



**GOALS GALORE**  
**WHY BRAZIL HAS**  
**MANY AMBITIONS**  
**FOR AEROSPACE**  
**COUNTRY SPECIAL**

**SUPERJET PROBE**  
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UK says current defence  
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# FLIGHT

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**EBACE REPORT**

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**COVER IMAGE**

This shot of a busy static display at EBACE in Geneva comes from BillyPix. The agency's Ian Billinghurst, Tom Gordon, Liam Ritson and James Robbins were on hand to shoot the highlights of the convention **P22**

**PIC OF THE WEEK**  
**YOUR PHOTOGRAPH HERE**

AirSpace user airXimages captured this Japanese air force Boeing 747-400 on finals for London Heathrow 27R, one of two to visit the UK capital on 16 May. Open a gallery in flightglobal.com's AirSpace community for a chance to have your photograph featured here.



[flightglobal.com/imageoftheweek](http://flightglobal.com/imageoftheweek)



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- 30** **Brazil takes off** Embraer has long dominated the aerospace industry of Latin America's largest country. It will continue to do so as it builds defence as a third major revenue stream, and invests in overseas engineering and manufacturing capabilities. Elsewhere, the sector is maturing as a thriving economy boosts airlines, airports and training and maintenance providers, and a home-grown supply chain develops. And, with Brazil a key market for VIP and utility rotorcraft, industry is setting its sights on a true indigenous helicopter.



**NEXT WEEK MILITARY ENGINES**

With its TP400-D6 in series production, we find out how Europrop International is switching its focus to the aftermarket and supporting export campaigns.

Europrop International

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## BEHIND THE HEADLINES

Editor Murdo Morrison was in **Brazil** to visit Embraer, Helibras, and others for our country special on the **Latin American powerhouse** (P30). Meanwhile, at least a dozen members of the Flightglobal team decamped to **Geneva** to put together our multimedia coverage of **EBACE** (P22).



For a full list of reader services, editorial and advertising contacts see P42

### EDITORIAL

+44 20 8652 3842  
flight.international@flightglobal.com

### DISPLAY ADVERTISING

+44 20 8652 3315  
gillian.cumming@rbi.co.uk

### CLASSIFIED ADVERTISING

+44 20 8652 4897  
flight.classified@flightglobal.com

### RECRUITMENT ADVERTISING

+44 20 8652 4900  
recruitment.services@rbi.co.uk

### WEBMASTER

andrew.costerton@flightglobal.com

### SUBSCRIPTIONS

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### REPRINTS

+44 20 8652 8612  
reprints@rbi.co.uk

### FLIGHT DAILY NEWS

+44 20 8652 3096  
flightdailynews@flightglobal.com

### ACAS

+44 1788 540 898  
acassales@flightglobal.com

## THE WEEK ON THE WEB

### flightglobal.com

Flightglobal's **journalists** became stars of the (very) small screen as John Croft, Murdo Morrison, Dominic Perry, Kate Sarsfield and Stephen Trimble fronted **video coverage** of



the EBACE business aviation convention in Geneva. There are packages on Garmin's avionics wins, **Citation** and Learjet launches, and Qatar Airways' North American partnership with Flexjet, plus **highlights of the static**

**display**. Watch the videos on our flightglobal.com/ebace landing page, where you will find our interactive magazines – complete with great images – produced over three days of the show. In blogs, Stephen Trimble runs through his EBACE takeaways on **FlightBlogger** and Israel correspondent Arie Egozi looks on Ariel View at how increasingly the **military is looking to adapt technology** developed for civil aviation, rather than the traditional other way round.



Find all these items at [flightglobal.com/wotw](http://flightglobal.com/wotw)

## QUESTION OF THE WEEK

Last week, we asked: **What are your views on the A350-1000?** You said:



Total votes: 4,110

This week, we ask: **Other than Europe and USA, who will be building most airliners in 2030** ☐ Brazil ☐ Canada ☐ China ☐ Japan ☐ Russia?

Vote at [flightglobal.com/poll](http://flightglobal.com/poll)

## HIGH FLIERS

The top five stories for the week just gone:

- 1 Crash site of Sukhoi Superjet found – Indonesian search agency
- 2 American 787s depend on pilots
- 3 UK reverses controversial F-35 switch
- 4 Gulfstream G650 launch could be overshadowed by NTSB probe
- 5 American considering livery update



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# Who's reshaping our world? Vote now!



The nominations are in, the shortlists have been selected and now we want you to vote for your choice of the brightest and best people in aviation today. The finalists are:

## Aviator of the Year

- Ian Davies and Dr Fred Prata
- André Borschberg and Bertrand Piccard, Solar Impulse
- Mark Stucky, test pilot at Scaled Composites
- Maj Richard Rusnok and Lt Col Matt Kelly

## Innovator of the Year

- Jean-Michel Billig and Eurocopter back-up battery team
- Rockwell Collins touch-screen flight displays team
- Matt Keennon, AeroVironment
- Corey Bird

## Leader of the Year

- Jean-Jacques Dordain
- Louis Gallois
- John Garrison
- Louis Chenevert

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# Power of final farewell

Photos taken before the ill-fated final flight of the Superjet bring home the human element of an accident that will raise questions about maintaining safety standards on demonstration flights

**E**ven with their eerily bleak composition, fragments of modern machines embedded in a vertical cliff wall, the photographs taken after the Superjet accident do not carry half the impact of those taken before.

Pictures of glamorous young cabin attendants, a confident crew and cheerful delegates coldly closed the distance that normally separates images of wreckage from an observer's sense of reality, and laced the media coverage with a bitter sprinkling of poignancy in a way that a passenger manifest could never have. Walls of rock do not discriminate by passengers' youth.

Pre-empting any accident inquiry means running the risk of appearing arrogant, at best, and downright foolish at worst. But as the crash probe enters the analysis phase, there is no denying that sudden technical failure during low-level flight near a mountain would turn out to be a remarkable coincidence.

And if this latest unhappy encounter between granite and aluminium turns out to be a failure of man, rather than machine, then the non-routine nature of the flight will prove impossible to ignore.

## The accident has generated more publicity for the Superjet than the promotional tour

Demonstration flights are not inherently unsafe but they have an ad hoc quality and carry a sense of occasion. Their purpose is to distinguish, and that doesn't mean acrobatics; it can be achieved simply by allowing guests the rare opportunity to visit the cockpit in flight.

Successful demonstrations mean balancing non-standard operating conditions and an informal atmos-



Crash photos lack the human element

phere against the strict discipline required for safe flight. Part of the inquiry's unenviable task will be to establish whether that delicate balance was maintained in this case.

The accident, ironically, has generated more publicity about the Superjet than the promotional Asian tour in which the ill-fated aircraft was participating – the first half of which passed largely unnoticed outside of the countries involved – as well as the predictable ill-informed claptrap about the safety of Russian aircraft and the prospects for Superjet sales.

But it has also brought home the human element, through not only the pictures of those involved, but also the testimonies of those who took them, and who, by opting against joining the Superjet on its final departure, escaped sharing the same fate by nothing more than a thought impulse.

All of which makes this particular loss seem somehow even more personal, more unfair and, perhaps, more unnecessary. ■

See This Week P8

## Lifeflood for the industry: donors needed

**B**y acquiring Oxford Aviation Academy, simulation and training giant CAE has accelerated the process of consolidation in the fragmented world of aviation training. In sheer size it is up there with FlightSafety International and Boeing's training division, but it has a wider spread of capabilities than either, from *ab initio* to airline recurrent training.

If this huge organisation works well – and there is no reason why it should not – it will be one of the principal providers of the air transport industry's future lifeflood: expertly trained professional pilots and engineers. The airlines themselves have not been preparing for a future in which more skilled personnel than ever before will be required.

As the citizens of the world's emerging giant economies – particularly China – gain the disposable incomes they never had before, demand for air travel is going to boom. But it cannot do so without sufficient trained instructors, pilots and engineers.

A global vision of the industry's skilled personnel needs and how they can be met is desperately lacking. Perhaps a global training empire such as CAE will be better able to “think big” than the old fragmented system of civil and military suppliers. CAE recognises this unprecedented opportunity, but let us hope it, and its competitors, and the airlines, also recognise the need for unprecedented levels of investment. ■

See Air Transport P11



For analysis of news on airline operational and safety issues, visit David Learmount's blog at [flightglobal.com/learmount](http://flightglobal.com/learmount)



# BRIEFING

## SOUTHWEST PULLS REINS ON FLEET GROWTH

**AIRLINES** Low-cost carrier Southwest Airlines will defer dozens of aircraft deliveries during the next two years, in a move it says will save the company \$1 billion in capital spending. "Until we hit our return on capital target, we don't plan to grow our fleet," says chief executive Gary Kelly. The airline will defer deliveries of 21 Boeing 737-800s in 2013, meaning it will take only 20 aircraft during the year. In 2014, Southwest will defer a net total of 10 737 aircraft. It expects to take delivery of 34 aircraft, all 737-800s, in total this year.

## WELSH SELECTED AS NEXT USAF CHIEF

**NOMINATION** US Secretary of Defense Leon Panetta has nominated Gen Mark Welsh to become the US Air Force's next chief of staff, to succeed Gen Norton Schwartz from August. The current head of the USAF in Europe, Welsh is a fighter pilot with experience in the Lockheed Martin F-16 and Fairchild Republic A-10.

## RELIEF AS SENATE RENEWS EX-IM BANK MANDATE

**FINANCE** A US Senate vote has re-authorised the US Export-Import Bank's charter, which is set to expire at the end of this month, for three years. The bill, which has been passed in the US House of Representatives, increases the export credit agency's total lending limit to \$140 billion, a 40% increase from its previous authorisation, up to September 2014. The move is good news for the airline industry, which is facing a significant increase in aircraft deliveries this year, with the total cost rising from approximately \$75 billion during 2011 to \$100 billion in 2012.

## FINLAND TO GET FIRST ORBITERS THIS YEAR

**DELIVERIES** The Finnish army will take delivery of its first of an expected 45 Orbiter 2 unmanned air systems from Israeli company Aeronautics Defense Systems before the end of this year. Helsinki has signed a €23.6 million (\$29.9 million) production order for the type.

## MAINTENANCE HANGAR TO CLOSE AT SHANNON

**MRO** Aer Lingus plans to close its maintenance hangar at Shannon airport. The Irish carrier is "at an advanced stage" in transferring the lease for the facility, which was approved by the executive board earlier this month, according to the Unite union. While the move is "likely to be finalised in the coming weeks", the decision has not been communicated to staff, the union adds. Some 70 employees are currently working at the hangar. Local media have reported that Aer Lingus plans to keep a small line maintenance unit operating at the regional hub.

## INVESTIGATORS PROBE NEPALESE DORNIER CRASH

**ACCIDENT** Search teams have recovered the cockpit voice recorder and the flight data recorder of the Agni Air Dornier 228-200 turbo-prop that crashed in northwest Nepal on 14 May. They are being passed to the Civil Aviation Authority of Nepal, which is setting up a committee to lead the investigation on the crash, says a police spokesman. It is not clear whether the recorders will be sent overseas for analysis. The aircraft, registered 9N-AIG, was operating on the Pokhara-Jomsom route. The spokesman says the pilot had told air traffic control about a minute before the crash that there was "something wrong with the aircraft indicators" on approach to Jomsom, and that he was going to execute a go-around and return to Pokhara airport. Fifteen people, including the pilot and the co-pilot, were killed in the crash. Six others survived.



Search teams have found several major components of the aircraft

## INVESTIGATION

# Indonesia to lead Superjet inquiry

Jakarta asserts its right to head investigation into May 9 crash but Russia will be "actively involved" in data analysis

Indonesian authorities have asserted their right to lead the inquiry into the fatal Sukhoi Superjet 100 accident, confirming they will head the analysis of the cockpit-voice recorder.

After the device had been located on 15 May, six days after the crash on Mount Salak, there were indications it would be transferred to Russian investigators for decoding.

However, the National Transportation Safety Committee has exercised its right to treat the inquiry as an Indonesian affair, although it will rely heavily on Russian assistance in case of "constraints", such as the need to interpret cockpit conversation. The flight-data recorder will similarly be examined by the NTSC.

While the cockpit-voice recorder had been subjected to fire, and sustained damage to its housing, it remained in an "acceptable" state, says the Indonesian transport ministry.

The ministry says the Russian authorities have demonstrated "seriousness" in aiding the inquiry, providing specialised equipment with which to examine flight-recorder contents.

Russia's ministry of industry says it will be "actively involved"

in the transfer, interpretation and analysis of information.

Deputy industry minister Yuri Slusar said putting a timeframe on obtaining the information would be "premature", but added: "We will try to work as quickly as possible."

The ministry says the Russian representatives will look carefully at data received from the Indonesian side, particularly the aircraft's trajectory, the traffic situation in the area, air traffic controller workload and weather conditions.

Search teams have located several major components of the aircraft, including both PowerJet SaM146 engines.

Few confirmed details have emerged regarding the circumstances of the 9 May accident, beyond the request by the Superjet's crew to descend to 6,000ft (1,830m) shortly before contact was lost.

Loss of the aircraft has not held up deliveries. Russian flag carrier Aeroflot formally accepted the eighth production airframe, serial number 95014, on 17 May ahead of a delivery flight to Moscow scheduled for 23 May. ■



David Learmount comments on operational and safety issues at [flightglobal.com/learmount](http://flightglobal.com/learmount)





**USA surprise market for regional jets**  
THIS WEEK P10

**CONTRACT** STEPHEN TRIMBLE WASHINGTON DC

# Saudi air force set to buy PC-21s as lead-in trainers

BAE Systems deal with Riyadh could also include resumption of Hawk T128/T2 production

**T**he Saudi Arabian air force could buy 55 Pilatus PC-21s to serve as a lead-in pilot trainers as part of a broader deal in negotiation with BAE Systems that includes resuming production of Hawk T128/T2 advanced jet trainers, say sources familiar with the transaction.

The Saudi order for PC-21s and Hawks is expected to be confirmed in less than two months, with BAE serving as prime contractor for both deals, sources say. BAE declines to comment about any potential new Saudi aircraft deals. Such a deal would preserve both airframers' tight grip on pilot training requirements for the Saudi air force at a critical moment for both aircraft programmes.

Pilatus needs a new order soon to continue production of the PC-21, after completing deliveries to



The Saudi air force operates 29 Hawk 65/65As delivered by BAE

the air forces of the United Arab Emirates and Switzerland. BAE also has proposed offering PC-21s to the UK Ministry of Defence under the military flying training system (MFTS) programme.

Meanwhile, BAE needs a new order to restart production of the venerable Hawk series, with potential follow-on trainer deals for the US Air Force and Poland.

The Saudi air force continues to operate 47 PC-9s delivered by BAE as part of a package deal with Hawks under an Al Yamamah order placed in the mid-1980s, according to Flightglobal's MiliCAS database.

