircraft will be certificated with some permanent role-equipment such as the plumbing in the wings for fuel transfer while other kit, including the hose drum units and military communications, will be removable in "hours not days".

The DPA has still not finally decided whether FSTA will be a PFI, although there is no alternative funding allocated for the programme. Kershaw says the agency and the Royal Air Force need to be satisfied that the proposals meet

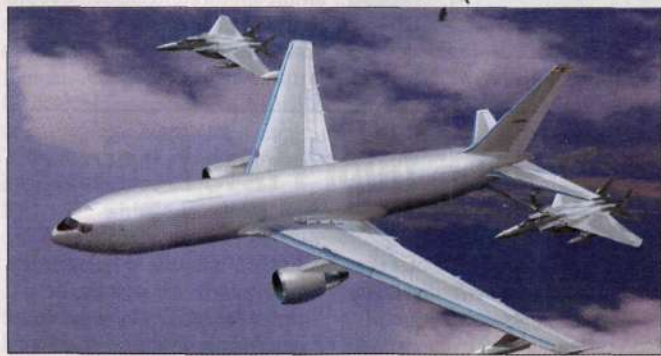
the requirement and are the best value for money. The programme will last 30 years, while its value has risen by £4 million (\$5.8 million) to £13 million due to a change in accounting methods, he says.

The three remaining contenders are due to submit their bids in early July and a decision on project go-ahead is due in the middle of next year, with a contract due to be placed in early 2003. The FSTA in-service date is 2007-09 but this could be brought forward if replacing the RAF's ancient BAC VC10s early is "good value for money".

Initially, FSTA was for 30 aircraft based on the Airbus A310, says Kershaw, but the competitors are concentrating on the larger Airbus A330 and Boeing 767, which means "fewer aircraft, in the low twenties" will be needed to meet the specification.

Meanwhile industry sources expect a further reshuffling of the bidders after Rolls-Royce wrapped its AirReach proposal into the Eurotanker consortium, formed from Cobham subsidiary FRAviation, Brown & Root, EADS Airbus and Thales Defence. SSM – comprising Serco and Spectrum Capital – is offering a package based around ex-British Airways 767s and industry sources speculate SSM could join a BAE/Boeing bid which will also offer the 767.

Boeing in the meantime has formed Military Aerospace Support to focus on the supply of tankers, support services and aircraft modifications for the role. □



Boeing has created a business unit to offer the 767 as a tanker-transport

## Ukraine to re-shape air defence forces by 2010

UKRAINE IS planning to merge its air force and air defence force into a single command after a meeting between senior defence ministry officials including Ukrainian defence minister Alexander Kuzmuk.

The services will be merged in three stages with completion set

for 2010. The resulting service will be known simply as the air force. The defence ministry is believed to be considering four different prospective plans for the shape of the new air force.

The move is similar to that of neighbouring Russia, which merged its air defence force into the air

force in the mid-1990s. Ukraine began moves toward a similar merger during the 1993-96 period but the plan was not completed.

The merger will proceed in parallel with the creation of a single system of air traffic control for civil and military flights and an integrated radar surveillance scheme. □

### CONTRACTS

**++ TRW Systems and Information Group** has won a **US Department of Defense** contract worth \$45 million to develop a production version of the Joint Signal Intelligence Avionics Family High Band Subsystem Demonstration unit. The system will provide signal intelligence and geolocation capability for airborne reconnaissance platforms. **++ French armaments agency DGA** has awarded **Aérospatiale Matra Missiles** a contract to modernise Exocet anti-ship missiles. Included in the work will be new motors for 50 MM38 variants this year and other variants from 2003. The missile's electronics will also be upgraded. **++ Northrop Grumman** has received a \$300 million **Boeing** contract to provide its Multi-role Electronically Scanned Array (MESA) radar for four 737 airborne warning and control system aircraft ordered by Australia. **++ An Aerojet/Pratt & Whitney** team will test two advanced solid rocket motors late next year under a \$9 million contract for Phase II of the US Air Force's Integrated High Payoff Rocket Propulsion Technology demonstration programme. The best technologies will be incorporated into an improved motor for a 2004 firing, which may lead to development of a future launch vehicle upper stage. **++ Orbital Sciences** will launch a single-stage guided suborbital rocket in March 2002 from Kodiak, Alaska, under a \$5 million contract for the Quick Reaction Launch Vehicle-2 (QRLV-2) programme. Orbital launches a sounding rocket from Kodiak this month, under the QRLV-1 programme. **++ L-3 Communications** is to provide solid-state recorders for the Shared Reconnaissance Pod (SHARP) under development by Raytheon for US Navy Boeing F/A-18s. L-3 will supply up to 28 recorders for development and low-rate production, with potential to produce 80 more units. **++ Goodrich** will supply new design nose gear doors for 200 Lockheed Martin F-16s to be delivered to Greece, Israel, Singapore and the United Arab Emirates from 2002.



# American ups its Trans World bid

RAMON LOPEZ/WASHINGTON DC  
CHRIS JASPER/LONDON

**A**ERICAN AIRLINES has raised its bid for Trans World Airlines to \$742 million, with the latter recommending that a US federal bankruptcy court accept the sweetened offer. United Airlines and regional operator Atlantic Coast Airlines (ACA) have meanwhile confirmed plans for ACA to buy three US Airways carriers as part of the planned merger between the two majors, while Delta Air Lines chief executive Leo Mullin has cast doubt on suggestions that Continental Airlines could engineer a 'reverse takeover' of Delta in response to the other deals.

American's improved bid for TWA followed an initial \$500 million one, and topped a late \$650 million offer from a group led by TWA's former owner Carl Icahn and investment banker Brian Freeman. Investor group Jet Acquisitions has bid \$889 million, although doubts remain over its ability to raise the cash, while Galileo International is bidding only for TWA's stake in the Worldspan computer reservation system.

Despite TWA's recommenda-

tion, which was due to be issued on 9 March, the court may approve an alternative offer. The Icahn bid is opposed by unions critical of what they say was his "prior plundering" of the airline.

American's plan will see it assume \$3.5 billion of leases/debt on 175 TWA aircraft (shedding 10). It would retain TWA's St Louis hub, reservation centres, maintenance bases and facilities at 60 airports, terminating leases at 10 others where it is already strong.

ACA's move for US Airways Express carriers PSA Airlines, Piedmont Airlines and Allegheny Airlines will cost it \$200 million, should it take all three, with an 18-month window for completion. United says the sale is meant to

alleviate labour problems stemming from the US Airways takeover, claiming it cannot provide the regionals' flight attendants the same pay/benefits as mainline crews.

A wholly-independent franchise carrier for United Express and Delta Connection, ACA says it will operate the regional trio as subsidiaries pending a final agreement. Its new deal for United Express operations, accruing a fee for each departure, will be extended to cover the three carriers, while it will receive \$10.5 million if the takeovers fail.

ACA says the takeovers will "add additional growth to our business and additional regional jet opportunities". The carrier is moving to

all-jet operations, so Bombardier Dash 8 and Fairchild Dornier 328 turboprops operated by the three may be replaced.

United has meanwhile agreed to extend US Airways' contract for regional jet operations by Mesa Air Group for two years, contingent upon the mega-merger with US going ahead. Mesa operates 32 regional jets for US, but the contract had appeared under threat, United having ended its own code-share deal with Mesa in 1998.

United and US have agreed to extend the period for completing their merger beyond 2 April to allow the US Department of Justice to further study the implications of American's planned purchase of other US Airways assets, including half of US Airways Shuttle and 49% of DC Air.

Delta's Mullin says he backs American's "rescue" of TWA, but opposes the United-US deal. He adds that if both mergers go ahead a Delta-Continental tie-up "would make sense", but says a take-over of his airline by Continental, bypassing Northwest Airlines' ability to veto a Delta bid for the smaller airline appears unrealistic. "People have asked me how it could be done, and I have to say it beats me," he told *Flight International*. □



American plans to retain the bulk of bankrupt TWA's aircraft fleet

## SES closing on \$5bn GE Americom satellite bid

**T**HE BIDDING for General Electric's space subsidiary GE Americom is being reportedly led by Luxembourg-based Société Européenne des Satellites (SES).

SES will not comment on reports that it has offered \$5 billion for Americom, but concedes that North America is the last big gap in its global network following the purchase of stakes in Asiasat, Brazilsat and Scandinavian company NSAB in the past three years.

"We have made no secret of our ambition to create a global satellite network," says SES. "To achieve

our aims we evidently need a North American presence."

Other companies which have expressed an interest in Americom include Echostar, Loral Space and Communications, and Intelsat.

Americom meanwhile plans to launch two new satellites - GE1i and GE2i - into geostationary orbits above the Atlantic and Pacific oceans to connect its 15 landmass-based satellites, which serve the USA (12 satellites), Europe and Asia. The new satellites will be launched by International Launch Services. □

## Gifas slams poor Paris backing

**T**HE FRENCH aerospace industry achieved its best ever order intake last year - but industry association Gifas says it is getting "too little support" from Paris in pushing exports, compared with the backing given by governments in the USA, Germany and the UK.

Charles Edelstenne, president of Gifas member Dassault Aviation, cites the Greek Government's selection of Eurofighter ahead of its own Rafale fighter. Eurofighter won, he says, only after "a lot of visits from German ministers". He adds: "Our government does not provide the same weight as our competitors when it comes to visiting potential customers."

Gifas members saw orders rise

40% last year compared with 1999, to Fr245.9 billion (\$35 billion), driven by record civil sales by Airbus, Eurocopter and Dassault Aviation. Exports accounted for 54%. Domestic business rose 16%, thanks to military orders for the NH90 transport helicopter, M51 nuclear missile and Mica air-to-air missile.

Sales rose 12.8%, to Fr162.7 billion, with exports totalling Fr100.3 billion, some Fr90 billion of them from the civil sector, continuing a steep increase from a low of Fr33 billion in 1995. Military sales will improve, says Gifas president Jean-Paul Béchat, as export deliveries of Mirage 2000s and domestic deliveries of the Rafale, NH90 and Tiger attack helicopter kick in. □



# BA set to clinch BRAL and Go deals in European rejig

CHRIS JASPER/LONDON

BRITISH Airways is to simplify its European franchises and subsidiaries network, confirming plans to buy the British Regional Air Lines Group (BRAL), and extending a deadline for bids for low-cost carrier Go, increasing the odds of it being bought by KLM. BA rival Lufthansa has meanwhile encountered regulatory hurdles in its bid for Eurowings, Germany's largest independent.

BA will offer £78 million (\$115 million) for issued stock in BRAL, 26% of which is owned by British Midland chairman Sir Michael Bishop. Chief executive Terry Liddiard owns 6% and Schroder Investment Management 20%, with the rest floated. BRAL includes Manchester-based British Regional Airlines, a BA franchisee since 1995, and Isle of Man-based Manx Airlines.

BA is to merge BRAL with Bristol-based Brymon Airways, and retain Manx as a stand-alone operation, to "reduce fragmentation among subsidiary and franchise partners" and to focus on higher yield operations with smaller aircraft and higher frequencies. The BRAL and Brymon fleets include BA's first Embraer ERJ-145s, with 26 in service, four on order and 17 on option.

BA has also extended its franchise accord with Birmingham-based Maersk Air, originally due to lapse on 24 March, until the end of



A combined BRAL-Brymon would have a potential fleet of almost 50 ERJs

its summer season. The length of the extension calls into question the future of BA's relationship with Danish-owned Maersk, in doubt since BA began to build Birmingham into a second hub for wholly-owned Brymon. The airport is also a base for the BA Regional operation.

BA's decision to delay a decision on Go gives KLM more time to consider a bid for the London Stansted-based carrier. The Dutch airline's chief executive Leo van Wijk last week told *Flight International* that he was mulling a move for Go with the aim of merging it with Buzz as an enlarged low-cost airline. "We are exploring the options and we might decide positively or we might decide negatively," he says. "It's a complex issue and we will only do it if we can see the benefit. And the downside for us is certainly greater than for BA." BA has already rejected approaches

for Go, with venture capital group 3i the other favoured bidder.

The UK airline meanwhile reports a good response to its new cabin product. With its fleet and in-cabin offerings restructured, analyst Chris Tarry says BA is now concentrating on retaining passengers. Capacity will be cut by 13% (rather than 10%) this summer compared with last, ahead of the expected US slump, although Tarry says it is now looking at growth plans for 2004 onwards.

German market consolidation is threatened after the country's federal cartel office said it would block Lufthansa's acquisition of 24.9% of Eurowings (with an option for 49%) in the absence of concessions to improve competition. CEO Jürgen Weber, complaining that similar purchases by Air France were waved through, says there will be no concessions, although talks will continue. □

## MTU builds overseas base with Caval purchase

MTU AERO Engines has acquired USA-based turbine disk producer Caval from Chromalloy Gas Turbine. The move further cements the German company's recent strategy of expanding its overseas manufacturing interests.

The "primary rationale" behind the acquisition is MTU's desire to

"get closer to our customers and partners", says the Daimler-Chrysler subsidiary's president and chief executive Dr Klaus Steffens. "MTU is forging ahead with its growth strategy, expanding now also into the manufacturing area," he adds.

Caval, to be renamed MTU Aero Engine Components,

employs around 180 people and has annual sales of \$30 million. It has been a supplier of rotor disks to Munich-based MTU for several years. The acquisition follows the recent establishment of MTU Aero Engine Design in Hartford, Connecticut, and the setting up of maintenance ventures in Zhuhai, China and São Paulo, Brazil. □

### e-business.com

++ Airline-led **Aerexchange** has added eight members of the Arab Air Carriers Organisation to its marketplace. EgyptAir, Gulf Air, Kuwait Airways, Middle East Airlines, Qatar Airways, Saudi Arabian Airlines, Royal Jordanian and Syrian Air will gain access to supply-chain management, purchasing intelligence, internet procurement, system integration services and the SPEC 2000 database from the US Air Transport Association. ++ Airline exchange **AirNewco** and supplier-led marketplace **MyAircraft** have named their merged aerospace exchange **Cordiem**. Launching in April/May, Cordiem has an 11-member airline advisory council including Aer Lingus, Aeromexico, Britannia, Finnair, LanChile and South African Airways, which are seen as likely launch customers. ++ **The International Air Transport Association** and **BIDjet.com** have launched an online portal for buying, selling and leasing commercial aircraft. The service will manage transactions from the location of available aircraft through to finalising financial details. ++ **AvBid.net** has joined the ranks of aerospace marketplaces to provide web-based auction and exchange technologies to allow buyers and sellers to acquire and reduce inventory. ++ **SITA** has introduced its **Aerocater** e-business catering service. It's launch customer is **British Airways**. SITA has established partnerships with catering suppliers **CALibre** and **Inflair**. ++ SITA-led **Aerospan.com** has formed an alliance with **Xelus** to use the latter's service inventory planning and forecasting tools. The alliance allows Aerospan users to plan and procure airline technical materials. ++ **China Southern Airlines** has selected Computer Associates Unicenter TNG to automate the management and control of its e-business operations. ++ **PartsLogistics.com** has chosen **Liquidation.com**, a provider of software tools for buying and selling business surplus, to power portals including its **Avsupport** Online spare parts site.



# PEOPLE

**++ Lockheed Martin** has promoted vice president (VP) and financial controller **Christopher Kubasik** to chief financial officer (CFO). He replaces **Robert Stevens**, who became president and chief operating officer (COO) last October. **++ Rob Ruijter** is to become CFO of KLM in July, replacing **Rob Abrahamson**, who is retiring. **++ Singapore Airlines** VPs **Michael Tan** and **Chew Choon Seng** are to become senior executive VPs in May, with senior VP market planning, **Huang Cheng Eng**, becoming executive VP marketing and regions, reporting to Tan. **Major-General Raymond Ng Teck Heng**, currently chief of the Singaporean air force, becomes senior VP flight operations projects in July, while **Chew Leng Seng** – retiring as chief executive of SIA Engineering in May – will be replaced by SIA senior VP engineering **William Tan**. **++ Finnair** VP alliances and international relations **Maunu von Lueders** is to be the **oneworld** alliance's first VP sales. **++ Bill Meaney**, formerly of South African Airways, has become CEO of the **Star Alliance** Management Team, succeeding **Friedel Rodig**, who is retiring. **++ Carlos Bañón Blasco** is the new director general of **Spanair**, joining from the telecoms division of Siemens. **++ Iberia** regional carrier **Air Nostrum** has appointed **Miguel Angel Falcon Martin** as director general. He succeeds **Carlos Bertomeu**. **++ Georges Sangis** has been named senior VP of **Snecma Moteurs**. He will be replaced as VP and general manager commercial engines by **Jean-Pierre Cojan**. **++ DeCrane Aircraft** has appointed **Walter Peters** as president of its Dettmers Industries aircraft seating subsidiary. He replaces **Andrew Perl**. **++ Joseph Ornelas**, formerly chief project engineer on Boeing's 777 programme, has joined **Hamilton Sundstrand** as VP engineering and technology. **++ Fairchild Fasteners** has named **Olivier Jarraut** as COO, US operations. He was previously vice-COO.

# Russia's airlines stage rally after a decade-long decline

PAUL DUFFY/MOSCOW

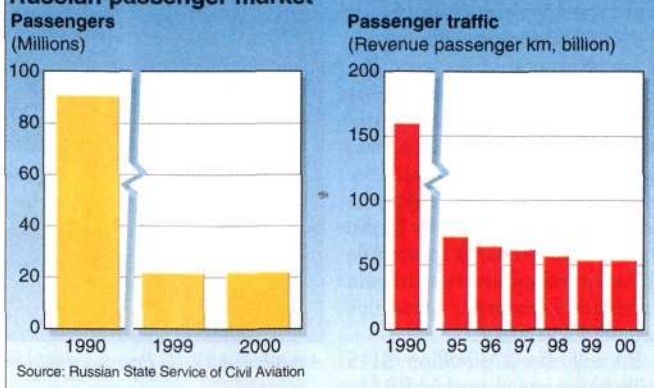
RUSSIA'S SICKLY airline sector is at last showing signs of recovery, with modest growth in both the passenger and cargo markets suggesting the industry may be pulling out of the steep decline which set in following the collapse of the Soviet Union in 1991. Russia's State Service of Civil Aviation (GSGA) reports improvements in key indicators for the first time since 1990 – although the sector has a long way to go before it regains Soviet-era levels.

Passenger numbers rose to 21.76 million last year, up 1.4% on 1999, while traffic inched up 0.1% to 53.48 billion revenue passenger kilometres (RPKs). The figures are particularly remarkable in that the first nine months of last year saw a contraction in the market.

International passenger traffic grew 17.5% last year, accounting for a third of the total, while domestic traffic – which had increased its share for the first time in a decade in 1999 – fell by 6.7%. The GSGA report says passenger load factors rose 1.5 points to 63.9%, with international services at 65.9% and domestic 62.1%.

The cargo sector also enjoyed growth, with volumes up 7.3% to 530,000t and traffic up 8.4% to 2.45 billion tonne kilometres. The international market accounted for 69.9% of the total (up 5%),

Russian passenger market



although the domestic cargo market grew faster (up 18.6%).

In line with efforts to restructure the industry – the GSGA is imposing tougher standards – the number of carriers holding air operator certificates fell last year to 294 from 323, and should fall further this year. Fifteen new AOCs were issued and 49 were cancelled.

Of the 294, 200 are listed as corporate bodies, with or without limited liability, and the rest are state or municipally owned. Twelve are categorised as general aviation operators, offering flight training, and six as state organisations (air force transport or emergency rescue units).

Just 22 have over 10 large commercial aircraft, 77 have 10 or more aircraft and helicopters of any category, and 84 have six to 10 aircraft. The rest have under five.

Russia's top four airlines carried 50% of all traffic (in terms of RPKs): the top 12 earned 70%, and the top 28 some 90%. Sales rose by 52.8% to R83.7 billion (\$2.94 billion). With costs of R81.4 billion, the sector generated a simple surplus of R2.4 billion, compared with R0.54 billion in 1999.

The GSGA report says Russia's airlines had a combined fleet totalling 6,540 aircraft and helicopters last year, including 1,918 older Russian jet and turboprop airliners and freighters, which generated 79.6% of revenues. The 27

'current generation' Russian aircraft produced 4.9% of sales, and the 46 foreign aircraft some 15.5%.

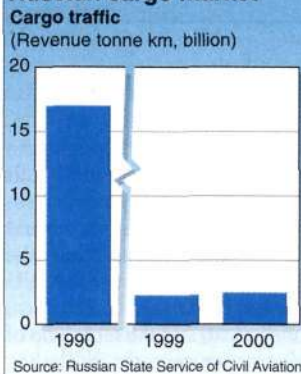
Up to 1995, most aircraft in Russia's fleets were at least part-funded by the state. Since then just 23 aircraft and 21 helicopters have been delivered from Russian factories. Rouble prices have increased six-fold during the same period, making it almost impossible for airlines to raise the cash necessary to renew their fleets.

The report also highlights the significant future costs facing Russian airlines wishing to operate into Europe and elsewhere. Many in-service aircraft will need up to \$1 million to meet tougher operating standards requiring the installation of traffic collision avoidance systems, reduced vertical separation minima and area navigation equipment. The GSGA adds that some aircraft – the Ilyushin Il-86, Tupolev Tu-134 and -154, and Antonov An-24 and -12 – may be pushed out of the market because of the cost of modification to meet new noise standards.

The report says 40-60% of most aircraft types require maintenance, repairs or spare parts. During the last year, 390 aircraft and 911 engines underwent overhaul.

Russia had 533 airports last year, down from 579 in 1999, with several smaller airfields closing. Finally, employment in the sector fell 1.7% to 227,100.

Russian cargo market







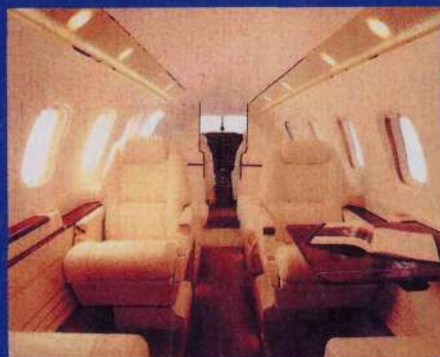
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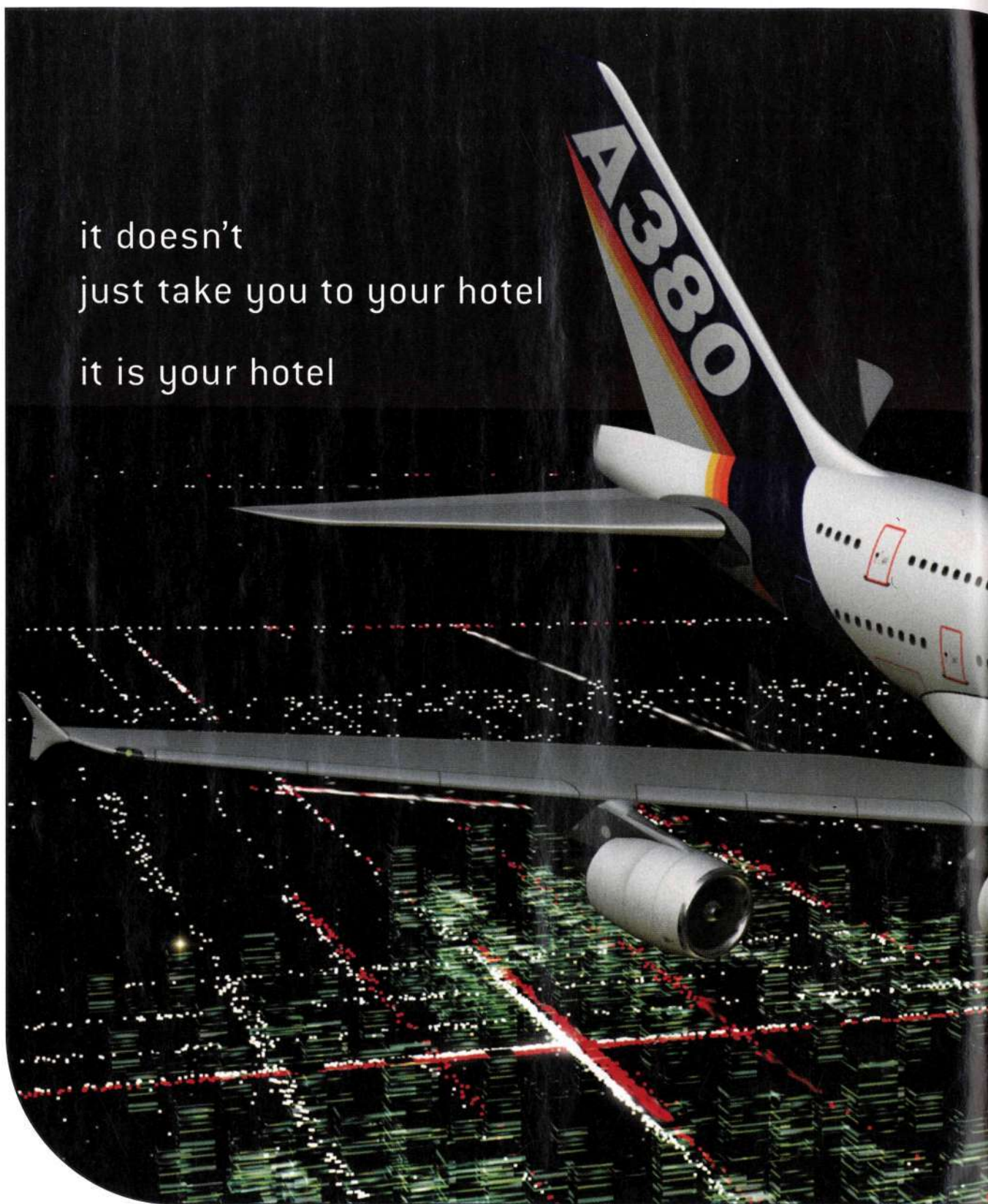
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## US helicopter fleets switch on to satellite communications

**A**N INCREASING number of AUS helicopter fleets are being equipped with satellite communications (satcom) for position reporting, flight following and two-way messaging. The OuterLink low-cost datalink capability, to be available worldwide by year-end, is particularly useful in regions with limited or no radar coverage.

Chevron has completed the installation of OuterLink satcom datalink units on its fleet of 29 helicopters operating in the Gulf of Mexico. As well as allowing automatic flight tracking and two-way messaging, the systems include a "Mayday" button and an automatic "missed-message alarm" indicating a loss of communication with the helicopter.

A second, unidentified petroleum industry operator has ordered 23 CP-2 satellite modems from OuterLink to equip its entire fleet.

The CP-2 L-band datalink is also popular with air medical operators. Air Evac has begun installations on 30 helicopters operating throughout the mid-west USA. Lebanon, New Hampshire-based Dartmouth-Hitchcock Medical Center and Duluth, Minnesota-based Life Flight both use the CP-2. □

# PrivatAir expands globally with Ogden acquisitions

KATE SANSFIELD/LONDON

**S**WISS BUSINESS aircraft "airline" PrivatAir is expanding into the US market and strengthening its position in Europe after acquiring Ogden's Flight Services Group (FSG) in Connecticut and Transair at Paris Le Bourget airport.

The deals also mark the Geneva-based company's entry into the fixed based operator, ground handling and aircraft sales market.