The air force's inventory also includes 29 Hawk 65/65As delivered under the same programme, the MiliCAS data show. ■

**SAFETY**

## Procedure calls after A300-600 reverser incident

**U**K investigators have stressed that go-around and reverse-thrust selection procedures need to be unambiguous, following an incident in which an Airbus A300-600 aborted a landing on reduced engine power after one of its reversers failed to stow. The Icelandic-registered freighter bounced during touchdown in gusting crosswinds at East Midlands on 10 January last year.

Despite having selected reverse thrust, the crew opted to execute a go-around. But the starboard thrust-reverser did not stow and the full-authority digital engine control kept the power setting at idle thrust. The A300 lifted off at low speed, in a high-drag configuration, striking its tail on the runway as it rotated, and struggled to climb away. It took off at 127kt (235km/h) and the airspeed remained below the approach reference threshold of 135kt during the first 13s of flight, as the A300 climbed by only 92ft. The aircraft, powered by Pratt & Whitney PW4000 engines, levelled until it achieved the reference speed then continued to climb.

In its analysis, the UK Air Accidents Investigation Branch says the aircraft's acceleration and climb performance "did not increase appreciably" for 47s after it became airborne again. The event "highlights the potentially serious consequences" of attempting to conduct a go-around after selecting reverse thrust, it adds. But the AAIB also points out that the A300's operating manual, which instructs immediate deployment of reversers upon main-gear touchdown, appears to "contradict" instructions to execute a go-around in case of a bounced landing.

Airbus will amend the operating manual in June, says the AAIB, to remove any ambiguity and prioritise the touchdown procedure over bounced-landing recovery, emphasising the need to complete a full-stop landing if reverse-thrust has been selected. ■

**PROGRAMMES** GREG WALDRON SINGAPORE

## Offset deals boost Indian industry

**I**ndia has received \$4.2 billion in counter-contracts from defence aerospace programmes since the introduction of its 30% offset programme in 2005.

Boeing has been the largest single contributor, with pledges worth a combined \$1.7 billion, defence minister A K Antony told India's parliament. This sum was secured through Foreign Military

Sales deals made via the US government for 10 C-17 strategic transports and eight 737-based P-8I maritime patrol aircraft. These were signed with offsets worth \$1.1 billion and \$641 million respectively.

In total, New Delhi secured offset business worth \$4.3 billion from 17 contracts, with the aerospace sector having accounted for

15 of these, all signed from 2007. Other major commitments were linked to New Delhi's deals to upgrade Dassault Mirage 2000 fighters (\$593 million), and to acquire Mil Mi-17V5 helicopters (\$405 million) and MBDA Mica air-to-air missiles (\$386 million).

"Indian industry, both public and private sector, are benefitting through investments and purchases by foreign vendors who have signed offset contracts," Antony says. "The positive impact of offsets on development of the indigenous defence industrial base will be visible in the coming years."

A yet-to-be finalised purchase of 126 Dassault Rafale combat aircraft carries a special 50% offset clause. ■



Offset for the Boeing deal for 10 C-17s was worth \$1.1 billion



For all the latest defence news from Asia, visit [flightglobal.com/asianskies](http://flightglobal.com/asianskies)



FINANCE STEPHEN TRIMBLE WASHINGTON DC

# USA surprise market for regional jets

Embraer and Bombardier expect to sign at least five deals by end of the year for more than 400 aircraft in 70-seat category

**B**ombardier and Embraer have identified the struggling US regional airline sector as a surprise market that is expected to sign at least five deals by the end of the year, placing orders for a total of more than 400 70- to 80-seat jets. The sector faces a starkly uncertain future, with American Eagle and Pinnacle Airlines in bankruptcy protection and Republic Airways Holdings' Chautauqua subsidiary undergoing restructuring. But the ageing of 50-seat jet fleets and rising fuel expenses are driving carriers to impose relief from union scope clauses that limit the size of regional fleets above 50-seat aircraft, clearing the way for buying aircraft with 50% more seats.

## BUSIEST YEAR

"This is the busiest year we've had in the last 14 to 15 years," says Charlie Hillis, vice-president of sales and marketing for Embraer's North America office. "Over 400 airplanes will be up for grabs. We have around five different deals going on right now."

Pierre Beaudoin, Bombardier chief executive, agrees the US carriers will sign orders for new regional jets in the "near future".

The expected wave of new orders by carriers including SkyWest, American Eagle and Republic Airways will begin the replacement of 40- to 50-seat aircraft delivered during the regional jet boom of the late 1990s, with

owners approaching the end of 15-year finance terms. Both regional jet makers also need the deals to revive once-booming US sales and balance-reduced prospects for new orders in other regions this year.

To estimate the size of the potential US order tally this year, Beaudoin told analysts on a 10 May earnings webcast to count the 50-seat jets approaching 15 years of service life. Nine US airlines operate 508 40- to 50-seat jets made by Bombardier or Embraer, according to Flightglobal's Ascend Online database. The fleet is almost evenly split between both airframers, but Embraer leads with 54% of the existing inventory.

SkyWest, which owns ExpressJet and SkyWest Airlines, has by far the largest need, with a combined fleet over 10 years old of 132 CRJ200s, 117 ERJ-145s, and four CRJ100s. SkyWest confirms it is "actively" considering new aircraft, but declines to provide details.

American Eagle also has a significant fleet over 10 years old, with 21 ERJ-135s and 82 ERJ-145s. For American Eagle parent AMR, one of its key restructuring goals is to replace its oldest 50-seaters with larger aircraft, allowing it to be more competitive against United-Continental.

Hillis expects at least two or three carriers to await the outcome of the AMR restructuring. Complicating the outlook is a possible takeover attempt by US



More 70-seat jets could be heading into the US fleet

Airways, which has persuaded AMR's largest unions to endorse its plan. AMR management has also agreed, under heavy pressure from a committee of creditors, to consider consolidation options. But not all the regional airlines can wait for AMR's situation to resolve before placing orders.

## MAJOR REPLACEMENT

"I only know of one deal that will happen before the American situation gets sorted out," Hillis says, declining to elaborate. Besides SkyWest, however, Hillis names two more carriers with major 50-seat replacement needs. Chautauqua has 43 ERJ-145s over 10 years old, while Trans States has 12 ERJ-145s above the same threshold. Both are potential order targets this year for Embraer.

Any orders would come during a pivotal moment for the US regional airlines sector. Once considered a steady source of profits,

their unique stability in a turbulent industry has been overwhelmed by the consolidation and bankruptcy-imposed cost reductions implemented by the US mainline carriers since 2005. Any 70-seat jets placed on order this year could be delivered to a very different industry in a few years.

Regionals depend on the 50-seat routes to feed the trunk carriers at hub airports, but fuel costs have made those jets uneconomical. Larger aircraft may increasingly be used on point-to-point routes with fewer frequencies to secure profitability, in turn reshaping the whole industry. But Hillis still thinks the 70-seater can fill a unique role alongside a diminishing fleet of 50-seat jets. "We think it will adjust at the end of the day," he says. "There's a need for 50-seaters." ■



For all the latest in airline route and strategy news, click  
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REGULATIONS DAVID LEARMOUNT LONDON

# Pilots who breach Olympic no-fly zone face bans

**T**he licences of all pilots infringing the Olympic Games restricted or prohibited zones near London will be suspended pending an investigation, says the UK Civil Aviation Authority.

Phil Roberts, assistant director of airspace policy at the CAA, says: "We realise that the security restrictions being put in place by

the Government will have an impact on general aviation during the Olympics. By working closely with the GA community we have achieved a significant reduction in their length and have ensured pilots have as much access to airspace as possible.

"The UK's GA representative associations have been doing ex-

cellent work to help us brief their members, and we now believe that the vast majority of pilots are well aware of the restrictions and will aim to abide by them.

"However, we also know that infringements do occur and it is right that pilots know in advance what action the CAA will be taking."

The CAA warns: "All infringements of the restricted or prohibited zones will be reported to the CAA by the Atlas Control military air traffic control unit controlling the restricted zone. Serious infringements that the security services deem as being a potential security threat are also likely to be intercepted by the UK military." ■





Complex wing fix  
drags on A380 line  
**AIR TRANSPORT P12**

**THIS WEEK**

**BUSINESS AVIATION** MURDO MORRISON GENEVA

# G650 lands at EBACE in record time

Gulfstream's new ultra-long-range twinjet crosses Atlantic to make its debut at business aviation show in Geneva

**G**ulfstream hopes to claim an official city-pair speed record after debuting its ultra-long-range G650 at the EBACE business aviation show in Geneva on 12 May.

The \$65 million flagship, which has more than 200 orders, flew 3,780nm (7,000km), "squawk-free" from Washington DC to the Swiss city, its first crossing of the Atlantic, in 6h 55min, cruising at 43,000ft (13,100m) at Mach 0.9 to 0.92. The ultra-long-range twinjet was one of a pair of Gulfstreams at EBACE for the first time.

The Savannah-based manufacturer also brought its super mid-size G280, which is due to receive certification in the third quarter. It travelled the same leg in 7h 47min at Mach 0.8.



The G650 cruised at 43,000ft at Mach 0.9 to 0.92

Pres Henne, Gulfstream senior vice-president for programmes, engineering and test, says the flight of G650 serial number 6020 "represents a milestone in flight test and certification", adding: "Its squawk-free performance demonstrates that the aircraft is meeting the substantial objectives we – and our customers – set for it."

Other notable announcements at EBACE included the announcement of the Cessna Longitude, the Wichita airframer's largest cabin aircraft after the axeing of the Columbus programme in 2009, and the relaunch of the Learjet 40 and 45 entry-level models as the 70 and 75. ■

**See our EBACE report which starts on P22**

**TRAINING** DAVID LEARMOUNT LONDON

## CAE acquires Oxford to extend its global reach

**S**imulator manufacturer and training company CAE has extended its worldwide professional pilot and engineer training empire by acquiring Oxford Aviation Academy (OAA) for C\$314 million (\$310 million).

Montreal-based CAE says the acquisition enables the company to grow its training centre footprint and *ab initio* flight training network, while extending its portfolio by adding OAA's Parc Aviation, which offers pilot and maintenance crew sourcing for airlines and leasing companies.

"Civil aerospace market fundamentals are strong and we are increasing our position at an opportune time," says CAE president and chief executive Mark Parent.

The OAA acquisition adds seven civil aviation training centres – offering pilot, maintenance and cabin crew training – to CAE's network, bringing the number of civil training locations worldwide to 42. OAA has 40

**"Civil aerospace market fundamentals are strong and we are increasing our position"**

**MARK PARENT**  
President and chief executive, CAE

full-flight simulators, bringing the CAE network total to 211.

CAE says all its *ab initio* training locations will retain or adopt the OAA name. This will bring the CAE-operated network of flight schools to 12, with a capacity to train 1,500 cadets annually.

OAA also operates seven type-rating training facilities in Denmark, Norway, Sweden, the UK and Hong Kong. Parc Aviation will be re-branded as CAE Parc Aviation Personnel. ■



David Learmount comments on operational and safety issues at [flightglobal.com/learmount](http://flightglobal.com/learmount)



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PRODUCTION DAVID KAMINSKI-MORROW LONDON & MARK PILLING GENEVA

# Complex wing fix drags on A380 line

Certification authorities examine solution to rib-bracket cracks but first line-fit aircraft will not be available until 2014

Airbus will not start delivering A380s with an in-production fix to its wing-rib bracket cracking problem until 2014, after admitting that a permanent answer has proven intricate to devise.

It says the solution, being discussed with certification authorities, is "more complex" than originally envisaged in March.

Once Airbus secures approval for the changes from the European Aviation Safety Agency, implementation of the retrofit will begin towards the end of this year, with initial deliveries in 2013. However, while implementation of a line-fit solution will take place around the same time, lead times mean the first A380s with the line-fit fix will be delivered in 2014.

The airframer's parent, EADS, revealed in its first-quarter results that it had already taken a €158 million (\$200 million) charge relating to fixing 71 in-service A380s – a charge which is being treated as a one-off, it says, because retrofit costs "go beyond" recurring warranty levels. But



Malaysia Airlines will be the next new operator for the type as Airbus aims to deliver 30 this year

EADS expects this charge level to rise to €260 million in 2012 to cover retrofit of 30 A380s which Airbus aims to deliver this year.

Airbus is standing by its 30-aircraft target but EADS admits the schedule is "becoming more challenging" because the delivery pattern has become "more back-

loaded". The airframer admits it had expected to hand over more A380s in the first quarter than the four delivered.

British Airways and Qatar Airways are each to receive their first A380s next year. Qatar Airways will take its first in October 2013, and chief executive Akbar

Al Baker says: "I want to stress very clearly that Airbus has given us guarantees that the issues concerning the wings will be resolved."

He emphasises the carrier will not accept any A380s with temporary fixes to the bracket cracking: "We need a fully certified, permanent fix to the wing. We don't want the aircraft to be delivered with an interim solution."

Al Baker says an interim fix would require the aircraft to enter service and then return to Airbus for remedial work at a later date. "We don't want people going in and out of our wings," he notes, adding that the airline will defer delivery if necessary.

EADS believes the wing costs and delivery scheduling "should not jeopardise" the A380 reaching its production break-even point at the beginning of 2015.

"Implementation in production of the final fix will temporarily generate headwind on the year-on-year A380 [earnings] improvement in 2012 and 2013 to account for non-recurring costs and delivery adjustments," says EADS. ■

FLEET MARK PILLING GENEVA

## Qatar talks 777 conversions and holds on to A350-1000s

Qatar Airways is discussing a possible Boeing 777-200 passenger-to-freighter conversion deal with the airframer, as it seeks to finalise an agreement to convert Airbus A330s under a new programme. The airline is in talks with the two airframers over an order for up to 25 widebody conversions, with a view to the aircraft entering service from 2015. Qatar Airways chief Akbar Al Baker, speaking in Geneva, says the carrier is "in very advanced discussions" with EADS's Dresden-based modification specialist EFW.

The airline has long been pushing Airbus for an A330 freighter conversion programme. It has a large fleet of A330-200/300s and some will be converted to freighters if a deal with EFW can be reached. Qatar is also talking to Boeing about poten-

tial conversion of 777-200s, says Al Baker. Qatar Airways does not operate this variant but there is plenty of availability in the used market, he says. Al Baker adds that a deal needs to be concluded shortly to ensure it can secure sufficient delivery slots at conversion plants to meet its 2015 in-service deadline.

Qatar Airways also indicated it would re-open negotiations with Bombardier over its new C-Series twinjet in the next six to 12 months. "We are still in talks with Bombardier for the C-Series but we are very busy at the moment and have delayed furthering our negotiations with them for the C-Series," Al Baker says.

"It is going to be a very fine air plane," he insists, adding that not only is Qatar interested in operating the aircraft in its own fleet, but is "in-

terested in buying them for our leasing company". Qatar is also sticking to its order for 20 Airbus A350-1000s after being persuaded by Airbus the new widebody will meet its as-advertised performance. Al Baker has been a critic of design changes proposed by Airbus for the -1000, but will not follow fellow Gulf carrier Etihad Airways, which has cancelled more than half its orders for the type, or convert to a different variant.