Dave Kinson, PrivatAir's technical director says: "We have been planning to widen the range of services offered to our customers, whom we felt we lost control of once they stepped out of the aircraft." The company admits expanding its product range will spread the risk in the event of an economic downturn.

Kinson says: "FSG is among the largest providers of corporate aircraft management, executive charter and aircraft sales and ac-

quisitions in the USA, while Transair has a 35% share of air traffic handling at Le Bourget."

PrivatAir specialises in transporting VIPs, including government officials and heads of state, as well as providing tailored charter services such as promotional tours and product launches.

The company plans to adapt its services to the US market from where it also plans to broaden its operating base through joint ventures and further acquisitions.

PrivatAir operates six aircraft in total – three Boeing Business Jets, a Boeing 737-300, a 757 and a Gulfstream IV-SP, which has been dispatched to Connecticut to support the US operation. The 737-300 is expected to follow shortly.

Kinson admits further aircraft acquisitions are unlikely in the short term as FSG manages a growing fleet of 46 aircraft, of which 20 aircraft are available for charter. He says: "Our immediate plan is to renovate the Transair FBO. Work has begun on an FFR8 million [\$1.1 million] facelift due to be finished in June." □



PrivatAir heads to the USA, aiming to be a key business aviation company

## Eagle hoping to land investors

**I**SRAEL'S DM Aerosafe is seeking investors for its Eagle vertical take-off and landing rescue platform, while US group PAM is continuing development of Individual Lifting Vehicle (ILV) prototypes.

The Eagle is being developed to rescue people beyond the reach of ladders in high-rise buildings, with the platform designed to land on the building or hover by windows, rescuing up to 10 people at a time, says David Metreveli, DM Aerosafe general manager.

Development would cost \$1 million annually over two years, says Metreveli. The company has failed to secure backing from Israeli investors and the government, however, forcing it to extend its search outside the country.

The two-level design has four wide-chord ducted fans attached to structural beams and driven by piston engines. A mock-up has been built, with the next stage being a scaled-down remote-controlled demonstrator. Metreveli says "once funding is secured" a sub-scale electric-powered flying model could be operating within months.

■ Virginia-based PAM's prototype one-man, rotor-based ILV is flying. Although currently powered by two two-cycle Hirth F-30 piston engines, a turbine engine is being considered for the PAM 100B. Applications include patrol duties, law enforcement and special military operations. The company is refining the design to enlarge the flight envelope. □

## Jet credits offers 'alternative'

**A** NEW BUSINESS aircraft and helicopter leasing programme has been set up in the UK offering "an affordable alternative" to fractional ownership.

Operated by sales and charter company Canford Aviation, Jet Credits is aimed at wealthy individuals and small to medium-size companies, which "are either new to business jet and helicopter travel or need more flexibility than that offered by the scheme they are in", says Canford Aviation chief executive Nick Davis.

Aircraft from the European charter market are divided into four categories, based on cabin size – from an entry-level Cessna Citation Jet or Agusta A109 Power in group A to a widebody Airbus

A319 Corporate Jetliner, group D.

Clients buy occupied flying time in the form of jet credits "along similar lines to pre-paid mobile phones". Credits are sold in blocks of 10 costing £30,000 (\$44,000) paid directly into the customer's lawyer's account and then on to Canford. Davis adds: "We act as a broker for our customers, handling all their travel requirements. There are no capital outlays, no deposits, no binding contracts and no management or positioning fees."

The programme is based on occupied time in the air – one £3,000 jet credit per occupied hour in group A to five Jet Credits per hour in group D. Discounts of 37.5% are available for overnight, multi stage and day return flights. □



# Aviation gets new voice in Asia

KATE SANSFIELD/LONDON

**A**SIA'S FLEDGLING business aviation community is planning to launch a dedicated industry association in May to promote business aviation and address its growing concerns over access and operating restrictions throughout Asia Pacific and South East Asia.

The Asian Business Aviation Association (ABAA) plans to establish its by-laws at a meeting in Shenzhen, China, on 8 May, to agree the location, nature and working practices of the group, and to elect key personnel.

ABAA members will be business aircraft owners and operators as well as manufacturers including Gulfstream, Cessna and Raytheon. "We are targeting companies which contribute to the operation of aircraft in the region as well as international companies. Based on the attendance at recent meetings we expect to have around 50 members

initially," says Mark Turner, managing director of Hong Kong-based business aviation service provider Metrojet, an ABAA member.

"Business aviation in Asia is very young and is struggling to gain acceptance in a region which is generally dominated by the airlines," he adds. Turner concedes that the negative image of business aircraft as "rich men's toys" is hindering growth. "You can count on one hand the number of charter operators in the region, and you can count on two the number of aircraft available for hire," Turner says.

Through promotional campaigns and government lobbying, the ABAA will focus on a number of issues, notably the high costs of business aircraft operations, including landing and handling fees.

The association will also address airport access and airspace restrictions, particularly in China, which suffers from a high level of govern-



Easing operating restrictions could aid the region's business aircraft fleet

ment bureaucracy. "It can take as long as 15 working days to receive a permit to fly within China, and then the choice of airports is limited," Turner says.

These factors, he argues, diminish the appeal of business aviation as a flexible and convenient method of transportation.

Meanwhile, Metrojet, which operates the Hong Kong Business Aviation Centre at Chek Lap Kok airport, is to take delivery of a Gulfstream IV for charter next month. The aircraft, leased from Gulfstream, will join the company's only other business charter aircraft, a Raytheon Hawker 700. □

## Lancair to distribute Italian twin-seat sports helicopter

**L**EADING kitplane manufacturer Lancair International has become the US distributor for the Italian Heli-Sport CH-7 Kompress kit-built helicopter.

The Kompress is a tandem two-seat version of the CH-7 Angel single-seat kit helicopter, over 120 of which have been delivered by Turin-based Heli-Sport.

The 450kg (990lb) gross-weight aircraft is powered by a turbocharged, 85kW (115hp) Rotax 914 piston engine. Cruise speed is 86kt (160km/h) with 5.8h endurance.

Redmond, Oregon-based Lancair will offer only the two-place Kompress. The dual-control helicopter can be flown single-seat, "so we feel the two-seater makes more sense in the long run, even though the kit is a bit more expensive." The company says. The helicopter will cost under \$60,000 without engine, paint and battery. □

## US report sends mixed messages on GA safety

**W**HILE THE fatal accident rate for general aviation (GA) in the USA continues to decline, the worst killers remain the same: bad weather and manoeuvres at low level, according to the first detailed analysis of figures from 1999.

The US Aircraft Owners and Pilots Association's (AOPA) annual Nall Report, which covers US-registered GA aircraft of less than 5,000kg (12,500lb), also reveals that "flight for personal reasons" - 45% of all GA flights - accounts for 68% of accidents and 67.5% of fatal accidents. Owner-flown or chartered aircraft, which account for 16% of GA activity, are involved in only 8% of the fatal accidents.

In 1999, 1,707 accidents were recorded, of which 320 were fatal, compared with 1,679 and 341 respectively for the previous year.

The number of related deaths in

1999 was 632. Flight hours increased slightly over the year, from 26.8 million to 27.1 million. Bad weather accounted for 12.4% of fatal accidents, says the report, but low-level manoeuvring accounted for the most fatalities at 29.4%.

The latter includes not only pilots "buzzing" locations on the ground, but also crop-dusting and law-enforcement flying at low altitude and low speeds. While agricultural flying accounts for 5.6% of GA hours flown, it makes up for 2.8% of fatal accidents, says Nall.

The AOPA notes that the number of "weather judgement" accidents has fallen markedly, but says it is too early to know whether its propaganda has been a factor.

Weather judgement accidents are those in which pilots elect to continue a visual flight rules trip - usually below a reducing cloudbase or into deteriorating visibility. □

### NEWS IN BRIEF

#### ■ GAMA ORDERS LEARJETS

Gama Aviation has ordered two Bombardier Learjet 45 business jets to replace the UK charter and emergency medical services operator's ageing Learjet 35s. The aircraft are set for delivery in September and October, joining Gama's Raytheon King Air 200 turboprops.

#### ■ EXECUTIVE BBJs

Executive Jet plans to take delivery this month of its first Boeing Business Jet for its NetJets fractional ownership programme. The company recently announced the switch of BBJ completions from Raytheon Aircraft, in Waco, Texas, to Lufthansa Technik in Hamburg, Germany, after long delays at the US outfitter. Lufthansa, which is contracted to complete 10 BBJs, delivers its first BBJ to NetJets in August.



# Leading trade show will get even bigger organisers predict

More than 150 exhibitors and the presence of almost 30 display aircraft at Aero Expo 2001 in Acapulco bolstered claims that the Mexican show is now Central America's premier trade fair and a worthy running mate to the bi-annual FIDAE show held in Chile on alternate years.

"It's our third event, and the best sign is the exhibitors keep coming back," says Hector Davila Cornejo, director general of Aero Expo 2001. "We expect to grow substantially, maybe by up to a third again, as we move towards 2003."

Cornejo's optimism is founded on three main points: the sustained growth of Mexico's aerospace industry, the failure of competing trade events in Argentina, Brazil and Venezuela, and the strategic location of Mexico as "a gateway from Latin America to North America".

Air transport growth in Mexico continues to be strong with an expected 6% annual increase in traffic for the rest of the decade, marginally ahead of the predicted rate for Latin America. The proposed shake-up of the state owned airline industry promises major fleet renewal. Stimulus is also being provided by the growing need for aircraft for anti-drug missions, policing and fire-fighting. "The war against drugs is driving the need for a lot of new equipment," adds Alfredo Miguel, president of Servicios Aeos del Centro and the Mexican representative of Bell Helicopter Textron.

# Mexicans study Lancair 1V for coastal protection role

GUY NORRIS/ACAPULCO

THE MEXICAN navy is assessing an armed, turbo-prop-powered derivative of the Lancair 1V single that would supplement and later succeed its fleet of coastal patrol/light attack Aermacchi M290TP Redigos.

The proposed variant, known as the Sentry, would be powered by a Walter 601E turboprop and fitted with two wing-mounted machine guns, possibly the 12.7mm guns pod-mounted on the TP-90 Redigo version used by the navy. With a span of only 9.2m (30ft) and a length of 7.6m, the light attack aircraft would have an empty weight of 930kg (2,050lb), and a maximum

take-off weight of 1,635kg.

The 560kW (750shp) turboprop would replace the Teledyne Continental TSIO-550 piston engine that powers the Lancair 1V and pressurised IVP, giving the aircraft better performance. Lancair and the Mexican navy estimate the Sentry would have a climb rate of 4,500ft/min (22.9m/s) and a top speed of 280kt (520km/h) at sea level. Cruise speed would be around 245kt and range is estimated at 1,450km (784nm). The aircraft would be stressed for manoeuvres from 4.4g to -2.3g.

"It is being designed for us by Lancair, and we are interested if the programme continues," says a navy official who cautions that the

recent change in government is forcing a review of defence programmes. "We don't know what will happen, but it could be confirmed by 2003," he says.

The Sentry is an extension of Lancair's relationship with the Mexican navy based on the manufacture of Lancair Super ES, Legacy and IVP aircraft. The service is building up to a fleet of nine aircraft which will ultimately be based at Veracruz for a variety of roles including aerobatics, training and transport. Two ES and a single IVP in service have so far amassed more than 200 flying hours. Two "tandem" versions will have been built with hardpoints for weapons training by next year. □

# MD launches Combat Explorer for South America

MD HELICOPTERS is launching a second generation armed "Combat Explorer" study aimed at attack requirements in several Latin American countries including Argentina, Brazil, Chile, Colombia and Venezuela.

The initiative was prompted by trials of a missile-equipped MD530F with the Chilean armed forces, and the success of weapon systems integration on the Explorer for the Mexican navy.

The navy operates six Explorers in an anti-drug role, with orders for up to an additional nine expected to follow. The initial armed version is cleared to carry machine guns and unguided rockets, but the "second generation" study is aimed at a multi-role variant armed with anti-tank missiles.

"We are in conversation with Lockheed Martin [over the AGM-114 Hellfire and Rafael NT-D Spike anti-tank missiles] to see what modifications we need to make and how they can be integrated," says Latin American sales manager George Perez. The company expects an 18- to 24-month development time, leading to a



MD plans to attack the market with a multi-role variant of the Explorer

proof-of-concept demonstrator at the end of the initial phase. "We will start engineering work this month," says marketing and sales vice president Colin Whicher. The target price for the system is around \$6 million, a fraction of the cost of a dedicated attack helicopter. "We don't have the same overheads, that's why we can do it so cheaply," he adds.

"With the first generation of Combat Explorer we have a platform from which we can offer a way to take the first step towards an attack helicopter," says Perez.

The second generation version would be fitted with NATO-standard hardpoints, infrared sensors, a more sophisticated weapons aiming sight, target acquisition and detection software and a laser rangefinder.

MD Helicopters recently cleared the Explorer to carry the General Dynamics GAU-19/A 0.50in-calibre Gatling gun, the M2 0.50in-calibre gun pod and the 70mm Hydra rockets during six days of testing at Fort Bliss, Texas (*Flight International*, 20-26 February). □



# Boeing ups the ante with Airbus

GUY NORRIS/ACAPULCO

**B**OEING IS opening a sales office in Mexico in June as the first stage of a strategic expansion in Latin America, and a key move in the battle with Airbus to meet a predicted demand for more than 200 airliners in the country over the next 10 years.

"It is the beginning of a long-term plan, and we don't intend this to be simply a sales office to put products into Mexico," says Boeing vice president sales Latin America Dan da Silva. "It's a big maybe, but we could be talking about production of parts for aircraft and other developments.

"It is really the establishment of part of Boeing as a Mexican company in the eyes of the public and the government," he adds.

Boeing's move to bolster its Latin American presence comes in the wake of stronger regional sales by Airbus, and the Mexican Federal Competition Commission's October 2000 recommendation to dissolve Cintra – the government-established holding company which runs Mexico's airline industry.

Cintra controls Aeromexico, Mexicana and their regional affiliates, Aerocaribe and Aerolitoral, as well as cargo carrier Aeromexpress. Final pronouncements on the formal ending of Cintra, and with it the future of long-standing fleet re-equipment plans, are expected around mid-year.



*Mexicana and Aeromexico will become the battleground for Boeing and Airbus*

Aeromexico and Mexicana between them are expected to seek upwards of 50 new aircraft ranging from A318/717 to A330/767 size as part of an overall demand estimated at more than 200 aircraft over the next decade.

Airbus predicts the Mexican fleet will grow from 194 in 2000 to 316 in 2010, of which 120 will be required to meet increased demand, and a further 107 will be replacements for older types. "The fleet in Mexico will grow by more than 5% per year to 2010, which will be the highest rate in the whole of Latin America," says Rafael Alonso, Airbus vice president commercial, Latin America.

Although Boeing operates the most aircraft, Alonso argues that Airbus has "sold 75% of the new aircraft in the area over the last 10 years".

Overall, Airbus expects the Latin American fleet, estimated at 785 commercial aircraft in 2000, to grow to 1,231 in 2010. Of this, almost 900 aircraft will be new, with the fleet split roughly evenly between replacement and "expansion" airliners. Boeing's projections show a market for 1,470 aircraft over the next 20 years, worth around \$79 billion.

Aeromexico and Mexicana meanwhile appear to be splitting along partisan lines as the influence

of Cintra wanes. Aeromexico is looking to Delta Air Lines to buy a large share in the operation through its SkyTeam alliance, and leans towards Boeing as its first choice for equipment.

Delta and Lufthansa have emerged as the latest potential bidders for Mexicana, while United, which was expected to lead the bidding for its Star Alliance partner, is believed to be "too distracted" by its US Airways acquisition.

The interest from Lufthansa and United is expected to reinforce Mexicana's preference for Airbus products, for its re-equipment needs, at least in the A320 family category. □

## Avia seeks government go-ahead to assemble Mi-17 helicopters

**A**VIA BALTICA, the Mexico City-based dealership for Kazan Helicopters, is preparing to request approval from the government to go ahead with plans to assemble the Mi-17 in Mexico from kits supplied from Russia.

The plan is part of a broader initiative by Avia Baltika and Mexican-based Kazan parts supplier Sparc Aviation to develop a maintenance, overhaul, inspection and refurbishment site for the country's estimated 60 Mi-8/17s.

The site of the venture is yet to be determined and will depend on the outcome of talks with the government and availability. "We have a lot of faith that it's going to work, and the market definitely needs it," says Avia Baltika executive Carlos Garza.

The company is already planning to install an Mi-8/17 flight simulator in Mexico City, and is beginning refurbishment work on the first of up to 30 helicopters grounded by a lack of parts or other

reasons. It also supports spares supplies to the Mexican navy, which operates 20 Mi-8s.

The Latin American and Caribbean region was flooded with cheap Mi-8/17s following the devaluation of the Russian currency in the 1990s, resulting in prices per unit as low as \$50,000. Subsequent spares and maintenance issues, leading to the grounding of much of the fleet, led to the emergence of Sparc and Avia Baltika. Garza says the venture will

also support sales of upgraded Mi-174 I and II versions which are optimised for high-altitude operations, with 1,640kW- (2,200shp) rated TV3-117VM turboshafts, and to carry payloads of up to 5,000kg (11,000lb) at cruise speeds up to 135kt (250km/h). The latest versions cost \$3.7 million per unit, making them competitive with similar western-built helicopters. Refurbished aircraft, with new components and systems, will cost \$2.5 million each, adds Garza. □









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# Japan plans July launch for H2A

TIM FURNISS/LONDON

JAPAN WILL attempt the long-delayed maiden flight of the upgraded H2A booster carrying a Vehicle Evaluation Payload (VEP), from Tanegashima on 22 July.

A second test flight is tentatively planned for December, carrying a Mission Demonstration Satellite and another VEP.

The first operational flight of the H2A will be made next February, carrying the Advanced Earth Observation Satellite Adeos 2 and three piggyback satellites – Australia's FedSat 1 and two national payloads, Micro-LabSat 1

and the Whale Ecology Observation Satellite.

Technical problems have thwarted H2A development, delaying its maiden flight by a year.

The new booster is based on the original H2, but is intended to be more cost-effective and efficient. From 1994 the H2 flew five successful missions and suffered two consecutive failures. The H2 was cancelled in 1999 as it was considered to be too expensive, offering commercial geostationary transfer orbit (GTO) missions at a cost of \$180 million – almost double that charged by other commercial launcher companies.

The H2A, equipped with upgraded LE-5A and 7A first and second stage engines and new solid rocket boosters, will replicate the 4,000kg to GTO capability of the H2. More powerful versions of the H2A featuring extra boosters and strap-on core stages will increase this capability to 7,500kg.

Meanwhile, Aerojet has been awarded a \$480,000 contract extension to continue design and studies for a new first stage engine for Japan's upgraded J-1 commercial low Earth orbit (LEO) satellite launch vehicle. The original J-1, an indigenously developed three stage solid-propellant vehicle, was

cancelled due to high costs after just one launch.

The first stage of the J1-A will be powered by a modified Russian NK-33 liquid propellant engine, which has already been altered by Aerojet to fly on the US Kistler reusable launch vehicle. The booster will also be equipped with a liquid second stage engine.

Japan will require the J1A for 1t LEO sun-synchronous orbit launches and other LEO flights.

The latest contract pushes funding to to \$2.9 million and allows the start of development. Configuration studies will be completed by the middle of the year. □

## Mir re-entry 'cannot be 100% safe' says Russia



Mir will break apart in the atmosphere with parts landing in the Pacific

THE PLANNED controlled de-orbiting of the Mir space station will take place around 20 March, when atmospheric drag conditions are expected to be optimal for the manoeuvre.

Firings of the engine on the attached unmanned Progress tanker, over the Gulf of Guinea and the Caucasus, will induce the eventual re-entry over the Pacific Ocean.

The re-entry "does not have a 100% safety guarantee", says the Energia company which built Mir.

Mir will make a sharp descent over Japan at an altitude of 150km (95 miles). The 137t station will enter the Earth's atmosphere

over the Pacific, north of New Zealand at an altitude of 60-70km.

During a 30km descent, Mir will break apart, with pieces burning up, although about 1,500 objects with a combined weight of 20-25t will survive and are expected to land in the ocean in a 6,000km long, 200km wide corridor between Australia and South America.

The Russian aviation and space agency, Rosaviacosmos has taken out undisclosed value third party insurance cover in the event of accidents.

Mir began life as a single module in March 1986 and during its life was manned permanently for two months short of 10 years. □

## ImageSat considers new Eros

ISRAEL-LED ImageSat International may cancel the launch of its A2 satellite later this year and instead start production of a new \$100 million B series craft which will offer better resolution. ImageSat launched its Eros A1 1.8m resolution commercial remote sensing satellite into orbit on 5 December.

Eros B would provide "better performance down to 0.8m and a longer lifetime" of 10 years com-

pared with the six year life for A1, says ImageSat. B satellites will be launched in 2003 at the earliest.

The move will involve risks, concedes ImageSat, as new optical technologies will be required from Israel's Electro Optics company.

Analysts believe that the decision could have been influenced by commercial operators of high resolution satellites failing to meet profit predictions. □

### SATELLITE AND SPACECRAFT LAUNCHES IN FEBRUARY

No	Date	Spacecraft	Type	Launcher	Country	Launch site
5	7 Feb	SkyNet 4F	Milcoms	Ariane 44L	Europe	Kourou
		Sicral	Milcoms			
6	7 Feb	Atlantis	ISS/Destiny	STS 98	USA	KSC
7	20 Feb	Odin	Science	Start	Russia	Svobodny
8	26 Feb	Progress M44	Tanker	Soyuz U	Russia	Baikonur
9	27 Feb	Milstar F4	Milcoms	Titan IV	USA	Canaveral

Last Satellite Launch Log: Flight International, 20-26 February

## Radio pioneers seek finance

XM SATELLITE Radio has raised \$326.4 million through a share and note offering, providing funding for the company until 2002.

Competitor Sirius Satellite Radio is seeking \$210 million through an offering this month.

The stock offerings come as analysts say that the market for these systems, providing audio enter-

tainment to motorists in the USA, is unproven.

XM Radio plans to launch two spacecraft, Rock and Roll, aboard Sea Launch Zenit 3L boosters this year, with Roll to be launched this month and Rock to follow in May.

The satellites will compete with three spacecraft operated by fellow Washington DC-based company, Sirius. □



## European joint task force set up to carry out space strategy

THE EUROPEAN Space Agency (ESA) and the European Commission (EC) have set up a joint task force to implement the continent's strategy for space, which was endorsed by the European Research Council and ESA's council last November.

The European Strategy for Space is intended to strengthen Europe's space activities; enhance scientific knowledge of the planet, the solar system and the universe; and exploit technical space capabilities. The task force will monitor implementation of the strategy, propose a framework to allow ESA to implement the space policy and submit a report on European space activities to the European Union and ESA councils and the European Parliament by the end of this year.

At its first meeting earlier this month, the task force agreed to focus efforts on analysing the situation regarding Europe's Galileo satellite navigation system and on a common effort to expand initiatives for Global Monitoring for Environment and Security. European transport ministers are due to make a go/no-go decision for Galileo next month after deciding late last year to delay approval while issues are resolved including financing and controlling the system and the EC's involvement. □

## Boeing in Eutelsat US e-bird satellite first

THE EUROPEAN satellite communications organisation Eutelsat has awarded Boeing Satellite Systems (BSS) a contract to supply an e-Bird satellite to be launched next year. It is the first Eutelsat contract to be awarded to a US supplier (*Flight International*, 6-12 February).

E-Bird will be the 57th BSS-379 spin-stabilised spacecraft supplied by the former Hughes Space and Communications company. The 20 Ku-band satellite, to be located at 25.5°E, will be optimised for internet protocol access networks. □

# First flight of uprated Proton set for launch of final Ekran

TIM FURNISS/LONDON

THE MAIDEN FLIGHT of the uprated Russian Proton M booster will be made from the Baikonur Cosmodrome on 16 March.

The booster will carry the Ekran M24 television satellite, which will be the last in the series of this 2t spacecraft developed in the 1970s. It will be positioned at 99°E in geostationary transfer orbit (GTO) and will replace the Ekran M18.

The Proton M features several upgrades over its Proton K predecessor, including a digital flight control system and new engines.

The first stage will operate using a new version of the RD-253 hypergolic engines, with sea-level thrust increased by 19,800lb

(88kN) to 360,000lb. Six RD-23s power the first stage.

With the standard second and third stages, the Proton M will be able to carry 22t payloads into low Earth orbit, including International Space Station modules, compared with the 21t capability of the Proton K.

A four-stage Proton M features the new multiple restart single hypergolic engine-powered Breeze M upper stage.

Proton K-Breeze M made its inaugural flight aboard a Proton K in July 1999, but the launch failed after a second-stage malfunction, according to the Molniya Space Consultancy.

The second Proton K-Breeze M launch last May was a success, and carried the final Gorizont series communications satellite.

The Proton K-Breeze M can carry a maximum of 3,200kg directly into geostationary orbit (GEO) compared with the Proton K's maximum demonstrated capability of 2,600kg, equipped with the cryogenic DM stage.

Molniya says comparative figures for GTO flights are 5,500kg and 4,940kg respectively.

The Proton M will be added to International Launch Services' inventory of Proton and Atlas launchers.

Builder Khrunichev plans further upgrades to the Proton, equipping it with the KB Salyut-KVRB cryogenic upper stage, which could place 4,500kg into GEO. "This will be the first Russian liquid-oxygen liquid-hydrogen cryogenic upper stage to be used," says Molniya. □

## Space Shuttle orbiters return to Kennedy



All four of NASA's Space Shuttle orbiters were at the Kennedy Space Center, Florida, on 5 March after the return of *Columbia* and *Atlantis* on the Boeing 747 Shuttle carrier aircraft. *Columbia* returned from Boeing's Downey, California, plant after its 17-month refurbishment, while *Atlantis* (pictured) returned from Edwards AFB, California, after the 19 February following its STS 98 International Space Station (ISS) mission. Meanwhile, *Discovery* was on launch pad 39B preparing for its 8 March ISS mission STS 102, while *Endeavour* was being prepared for its ISS mission - STS 100 in April. *Atlantis* will fly the STS 104 ISS mission in May, and *Columbia* will make either a non-ISS Spacelab science flight or a Hubble Space Telescope servicing mission, STS 107 in November.

## NEWS IN BRIEF

### ■ PLUTO HOPE

NASA is trying to save the Pluto Express mission which was axed earlier this month by the Bush Administration's cuts in the space agency's programmes. Companies which responded to NASA's announcement of opportunity in January will be allowed to continue work in the hope that Congress can be persuaded to allow the mission to go ahead.

### ■ ENTERPRISE BID

The Russian space and aviation agency, Rosaviacosmos, has endorsed the development of the commercial Enterprise module for the International Space Station. The 12t Energia-Spacehab US/Russian module replaces a planned docking and stowage module and will be launched on a Zenit 2 booster.



# Bridging

Differing  
priorities  
among Gulf  
states  
have made  
defence  
integration  
difficult



# the Gulf



**D**ESPITE SOME improvements, co-ordination of defence policies among the six Arab states that make up the Gulf Cooperation Council (GCC) remains hampered by the same intra-regional differences that prevented the countries achieving full economic integration.

Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (UAE) formed the GCC in 1981 as a direct response to fears of threats to regional security. The Iran-Iraq war had begun the previous year, and the Tehran authorities were talking about exporting the Islamic revolution to the Arab Gulf states. But the GCC's failure to develop an effective joint defence strategy in its first decade was painfully exposed in August 1990 when Saddam Hussein ordered his army to invade and occupy Kuwait.

One of the GCC's original goals was the creation of Peninsula Shield, a battle-ready ground force of 7,000 men – to be increased to 20,000 at a later date, with air and naval divisions added – drawn from all the member states.

Under a joint command, this force – stationed at Hafr al-Batin in Saudi Arabia – was to be ready to go into action to help a member state when needed. But differences over the funding and composition of the force meant that its number never rose above 3,000 men, so the Gulf states were caught totally unprepared when Iraq invaded Kuwait as Peninsula Shield could not be mobilised in time.

While GCC countries contributed forces to the US-led Allied coalition that liberated Kuwait in 1991 and defeated the Iraqi army, they rely today on the US and UK forces stationed in the Gulf for their first and last lines of defence – a situation which is unlikely to change in the near future.

The reluctance of GCC governments to commit troops to Peninsula Shield has been matched by a preference for developing their own military. Individual agendas on defence and most other matters continue to take priority over those affecting the Gulf as a whole.

"Every Gulf state," an Arab diplomat says, "pays lip service to the GCC. But every one has its own set of priorities, and these can differ enormously." For example, Kuwait's preoccupation is with developing a strong defensive shield against another attack from Iraq. States further south, in assessing any danger from Iraq, are more interested in long-range early warning systems. Saudi Arabia, for example, is interested in expanding its fleet of five Boeing E-3 Sentry Airborne Warning and Control System (AWACS) aircraft.

At the southern end of the Gulf, the UAE sees more potential threat from Iran than Iraq, as the Iranian armed forces occupy three small islands claimed by the UAE. At the same time, Bahrain and Qatar are locked into a long-running border dispute (over the Hawar Islands) which is awaiting adjudication from the International



*Gulf states rely on western suppliers for aircraft such as the Tornado (top) and the Hawk (above)*

Court of Justice in The Hague. Meanwhile, Saudi Arabia, the largest by far of the Gulf states, has borders with Yemen in the south and Iraq and Jordan in the north – in other words, plenty to concern it, even before it considers what the regimes in Baghdad and Tehran might be planning.

#### **DEVELOPING CLOSER TIES**

Despite the range of differing priorities among the Gulf states, and the failure of Peninsula Shield to form the nucleus of a joint GCC land, air and sea force, the GCC states have taken some steps towards greater consultation and co-ordination. The forces from the individual states hold frequent military exercises together. Last January, 40 combat aircraft from the six Gulf states took part in Operation Gulf Falcon, and another operation, Initial Link, is set for April. "On the question of joint exercises," a

Western diplomatic in the Gulf says, "they do rather well. They have managed to develop a much better regime of training exercises, with individual forces taking part, rather than operating under a permanent single command – as was originally envisaged."

But the concept of differently equipped and trained forces coming together for exercises has inherent difficulties. Some of these have been overcome. In the early days of the GCC, exercises, according to a senior officer in one of the Gulf armies, "were little short of farcical. The states were using different sorts of radio systems and we found we couldn't even communicate with each other."

Today, most of these basic problems have been overcome. At the end of February, military commanders from the GCC states, meeting in Kuwait, launched the first phase of a \$158 million early warning radar system to link their





C. Van Der Ende

*Saudi Arabia is the only GCC member with force multipliers such as the KC-30 tanker*

command and control systems. Under the first phase, set up by Ericsson of Sweden at a cost of \$70 million, the six member states have been connected to a fibre-optic link extending from Kuwait in the north to Oman in the south.

The second phase involves the creation of a system to track potential targets and co-ordinate defence responses.

Despite this progress, the biggest obstacle to greater defence co-ordination and integration is the states' failure to agree on a joint purchasing strategy. "The rationale behind the ordering of aircraft and other defence equipment is personal gain," says an Arab diplomat. "As much as anything it's a question of who's going to offer the best commission. So you get a range of different planes, different weapons," he adds. This in turn creates problems.

"As the past has shown," a Western military attaché in one Gulf state says, "there are complications if you are trying to move ground forces or air forces to operate in another location and you find when you get there that there are different spares, different ammunition, and so on. This is bound to set a limitation on how far the Gulf states can create a joint military force that is both powerful and flexible."

But as defence analyst Andrew Brookes of the International Institute for Strategic Studies (IISS) in London points out, neither Europe nor the USA's military arms have attained full interoperability. But Brookes also notes that the Gulf states must take geography into account when working toward interoperability. "What they can't buy is warning time," he says. "They can't buy some of the warning distances that only geography will give them. If they haven't got the geography on their side, they've got to align with somebody who has that geography to offer."

With different states buying different equipment, the GCC finds itself unable to achieve another of its goals – that of establishing its own regional military training establishments. Taking part in the Gulf Falcon exercise, for example, were Saudi Boeing F-15 Eagles, Omani Sepecat Jaguars, Dassault Mirage 2000s

from Qatar and the UAE, Lockheed Martin F-16s from Bahrain and Boeing F/A-18 Hornets from Kuwait. An increasing number of GCC combat aircraft are flown by Gulf Arabs – but they are trained in countries outside the region. The air forces of Kuwait, Bahrain and Qatar are manned exclusively by nationals of those countries. Only the UAE, a vast purchaser of military jets with a small indigenous population, looks set to rely on expatriate combat pilots for many years to come.

## HIGHER STANDARDS

The IISS's Andrew Brookes contends that training standards are increasing in the Gulf, thanks to factors such as the growth of the internet, increasing pressure for high-technology expertise and more travel by the forces' leaders beyond their own borders to "swap notes" with their peers. In the Gulf, there is also the matter of pride: keeping up with the neighbours – some of whom, including Jordan, Oman and Egypt, have highly credible forces.

Another problem when trying to establish a joint force is identifying a common enemy. "The question you have to ask," says a Western defence analyst, "is whether GCC states or the GCC itself have a clear doctrine. Do they have a clear visualisation of whom they are defending themselves against?" The answer given by gov-

ernments in the Gulf, is that a threat could come at any time either from Iran or Iraq. "We can't tell what might happen in Iraq after Saddam, or who will win the power struggle in Iran," a Qatari government official says.

The USA and UK, in general, agree with this assessment. The Clinton Administration urged the GCC not only to increase the potential of Peninsula Shield and develop further intra-Gulf military co-operation, but also to co-operate with a US-led integrated air defence system, linking up with Egypt and Jordan.

At a time of increased tension in the Middle East and in the wake of a tide of anti-US feeling, Gulf governments are reluctant to express public interest in the scheme. But the new Bush Administration, with its clearly stated intention of refocusing the attention of the USA on Iraq, is likely to press for its adoption.

IISS assistant director Terence Taylor suggests that the Gulf states' public expressions of concern over the US-UK's recent bombings of Iraq may be only that: "I'm not so certain that underneath they feel the same way and [actually] favour a robust line as far as Iraq is concerned because a re-armed Iraq is bad news for any of the Gulf states and that worries them a lot – whatever they may say in public."

In the immediate future, all the Gulf states are expected to increase defence expenditure, after a period of restraint, encouraged by a period of higher-than-average spending. And at their last summit in Bahrain in December, after years of procrastination, GCC leaders signed a common joint defence pact, paving the way for the creation of a joint command with integrated strategic planning and procurement policies.

But, say diplomats in the region, this opportunity will probably be missed, and individual states will go on buying expensive military hardware to suit their own agendas and to cash in on the highest commissions on offer.

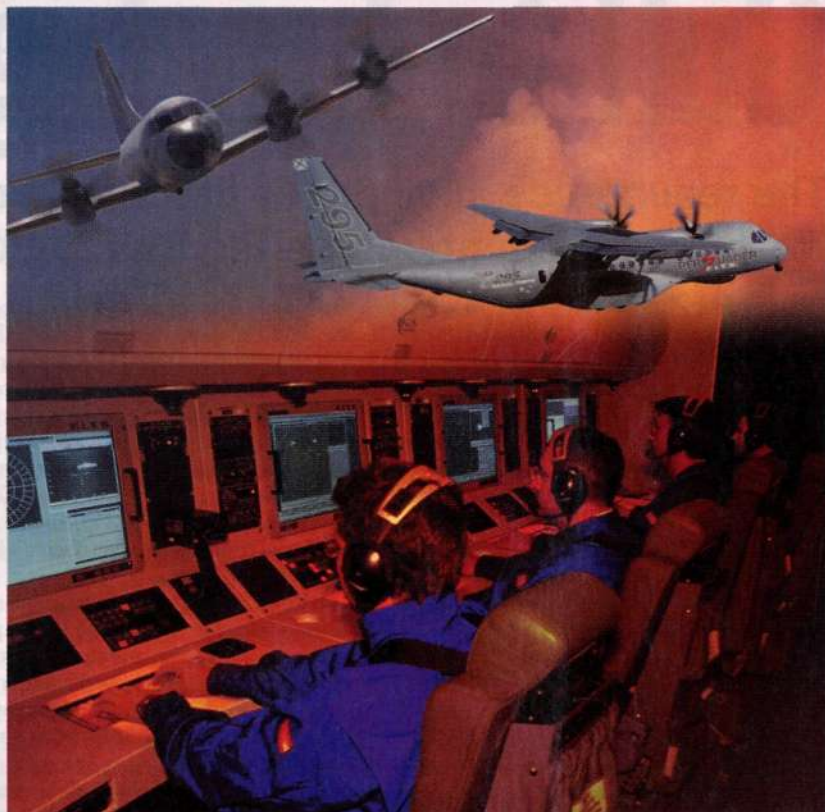
"They are worried about their security, and they are worried by Iraq and developments in Iran. So defence will always be near the top of their agenda anyway," says Taylor. "It has always been a difficult neighbourhood and remains so."

*Additional reporting by DeeDee Duke in London*



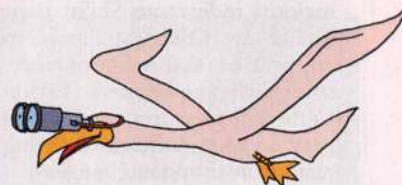
*Kuwait has been building its defences with buys such as the F/A-18 Hornet*





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## ECONOMIC FLUX

**W**HILE DEFENCE remains a crucial priority for the Gulf states today, the economic and political landscapes are shifting for some, with new priorities rising to the top of their agendas.

Such changes mean "they'll be even less insulated from what's going on in the world, both in terms of information and in terms of trading and economy," says Terence Taylor, assistant director of the International Institute for Strategic Studies in London. "They don't want to be left behind; they don't want to be on the wrong side of the so-called 'digital divide'. I don't know that they're ready to move past oil yet, but I think they want to enlarge their participation in the global economy."

Qatar in particular is moving forcefully towards joining the global economy as a player in electronics. "Qatar is probably the leader at the moment," Taylor says. Oman, too, is demonstrating its interest in the IT industry by intensifying its national higher education focus on the subject.

In Bahrain, steps towards a limited democracy are being made, in part because of a change of rulers several years ago and because the country has a majority indigenous Shi'ite population, Taylor says. Other Gulf states may face less pressure at this time to move toward similar change because, Taylor notes, "although pressures are there for some, they are not sufficient to bring about major constitutional changes".

The next rounds of bargaining for new weapons systems and accessories may find Gulf states' leaders driving for better deals than in the past because they have less cash than they used to. But Taylor suggests: "The link between oil price and orders is less direct than one might think – what drives them is a threat, whether or not they reach a point where they have obsolescent aircraft or other major weapons systems that need to be replaced."

He adds that "the orders are mainly over-ambitious anyway and they are rarely 100% fulfilled, with the exception of contracts such as Al Yamamah – the £4 billion (\$6 billion) Saudi military programme with the UK that included airbases and other infrastructure as well as aircraft and associated equipment purchases – which is such an amazing deal, how could they refuse it?"

# Gulf to buy big

## The resurgence in oil prices has sparked fresh procurement across the Gulf region

STEWART PENNEY/LONDON

**P**ROCUREMENT IN the Gulf dipped significantly during the late 1990s as the oil price collapsed and coffers were drained. The resurgence of oil prices has led governments to restart some competitions, and preparatory work for other buys has kicked off.

Saudi Arabia is the biggest country in the region with potentially the largest shopping list. Its biggest need is for a Northrop F-5E/F Tiger replacement; nominally the order would be for 100 aircraft. In March 1998, the Lockheed Martin F-16C/D was selected over the Saab/BAE Systems Gripen, but no contract was finalised and it is not clear whether Saudi Arabia will stick to its earlier choice or re-open the competition, particularly after the United Arab Emirates (UAE) selected the F-16 Block 60 last year. Saudi Arabia's tactical transport fleet also needs overhauling. In the near-term, an order for 24 Lockheed Martin C-130J Hercules is expected, although up to 70 could eventually be ordered if airborne tanker requirements and the needs of the Saudi Armed Forces Medical Services – which operates around 26 fixed- and rotary-wing aircraft in civilian markings for medevac – are to be met. Kuwait is also believed to be on the verge of ordering four C-130Js.

Saudi Arabia has voiced a need to increase its capabilities. It wants further Boeing F-15S Eagles (a derivative of the F-15E), and early last year told the then US defence secretary William Cohen that 24 more aircraft were needed to supplement the 72 previously ordered. It has also stated a need for more airborne warning and control systems. The air force operates five Boeing E-3A Sentrys – a type no longer in production – but Boeing's E-767 could fit the bill.

The Royal Saudi Land Forces has expressed an interest in the Boeing AH-64 Apache Longbow, possibly as new production machines or rebuilds of its 12 AH-64As. Kuwait, meanwhile, is still expected to finalise a long-awaited deal for 16 radar-equipped AH-64Ds, a type it selected in 1997.