"We are not very happy with the A350-1000 but Airbus has assured us the aircraft will meet and surpass its contractual obligations to Qatar Airways, so we have to take them at their word. We will wait and see. But if it does not meet the performance guarantees – the payload, the range – then, of course, we will [change our order]." ■







Merpati expansion  
rethink threatens  
ARJ and Sukhoi  
**AIR TRANSPORT P14**

**INVESTIGATION** DAVID KAMINSKI-MORROW LONDON

# A340 probe supports 'shock' tactics

Inquiry advises crews train for unexpected events in cruise after surprised pilot sent Air France jet into undetected climb

French investigators are advising that simulator training should incorporate shock effects after a pilot's startled reflex reaction to an overspeed alarm sent an Air France Airbus A340-300 into a rapid climb, unnoticed by the crew.

The A340 reached climb rates of 5,700ft/min (30m/s), powering from its assigned transatlantic cruise level of 35,000ft (10,700m) to a maximum altitude of 38,000ft as the first officer – the non-flying pilot – reacted to the sudden alarm with a nose-up input to the side-stick.

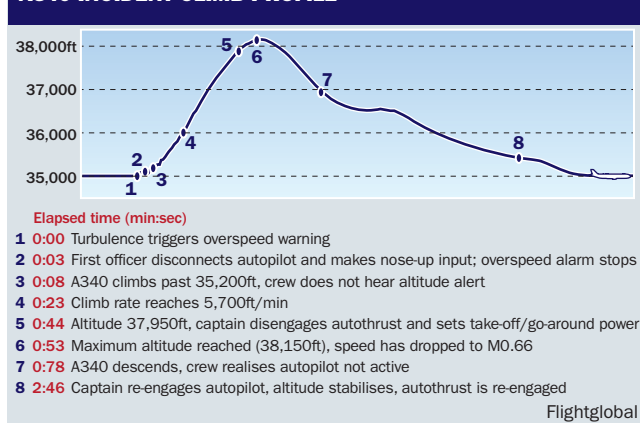
French investigation agency Bureau d'Enquetes et d'Analyses found the aircraft, operating Caracas-Paris last 22 July, drifted into a turbulent region of convective weather because the weather radar setting had "not been optimal".

## OVERSPEED WARNING

The A340 (F-GLZU) had been cruising at M0.83 northeast of Guadeloupe but a wind gust triggered an overspeed warning as the aircraft's airspeed rose to Mach 0.87. Reflexively, the first officer disconnected the autopilot using the side-stick button and pulled back on the stick for 6s.

"The [pilot] indicated that he did not remember these actions," says the BEA, which points out that it reconstructed the incident through flight-data recorder infor-

## A340 INCIDENT CLIMB PROFILE



mation because the cockpit-voice recorder was overwritten.

Although the overspeed alarm stopped after only a few seconds, it masked a separate warning that the autopilot had disconnected. The crew also could not remember hearing an altitude warning, which signals deviation of 200ft from an assigned level, as the aircraft – climbing at 1,950ft/min –

**Reflexively, the first officer disconnected the autopilot using the side-stick button and pulled back on the stick for 6s**

passed through 35,200ft. The BEA says the effect of surprise on human memory "probably contributed" to the crew's failure to recall the altitude warning.

Unaware the autopilot was not activated and that the A340 was climbing, the crew selected various Mach settings. The pitch increased and, as the aircraft's Mach speed fell, the crew selected M0.93.

The aircraft soared to a climb rate of 5,700ft/min and exceeded 38,000ft before the captain realised, with surprise, how high the A340 was flying. Its airspeed had fallen to M0.66 and was displayed as 226kt, 19kt below the minimum selectable speed.

Only as the pilots queried how

to return the aircraft to its 35,000ft cruise level did they begin to realise the autopilot was not active, nearly 90s after its disconnection.

The BEA says the crew missed several visual cues pointing to the A340's attitude and position, including the nose-up pitch of 12°, the high climb rate, the excessive altitude, and instrument panel signals that the autopilot was off.

Without the cockpit-voice information, however, the inquiry was unable to explain the lack of monitoring of these parameters.

## STARTLE EFFECT

However, it states that long-haul flights are routinely calm and that an unexpected alarm can generate a "startle effect", a temporary period of stress which sparks instinctive reactions and motor responses.

These basic reflexes might bring the wrong response to an alarm and be "difficult to correct" under pressured circumstances. The inquiry highlights that the crew engaged in low-priority actions – such as visual observation of the weather, and making a passenger announcement – to the "detriment" of monitoring crucial aircraft parameters.

The A340's captain had logged more than 3,000h on type, while the first officer had over 2,400h.

"Recent studies show that the effect of surprise is the subject of little, or no, simulator training," says the BEA. It is recommending to the European Aviation Safety Agency that surprise effects be introduced to training scenarios to help pilots react to them and work under stress.

Investigators have also advised that aircraft autopilot disconnection alarms be brought into line with current certification requirements, after pointing out that the A340's disconnection alert, designed to an earlier standard, only sounded for 1.5s. ■

## OPERATIONS

### Faith in autopilot would have minimised height deviation

If the Air France A340's autopilot had not been disconnected it would have remained engaged, corrected the overspeed and restored the aircraft to stable flight, investigators have determined.

Analysis of the flight data showed that the increase in the aircraft's altitude would have been limited to only 200ft (60m), and it would not have entered the rapid climb.

Examination of several severe turbulence events, says the BEA,

indicates that adverse consequences "can be minimised" if pilots keep the automated systems, such as the autopilot, activated and "avoid an instinctive reaction" to recover the aircraft manually.

Circumstances of the A340 event share similarities with the moments preceding the loss of Air France flight AF447 two years earlier, when an encounter with convective weather, the disengagement of the autopilot, and nose-up pitch inputs resulted in

the Airbus A330 climbing from 35,000ft to 38,000ft and stalling.

In the wake of the Guadeloupe A340 incident, the BEA has recommended that pilots be better trained in the understanding and use of weather radar, to ensure that they can assess cumulonimbus cloud development.

The A340 crew had mostly kept the range setting at 320nm (590km), while Air France required 160nm or 80nm. ■

David Learmount comments on operational and safety issues at [flightglobal.com/learmount](http://flightglobal.com/learmount)



FLEET MAVIS TOH SINGAPORE

# Merpati expansion rethink threatens ARJ and Sukhoi

Indonesian airline's new chief could axe Comac and Superjet plans until load factor rises

Indonesia's Merpati Nusantara Airlines could cancel plans to take 40 Comac ARJ21s and 10 Sukhoi Superjet 100s until passenger loads justify the acquisition.

This comes after the state-owned carrier's new president-director, Rudy Setyopurnomo, mandated that all new aircraft purchases will be on hold until load factor hits 90%, says the airline. The carrier adds it is "not sure what will happen" with regard to the plans for the ARJ21.

Merpati signed a memorandum of understanding with AVIC International for 40 of the Chinese-built type at the Singapore air show in February, and was due to firm that up in the next two years.

## CERTIFICATION DELAY

More than 200 ARJ21s have been ordered – mostly by Chinese airlines and leasing companies. Merpati was the first potential foreign major customer, with Lao Airlines and Myanmar Airways also planning to acquire two aircraft each.

The aircraft was due to be delivered to launch customer Chengdu Airlines in December 2011, but that has been pushed back by at least a year because of delays in the certification process.

Merpati's plans for the Superjet



Up to 40 Chinese ARJ21s had featured in the modernisation

100 were mainly cancelled as a result of the directive, but the decision was also influenced by the fatal loss of a prototype outside Jakarta on 9 May, during a demonstration flight for Indonesian customers. "The Sukhoi was very good for us to fly to small cities because it is also suitable for the runways. But now, the order plans are cancelled," says Merpati.

Comac conducted crosswind test flights of the ARJ21 at Jiayu-guan airport, Gansu province, in late April, examining directional stability and the effects on engine and auxiliary power unit exhaust.

Indonesia's ministry of state-

owned enterprises appointed Setyopurnomo to head Merpati after firing his predecessor, following the airline posting losses of Rp750 billion (\$82.5 million) for 2011. It also received an Rp516 billion equity infusion from the government last year to repay part of its debt, reduce cash flow deficit and improve its competitiveness.

Merpati has faced intense competition in recent years from privately owned airlines that have grown rapidly. To cope, it has tried to shift its focus to operating feeder services in the remote eastern regions of the country. ■

## OPERATIONS

# Electric-taxiing partners extend testing to 737

Safran and Honeywell have conducted taxi tests with a Boeing 737 ahead of the development of an electric taxi system for the type.

The two companies are jointly working on an electric wheel drive system for the main landing gear of Airbus A320 aircraft, which is to be tested for the first time later this year.

They acquired an A320 in 2011 and undertook tests with the conventionally-powered aircraft in November to gather specification data for the development of the wheel drive system.

This test has now been repeated with a 737-800 from the fleet of German leisure carrier TUIfly in Montpellier, France.

Safran says the trials were conducted to "evaluate runway conditions and calculate the necessary loads for moving a Next Generation 737 aircraft on ground".

John Bolton, global president of Honeywell's air transport and regional business division, says "this second phase" would provide provider greater insight in making electric taxiing "more viable and efficient".

Honeywell and Safran's green taxiing system is to enter service in 2016. ■



Keep up with the latest in air transport news by logging on at [flightglobal.com/airtransport](http://flightglobal.com/airtransport)



## Interactive survey gives low-down on budget carriers' rise

Leading low-cost carriers enjoyed double-digit revenue growth in 2011 as collective passenger numbers rose nearly 12%. The latest *Airline Business* low-cost carrier survey showed revenues increased strongly at virtually all of the 30-plus carriers for which 2011 financial results were available.


Southwest Airlines remained the largest budget operator by revenue and passenger numbers. Its revenues jumped nearly 30% to \$15.7 billion when accounting for its 2011 acquisition of AirTran. Excluding the merger, its revenues were up 6%. Passenger numbers reached 135 million.

Ryanair, using an annual figure based on revenues from its four published quarters, was the second-largest no-frills operator by revenues at just less than \$6 billion. The budget carrier was also among the most profitable of low-cost operators.

It posted net profits of \$496 million to March 2011 and has been aiming for net profits of \$630 million for its latest financial year. Passenger numbers across 75 low-cost carriers in the survey grew 11.6% in 2011.

See our interactive treatment of the top 10 low-cost carriers at [flightglobal.com/ilowcost12](http://flightglobal.com/ilowcost12)





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**Closer examination revealed a bias in Bristol landing incidents**

**INVESTIGATION** DAVID KAMINSKI-MORROW LONDON

# Hard touchdown prompts calls to refine flight data

Inquiry into 767 heavy landing finds narrowing analysis to individual runways could highlight operational problems

**O**perators should consider analysing flight-monitoring data by runway, not only by airport, investigators have concluded after examining a Boeing 767-300 hard landing at Bristol.

In its inquiry into the event – in which a Thomson Airways jet, still in First Choice colours, sustained serious crown damage – the Air Accidents Investigation Branch found an “unusually high” rate of hard landings of 767s on Bristol’s Runway 09. While the operator’s method of analysing operational data was common in the industry, says the AAIB, it had “not highlighted” the cluster.

“It is probable that other similar opportunities to identify unusual rates of events may similarly be lost,” it adds in its report into the 3 October 2010 landing.

Despite low visibility, rain and turbulence, the 767’s approach had been stable. However, the AAIB says the runway profile “deprived” the captain of full runway length as the aircraft neared the flare, and “probably contributed” to the high rate of hard landings.

The main gear contacted the

runway at 2.05g – enough to classify as a heavy landing – but the crown damage occurred when the jet rapidly de-rotated and its nose-gear struck the runway, possibly as a result of the pilot being thrown forward and pushing on the control column.

Although the carrier identified a relatively high rate of hard landings at Bristol – seven in 2,855 arrivals – an AAIB analysis revealed all but one had occurred during the 709 arrivals on Runway 09.

It has recommended the Civil Aviation Authority advise operators of the “benefits” of examining such flight-monitoring data by runway, rather than simply by airport, and suggests setting a threshold rate for unusual events beyond which action should be taken.

Vietnam Airlines had similarly damaged the same aircraft on 19 September 2000, in circumstances which are unclear, says the AAIB. But it states there is no evidence to suggest the repair contributed to the damage suffered at Bristol. ■



David Learmount comments on operational and safety issues at [flightglobal.com/learmount](http://flightglobal.com/learmount)

**ECONOMICS** MARTIN RIVERS LONDON

# Emissions-trade boycott fails to gain momentum

**J**ust eight Chinese airlines and two Indian carriers failed to submit carbon emissions data before a 31 March deadline stipulated in the Emissions Trading System.

With more than 1,200 international carriers adhering to the deadline, the revelation suggests efforts spearheaded by China, India and Russia to oppose the carbon trading system are faltering.

“We have given them until mid-June to report back their data,” European climate commissioner Connie Hedegaard said of the 10 airlines that did not report emissions figures. None of the carriers has been identified.

Under terms of the ETS, airlines must declare carbon emissions data for any flights landing in or taking off from EU territory. Yearly figures are then set against company-specific quotas determined by Brussels and carriers must pay for surplus emissions by buying carbon permits on the free market. Although opposition to the ETS remains widespread – with more than 20 countries attending a “coalition of the unwilling” conference in Moscow in February – the scheme’s detractors appear to have been swayed by EU threats of punitive measures for non-compliance.

Penalties for boycotting the

ETS start at €100 (\$128) per tonne of carbon. Repeat offenders can be banned from EU airspace. The Chinese government banned its airlines from participating in the cap-and-trade scheme earlier this year, while India and Russia talked of a global trade war if foreign carriers were included in the system. Opponents view it as

**The scheme’s detractors appear to have been swayed by EU threats**

an extra-territorial tax which violates international treaties such as the Chicago Convention.

However, the EU Court of Justice overturned legal challenges to the ETS in December, concluding that Brussels was acting within the constraints of European law.

Hedegaard says the EU will now redouble efforts to establish a global carbon trading system under the auspices of the International Civil Aviation Administration. All sides of the dispute view an ICAO solution as the best way forward, although the EU says the UN body has dragged its feet over implementation of a wider scheme. ■

**TURBOPROPS** TOM ZAITSEV MOSCOW

# Q400 undertakes Russian tour

**B**ombardier is to conduct a presentation tour in Russia with one of its Q400 turboprops after several carriers signalled interest in the type.

Moscow office chief Sergei Ermolayev says the event is scheduled for the end of May and will be part of a Q400 global roadshow. He adds: “The details of its Russian leg are under discussion with local authorities but there certainly will be a stop in Kazan. We see a clear business case for using regional turboprops on short-to-medium range routes in Russia and

elsewhere, both from fuel efficiency and speed standpoints.”

Kazan-based charter operator Tulpar Air expects Bombardier to fly the Q400 to Kazan after demonstrating it in Yakutsk and Ekaterinburg. Tulpar Air director general Sergei Trifonov says the carrier is evaluating the Q400 and will probably start by taking a financial lease on one second-hand or newly built example.

Sister company Tulpar Technik is due to obtain approval to provide technical support for Bombardier aircraft soon. ■





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ORDERS CRAIG HOYLE LONDON

## Saudi Arabian Typhoons to get capability boost

**B**AE Systems will deliver the remaining 48 Eurofighter Typhoons on order for Saudi Arabia over the next five years, with the first examples in final assembly at its Warton site in Lancashire.