Having signed a deal for 80 F-16s last year and 30 Mirage 2000-9s before that, the big item left on the UAE's shopping list is maritime patrol aircraft. It selected the EADS CN235MPA in 1998 but has yet to finalise a deal.

Oman has several needs, the most pressing being for helicopters, maritime and utility. Up to 50 machines are required and while they could all be one type – the NH Industries NH90, for instance – the order is likely to be split between a utility helicopter such as the Sikorsky UH-60 Black Hawk and a maritime machine such as the



**Saudi Arabia wants further Boeing F-15S Eagles, and last year told the then US defence secretary William Cohen that 24 more aircraft were needed to supplement the 72 previously ordered**



AgustaWestland Lynx. The Sultanate is also known to be considering the replacement of its Sepecat Jaguars, which have been upgraded to a standard similar to the UK Royal Air Force's Jaguar GR3. The competition is likely to be between the Gripen and the ubiquitous F-16.

Iran has acquired fighters from China and Russia in recent years but is also embarking on several indigenous programmes. The army is seeking utility transports and attack helicopters, and while Kamov's Ka-60 and Ka-52 respectively are being considered for these roles, Iranian industry has produced the Shahed-5, as well as the Shahbaviz (Owl) 2-75 and the Shahbaviz 2061 which are respectively reverse engineered Bell 206 JetRangers and Bell 212/214s. Iran also has the capability to restore non-airworthy Bell AH-1s to flight status, a capability which could be developed to produce new build machines.

Iran is also developing fixed-wing aircraft, the Azarakhsh (Lightning) fighter and the Dorna (Lark) jet trainer. The former resembles a 10-20% scaled-up version of the two-seat Northrop F-5 with an 8,000kg (17,700lb) maximum take-off weight. It is thought to be powered by two Klimov RD33 engines (the same as the RSK MiG-29 Fulcrum, which is in Iranian service) and equipped with Russian systems and avionics including the Phazotron Topaz radar.



□ Oman is considering the replacement of its Sepecat Jaguars. The F-16 and Gripen are likely candidates

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While it has neither the land mass nor the population of the region's largest states, the UAE is a giant in terms of its role in civil aviation in the Middle East

# UAE sets the agenda

JULIAN MOXON/DUBAI

**D**UBAI, THE UAE's main commercial centre, has the busiest and fastest growing airport in the region as well as the most rapidly expanding airline, Emirates. While oil wealth still provides 18% of Dubai's income, tourism has taken its place as the major growth area.

Evidence of the dramatic changes under way is seen just outside Dubai, where a huge free trade area and a specialised internet "city" are becoming firmly established. Couple this with a population that is 75% expatriate, and it is not difficult to see why the demands on air traffic management (ATM) are growing daily.

Emirates Air Traffic Control Centre (ACC) handled 260,000 instrument flight rules (IFR) flights in 2000 – about a sixth of the number handled by the London ACC. This has put the federal air traffic services system – based at Abu

Dhabi – under relentless pressure.

While the General Civil Aviation Authority (GCAA) is coping with the growth, there are major challenges ahead. UAE air navigation services director Riis Johansen says: "We are not afraid of meeting them. This is a region going through a phenomenal transition and as the oil business gives way to more general development, we expect air traffic density to increase accordingly."

To cope with the annual 8% growth in passenger traffic, a second terminal is to be built at Dubai airport, doubling capacity to 25 million passengers a year, while Abu Dhabi is to receive a second runway, parallel to the first, and a new terminal. As it is, the airport handles 4,800 international departures a month, a further 2,000 come out of Abu Dhabi, and more depart from the other international airports in the UAE – Sharjah, Ras Al Khaimah, Fujairah and Al Ain.

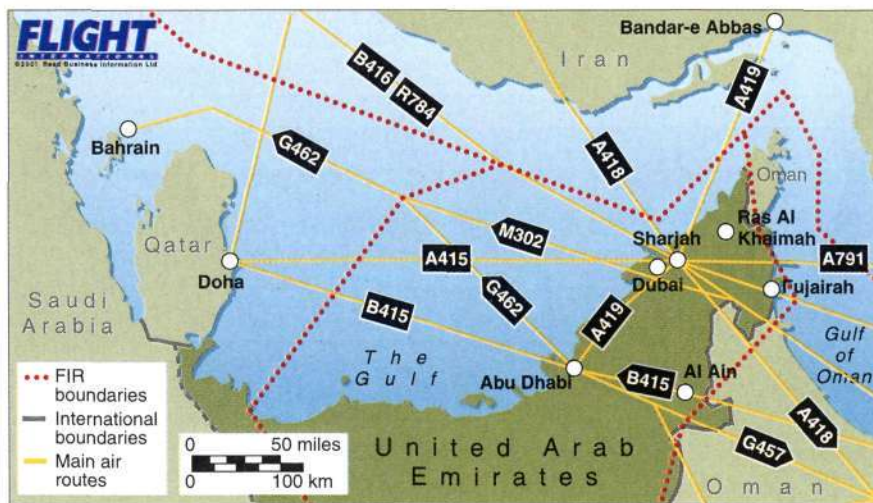
Emirates will double its passenger capacity in the next five years as the arrival of new aircraft continues its strong growth. In January 2003, it will take on its first Airbus A340-500 to give it access to the USA, South America and Australia. It will also be the first airline in the Middle East to acquire the 550-seat A380 – planning for which is being included in the design of Dubai's second terminal.

Of the top 25 city pairs operated from the Middle East to Asia, 16 originate from UAE airports, while the busiest routes between the Middle East and Europe/Asia are Dubai-London and Dubai-Karachi respectively.

Considering UAE the regional hub, the GCAA has taken an innovative approach to developing the ATS system. It has introduced the ICAO Required Navigation Performance-5 (RNP-5) in its airspace above 10,500ft (3,000m). RNP-5 is the latest standard for instrument nav-



UAE air traffic services' regional centre at Dubai began operations in February





igational accuracy, used by Europe to define basic area navigation standards.

"We are the first state in the region to introduce RNP-5, which we see as essential to providing more airspace capacity," Johansen says. A number of other Middle East states will introduce RNP-5 on airways to Europe from 22 March this year. But Johansen remains worried about the time it will take for full regional implementation. "The UAE has a one-way airways system [which provides double the number of airways] and is still the only Middle East country to have adopted RNP-5."

"From the ATM point of view, introduction of RNP-5 enables us to establish a dual-carriageway in the airspace previously taken up by the equivalent of a one-lane road. This gives a large improvement in both capacity and safety. It is of particular importance in our airspace, where most of the traffic is climbing or descending," adds Johansen. The GCAA was also the first authority in the region to introduce satellite navigation as a supplementary means of navigation, and GPS non-precision approaches are already published for Dubai.

One of the main difficulties facing the despatch of aircraft towards Europe is the application of procedural coverage on the airways to Europe, which means that 10min longitudinal separation, or around 129km (70nm) per aircraft, is required west of the Emirates flight information region (FIR). "By comparison we use 8km radar separation throughout the FIR," says Johansen. While some countries in the region are busy upgrading their ATS systems, the GCAA remains concerned about bottlenecks between the Gulf and Europe.

Despite that, the figures for departure delays would "make a European controller's eyes water," says Johansen. "During the fourth quarter of 2000 we had 24,900 international departures from the UAE without a single delay, and in the third quarter there were only 12." That amounts to an average of 0.4s per departure, "which isn't bad – but we're still not celebrating because the statistics hide two regrettable facts: if procedural separation was replaced by radar separation minima all the way to Europe there wouldn't be any delays – or flow control – at all. Furthermore, very few flights would be cruising at uneconomic levels, as they are now".

Robust flow management measures have been implemented to alleviate the problem, and delays were cut by two-thirds during 1999 despite a 15% increase in traffic. Part of the reason for this is Emirates' practice of planning for up to 12 possible routes for each flight, and airspace planning criteria have also been tightened. "We calculate our exit point from procedural airspace very carefully to try and ensure that UAE departures arrive at precisely the right time. This means we can actually increase the number of flights through the area from 4-6 per flight level," says Johansen.

The arrival of reduced vertical separation minima in late 2003 will ensure aircraft are fly-



### **Delay figures for Dubai "would make a European controller's eyes water" – air navigation services director Riis Johansen**

ing closer to their optimum levels, "but unless radar separation is implemented throughout the airways to Europe, it will make precious little difference to us because of the strong traffic growth," he adds.

In addition to providing air navigation services, the GCAA is also the regulatory authority in all aspects of civil aviation, including flight operations, airworthiness, security, airport operations and air navigation services. In its regulations, the GCAA is following the European Joint Aviation Authorities' requirements wherever possible because these are normally compatible with, but more specific than, ICAO standards, recommended practices and procedures.

#### **FOCUSED ON AIRPORTS' NEEDS**

The GCAA is an autonomous, government-owned organisation established in 1997 with a government cash injection of 100 million UAE dirham (\$27.2 million). The chairman of the board of directors is the minister for communications, and each airport operator has a seat. "This keeps the GCAA focused on the needs of the airports and, in turn, the operators, while maintaining perspective in its function as state regulator," says the director general, Mohammed Ghanim Al Ghaith. He

points to the efficiency of an operation which handled 260,000 movements in 1999 with just 30 controllers.

Originally, none of the profits were to be retained. The income generated by overflights, which accounted for about 90% of the total, was balanced by the cost of providing a safe and efficient service. Recently however, the government has allowed the GCAA to increase its capital base to 300 million UAE dirham against the need for future investments, which confers the benefits of privatisation without losing the advantages of direct government links. "It is a huge step forward," says Al Ghaith, "because it means we are autonomous and can run our modernisation process with a speed and efficiency that was not possible before."

While the GCAA charges about 60% less than Eurocontrol, Johansen hints that a "slight increase" may be necessary to hedge against future investments. "We're having to think long-term, to the end of the ACC lifetime in around 2010. The current Airsys Watchkeeper equipment was installed in late 1997, but in 13 years there will be real difficulty getting spares. For instance, we're already stockpiling computer cards against that problem."

Immediate plans are for Watchkeeper to be upgraded to Eurocat 2000 standard in 2002. □

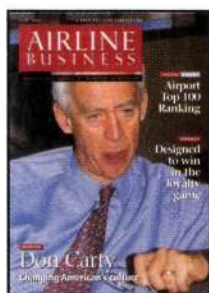


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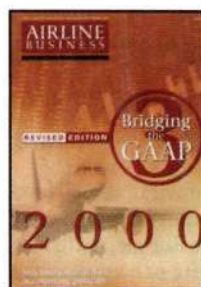
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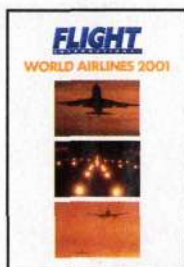


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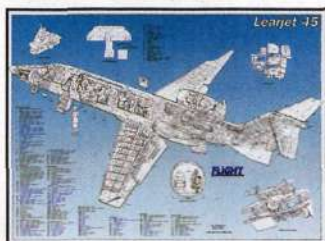
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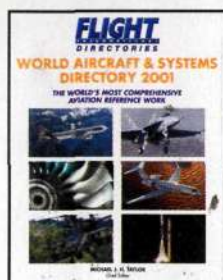
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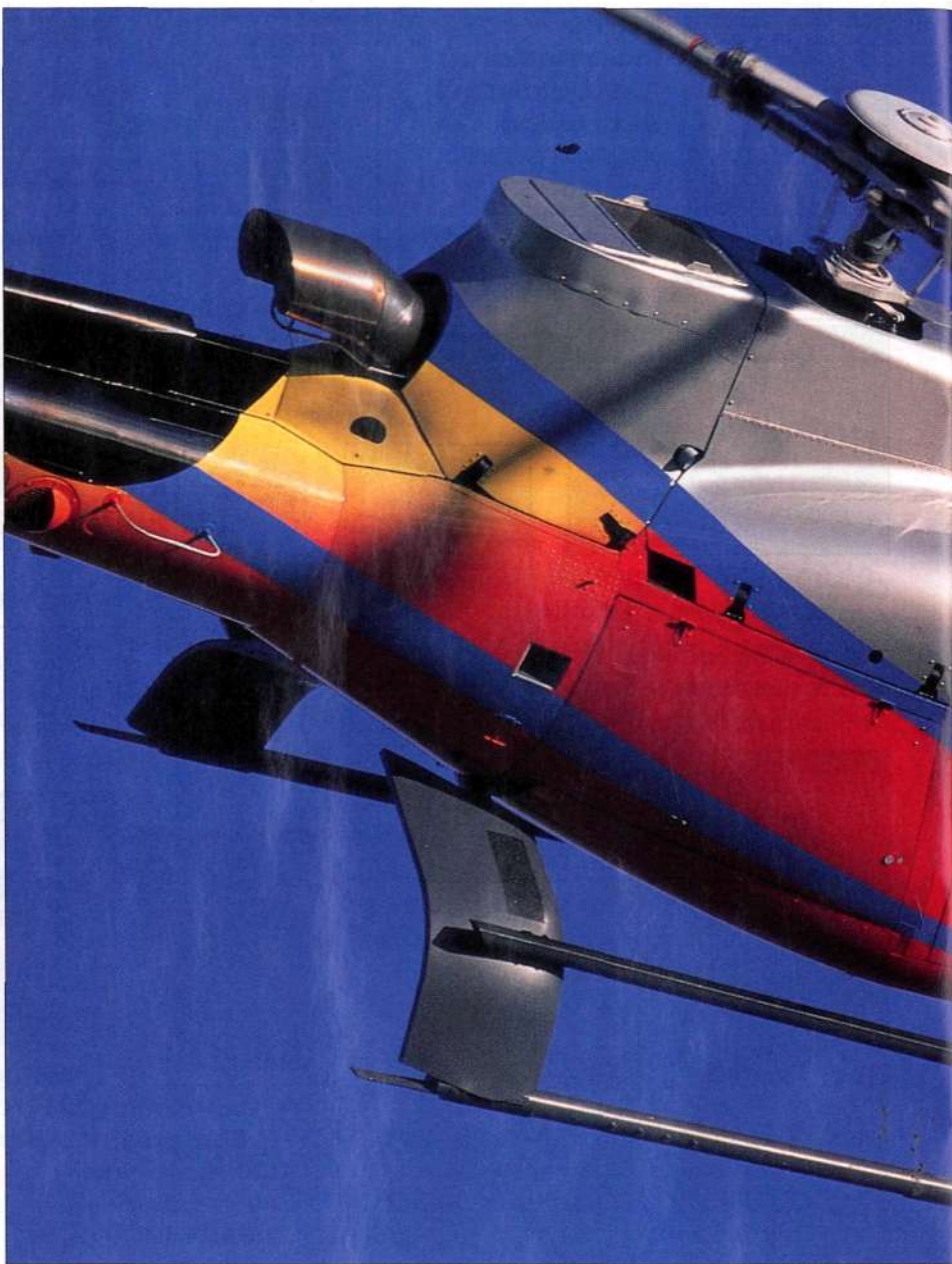
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## FLIGHT TEST



(Top) the compact instrument panel offers good visibility; (above) the twist-grip throttle is made largely redundant by the FADECs (below) the aircraft seats up to eight



PETER GRAY/ANAHEIM, CALIFORNIA  
MIKE REYNO/PHOTOGRAPHER

**F**OLLOWING last month's sneak preview of the Eurocopter EC130, *Flight International* flew the light helicopter at the Heli-Expo in Anaheim.