A contract modification to Riyadh's 72-aircraft Project Al Salam deal was signed earlier this year, with BAE having resumed assembly work in January.

The Royal Saudi Air Force's remaining aircraft will be completed at a rate of between eight and 10 per year, and be "future-proofed" to receive planned enhancements. Airframe modifications would enable them to carry an active electronically scanned array radar and potentially range-extending conformal fuel tanks.

Saudi Arabia already has 24 Typhoons operational at its Taif

air base, and is seeking to integrate national-specific equipment such as a French- or US-sourced targeting pod and precision-guided bombs in the short term. However, the bulk of its equipment requirements are in alignment with the development path now being defined for the four Eurofighter partner nations via a phase one enhancement process.

"The core nations can only benefit from work beyond the core programme," one source says, referring to the Saudi commitment as "a critical mass to hook into for exports".

BAE Systems Saudi Arabia will establish a new support capability for the Typhoon, with Riyadh to receive significant technology transfer under the terms of its revised contract. ■



Raptor pilots have continued to encounter hypoxia-like symptoms

OPERATIONS DAVE MAJUMDAR WASHINGTON DC

## F-22 fleet hit by fresh restrictions

US Secretary of Defense directs US Air Force to ensure all Raptor flights remain within proximity of landing locations

**A**n ongoing safety issue affecting the US Air Force's Lockheed Martin F-22 fleet has taken a new twist, with Secretary of Defense Leon Panetta having directed the service to take additional steps to ensure the safety of its Raptor pilots.

"All F-22 flights will remain within proximity of potential landing locations to enable quick recovery and landing should a pilot encounter unanticipated physiological conditions during flight," says acting assistant secretary of defense George Little.

Imposed in mid-May, the order is intended to enable pilots operating the stealthy fighter to recover the aircraft quickly should they encounter problems with the type's under-scrutiny onboard oxygen generation system. The Department of Defense says the restriction will remain in place until Panetta is satisfied that the problem has been mitigated.

Some pilots flying the F-22 have encountered hypoxia-like symptoms, but the USAF has yet to find the root cause of the issue. The service believes that it has narrowed the potential source to either a toxin or the quantity and quality of oxygen flow to the pilot. Decompression sickness has not been ruled out, however,

and sources say the problem could even be down to an insidious form of hyperventilation.

The Raptor fleet was grounded for four months last year after 14 such incidents logged since 2008. The air force resumed flying the type last September, and has since recorded about a dozen fresh incidents.

Panetta's decision came shortly after a number of pilots had refused to fly the F-22, including two who appeared on national television to draw attention to the unresolved oxygen issue.

The new safety measures will have some impact on USAF operations. Other aircraft will have to pick up the slack in flying long-range air sovereignty missions from Joint Base Elmendorf-Richardson, Alaska, but the 7th Fighter Squadron deployed to Al Dhafra air base in the United Arab Emirates will continue its activities.

Panetta has also ordered the USAF to speed up the installation of an automatic back-up oxygen supply into the 185-aircraft fleet. Testing should conclude by the end of November, with the system to be retrofitted from December at a rate of 10 per month. ■



More about the USAF fleet on our 2011-12 World Air Directory: [flightglobal.com/wafdownload](http://flightglobal.com/wafdownload)



Riyadh will receive its remaining Typhoons in the next five years

PRODUCTION

## India delays fifth-generation fighter

**I**ndian plans to field a version of Sukhoi's PAK-FA stealth fighter have been delayed by at least two years, according to a statement by deputy defence minister M M Pallam Raju.

"The fifth-generation aircraft is scheduled to be certified by 2019, following which the series production will start," he told the nation's parliament on 14 May.

Defence minister A K Antony had previously said that the Su-

khoi/Hindustan Aeronautics-built type would be inducted into service with the Indian air force by 2017.

New Delhi hopes to eventually buy 250 of the aircraft at a cost of about \$100 million each.

It wants to incorporate numerous changes to the current design, including the addition of 360° active electronically scanned array radar coverage and potentially also a two-seat version. ■



Hammond fills  
UK budget  
black hole  
DEFENCE P21

TECHNOLOGY DAVE MAJUMDAR WASHINGTON DC

# US Navy jammer proceeds but F-35 integration stalls

Service to focus on fielding next-generation electronic warfare equipment with EA-18G fleet

The US Navy is moving ahead with its Next Generation Jammer (NGJ) pod development effort, but integration on to the Lockheed Martin F-35 Joint Strike Fighter has been deferred indefinitely.

The navy is focusing on getting the NGJ fielded with its Boeing EA-18G Growlers by 2020, with the electronic-attack aircraft likely to be in service until at least the mid-2030s. The new electronic warfare system will replace the ALQ-99 jammers now carried by the Growler fleet and the service's remaining Northrop Grumman EA-6B Prowlers.

A final request for proposals for the NGJ programme should be ready by late June, with a draft

document having been issued in April. The navy currently has technology maturation contracts in place with BAE Systems, ITT Exelis, Northrop and Raytheon, with the 33-month programme phase nearing completion.

Proposals should be returned by August, with the USN expecting to select one bidder around June 2013 for a 22-month technology development phase which will involve building a full-scale prototype. A subsequent engineering, manufacturing and development contract will cover integrating the NGJ with the EA-18G and building developmental test articles.

An operational test activity

should start in late 2019 or early 2020, with initial operational capability also planned to occur during 2020.

The focus is on developing a mid-band jammer, says Capt John Green, the USN's programme manager for airborne electronic attack. This is likely to deliver a two-pod solution to provide 360° coverage, and use active electronically scanned arrays which will offer a better than ten-fold performance increase over previous technology. A requirement for the system to be flown at supersonic speed has been removed.

It is uncertain whether the selected pod will also be integrated onto the F-35, due to the expected high integration costs. "Depending upon the capacity that we need in airborne electronic attack, it is conceivable that we would stay with the Growler and not even look at a second platform until late into the next decade," Green says.

The US Department of Defense is also now looking at alternative ways of conducting the electronic warfare mission, with one possibility being using dispersed pieces of the NGJ pod equipment carried by unmanned air systems. ■

Keep up to date with all the latest US defence news at [flightglobal.com/dewline](http://flightglobal.com/dewline)



The Growler's current ALQ-99 pods should be replaced from 2020



Astana wants to perform local assembly of the Eurocopter type

AGREEMENTS

## EC725 aims at Kazakh contract

Kazakhstan is to expand its cooperation with Eurocopter, having signed a letter of intent linked to the proposed local assembly of 20 EC725 transports.

Signed during the KADEX-2012 exhibition in Astana this month, the EC725 pact could lead to the type being completed at the Eurocopter Kazakhstan Engineering facility for the nation's armed forces. The Super Puma derivative would be operated "in a full range of mission applications", Eurocopter says.

Eurocopter has also received a new contract for the local assembly of eight EC145 medium-twins. Representing the second batch of aircraft from a projected 45-unit requirement, the deal includes two search and rescue examples for the Kazakhstan air force – which has received six under a previous order – and six transports to be operated by the Ministry for Emergency Situations. ■

WEAPONS HOWARD GETHIN MOSCOW

# Russia set to resume hypersonic missile activities

Russia must restart the development of hypersonic weapons to respond to US advances in the field, acting deputy prime minister Dmitry Rogozin says.

Rogozin, who has responsibility in the Russian government for the military-industrial complex, cites the USA's work on programmes including the Falcon and X-51 demonstrators as proof

of the potential threat to be posed by operational hypersonic weapons from around 2015–2018.

"The undertaking of this work [by the USA] allows us to lay the basis for setting up a national competitor," he said during a visit to the state-owned Raduga Berezhnyak missile design bureau at Dubna in the Moscow region.

Raduga and NPO Mashinostro-

eniye both conducted research work on hypersonic weapons during the Soviet era, but all activity was halted in the late 1980s following a political decision. Rogozin describes this as having been "a treasonable act to our national interests".

"Sadly today we see Russia lags noticeably in this sphere," Rogozin says.

"Hypersonic missiles have significant advantages in terms of reaction times, invulnerability to existing and future air defence systems, long range and high altitude and kinetic energy."

Earlier this year India announced a joint project with NPO Mashinostroeniye to build a hypersonic successor to its BrahMos supersonic cruise missile. ■

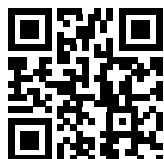
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Learjets reinvented  
from inside out  
SHOW REPORT P22

FUNDING CRAIG HOYLE LONDON

# Hammond fills UK budget black hole

All major aircraft acquisition programmes to remain as defence secretary balances the books under 10-year spending plan

The UK will be able to meet its military spending priorities for the next 10 years without having to make additional cuts to its personnel or equipment profiles, defence secretary Philip Hammond says. Marking the completion of a delayed planning round process for 2012, Hammond's 14 May statement confirmed the Ministry of Defence's long-term funding has been brought into balance, with £152 billion (\$245 billion) to be made available during the next decade, plus an unallocated contingency of £8 billion.

"The black hole in the defence budget has finally been eliminated," he says, referring to a previously identified funding shortfall of £38 billion in delivering the UK's Future Force 2020 structure.

All major aircraft acquisition programmes remain in place under the allocation, which will include funding undisclosed capability enhancements to the Eurofighter Typhoon and ordering the UK's first series production examples of the short take-off and vertical landing Lockheed Martin F-35B Joint Strike Fighter (JSF).

## PROGRAMMES SECURE

While conceding it is difficult to budget exactly on the latter type at this stage in the US-led programme, Hammond says: "We have a pretty shrewd idea of what the JSF is going to cost."

Also safe are programmes to introduce the Airbus Military A400M, A330 Voyager and an eighth Boeing C-17, as is a deal with L-3 Communications for three RC-135 Airseeker electronic intelligence-gathering aircraft.

The UK will also proceed with orders for AgustaWestland's Lynx Wildcat and 14 Boeing CH-47 Chinook HC6 helicopters, along with upgrades to the AgustaWestland Merlin HM1 and Eurocopter Puma HC1 for the Royal Navy and Royal Air Force respectively. A life-extension programme for the British Army's Westland/Boeing Apache AH1 attack helicopters is also se-



Undisclosed capability enhancements to the RAF's Eurofighter Typhoons will now go ahead

cure. Some £7 billion has been allocated to support precision-guided weapons programmes for the three armed services, while £4 billion has been earmarked for new cyber projects and intelligence, surveillance, target acquisition and reconnaissance equipment.

The latter will include a "Crow's Nest" effort to replace the navy's Westland Sea King 7 airborne surveillance and control system helicopters. The MoD will also assess its options to retain the Raytheon Systems Sentinel R1 airborne stand-off radar fleet post-2015, or retire the modified business jets as planned and replace their capability using other equipment.

With painful cuts having already been made under the UK coalition government's Strategic Defence and Security Review of September 2010, Hammond says the 10-year planning process has been about "reluctantly accepting smaller armed forces and redoubling our resolve to invest in the best possible equipment for them".

Ongoing procurement reform should look to learn lessons from the urgent operational requirement model used to rapidly ac-

quire new equipment to support operations in Iraq and Afghanistan, he believes.

Referring to a previous "conspiracy of optimism", where politicians, defence procurement officials and the military would launch programmes against an unrealistic best-case scenario, Hammond says "no project will be allowed to commit without a 10-year budget line to cover not only its procurement, but also its support costs". And he cautions that "individuals and contractors can expect to be held to account for the estimates on which decisions are based".

## CONTINGENCY FUND

The UK National Audit Office will perform a review of the plan and report on its affordability against the available budget, which counts on a 1% real-term increase in defence spending per year from 2015. Hammond says the MoD also has an assurance from the Treasury that any funds released via further efficiency savings will be spent on defence equipment. This would add to the £8 billion contingency fund, parts of which will be allo-

cated on a yearly basis "to respond to emerging equipment requirements" not yet included within the core defence programme.

One major element lacking from the Future Force 2020 plan is any reintroduction of the RAF's lapsed maritime patrol aircraft capability. Hammond confirms: "A number of different technologies will be available to deal with it as we approach the end of the decade. That is one of the decisions that the armed forces committee will have to make when it considers the prioritisation for the headroom in the planned equipment budget."

"Military stability – knowing what we can afford; how many personnel, ships, vehicles and aircraft – is essential to planning for future success," says Gen Sir David Richards, Chief of the Defence Staff. "This balanced budget will give us much greater stability. Through it we have received a commitment of investment over the next decade, giving us much-needed clarity on which to base our plans." ■

For more stories each week from the defence sector, go to [flightglobal.com/defence](http://flightglobal.com/defence)



## EBACE 2012

Despite deepening woes about the region's economy, a flurry of product launches and quiet confidence about market recovery gave Europe's business aviation convention – held in Geneva from 14-16 May – an upbeat feel. However, emerging markets remain the biggest hope for the industry. Reporting and production team: Dan Bloch, Pippa Booth, John Croft, Andrew Doyle, Rachel Kemp, Lauren Mills, Murdo Morrison, Alan Peaford, Dominic Perry, Mark Pilling, Miquel Ros, Michael Targett and Stephen Trimble. Photography and video by BillyPix



See Europe's business aviation show in a different way with three issues of our interactive magazine, featuring stunning photographs and video as well as the biggest stories. Also: we name the top 12 business aircraft of all time.



### LAUNCH

# Learjets reinvented from inside out

Family's entry-level aircraft get new designation, Garmin avionics, Lufthansa Technik CMS and uprated Honeywell engine

**E**BACE product launches from two of the industry's smaller-jet brands gave a boost to a segment that has been short of innovation since the market plunged in 2009.

While Cessna (*see P23*) unveiled its biggest jet – following the cancellation of the Columbus project in 2009 – rival Bombardier has revamped the bottom of its Learjet family, relaunching the entry-level 40 and 45 as the Learjet 70 and 75, with a new flight-deck, cabin management system (CMS) and interior, as well as an upgraded Honeywell engine offering extended range.

Although the new jets share their airframes with their Learjet 40 and 45 predecessors, the similarities stop there, says Ralph Acs, Learjet vice-president and general manager. "It's all about newness. We have preserved the look and feel of our existing Learjets but with a lot of features that you will find in our Learjet 85," he says.

Bombardier has already been secretly testing the pair at Learjet's Wichita facility.

The 40 and 45 range will cease

production in 2013. The Learjet 75 will enter service in the first half of next year, while the 70 will follow about six months later.

The new aircraft's touch-screen Vision flightdeck – which uses Garmin avionics – is similar to that on the Global 5000 and 6000, while the Lufthansa Technik-designed Nice CMS includes 7in (178mm) pop-up touchscreen monitors and "shares the same DNA" as the top-of-the-range in development Learjet 85 and Challenger 300. Instead of speakers, passengers experience surround-

sound, says Acs. "The whole cabin wall is a speaker. It's like sitting in a speaker," he adds.

An improved 3,850lb (17.1kN) TFE731-40BR powerplant delivers an additional 10% thrust and extends range from "just over 1,900nm [3,515km] to cross the 2,000nm mark", says Acs. "It means we can get in and out of 5,000ft [1,525m] runways comfortably and it really opens up more city pairs, especially out of hot and high locations."

Test aircraft three to five will fly in the next six months, with

the fifth aircraft the first "real 75" – with cabin, CMS, engine and avionics.

Honeywell has delivered the first two examples of the upgraded TFE731 engine to Bombardier for testing. Engine certification is scheduled for the end of the year. The company has limited changes in the engine to the hot section, with a software change allowing the digital electronic engine controller to burn fuel at a higher temperature. To compensate for the increased heat, Honeywell is adding a ceramic coating to the non-rotating shroud around the high-pressure turbine stage. The third-stage low-pressure turbine has also been modified.

Acs says the new Learjets will retain the qualities of the iconic brand. "When you talk about Learjet, the heritage that comes across is phenomenal. In China, Australia, wherever you are, they know what you are talking about. Pilots love the look and feel of a Learjet, and especially its performance."

Acs says production of Learjet's other aircraft, the 60XR, will continue for the time being. ■



Learjet 75 and its Learjet 70 sister are already in flight test





Embraer passes  
Legacy milestones  
SHOW REPORT P25



**AIRLINE**

## Qatar Airways takes a flexible route to USA

**Q**atar Airways, one of the world's blue-chip airlines, is breaking into the North American market in a big way by teaming up with Bombardier fractional and charter provider Flexjet.

The partnership, inked at EBACE, will mean the Middle Eastern airline can offer its premium passengers connections from its four North American destinations – Houston, Montreal, New York and Washington DC – to a further 5,000 airports on Flexjet's fleet of about 80 Bombardier Challenger 605 and 300 aircraft, as well as Learjets. The service will be offered through Qatar

Airways' business jet division, Qatar Executive.

Qatar Airways chief executive Akbar Al Baker also reveals that negotiations are continuing for 10 new-generation Bombardier Global 7000 and 8000 ultra-long-range jets for Qatar Executive, for which a letter of intent has already been signed. Qatar Executive operates an all-Bombardier fleet of one Global XRS, two Global 5000s and three Challenger 605s.

The venture will also allow Flexjet customers travelling from North America to connect to more than 100 cities worldwide via Qatar Airways services to Doha. ■

**UNVEILING**

## Cessna sizes up with Longitude

Super midsize jet is latest launch for reassertive brand

**C**essna's resurgence continued at EBACE with the launch of the Longitude, a stretched, super midsize sister to the midsize Latitude unveiled last October, and the new flagship of its Citation range.

The Wichita airframer – one of the worst-hit manufacturers in the past three years – axed its last high-profile project, the large twinjet Columbus, at the onset of the slump in April 2009.

The eight-passenger \$25.9 million Longitude will sit at the top of Cessna's line-up, alongside the high-speed Citation Ten. The aircraft is pitched against the Hawker 4000 and Gulfstream G280. However, Cessna believes the Longitude's pricing, coupled with its 4,000nm (7,400km) range, will give it an edge in the large-cabin market against established rivals such as the Dassault Falcon 200LX, Bombardier Challenger 605 and Embraer Legacy 650.

"Having a product in this sector will help us to keep loyal cus-

tomers within the Citation family as they move up through our business aircraft family," says Cessna president Scott Ernest.

The Mach 0.86 Longitude will be powered by two 11,000lb (49kN) Snecma Silvercrest engines pylon-mounted on the rear fuselage. The aircraft has a newly designed 26.5m (87ft) swept wing and also features winglets and a "T" shape empennage.

The flight control systems use conventional and fly-by-wire technology. The integrated cockpit is based on the Garmin G5000.

Cessna is targeting first flight for mid-2016, leading to certification by the end of the following year.

Snecma will this summer begin running the first of eight turbofans taking part in the Longitude's engine certification programme. The two-spool engine will feature a 5.9:1 bypass ratio using a 1.08m (42.5in) diameter 20-blade, Snecma-built fan and a four-stage axial compressor made by Techspace Aero. ■



**Ernest: Longitude will help us keep loyal customers in the family**

### PROVISIONAL SPECIFICATIONS

Maximum overall height	26ft (7.9m)
Maximum overall length	87ft (26.5m)
Maximum overall width	86ft (26.2m)
Cabin height	72in (1.83m)
Cabin width	7in (1.95m)
Cabin length*	37ft 8in (11.5m)
Range**	4,000nm (7,410km)
Maximum altitude	45,000ft (13,700m)
Maximum cruise speed	490kt (907km/h)
Maximum gross weight	55,000lb (25,000kg)

NOTES: \*from forward pressure bulkhead to aft pressure bulkhead. \*\*at full fuel payload, NBAA IFR Fuel Reserves, average cruise speed Mach 0.82. SOURCE: Cessna





## FRACTIONAL OWNERSHIP

### NetJets Europe moves into management

**N**etJets Europe is making its first foray into the aircraft management arena. The move is designed to complement its fractional ownership and charter card programmes and provide another revenue stream for the Lisbon-based company.

The new venture, named NetJets Aircraft Management, will provide crew recruitment and training, flight planning, crew planning, aircraft hangarage, maintenance, and all related activities, says the company.

"An increasing number of aircraft owners were asking us why we weren't in the aircraft management business, given our expertise in the business aircraft services market," says NetJets Europe chairman and chief executive Eric Connor. "Our sister company in the USA has been offering aircraft management for many years through its Executive Jet Management arm, so it seems a natural progression for NetJets Europe to move into this area."

The European management arm will operate under a UK AOC – for which NetJets has applied – rather than its established Portuguese AOC. "We want to keep the two businesses separate," says Connor. "But until approval has been granted, we will continue to use the Portuguese AOC."

NetJets says management customers can make their aircraft available for charter. This, Connor says, will not only generate income but will also give the operator additional capacity and reduce its reliance on third-party charter providers.

Management charges will be calculated on the number of flying hours undertaken – borrowing a core principle from NetJets' fractional ownership model – rather than the "flat" management fees commonly associated with the management market. ■



For all the news, interviews, videos and photos from EBACE, visit [flightglobal.com/ebace](http://flightglobal.com/ebace)



The Legacy 500 has completed taxi runs, where the aircraft was taken to a speed of 80kt

## DEVELOPMENT

### Embraer passes Legacy milestones

**E**mbraer is moving ahead with development of the two newest members of its business jet family, the Legacy 450 and 500, as it moves towards first flight of the latter type in the third quarter of 2012.

Recent milestones passed by the midsize Legacy 500 include taxi runs, where the aircraft was taken to a speed of 80kt

(148km/h), and the completion of ground vibration tests.

Its second and third prototypes have also begun production, with wing-to-body join and power-on completed on prototype 2 and wing-to-body join completed on prototype 3. The second prototype will roll out later this month, says Embraer, followed by the Honeywell HTF-7500E engine

run and start of ground tests. Prototype 3 will be used to test interior materials and systems, including the galley and the Honeywell-supplied in-flight entertainment system. Its iron bird flight controls test rig has also logged 1,700h of testing. ■



For more on Embraer and the Brazilian aerospace industry, visit [flightglobal.com/brazil](http://flightglobal.com/brazil)

## FINANCES

### Hawker Beechcraft owners to ditch their equity stake

Creditors of Chapter 11 airframer will exchange \$2.5 billion debt for company ownership

**H**awker Beechcraft has revealed the company will have new owners when it emerges from a financial restructuring under Chapter 11 bankruptcy protection later this year.

Co-owners Onex Partners and GS Capital Partners are selling their equity stake, with Hawker Beechcraft's creditors exchanging a \$2.5 billion debt load for ownership in the company, says executive vice-president for customers Shawn Vick. The creditors will then become the new owners of Hawker Beechcraft as part of the restructuring process, Vick adds.

"Over \$2 billion of our debt [has] been wiped off the balance sheet as our debt holders have agreed to exchange their debt for ownership in the company," he says. Vick will only describe the company's future

owners as a mix of undisclosed financial institutions. Despite its financial woes, Hawker Beechcraft is eager to stress "it's business as usual" and is optimistic over its long-term future as it celebrates its 80th anniversary this year.

**"Over \$2 billion of our debt [has] been wiped off the balance sheet"**

#### SHAWN VICK

Vice-president, Hawker Beechcraft

Earlier this month, Hawker Beechcraft voluntarily entered into Chapter 11 bankruptcy protection but says it is continuing to build, support and deliver aircraft to customers.

At EBACE it handed over a pair of Hawker 4000 business jets – one to charter company Orion Malta and the other to Romanian operator InterAviation. The super midsize business jet is one of eight aircraft Hawker Beechcraft displayed at EBACE this year.

The airframer was also keen to stress the importance of its after-sales business. According to Brian Howell, vice-president of aftermarket sales and business development, 25% of Hawker Beechcraft's 2012 development budget has been earmarked for performance-enhancement programmes on its fielded fleet of 36,000 aircraft. These will include engine, avionics and winglet upgrade packages for the Hawker Premier jet and King Air 200 and 350 turboprops. ■



**CERTIFICATION**

# Third HondaJet joins the flight test programme

Airframer displays new cockpit and cabin features at EBACE, as aircraft speeds towards second half 2013 certification

**H**onda has flown the third of four HondaJet flight-test aircraft set to take part in the US Federal Aviation Administration certification programme for the \$4.5 million HA-420 entry-level jet.

Of the four conforming aircraft built to date, three (F1, F2 and F3) are flight-test aircraft and the fourth (ST1) is a structural test article on which the company successfully completed an ultimate strength test to 150% of design limit loads, says HondaJet president and chief executive Michimasa Fujino. He says the final two aircraft are in fabrication, one for the flight-test campaign and one for structural testing. Aircraft F3 will be used primarily for avionics and electrical system flight testing.

Fujino says testing on F1 and F2 have confirmed the aircraft's maximum cruise speed of 420kt (780km/h), maximum cruise altitude of 43,000ft (13,100m) and climb rate of 3,990ft/min (20m/s).

New HondaJet features displayed at EBACE include an option for pilots or co-pilots to split the 14in (356mm) primary flight displays in the Garmin 3000

flightdeck in a 40/60 format to include more information, an upgrade designed to improve the visual scan process for single-pilot operations. A new cabin management system allows passengers to use an iPad to control cabin elements, including light, sound and temperature.

Providing the HondaJet's GE Honda Aero Engines HF120 can gain approval in the second half of this year, Honda says it will certificate the twinjet in the second half of 2013, shipping completed aircraft to first customers immediately afterwards.

In October, Honda revealed a one-year slip for the HondaJet entry-into-service to the second half of 2013, because of a required engine redesign. Problems were encountered during ice slab induction tests at GE facilities, requiring the redesign of the one-piece titanium fan blisk for the 1,950lb (8.7kN) take-off thrust engine. Brad Mottier, vice-president and general manager of GE Aviation's business and general aviation group, says the company will achieve FAA certification this year. ■



**Chabbert:** two of TBM 850's six seats can be removed in 30mins

**LAUNCH**

## Daher-Socata celebrates reception of TBM 850

**D**aher-Socata has received a "fabulous reception" for its new rapid-change TBM 850 Elite, presented to the business aviation community for the first time at EBACE. The French airframer is offering all TBM 850s in the configuration, which allows two of the six seats to be removed in as little as 30min. It has already delivered seven. Nicolas Chabbert, senior vice-president of the aircraft division, says the version has received a "fabulous reception", mainly because the four-seat cabin allows pilots to "reconnect with the feel

of the Cessna 206 they started flying on and now miss, but keeping the speed of the TBM".

The new version involved changing the position of air vents and oxygen mask holders, and reinforcing rails. Two new avionics options are also offered: a long-range KHF 1050 radio and Garmin's GSR 56 Iridium satellite transceiver, giving access to weather information, text/voice communications and near real-time positioning. ■

For news from the business and general aviation sectors, go to [flightglobal.com/bizav](http://flightglobal.com/bizav)

**DESIGN**

## Brabus has designs on business jets

Business jet owners who want the same uncompromising level design in their private jet as they have in their car can now turn to design studio Brabus for help. The German company, which has worked extensively with Mercedes-Benz to provide bespoke interiors for its top-end cars, is partnering with completions company Ruag, paint specialist Happy Design Studio and jet management firm PrivatAir to launch Brabus Private Aviation.

"We don't aim for the customer that wants cheap," says the company's Constantin Buschmann, "but the customer that wants the best available on the market." Brabus will focus on the Bombardier Global Express and Challenger families, as well as the Dassault Aviation Falcon series. It presented two concepts at EBACE – Elegance and Sportive – for the Global Express.





## RE-ENGINEING

# War of words over Hawker 400 series

Nextant chief says Hawker Beechcraft's 400XPR unlikely to reach market, while rival insists it is on course for certification

**N**extant Aerospace and Hawker Beechcraft have renewed hostilities as they fight for the upper hand in the market for re-engined Hawker 400-series jets.

Speaking at EBACE, Nextant chief executive Kenneth Ricci criticised Hawker Beechcraft's strategy, suggesting it was unlikely its rival's 400XPR would ever become commercially available.

"I don't think they'll get it built. Certification is a long way away," he says, pointing out that the 400XPR's first flight on 3 May was made with a non-conforming aircraft. "First flight may have been accomplished but we know from having gone through it with a non-conforming aircraft, they really have a little ways to go." He suggests it will be another 12



Nextant received US FAA approval for its Williams FJ44-3AP-powered 400XT in October 2011

months at least before the 400XPR gains full certification.

Meanwhile, Nextant received US Federal Aviation Administration approval for its Williams FJ44-3AP-powered 400XT in October 2011, says Ricci.

However, Hawker Beechcraft

insists the 400XPR – which uses the higher-rated Williams FJ44-4A-32 engine – is on course for certification in the third quarter. Brian Howell, Hawker Beechcraft vice-president aftermarket sales and business development, says the programme is "exactly where it needs to be". He adds: "We do have a bit of history as an OEM of certificating airplanes. Nextant is not a company that's ever done this before."

## CORNERSTONE

The 3 May flight was "very successful", he adds. "Every characteristic the pilot went after we achieved. Every scenario he put it through, it responded impeccably. Howell says: "The [400]XPR is the cornerstone of the new Hawker Beechcraft."

Hawker Beechcraft is continuing to take new orders for the type. At a signing ceremony during the show, Danish charter operator JoinJet added its name to

the aircraft's backlog. General manager Kristoffer Sundberg says it also considered Nextant's offering but says he was not convinced by the back-up offered by Nextant's nine-site support network. "We looked at [the 400XT], but not for long," he adds.

"As a charter operator, if we can't get a repair made very, very quickly, then we are going to lose revenue."

Production for 2012 is sold out, says Howell, and Hawker Beechcraft intends to deliver "double-digit" numbers of aircraft this year and 36 following next year. He declines to be drawn on the total backlog for the programme but says it was a "double-digit figure", hinting that "big fleet orders" could soon be on the way.

Meanwhile, Nextant has taken 67 orders for the 400XT and delivered 10 aircraft. ■

## PRODUCTION

### Nextant acquires manufacturing facility

Nextant Aerospace has acquired a new manufacturing facility for the Nextant 400XT at Cleveland's Cuyahoga County airport in response to "greater-than-expected" demand for its remanufactured jet.