My pilot was Eurocopter experimental test pilot Didier Delsalle. Also present was flight test engineer Bernard Certain and programme director Xavier de la Servette. The weather was standard ISA at sea level with a light wind. Take-off weight was 330kg (725lb) below the maximum of 2,400kg since, unlike at the factory,

it was not possible to ballast the aircraft.

Looking round the EC130, I noted the wide, spacious cabin, able to seat seven or eight passengers instead of the seven allowed by its predecessor, the Eurocopter AS350B3. The centre of gravity limits had to be expanded to contain this but now passengers can sit where they want. In extreme cases, the battery can be moved to its second location to balance the aircraft.

Vertical space is reasonable – you would have to be over 6ft (1.83m) tall to hit your head on the roof, even though the rear four seats are elevated to increase passenger external visibility. The elevation platform can be easily removed with

*Pilots will appreciate the EC130's handling characteristics while operators should benefit from the cost effective features. Passengers will enjoy the comfort*



# Keeping the noise down

**Eurocopter's new  
light helicopter –  
the EC130 – is  
claimed to be the  
quietest in its  
class**

the seats if a flat floor is required for cargo. The Agusta A119 Koala is the only other helicopter among the EC130's nearest rivals that can carry eight – the Bell 407 seats seven. With eight on board the EC130, maximum fuel has to be reduced to 50% and with seven it is 80%.

#### **WEIGHT INCREASE**

The empty weight has inevitably increased over the AS350B3 to support the heavier Fenestron tail rotor, a penalty of about 150kg. To compensate and to take advantage of the good performance, the maximum take-off weight has also been increased, from 2,250kg to 2,400kg. The EC130 with full fuel has a useful load of 485kg, compared to the AS350B3's 570kg, the Koala's 575kg and the 407's impressive 620kg.

For casualty evacuation, the EC130 can carry

one pilot, two stretchers and two attendants or two pilots, one stretcher and two attendants. The lower power-to-weight ratio and larger cabin compared with the AS350B3 reduces the maximum cruise speed (127kt (235km/h) against 140kt) and lowers the inside and outside ground effect ceilings. But these are still a respectable 10,720ft and 8,740ft – not too different from the Koala and 407. If you want better hot, high and heavy performance, choose the AS350B3 (13,285ft and 10,825ft). The 407 cruises at 128kt and the Koala at 136kt. All these figures are for maximum weight at sea level on a standard day.

The EC130 has more baggage space (just over 1m<sup>3</sup>) than any of its competitors and its smaller brother, though the space is divided into three separate bays. Underslung load work requires good out-of-ground effect performance. Older



*The EC130's Fenestron has unequally spaced blades, the key, says Eurocopter, to lower noise and vibration levels*

generation helicopters struggle with heavy loads, these latest models do not. They will all carry the maximum load allowed on the hook. I noted the newly designed undercarriage with its profiler on the rear strut to give it good stability.

The Turboméca Arriel 2B1 engine is the same as the AS350B3's except for several key differences: not only are there two full authority digital electronic controls (FADECs) to manage it – though only one fuel valve – but also a back-up fully independent fuel control box that automatically controls the engine in the unlikely case of a double FADEC failure (belt and braces). So the twist grip throttle on the end of the collective lever becomes largely redundant,





(Top) The EC130 has excellent rotor characteristics; (above and middle left) the Turboméca Arriel 2B1 engine has two FADECs; (middle right) the baggage compartment has more space than its competitors

useful perhaps to wind off RPM in the event of a tail rotor failure or to practise autorotation. If the pilot inadvertently winds off the throttle, it automatically winds itself back to the flight stop, once released.

All of the EC130's competitors and the AS350B3 have either a single FADEC or, in the Koala's case, a single electronic engine control with a manual throttle in case of failure. This requires extra training and practice.

Another unique feature of the EC130 is its two independent hydraulic systems. This is an important improvement on all competing aircraft which have either one, or, in the Koala's case, two, but one for the tail rotor pitch change.

## THE KEY TO LESS NOISE

I noted the newly designed tailboom, drive shaft and tail gearbox. The Fenestron, similar to the EC135's with the unequally spaced blades, is the key to less noise. Eurocopter claims that this aircraft is the quietest of its class and is well below all the limits set by the various authorities including the Grand Canyon National Park, which is the most stringent.

The other significant noise reducer is the rotor RPM ( $N_R$ ) automatically reducing from 400RPM in the hover to 386RPM in the cruise. The tip of the advancing rotor blade experiences not only its revolution speed, which can be as high as 500kt (925km/h) but also the aircraft's forward speed. As the aircraft exceeds 100kt, the advancing tip approaches Mach 1 with all its associated problems, including noise. The oddly shaped main tips on some high-speed helicopters are attempts to address these problems. This  $N_R$  reduction is cleverly managed by the FADEC and is not noticed by the pilot. Conversely,  $N_R$  increases as the aircraft comes to the hover.

All the energy-absorbing seats inside had high backs and dual shoulder harnesses. None of the competitors are as well equipped.

I sat in the comfortable left-hand pilot's seat. Eurocopter has chosen this seat for the pilot instead of the conventional right-hand position to eliminate interference with the collective lever by passengers or internal freight (although this should not happen if the load is secured properly). It also offers a better position for vertical reference operations when the pilot must lean out and watch the load on the end of the line below. You cannot do this from the right-hand seat in the AS350 as the seat is too far from the ledge. Eurocopter compromises in these helicopters by providing a window in the floor by the pilot's seat, but it is nowhere near as effective.

Most other helicopter manufacturers offer a choice of avionics and instruments. This can take extra time to fit, undoubtedly at extra cost. Eurocopter has decided to fit a standard comprehensive package, only just short of IMC (instrument meteorological conditions) standards. The avionics are integrated. For example, the two navigation systems are linked to the



horizontal situation indicator (HSI). The GPS satellite navigation has a moving map display. Some competitors charge extra for such essentials as an attitude indicator, directional gyro, vertical speed indicator or turn and bank – all are standard in the EC130.

The Thales Avionics vehicle and engine multifunction display by is the same model as the one I liked in the AS350B3. It reduces the clutter on the instrument panel to a simple display, telling you all you need to know at the time. I particularly like the first limit indicator (FLI) which monitors torque, turbine exhaust temperature and compressor speed and shows you with one indication at a glance which one is highest and how much you have in hand. Consequently, the compact instrument panel allows excellent forward and downward visibility and there is plenty of available space on the right of the panel for whatever extras the operator requires.

To complement the attention to detail there are two fairly large map pockets under the panel. Overhead there is only the rotor brake (standard equipment) and an emergency fuel shut-off, allowing good overhead visibility. This is important when coming vertically out of a jungle clearing. All eight occupants can talk to each other over their headsets, though the noise level was comfortable when I removed my own headset in flight. As is usual in small helicopters, the pilot's seat and pedals can be adjusted only fore and aft but I found a comfortable position. The cyclic stick and collective lever (the lever) are nicely balanced and have their own friction devices, though there is built-in friction.

There have been incidents in which the pilot has moved the helicopter or even taken off with the external power unit still attached. To avoid this, I always check to see if the pilot can see the connection point on the fuselage. You cannot in the EC130 but there are two warning lights.

#### TYPICAL FADEC START-UP

Start-up was typical FADEC – fuel pump on, select start and watch. You can start in idle or flight modes. We were parked fairly close to two other helicopters, one each side, facing the hangar so requiring a rearwards exit to the taxiway. But Delsalle had such confidence in his machine that he allowed me to come to the hover, look over my shoulder and back out. Once backed out and before hover taxiing, a quick glance at the FLI showed me how much power I was using and how much I had in hand, freeing me from having to remember torque, temperature or compressor limits. We headed south to the beach then west to follow it. I trimmed for straight and level and released all the controls. The aircraft, which is not equipped with a stabilisation augmentation system, continued straight and level.

Delsalle and I then had some fun by leaning in the same direction to turn it. Delsalle took control and pulled into the transient excess power level. After 1.5s we had a warning light. Since



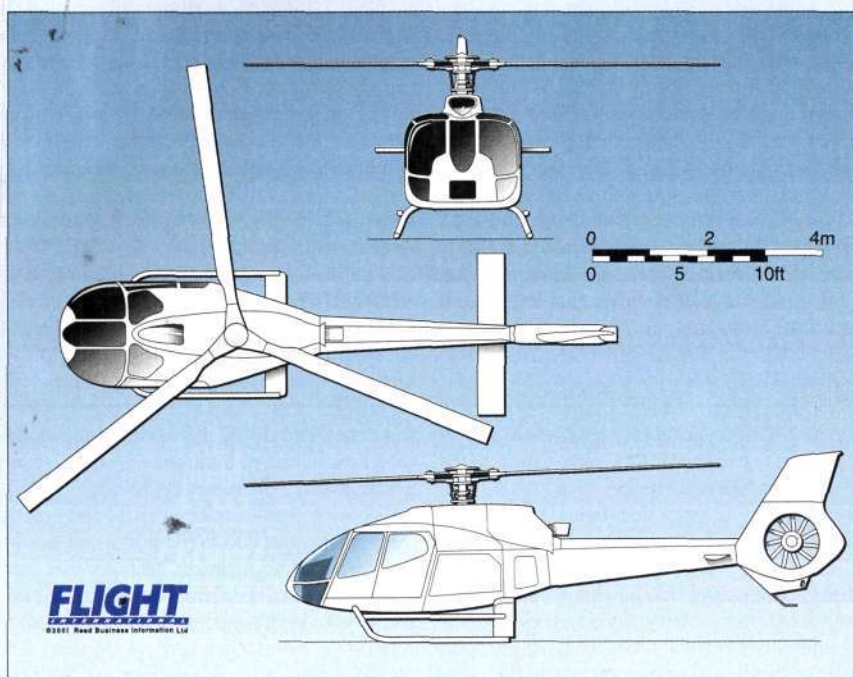
The rear four seats are elevated to increase passenger external visibility

this was within transient limits it was not recorded; any outside limit excess would be.

I came to a 1,500ft hover, trimmed and released the controls. Even with no artificial stabilisation the aircraft remained stable – an impressive demonstration of good dynamics. Some 360° pedal turns were equally stable. Maximum continuous power at this altitude, the EC130 now 360kg below maximum weight,

gave us 135kt IAS/TAS. A slight dive took us to the  $V_{NE}$  of 155kt. There was hardly any noticeable increase in the vibration level, which was already benign (there are three anti-vibration systems installed) and likewise a 45° turn to the left followed by a swift 60° turn to the right. The rotor was crisp. Delsalle pulled the nose up vertically and performed a graceful “wing over”. All this demonstrates excellent rotor character-

### EUROCOPTER EC130



Length overall	12.64m	MTOW	2,400kg
Rotorspan	10.69m	Maximum slingload	1,160kg
Height overall	3.61m	MTOW with slingload	2,800kg
Powerplant	1 Turboméca Arriel 2B1 632 kW	Range, no fuel reserves	600km (approx)
Fuel and payload	910kg	$V_{ne}$	155kt





*Eurocopter has achieved other aims of good performance and finish*

istics. Thereafter 90° steep turns in both directions at 120kt were a formality. However, the limit light came on as a gentle warning not to go too far. Slowing to 100kt and going over the vertical, the light stayed out.

Sudden engine failures still occur and over-relaxed helicopter pilots let the  $N_R$  get too low before reacting. So I always check rotor droop and time available in a single engined helicopter by having the engine suddenly reduced to idle in the cruise, doing nothing and watching  $N_R$ . The EC130 allows 3s, which should give plenty of time for even the slowest pilot to realise what has happened. A distinctive and loud audio warning is heard, and a red warning light comes on. The FADEC recovered the engine quickly to flying RPM.

Another potential killer in helicopters (and also in tilt rotors) is vortex ring/settling with power, which can trip up even experienced pilots, as happened in one of the fatal Bell Boeing V-22 Osprey accidents. Some helicopters will literally drop into the condition easily and quickly and before the pilot has realised what is happening, will hit the ground excessively hard, because it usually occurs close to the ground—just like the stall of a fixed wing aircraft turning onto final approach when the pilot overdoes the angle of bank. So I like to evaluate the lead up to the condition: looking for warning signs such as how much control there is, and the effect of the recovery actions (at least 20–25kt IAS, then raise the lever to control the loss

of height or, if height permits, enter autorotation, then build some airspeed).