The facility will support an annual production rate of 48 aircraft and quadruples the size of the company's current site. Production time will fall to eight weeks per aircraft by July, says chief executive Kenneth Ricci.

It features a production hangar that can handle six aircraft simulta-

neously, a second hangar for aircraft delivery and completions, and a third that will house an enlarged painting operation. Staff numbers have also increased to more than 150, up from 28 a year ago.

Nextant expects to have delivered 32 aircraft by the end of this year and recently handed over its 10th aircraft to an undisclosed US client.

The company says 30% of sales to date have come from overseas markets. European Aviation Safety Agency certification is slated for the second quarter of 2012. ■



## ROTORCRAFT

### First flight for on-schedule AW169

AgustaWestland has completed first flight of the AW169 light intermediate helicopter, as the programme continues on schedule to achieve certification in 2014. The AW169 prototype, flown by AgustaWestland chief test pilot Giuseppe Lo Coco and test pilot Giuseppe Afruni, performed "as expected". The flightcrew, which also included engineers Massimo Longo and Stefano Rogoni, assessed general handling and basic systems, AgustaWestland says.

The Italian helicopter maker launched the 4.5t AW169 in July 2010 at the UK's Farnborough International air show to fill a gap between the 6t AW139 and the 10t AW189.





Korea Aerospace Industries feels the export blues  
**BUSINESS P28**

**LAUNCHERS** ZACH ROSENBERG WASHINGTON DC

# ATK set to develop capsule for Liberty launch vehicle

Spacecraft heavily based on unique testbed delivered to NASA to test use of composites

**A**TK is to develop a unique capsule for the Liberty launch vehicle (LV) as part of its bid for NASA's commercial crew integrated capability (CCiCap), which is meant to lead to a system to launch astronauts to the International Space Station.

"We're starting with the service module that NASA Glenn [research centre, Cleveland] designed for beyond low Earth orbit," says Kent Rominger, ATK vice-president and programme manager. "We're simplifying that, we don't need to carry nearly as much propellant, that leaves us with some space to carry unpressurised cargo for the Space Station."

The capsule, called simply "Liberty spacecraft", is heavily based on ATK's composite crew module, a one-off testbed delivered to NASA in 2009 to test the use of composites in spacecraft.

"We're trying to minimise any changes," adds Rominger. "The fact is, the module as it is today is probably overdesigned, it's stronger and more robust than we actually need."

## ABORT TESTS

The capsule's first two flights are scheduled for 2014, both abort tests, followed in 2015 by an orbital flight and, finally, a crewed orbital flight. Each spacecraft is designed for ten flights and ATK plans to build a minimum of four capsules. All flights will be launched by the Liberty launcher, and ATK is not actively exploring adapting the capsule for other LVs.

While ATK is constructing the outer shell, Lockheed Martin has been selected to fill crucial roles such as systems assembly and integration. The capsule will have significant commonalities with Lockheed's Orion capsule, a much larger spacecraft being developed for long-duration missions beyond Earth's orbit.



Liberty spacecraft's first two flights are scheduled for 2014

"The systems are going to have a lot of commonality," says Rominger. "Guidance, navigation, control, heat shield, back-shell, everywhere that system fits a low earth orbit mission, we're going with it. If you don't have to develop, test and certify [the components] you're way ahead."

**"The module as it is today is probably overdesigned, it's stronger and more robust than we actually need"**

**KENT ROMINGER**  
VP and programme manager, ATK

The Liberty LV is designed to launch about 44,500lb (20,200kg) to low Earth orbit and was awarded an unfunded Space Act Agreement from NASA, allowing information sharing and an official licence. ATK sees openings for

Liberty in commercial and government markets and intends to offer the LV for government missions requiring the most reliable launchers, including high-value NASA science payloads and National Reconnaissance Office spy satellites.

"Our business case is robust. In the commercial world, that's where I think Liberty is also at an advantage. Because we control the entire stack, cargo is part of our business case, as are stand-alone missions. We've been talking with Costa Rica, Brazil, Australia."

Liberty LV uses a five-segment solid rocket booster as a first stage, derived from those used to launch the Space Shuttle, and the Vulcain 2 as a second stage, which is also used on Ariane V as a first stage. Competition for CCiCap funding is fierce, including companies such as SpaceX, Sierra Nevada and Blue Origin. NASA will trim the field later this year. ■



News from the spaceflight sector is on our reactivated blog at [flightglobal.com/hyperbola](http://flightglobal.com/hyperbola)

## PAYLOADS

# Spaceflight Inc unveils Sherpa tug vehicle

**S**paceflight Inc has unveiled its Sherpa in-space tug vehicle to transfer hosted payloads between different orbits.

Two versions of Sherpa will be built. A smaller version will be capable of accelerating a payload to 400m/s (78,700ft/min) change in velocity, or delta-v. The larger version will be 2,200m/s delta-v.

The system will be used on SpaceX's Falcon 9 rocket. A sun-synchronous test flight is planned for early 2014, with a first operational mission for late 2014.

"In a lot of cases, as a secondary payload you're restricted by where the primary payload goes," says Jason Andrews, chief executive of Spaceflight Inc.

The Sherpa 400 is optimised for low Earth orbit missions, adds Andrews, while the larger Sherpa 2200 can bring small satellites

**The Sherpa will be used on SpaceX's Falcon 9 rocket**

from geosynchronous transfer orbit to geosynchronous orbit (GEO), and is capable of propelling an object from GEO to escape velocity for missions outside the Earth's orbit.

Hosted payloads are a growing field. Launch vehicles are generally selected to launch a given payload through complex calculations of cost, reliability and availability. Launchers frequently have significant spare capacity and, if space allows, the launch company will offer rides to smaller secondary payloads.

The downside is they are inserted into nearly the same orbital inclination and altitude as the primary payload, an orbit for which it may not be ideally suited. Sherpa, by transferring a secondary payload to a different orbit without the need to use its own propellant, will allow significantly greater flexibility. ■



## Good week

### ROCKWELL COLLINS

The avionics major has joined forces with Air Asia boss Tony Fernandes's Caterham Formula 1 team to bring aviation technology to the former Team Lotus's motor racing armoury. In exchange, F1 fans will see the Rockwell Collins logo on the Caterham F1 cars, in the pits and elsewhere throughout the racing season, a deal which Collins says perfectly complements a growth strategy to establish stronger local presence in key markets.



Caterham F1



USAF

### ORBIT INTERNATIONAL

The electronics maker will be happy to move on from the first quarter, which saw sales slump 10% to \$6.2 million and net profit collapse from a profit of \$524,000 last year to a loss of \$1.38 million. Orbit, which makes components for aircraft such as the US Air Force's RC-135 Rivet Joint (pictured), has reached a "mutual understanding" with executive VP Bruce Reissman, who will step down on 31 July with a one-off payment of \$1.19 million.

## Bad week

**INVESTMENT GREG WALDRON SINGAPORE**

# KAI feels the export blues

Korea's aerospace champion hopes investment from overseas will unlock foreign sales

The early months of 2012 have been unkind to Korea Aerospace Industries (KAI). Early in May, India dismissed a protest by KAI related to a basic trainer competition for 181 aircraft. The announcement all but eliminated KAI's KT-1 in favour of the Pilatus PC-7 Mk II. India's rebuff followed another blow in February, when Israel selected the Alenia Aermacchi M-346 over the KAI/Lockheed Martin T-50 for a 30-aircraft advanced jet trainer deal, despite intense lobbying by Seoul.

The year has not been completely devoid of bright spots. In March, KAI entered a \$1.1 billion deal to supply the wing bottom panel assembly for the Airbus A320 family of aircraft, adding to the extensive work KAI performs for Airbus.

Although important, the A320 deal was no major breakthrough: KAI has provided the wing top panel for the A320 family since 2001, an arrangement renewed in 2011. KAI also participated in the development of the A380 and is a risk-sharing partner in the A350.

While KAI has enjoyed success as a key supplier to major airframers, including Boeing and Airbus, it has struggled to export home-grown types, especially its flagship T-50 supersonic trainer, and has had limited success with the KT-1 turboprop trainer (pictured).

### PARTNERS WANTED

It is amid this tough export environment that the company's shareholders hope to divest a 40% stake in the firm, although details are still sketchy. One analyst says a major element of the stake sale is boosting KAI's "sluggish exports." KAI itself is unaware of the exact details of the plan, calling it "an agreement between the major shareholders".

KAI adds: "It is believed the stake is being offered to financially strong companies in order to provide a boost for the aviation industry in this region."

KAI's major shareholders hold



Greg Waldron

### Let's make a deal

56.4% of the company. They are government-owned Korea Finance Corp (26.4%), Samsung Techwin (10%), Hyundai Motor (10%) and two units of industrial conglomerate Doosan: DIP Holdings (5%) and Odin Holdings (5%). Institutional and individual investors own 34.6% and KAI employees own 9%.

In a research note, Paul Hah, of Woori Investment & Securities, says Korea Finance Corp will sell 10%, while Samsung Techwin, Hyundai Motors, and Doosan will divest their entire stakes.

Media reports say potential buyers could include a major foreign player, or possibly a major local conglomerate such as Hanjin, Hanhwa, or Hyundai Heavy Industries, which is entirely separate from Hyundai Motors. After the sale, the government will remain the second-largest shareholder. A big government shareholding is seen as essential given the strategic nature of KAI's defence business.

Hah says that KAI envisages three main benefits from a stake sale. These are faster decision-making for investment opportunities, improved exports owing to the sales and marketing clout of the prospective stake buyer, and improved technology through higher investment in research and development.

Hyesung Kim, an analyst at South Korea's AM Consulting, says the stake sale is unpopular with

Korean taxpayers, who have financed KAI with about \$881 million since the company's founding in 1999. Hah notes that KAI's shares have fallen 29% since November 2011 on divestment concerns. The Korean government attempted to privatise KAI in 2009, but pulled back due to protests by workers, Kim says. "Thus, how KAI deals with unfavourable public opinion and its employees will be a great challenge."

### DIFFICULT PROCESS

Kim's reasoning suggests the sale of a major stake to a foreign multinational could be controversial. Moreover, some think it may not greatly improve overseas sales.

"The biggest challenge is going from state-owned arsenal company to competitive international player," says Teal Group analyst Richard Aboulafia. "That's a long and difficult process, and an alliance with a larger western defence investor doesn't guarantee success."

Nonetheless, Aboulafia feels privatisation will be good for KAI as it could improve the company's market focus. "The discipline of the market is immensely helpful to any emerging aerospace company," he says.

"It also starts the process of freeing them from the shackles of government ownership, which inhibits competitiveness." ■



For all the latest defence news from Asia, visit [flightglobal.com/asianskies](http://flightglobal.com/asianskies)





**Brazil's aerospace industry is in the ascendency**  
SPECIAL REPORT P30

## PEOPLE MOVES

Ball Aerospace, Virgin Atlantic Cargo, Etihad, Skyworld



Ball Aerospace

### Osterkamp: Ball engineering

**Ball Aerospace** has made company veteran Jeff Osterkamp VP engineering, with overall strategic and operational leadership for all disciplines including manufacturing, test, supply chain management, IR&D and intellectual property. He will also direct hiring and oversee programme staffing, infrastructure capabilities and engineering processes. Osterkamp joined Ball more than 25 years ago from Sperry Flight Systems, and most recently served as VP component technologies. An electrical engineer by training, he has also been VP business execution

within Ball's National Defense strategic business unit. Former Globe Air Cargo managing director Jim Barruch has joined **Virgin Atlantic Cargo** as regional sales manager, Americas. At **Etihad Airways**, Asia Pacific general manager Kirk Albrow is now general manager Thailand and Mahfood Al Harthy has joined from Gulf Air as general manager Oman. Former Antonov deputy marketing director Tatiana Buryak has joined aircraft marketer **Skyworld Aviation** as Moscow-based business development manager for Russia, the CIS and Eastern Europe.



Skyworld Aviation

### Buryak: Skyworld CIS

### QUOTE OF THE WEEK

**"The only thing that holds us back is the speed of sound"**

#### Virgin Atlantic boss **STEVE RIDGWAY**

acknowledges the limits of high-speed air travel – but looks forward to the day when new technology makes sister company Virgin Galactic's suborbital venture the foundation for a new era of point-to-point service



## BUSINESS BRIEFS

### SPEEA RAISES INFLUENCE AT BOEING

**LABOUR** In a vote that more than doubles the number of pilots at Boeing represented by a trade union to over 100, pilots and instructors in Flight Training Services are joining the Airplane Manufacturing Pilots Association bargaining unit of the Society of Professional Engineering Employees in Aerospace. SPEEA, which claims to be the largest professional aerospace labour union in the USA, will this year negotiate new contracts for more than 22,100 engineers and technical workers at Boeing plants in Washington, Oregon, Utah and California, and for 750 engineers at Spirit AeroSystems in Wichita. SPEEA is Boeing's second-largest union, behind the International Association of Machinists and Aerospace Workers, which staged a two-month strike in 2008.

### COMMERCIAL SALES LIFT CPI AEROSTRUCTURES

**MANUFACTURING** At CPI Aerostructures, first-quarter pre-tax profits gained 35% to \$2.7 million on sales up 23% to \$19.7 million. Commercial contracts revenue nearly trebled to about 28% of total revenue. Almost a third of the value of new contracts won this year came from two customers, Goodrich and Embraer.

### BOEING COMPLETES ACQUISITION OF INMEDIUS

**SERVICES** Boeing has completed its acquisition of software provider Immedius, for an undisclosed sum. Immedius, with 75 employees and Pittsburgh headquarters, will be integrated into Continental DataGraphics, a documentation and training subsidiary of Boeing Commercial Aviation Services.

### MIXED FIRST QUARTER FOR ST AEROSPACE

**MAINTENANCE** ST Aerospace posted a 5% rise in first-quarter pre-tax profit to \$59.8 million (\$47.6 million) as revenue edged up 1% to \$457 million. Aircraft maintenance and modification revenue dipped 3% to \$223 million, but pre-tax profit gained 13% to \$41.9 million. Component and engine repair and overhaul revenue was up 5% to \$170 million, but profit soared by 45% to \$14.4 million. Engineering and material services revenue was up 6% to \$64.2 million, but profit fell nearly two-thirds to \$3.47 million.

### ALITALIA GROWTH HOBBOLED BY RISING FUEL COSTS

**AIRLINES** High fuel costs and the strong dollar offset good revenue and load factor growth at Alitalia in the first quarter, as the Italian carrier posted an operating loss of €109 million (\$140 million). Revenue grew 13% in the first three months of the year to €776 million. Alitalia cites development of its long-haul charter business, increased ancillary revenue and improved cargo belly performance for the jump in revenue. Net loss was €131 million, down €43 million against 2011's figure.

### CHINA AIRCRAFT LEASING SPREADS EQUITY STAKES

**ACQUISITION** China Aerospace Investment Holdings has acquired an 8% interest in Hong Kong-based China Aircraft Leasing Holdings, and says the investment will help expand its fleet from 12 aircraft to 100 during the next three years. China Everbright Aerospace Holdings bought a 40% stake last year and Friedmann Pacific Asset Management holds 48%.

### INDIAN AEROSPACE EXPORTS UP NEARLY A FIFTH

**INDUSTRY** According to a study by India's Associated Chamber of Commerce and Industry, Indian aerospace and defence industry exports grew about 18% in the first three quarters of 2011-2012. Parts and components accounted for 96% of the total.





Legacy 450: one of two business jet programmes under development at Embraer

# BRAZIL TAKES OFF

When Embraer's functional Bandeirante turboprop took to the air in 1972, few would have guessed that four decades later the modest government-launched venture would have morphed into one of the world's big four airframers, with a portfolio spanning commercial, business and military aircraft. Embraer's success story is well known, and without it there would be no Brazilian aerospace industry. The now privately owned company still dominates, but a sizeable aerospace community has flourished around it, including a network of foreign-owned suppliers and locally owned small and medium-size enterprises. Long-established Eurocopter subsidiary Helibras is entering a new phase of growth, while the thriving airline sector in Brazil and the rest of South America has provided a lucrative market for service providers such as training specialist CAE, engine maker Rolls-Royce and TAP Maintenance & Engineering in MRO. In this country special, we examine the make-up of Brazil's aerospace sector and its prospects





EMBRAER



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(Top left) Helibras is to build Eurocopter EC725s for the Brazilian armed forces at its facility in Itajuba; CAE's Sao Paulo facility (above centre) is its original site in Latin America – it will shortly operate five. Embraer has high hopes for its biggest aircraft ever, the KC-390 airlifter (top right); Sao Paulo's size and congestion makes it the perfect market for VIP helicopters (left)



EMBRAER

# Decade of departure

With a mature E-Jets business and growing executive jet line-up, overseas expansion and defence will be airframer's next priorities

**MURDO MORRISON**

SAO PAULO AND SAO JOSE DOS CAMPOS

If the 1990s were when a struggling Embraer secured its future with the ERJ family of regional jets, and the 2000s all about E-Jets and the breakthrough into business aviation, this decade is likely to be characterised by Embraer's development of an industrial footprint beyond Brazil and a third significant arm of its business – military aviation. The moves should help the airframer hedge against fluctuations in the Brazilian currency, by moving costs into the dollar and euro zones, and develop a third, government revenue stream.

Although there have been wobbles since its foundation in 1969 – including bouts of hyper-inflation and a financial crisis in the early 1990s – Embraer's history has generally been one of making the right investment decisions at the right time. In the 1990s, it brought its ERJ-135 and ERJ-145 to market just as US airlines were developing a taste for jet commuter services. In the 2000s, the manufacturer helped create the large regional jet segment with the E-Jets family, and – using a variant of the ERJ-135 as its start point – broke into the business jet market just as it was expanding outside the North American heartland dominated by its established competitor brands.

The turn of the decade saw two major new departures. Backed by a launch order from the Brazilian government, Embraer launched its most ambitious military programme yet, the KC-390 jet tanker/transport. The company believes defence sales, including from the Super Tucano military turboprop trainer, will make up a quarter of its revenues by 2020 (see box). At the same time, Embraer opened a factory in Melbourne, Florida to assemble Phenom 100 and 300 light jets, and earlier this year announced it would be adding an engineering and technology centre this year, creating a further 200 jobs. A business jet completion capability is likely to be next.

Around the same time as the Melbourne plant was being built, Embraer also announced it was establishing a production plant in Portugal to build metal and composite structures, initially for the new Legacy 450 and 500 business jets. It is Embraer's first overseas subassembly facility, although it has a



**“Five years ago there were no E-Jets in Latin America; now we have eight customers”**

**PAOLO CESAR DE SOUZA E SILVA**  
Commercial aviation president, Embraer

majority ownership of Portuguese maintenance house and aerostructures manufacturer OGMA. A joint venture in Harbin, China – which carried out final assembly of now out-of-production ERJ-145s – may switch to assembling its cousins, the Legacy 600 and 650, although a deal still has to be concluded.

With Embraer's four-variant E-Jet family now mature, the company's medium-term strategic focus in its commercial aviation business is on new product development. It appears to have settled on a re-engining, and a possible further stretch, of its E-Jet range, with a service entry of 2016-2108, rather than developing a clean-sheet, five-abreast airliner to compete with Bombardier's CSeries. Its thinking appears to be that in trying to keep up with

its Canadian rival, Embraer would be walking straight into a four-way fight with two much bigger competitors, Airbus and Boeing, who still want to compete in the 130-seat segment.

Embraer could have developed a technologically superior and more efficient jet in the small narrowbody category, benefiting from new engines and a fresh design, says commercial aviation president Paolo Cesar de Souza e Silva. But the investment needed would not have justified the risk. “It is a market three times as big as the one we currently compete in, but there are already two big manufacturers and to convince an airline to switch from one fleet to another would be challenging, especially when [Airbus and Boeing] have the advantage of being able to cross sell other types,” he says.

## TURBOPROP MARKET

Likewise, Embraer appears to be going cool on a return to the turboprop market, with a 90-seat competitor to the Bombardier Q400 or ATR 72. While soaring fuel prices have rekindled a turboprop segment that appeared to





**Clean-sheet  
design: Legacy  
500 takes shape**

EMBRAER

have burned out a decade ago, the market is still limited, says Cesar. "There are two established manufacturers in that sector selling 120-130 unit a year. That does not seem big enough," he says. However, new propulsion technology could change things. "If the right engine came along, that could give us a new opportunity," he says.

The E-Jet family is developing into a healthy cash cow for Embraer. Originally developed to take on the Fairchild Dornier 728Jet, sales got off to a slow start but the family now has around 1,100 orders. Cesar sees the main opportunity for the family now not so much in the traditional regional feeder sector, but in airlines "right-sizing" routes – complementing narrowbodies with E-Jets at certain times of day, for instance. In fact, fewer than four in 10 E-Jets in service are used for traditional regional or feeder routes. Almost three in 10 are with low-cost airlines and the rest are used for point-to-point services by full-service airlines, he says.

Emerging markets generally are also a big focus. "Five years ago, there were no

**MILITARY** MURDO MORRISON SAO PAULO

## EMBRAER OPENS UP A NEW FRONT IN DEFENCE

EMBRAER'S ROOTS are in defence. Its first aircraft – the EMB-110 Bandeirante – was built for the Brazilian armed forces in the early 1970s, and it designed the AMX fighter with Italian industry in the 1980s. Embraer also developed the Tucano and Super Tucano trainers/light fighters. However, as the firm focused on commercial and business aviation in the 1990s and 2000s, defence took a back seat.

The launch of the KC-390 in 2008 changed that. Although maintenance work, special mission and other modifications and Super Tucano sales have kept the defence division ticking over, the military transport is Embraer's biggest and arguably most ambitious aircraft to date, and will help to elevate the defence segment to an expected 25% of Embraer's revenues by 2020.

With the Brazilian government helping to underwrite the programme with an order for 28 of the IAE V2500-powered twinjet, Embraer has secured further commitments (though not firm orders) for 32 aircraft from Argentina, Chile, Colombia, the Czech Republic and Portugal. All five countries are expecting industrial participation, with Czech firm Aero Vodochody and Portugal's EEA and Embraer subsidiary OGMA among those already lined up as programme partners.

The prototype of the KC-390 is due to fly by the end of

2014, with a targeted service entry with the Brazilian air force of 2016. Luiz Carlos Aguiar, the president of Embraer's defence business, sees a potential market for the 23-tonne payload airlifter of around 100 aircraft – mostly replacements for older versions of the ubiquitous Lockheed Martin C-130 Hercules – assuming a 15% market share for Embraer. "There are a lot of ageing C-130s out there," he says.

### AMBITIONS

But Embraer's defence ambitions do not stop with the KC-390. Aguiar is keen to follow companies such as Lockheed, Finmeccanica and BAE Systems and position Embraer in the growing homeland security segment – with a World Cup and Olympics coming up in Brazil, as well as pressing needs to control borders and deter drugs trafficking, this could prove a lucrative market. But it will require developing technologies within Brazil, and this will mean Embraer partnering with or even making "middle-size acquisitions" of the companies behind the technology, he says.

Linking with international companies in this sphere is not an option, however. "They have developed their own technology and consolidated their markets. It doesn't make sense for them to open up to us," says Aguiar. "Our model is

to take our capability, take it through Brazilian acquisitions and then export a Brazilian solution." Ideas being developed for the domestic market today, he says, "could in five years be exported to Africa and Latin America. There are lots of countries growing fast from a small base, and like Brazil will face future changes in social demands."

Another departure for the business is unmanned air systems. Late last year Embraer formed a venture with Israel's Elbit Systems, Harpia Systemas, to develop tactical and strategic UAS for the air force for border protection. Elbit's Hermes 450 will provide the initial platform. However, Aguiar says Brazil, rather than Israel, will own much of the intellectual property. "We have technology here in Brazil. The air force needs to have commonality with datalinks, so it is not going to buy off the shelf from Israel. It has to be very specific for a Brazilian environment."

### RESURGENCE

An established product – the Super Tucano – is also enjoying a resurgence, in a security role. Embraer was dealt a blow in February when a contract to supply 20 for a US Light Air Support requirement to equip the Afghan air force, with US partner Sierra Nevada, was put on hold after a challenge by rival Hawker Beechcraft. However, while the USA remains very much in Embraer's sights for the Super Tucano, counter-insurgency demands in Asia and Africa have helped to deliver strong sales, with Angola, Burkina Faso and Mauritania among recent customers. "We estimate that the counter-insurgency market represents around 300 aircraft to 2020," says Aguiar. "And we conservatively expect to sell 50% of these." ■



EMBRAER

**Five countries, plus Brazil, have committed to KC-390**

» E-Jets in Latin America,” says Cesar. “Now we have eight customers.” The Chinese market too is showing “good demand” and Indonesia with its 240 million population and 17,000 islands is an “amazing country for aviation”. Even the beleaguered US market shows promise, with the oldest fleets 15.5 years old and the reorganisation of many of the airlines driving through further efficiencies.

The commercial aviation business held its own in 2011, with 124 E-Jet sales, up by 28% on 2010, and 105 deliveries, compared with 100 the previous year. The backlog for the family stands at 249 units. Commercial jets remain Embraer's bread and butter – representing 64% of revenues in 2011 – but it is in its other divisions, particularly executive aviation, where most new product development has been taking place of late.

### MAINSTREAM MANUFACTURER

Embraer's shift into business aviation to become one of the six mainstream manufacturers has been rapid and bold. From a single product – the ERJ-135-derived Legacy 600 a decade ago – Embraer now has a line-up of seven types: the entry level and light jet Phenom 100 and 300, the under-development, clean-sheet Legacy 450 and 500 in the medium-cabin segment, the 600 and its 650 variant, and the large-cabin Lineage 1000, which is a derivative of its E-190 twinjet. The division now accounts for almost a fifth of Embraer's revenues.

However, the peak of that new product development has coincided with the sector's worst slump – four of its new models entered service between 2008 and 2010 – and Embraer has not escaped the effects. Deliveries last year slumped to double figures – 99 – compared with 144 in 2010, with the Phenoms worst hit, down from 126 to 83 last year. Like most industry observers, Embraer does not expect sales across the industry to return to the highs of 2008 until the end of this decade.

However, Embraer is determined to ramp up its market share. It has relocated its divisional head office to Florida to bring it closer to its North American customer base, a move that could also help it swing future lucrative US military contracts.

And with new products on the way – the midsize Legacy 500 is due to fly for the first time in the third quarter, with its mid-light Legacy 450 stablemate following in the second half of 2013 – Marco Tulio Pellegrini, chief operating officer for Embraer Executive Jets, says Embraer has built a strong portfolio and powerful market position. “We have 500 jets in service. For a business that started in 2002, that is a good result so far,” he says. ■

For more information and to read Mike Gerzanics' flight test of Embraer's Phenom 100, go to [flightglobal.com/phenom100](http://flightglobal.com/phenom100)

By 2017, each EC725 will have 50% local content



### HELIBRAS

## Brazil's other OEM

A contract to assemble EC725s for the military has elevated its status. Next step could be an all-Brazilian helicopter

MURDO MORRISON ITAJUBA

The opening in April of a new \$300 million extension to Helibras's Itajuba facility has finally established the Eurocopter subsidiary as Brazil's second original equipment manufacturer. Helibras had been selling, maintaining and final-assembling Eurocopter helicopters – and those from predecessor Aerospatiale – since being set up in 1978, but it was a Brazilian deal to buy 50 EC725 Super Cougars for its army, navy and air force in 2008 that has really elevated its status to OEM proper.

The initial aircraft will be manufactured in France but, as part of the contract, Helibras will begin full assembly from the 17th helicopter in the final quarter of 2013, with flight testing being carried out on helicopter number nine and ground testing two units later.

A local supply chain has been established, with 14 Brazilian companies winning contracts. By the time the 50th helicopter is delivered in 2017, each EC725 will have 50% local content, says Eduardo Mauad, Helibras executive vice-president.

However, Helibras's ambitions go much further than assembling around 33 helicopters for the Brazilian military. Helibras will also build from 2014 civilian versions of the Super Cougar – the EC225 – for the local market. Twelve are in service already in Brazil, and Mauad reckons there is a capacity for around 40-50 helicopters in its category – it competes with the Sikorsky S-92 – over the next five years. Helibras may benefit from Brazilian government export aid in its efforts to market the EC225 to other Latin American countries because of its local content, he says.





pansion of the engineering capability is key to turning Helibras from a manufacturing and assembly facility into one that can develop its own systems and eventually a complete aircraft, he adds. "Our intention is that some Brazilian engineering will eventually be reversed into the French assembly line."

The Super Cougar deal has also helped Helibras to consolidate its legacy business, which sees it final-assemble, modify and maintain AS350/355 Ecureuils, EC120s and EC155 Dauphins for the local market. Late in 2010 it won a deal to lead a major upgrade of the Brazilian army's fleet of AS350s, with work scheduled to last until 2018. Under the contract, Helibras will modernise 36 of the single-engine aircraft with an automatic flight-control system and improved crew seats.

Total employment at Helibras is also growing fast, from 300 in 2008 to a projected 1,000 by 2015 – this in a city that has been largely dependent on agriculture. The EC725 deal – which will see the army and navy each receive 16 helicopters and the air force 18 – has had a number of "positive lateral effects" on the local economy, says Mauad. The local university is developing an aerospace engineering course in cooperation with a university in Toulouse.

An agreement between the state government and the Brazilian development agency will see a helicopter-technology centre being set up – a "mini version" of the facility in Brazil's aerospace capital Sao Jose dos Campos, says Mauad. Itajuba, a twisting 3h drive inland from the major cities of Sao Paulo and Rio de Janeiro, will also benefit from a new regional airport, being developed opposite

Beyond that lies the prospect of the first indigenous helicopter from a clean-sheet design. "We plan to develop a Brazilian helicopter in the next 10 years with the integration of a Brazilian supply chain," says Mauad. "We are not investing all this money just to produce 70 helicopters. We are investing in technology transfer, qualification and training."