The EC130 gave us all the warnings – a significant increase in vibration levels, yawing, increased rate of descent. Delsalle, with his vast experience of the Ecureil/Squirrel family, flew out of the condition quickly by lowering the nose and simultaneously raising the lever to contain the height loss. We were at a safe height. So while there is plenty of warning if the pilot recognises it, there is also plenty of control to enable the pilot to recover.

## AROUND THE AIRFIELD

Continuing our upper air work, I asked Delsalle to raise the lever from fully down to a high power setting as quickly as he dare while I checked  $N_R$  and engine response. The helicopter recovered from the slight droop in less than one second. I then invited him to dump the lever from a high power setting. There was no droop.

We arrived at a satellite airfield and I carried out a steep approach to the hover and landing. Downwards and forwards visibility was excellent, as expected. I did not have to yaw the nose sideways to keep my landing area in view all the way down. Similarly a vertical climb to 100ft and back down allowed excellent outside references to keep the flight path vertical.

Using the GPS for a groundspeed check, I flew sideways to the left up to 48kt before I used full right pedal. Sideways flight to the right at 40kt still had a little more left pedal remaining.

Modern helicopters do not suffer the nose down pitch, often severe, accompanied by excessive rearwards stick application of earlier designs, so I confidently roared backwards at high speed. Delsalle demonstrated his usual high speed spot turns where the sideways  $G$  force can be felt and the outside world starts to blur.

All these manoeuvres, while not used in normal operation, give the pilot confidence he has enough main, Fenestron and engine power to deal with strong wind from any direction.

A 65kt autorotation gave a rate of descent of 1,900ft/min (9.6m/s) – anything under 2,000 is satisfactory. A powered recovery to the hover showed how effectively the FADEC can accelerate the engine. There was no opportunity to take the aircraft to its out of ground effect hover height so I had to rely on Delsalle's observations, particularly the amount of Fenestron power available, which he said was ample. The aircraft is cleared for 6° of up and down slope and 8° sideways, though Delsalle says that 10° is not a problem.

We returned to our landing position, idled the engine for 30s, switched off the FADEC and applied the sliding lock on the lever. Delsalle interrogated the VEMD to extract flight and engine power details, and examine for any exceedances or failures (there were none). It will also provide technicians with peripheral maintenance information.

The EC130 proved Eurocopter's design objectives. It is indeed comparatively quiet, both inside and out. The cockpit/cabin is roomy, the outside visibility excellent and the ventilation/heating/air conditioning satisfactory.

Eurocopter has used its vast experience (the Ecureil family has accumulated over 11 million hours) to provide reliable components with high time between overhaul. Commonality with other models has been addressed. All this means that development and operating costs have been minimised. Eurocopter's other aims of good finish and performance have also been achieved.

As an aviation safety advisor to many of the world's largest oil and seismic companies, I appreciate the built-in safety features such as crashworthy seats throughout and dual shoulder harnesses, dual hydraulics and FADECs with the additional back-up system. The Fenestron should minimise or even prevent damage should the pilot get too close to ground objects (not uncommon on seismic operations). Someone walking into it may well escape unharmed. Based on experience with their previous models, Eurocopter expects maintenance hours per flying hour to be somewhere between 0.3 to 0.53.

Pilots will appreciate the EC130's handling characteristics while operators should benefit from the cost effective features. Passengers will enjoy the comfort and, most importantly, those on the ground the low noise signature. The EC130 is a useful complement to the rest of the Eurocopter fleet. □



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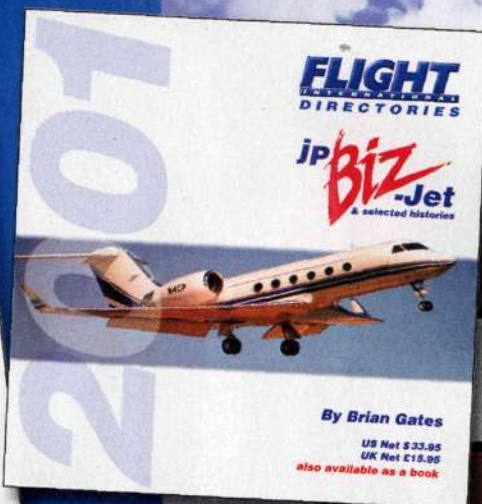
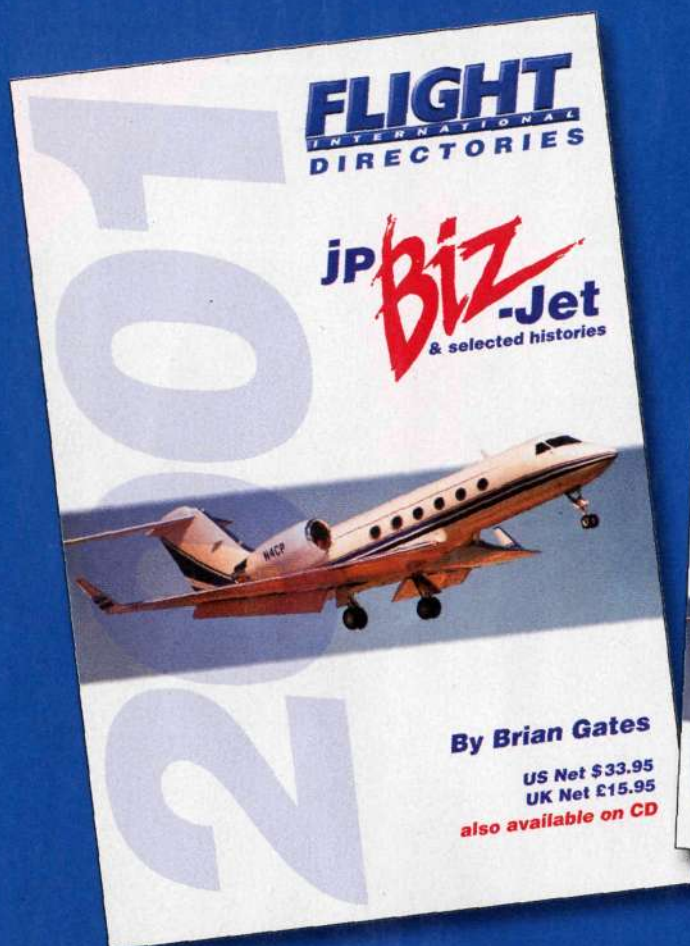
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## Concorde does not deserve privileges

So Concorde is to resume commercial flying by June 2001 (*Flight International*, 13-19 February 2001, P9).

Concorde, beautiful to behold flying, is the greatest polluter of all commercial aircraft. It gets priority on landing and take-offs, climb and approach. Whenever a Concorde is involved in an approach area, conventional traffic is penalised.

Since the Concorde fleet, say British Airways and Air France, is commercially viable, shouldn't they pay for the priority status they have been granted? Shouldn't they compensate airlines for being penalised in the take-off, climb, descent and approach phases?

What about compensating those living around the airports from which Concorde operates?

Concorde flights satisfy the whims and egos of the very rich who have no problems paying for it.

I lived near Heathrow for six years and remember the noise of the 11.00 daily flight to New York. It was not pleasant and pets suffer a great deal more.

**CAPT ORLANDO GIACICH**  
*Weston-super-Mare, UK*

## Bye bye BA

I raised an eyebrow when I read "Deal raises hopes of e-ticketing take-up boost" (*Flight International*, 20 - 26 February), and read: "E-ticketing is expected to reduce processing and costs and improve customer service". That it will reduce processing and costs is obvious as at least BA now passes on these costs for issuing tickets to passengers.

A mixture of e-tickets and paper tickets does not work, as luggage cannot be checked

through. This prolongs the time required to go from one flight to another beyond the minimum stipulated for each airport and may prolong travelling time.

Flying the first leg of my journey last week on BA and the second on an airline not in the same alliance and not issuing e-tickets, I asked for a paper ticket when I booked the BA ticket. Yes, this could be done for a charge of £25 (\$37). And this was after I had paid for a full fare business class ticket. Making my thoughts known to the individual at BA sales I was told that the charges could be reduced to £12.50 if it was sent to me by courier express.

This policy will certainly reduce processing and costs as I will avoid flying BA from now on, if at all possible, as I heard the gentleman in seat 2a behind me decide too, for the same reason.

**ERIK JOHANSSON**  
*Swadlincote, UK*

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Flight International's "Beneath the skin" exhibition is on at La Musée de l'air et l'espace, Aéroport de Paris, Le Bourget BP173, 93352 Le Bourget, Cdx, France. For further information contact:  
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# FLIGHT INTERNATIONAL

## World Airlines 2001

Flight International's comprehensive annual reference guide to airlines provides a detailed **alphabetical** listing of the World's scheduled and charter airlines:

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- History
- Marketing Alliances
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- Key executives
- Services
- Fleet
- Number of employees
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World Airlines 2001 is split between three issues of Flight International:

**March 20th: Part 1 A to B\***

**March 27th: Part 2 C to L\***

**April 3rd: Part 3 M to Z\***

\*Subject to change.



## FLIGHT INTERNATIONAL

### 25 YEARS AGO

*Extracts from Flight International,  
13 March, 1976*

#### UK backs air-defence MRCA

British Defence Secretary Roy Mason announced a development go-ahead for the UK-only Air Defence Variant (ADV) of the Multi-Role Combat Aircraft on 4 March. The type is designed to replace Phantoms and the remaining Lightning squadrons from about 1983 or 1984. The decision follows a review of British air-defence requirements and the means available to meet them from the mid-1980s to the end of the century. There had been suggestions that American F-15s or F-14s would prove both cheaper and more cost-effective. Unit production cost of the ADV is officially quoted as £6.5 million at 1976-77 UK Defence Estimates price levels.

#### Iran Air Concorde Order

The Iran Air order for two Concorde (aircraft 14 and 16), plus an option for another, is contractually virtually complete, with the specification agreed. The order depends now only on clarification of the environmental problems. The Iranians are watching the New York case particularly closely, with a Tehran-New York service via London and Paris in mind. Concorde 002, G-BSST, retired last week when it flew to RNAS Yeovilton, Somerset, where it will be displayed alongside the Fleet Air Arm Museum. The aircraft was given to the London Science Museum by the British Department of Industry, and Yeovilton was chosen as the display site because of the existing museum and good spectator facilities. Apart from a short test flight on February 27, this was 002's first flight since the undercarriage was seriously damaged by over-rapid extension during an approach to Fairford on August 26, 1974. Piloted on its first and last sorties by Brian Trubshaw, Concorde 002 totalled 836hr 51min flying time (178hr 26min supersonic) in 439 flights over a little less than seven years.

■ Concorde 02, the French-assembled pre-production aircraft, made its last operational flight on January 29 and will soon make its final flight to Paris Orly, where it will replace the Concorde mock-up on display there. Last task for 02 was the life testing of the thrust reversers. After operation on the engines, these were removed to the French Government engine-test establishment at Saclay. Concorde 02 made 313 flights totalling 655hr 29min, of which 281hr 20min had been supersonic.

#### Blue on er... 'Pink'

■ As we all know, shrinking defence budgets have had a pronounced influence on the industry, forcing Cold-War warriors to adopt commercial sales tactics. This appears, however, to cause some occasional confusion.

*Unmanned Combat Air Vehicle (UCAV) programme manager:* "It needs to be able to go in there as a suppression of enemy air defences aircraft, and take out some of the SAM and other air-defence assets that the customer has...er excuse me—I mean enemy..." Oh by the way, you ought to tell those prospective UCAV leasing company customers they can only be offered on 'dry' leases.

#### Scruggs Becomes Moth Minder

■ As part of its commitment to grow into new businesses, BAE Systems is to take technical responsibility and customer support for, er, 2,000 "ah...de Havilland" Moths, Rapides, Dominies, Devons, Herons, Chipmunks and Beavers. In co-operation with the Moth Club, BAE Systems has even formed a new company: de Havilland Support Ltd (DHS Ltd). It gets better. Based



*Health inspector prepares to spray cabin, London Heathrow*

from a proposed headquarters at Duxford, DHS will have design authority for 16 types of Moth, three types of Dragon and Dragon/Rapides, the Dragonfly, all series of Doves, Devons, Sea Devons and Sea Herons, at least six types of Chipmunk and the DHC2 AL Mk 1 Beaver.

Ahhhhhhhhhhhh! And whoever said the soul had gone out of the aviation industry?

#### Mirror, Signal, Manoeuvre

■ Worried about flying backwards in some of the rear facing seats now appearing in Birdseed aircraft? Fear not, helpful advice has been posted on its website – as spotted by the sharp eye of nephew

Geoff Leach:

"If you have never flown backwards before it may feel novel at first, although aviation experts have advised that there are no physiological effects of flying backwards as opposed to forwards. Passengers travelling on private jets already do this. Please note all our crew sit backwards now."

In other words, sitting facing backwards is going to be the *least* of your worries! It's going to make those take-offs and landings very interesting....

*Geoff Leach*



*Aircraft cleaners prepare to board aircraft inbound from Bombay, India*



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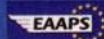
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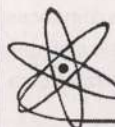
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Applications with CV should be made in writing to the General Manager Engineering, MK Airlines, Hartfield, East Sussex TN7 4DL, quoting the above reference.

Closing date for applications: 16th March 2001.



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# FLIGHT INTERNATIONAL

## Munich Correspondent

Munich continues to develop rapidly as a major European aerospace centre and has been a key focus of recent industry restructuring. Bavaria's largest city is home to the German operations of newly-formed European Aeronautic Defence and Space and its majority-owned subsidiaries Astrium and missile house LFK, and serves as headquarters for Fairchild Dornier, Eurofighter and engine manufacturer MTU.

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