Part of that investment includes a bustling engineering department – housed when we visited in a rather cramped first-floor office in Helibras's old factory, but soon to move to quarters in the new facility next door, construction of which began in 2010.

Three years ago, the department consisted of just nine engineers. Today, there are 65, but that will increase to 100 by 2015. French mingles with Portuguese in the chatter around the room. Around 40 engineers have been seconded from Eurocopter's headquarters in Marseilles. A similar number of Helibras engineers are updating their skills in France.

"Getting the design office growing and bringing in state-of-the-art tools is the most important thing for me," says Mauad. The ex-

## **"We plan to develop a Brazilian helicopter in the next 10 years with the integration of a Brazilian supply chain"**

**EDUARDO MAUAD**

Executive vice-president, Helibras

Helibras's factory and due to open by 2014. It could have been very different for Helibras. The Brazilian government considered a Eurocopter proposal for French-built EC725s – which will be deployed in roles such as combat search and rescue, long-distance tactical airlift, medical evacuation, logistics support, naval missions and head of state transport. A study concluded that involving Helibras in the project would have substantial benefits for the Brazilian economy. "This is a big change for the Brazilian industry," says Mauad. "We are very proud to be part of it." ■



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## **INDUSTRY**

# **Made in Brazil**

Despite Embraer's success, the country has struggled to create a sizeable home-grown supply base. Could this change?

**MURDO MORRISON** SAO JOSE DOS CAMPOS

While Embraer has been an enormous success story for the Brazilian economy, the rest of its aerospace industry has lagged behind. Compared with the aerospace sectors in Canada or many European countries, Brazil lacks a supply chain of sizeable small and medium-size enterprises. Embraer has tended to use local firms only for simple, build-to-print manufacturing, turning to international risk-sharing partners when it comes to major sub-systems development.

Although the growth of Embraer and Eurocopter subsidiary Helibras has prompted a number of global suppliers to set up shop in the country, including General Electric, Turbomeca and Latécoère, there have been few home-grown start-ups. This is partly down to Embraer's heritage as a government-sponsored, vertically-integrated enterprise, and partly the company's need to take several technological leaps over the years. Rather than nurturing local suppliers, Embraer required experienced and well-capitalised suppliers to embark on ambitious programmes such as its E-Jets and business aircraft.

"Although Embraer helped benchmark the risk-sharing approach – with global companies providing complete systems – it has meant that the local supply chain is very weak," says Walter Bartels, the director of Brazilian aerospace association AIAB. "Outside a few companies, aerospace is not a very big activity in the economy."

This could be about to change, however, thanks to an initiative by Embraer and the Brazilian air force to find local suppliers for the KC-390 military transport and tanker being developed for the air force. Around 80 companies attended a workshop last year in Embraer's home town of Sao Jose dos Campos. The government wants the "nationalisation index" of the aircraft to be 80% of its value – if the engines are excluded.

## **OVERSEAS SUPPLIERS**

Although overseas suppliers currently dominate the list of major systems suppliers to the KC-390, two Brazilian companies have been selected. AEL Systemas, a subsidiary of Israeli defence firm Elbit, is responsible for, among



» other items, the self-protection system and head-up display, while Embraer-owned Eleb will provide the landing gears. Some of their subcontract work may in turn feed down to smaller suppliers.

One of the most successful start-ups in the Brazilian aerospace sector has been Akaer, a Sao Jose dos Campos-based engineering design company founded in 1992. Although most of its work has been for Embraer, on programmes including the Legacy 450 and 500 business jets, the firm has also been involved with Brazil's space activities and won con-

### "Outside a few companies, aerospace is not a very big activity in the economy"

**WALTER BARTELS**

Director, Brazilian aerospace association AIAB

tracts from Airbus and Boeing suppliers on the A380, A400M and 747-8. It is part of a Brazilian consortium working on Saab's Gripen NG fighter.

Brazilian aerospace employment numbers,

which stood at 22,600 in 2010, according to AIAB, are growing again as Embraer's new programmes come on stream. As in other countries, the total dipped following a peak of 27,100 in 2008, but still indicates a substantial growth over the decade, from 15,000 in 2001. Aerospace turnover shows an even more marked upswing, according to the AIAB, from \$2.5 billion in 2003 to just under \$7.6 billion in 2008, dipping to \$6.7 billion in 2010.

Brazil's aerospace SMEs will be hoping to push that figure up considerably in the decade to come. ■



CAE's original centre near Sao Paulo's Guarulhos airport has just been expanded

#### TRAINING

## CAE's pilot strategy

Latin America's thriving airlines are pushing up demand for flightcrew training. The Canadian provider is leading the way

**MURDO MORRISON** SAO PAULO

Eleven years ago, CAE established Latin America's first independent civil aviation training centre near Sao Paulo's Guarulhos international airport. Today, that centre – now expanded to 10 bays – is one of five centres

that the Canadian simulator manufacturer and training provider will be operating in the region by the end of the year to serve its burgeoning airline sector.

"We have been right there with the growth of the industry in Brazil and Latin America," says Jeff Roberts, CAE's group president for civil simulation products, training and services. "In fact, we've been ahead of the curve. We have gone from one facility to five in a decade and they are all growing." CAE, which has 35 simulator centres throughout the world, remains the only major training provider in Brazil, although Boeing has a facility in Argentina.

CAE has centres in Santiago in Chile, Taluca in Mexico and Lima in Peru. However, it is Sao Paulo that remains the heart of its Latin American activities. An extension this year to

its Guarulhos facility – which has Brazilian airlines Gol and TAM as its anchor clients – is adding four simulator bays.

Five of the machines at the Guarulhos facility are Airbus (A320 and A330) and four Boeing (three 737 and one 777). Its first rotorcraft simulator – a Sikorsky S-76++, a joint venture with Brazilian helicopter operator Lider – will take up the 10th bay. Further Sikorsky S-92 and Eurocopter EC225 machines will be added in 2014.

The move into helicopters in South America is an important one for CAE, which operates seven other helicopter-training facilities. Brazil's oil and gas platform transport sector is expanding fast. Lider, which operates more than 50 helicopters and claims to represent half the market, has been CAE's training representative in Brazil for several years.

In April, CAE announced that it would be building a second, six-bay Sao Paulo site, with TAM as anchor client, this time at the downtown Conghonas airport, close to TAM's headquarters. The facility will open in the second half of the year and initially provide training for Airbus A320 pilots as well as, for the first time, Embraer. A Phenom 100 and 300 simulator is being built, and will offer training for

### "We have gone from one facility to five in a decade and they are all growing"

**JEFF ROBERTS**

Group president for civil simulation products, CAE

the light and very light business jets in a joint venture with the Brazilian airframer. The growing need for pilots in Brazil and Latin America is also prompting CAE to consider a move further down the learning route. CAE recently launched its Global Academy, a network of joint ventures with *ab initio* training schools. So far, there are none in the region, but Roberts hints that conversations with potential partners are ongoing and "you may hear something this year". ■

**BUSINESS AVIATION**

# Taking the high road

Brazil's sheer size, increasing wealth and congestion in its cities makes it a lucrative market for VIP jets and helicopters

**MURDO MORRISON** SAO PAULO

**T**ake a tortuous taxi ride through Sao Paulo's traffic-clogged streets and you realise why helicopters are such a popular method of travel for the city's time-poor, ultra-rich business leaders. Every rush hour, as the roads slow to gridlock, the only way is up, as a procession of corporate shuttles carry Brazil's masters of the universe between villas and the downtown towers of the country's financial hub.

The helicopter market in Brazil has been growing 12% a year, thanks to demand for VIP transport in Sao Paulo and Rio de Janeiro, as well as a booming offshore oil sector. But the fixed-wing fleet has also been expanding by a consistent 6-8%, says business aviation association ABAG. "The drivers are a strong economy with companies having increased purchasing power, and the need to move rapidly in a country of continental dimensions," says executive

vice-president Ricardo Nogueira. Figures from Flightglobal Ascend show the Brazilian fleet grew from 577 to 680 business jets between 2010 and 2011, and after four months of this year were nudging 700.

Small jets predominate: there are 101 Brazilian-built Embraer Phenom 100s and 300s – with 29 joining the fleet in the past two years – and 115 Bombardier Learjets. There have also been additions of Bombardier Global Express and Gulfstream 550 aircraft.

The failure of Brazil's infrastructure to keep pace with its economic development has been to the advantage of its business aviation sector. While the country's airline sector has been prospering, airports, including the biggest – Sao Paulo's Guarulhos – are overcrowded. A congested two-lane highway is the main link between Sao Paulo and Rio and there are few railways or metros. For those who can afford it, business aviation is perfect way of getting from A to B in the world's fifth-largest nation.

Not that the industry has it all its own way. "The biggest problem we are experiencing is the infrastructure in the airports," says Nogueira. Although the government has been working on improving things following pressure from the aviation community, there are few fixed-base operations and access to slots and airspace is restricted at the big airports, he says. It is the main brake on an sector that looks set to keep pace with the expanding Brazilian economy. ■



**TAP M&E's facility in Porto Alegre**

**MRO**

## TAP turns it on in Brazil

The maintenance division of Portugal's flag carrier saw an opportunity when the MRO arm of Varig came on the market

**MURDO MORRISON** LONDON

**W**hen former Brazilian flag carrier Varig went into administration in 2005, its Portuguese counterpart, TAP, spotted an opportunity to expand across the Atlantic – but by maintaining other airlines' aircraft rather than flying its own.

TAP snapped up one of Varig's prize assets – its maintenance, repair and overhaul unit – and set about transforming it from an in-house division that was sourcing 85% of its sales from its parent airline, into Latin America's largest MRO, with an almost 100% third-party customer base.

Boasting an annual capacity of 1.6 million hours, the MRO – run as part of TAP's Lisbon-based Maintenance & Repair division – is the seventh-largest in the world, says chief executive Nestor Koch.

Its 242,000m<sup>2</sup> (2.6 million ft<sup>2</sup>) of infrastructure is more extensive than the operations in Portugal. TAP M&E Brazil's hangar in Rio de Janeiro – the biggest in Latin America – can house four twin-aisle aircraft, and a second facility at Porto Alegre has room for one wide-body and four narrowbodies. In addition, there are around 20 workshops and laboratories for electrical calibration and chemical and metallographic analysis.

### SWITCHING FOCUS

Koch is proud of the speed at which the unit has switched its focus, building expertise in the last few years in Airbus and Embraer as



Clear up here:  
Sao Paulo as  
viewed from a  
helicopter



» well as Boeing aircraft – which had made up the bulk of Varig's fleet. Around 60% of the MRO's revenues come from airframes, with Airbus making up about half of that, Embraer a third and Boeing the remainder.

"It's completely different to eight years ago," he says. Component MRO makes up a further 30% of the business, where its approvals include with Boeing to repair and overhaul 777 landing gear axles. With no anchor airline, it exited the line-maintenance market in 2008.

With only 2% of its revenues coming from TAP airline itself, TAP M&E Brazil has built itself a global customer base. Domestic airlines – including rivals Gol and TAM – account for less than half of its business, while the rest of Latin America makes up around 15%, says Koch.

North America is a key target market, with several charter airlines taking advantage of the division's competitive rates and capacity to maintain several aircraft at once during the winter season. "We have invested heavily in our brand, convincing US and Canadian airlines to come here because we are cheaper," says Koch.

### SKILLED WORKFORCE

However, the MRO's image is not all about low cost. TAP M&E Brazil's 85 years of heritage – Varig began flying and fixing its aircraft in 1927 – has created a "very skilled workforce", to which "European expertise" has been added in recent years, says Koch.

TAP's Rio hangar is largest in the region



**"We have invested heavily... convincing US and Canadian airlines to come here"**

**NESTOR KOCH**  
Chief executive, TAP

However, keeping competitive is an ongoing battle. Brazil's breakneck economic growth is causing inflationary wage pressures and driving up the value of the currency against the dollar.

"We try to keep our prices down but every year we need to be 6-7% more competitive than the last," says Koch. "If we are charging \$50, next year that needs to be \$53, but the market will be charging \$47."

That means Koch and his management team have constantly had to innovate when it comes to lean processes and efficiencies. "It's all about reducing the man hours you need to take when you receive the plane," he says. "We need to be better each year. If not, we lose the international market."

He remains bullish though. "We want to grow our share of the international market by 6-7% over the next three years, and domestic MRO is growing a lot too," says Koch.

Other possible growth areas could be business jets and helicopters – two rapidly expanding sectors in Brazil and the rest of Latin America – although the company would only consider component MRO, not airframes, he says.

Another is the military market. TAP M&E has been providing services to the Brazilian armed forces, as well as other Latin American nations, since the 1970s, although this has been less of a focus for the business in recent years. ■

For all the latest aircraft maintenance, repair and overhaul news and data, visit [flightglobal.com/mro](http://flightglobal.com/mro)

### ENGINES MURDO MORRISON LONDON

## ROLLS-ROYCE'S 53 YEARS OF LOCAL HERITAGE

ROLLS-ROYCE is one of the oldest foreign aerospace investors in Brazil – its facility in Sao Paulo opened in 1959, one of five service centres globally wholly owned by the UK engine maker (another eight are joint ventures) and the only one in Latin America.

As well as the region's airlines and general aviation operators, the Brazilian military has been a major customer over the years, with Rolls-Royce engines currently powering its Lockheed Martin C-130Hs and P-3 Orions, as well as AgustaWestland Lynx helicopters.

The site, which employs almost 300 people, focuses on repairing and overhauling mostly legacy Rolls-Royce types – the AE 3007, Avon,

Gem, M250, Tay and T56. However, the region's recent spate of airline orders for Trent XWB-powered Airbus A350s and Trent 1000-powered Boeing 787s holds out the possibility of the facility at

**GDP is predicted to continue growing strongly in Brazil**

**PETER TURNER**  
Vice-president, CCA

some point moving into the highly lucrative Trent overhaul market. At the moment, Sao Paulo carries out "hospital work" on the Airbus A330's Trent 700. "We continue to assess our network of over-

haul capability", but moving seriously into the Trent segment would require "multi, multi tens of millions of dollars" of investment, says Peter Turner, vice president customers civil aerospace.

For Rolls-Royce, "things are going very well in Latin America", says Turner. "GDP is predicted to continue growing strongly, not just in Brazil, but also in Chile and Colombia. Industry drives business travel and prosperity drives leisure travel. It's very rosy."

Recent customers in the region have included Avianca Taca and LAN, which have ordered 787s, and TAM and Synergy Aerospace for the A350. "When you add it all up, it's 81 firm aircraft orders," says Turner. ■



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From yuckspeak to tales of yore, send your offcuts to [murdo.morrison@flightglobal.com](mailto:murdo.morrison@flightglobal.com)

## Farnborough returns to past

British air power at Farnborough is celebrating a centenary. The site of the air show is, of course, famously also the birthplace of the UK's military aviation industry.

It was on 13 April 1912 that the Royal Flying Corps and Royal Aircraft Factory were officially created, paving the way for the formal establishment of a combined British military air arm and an official centre for aviation research and development.

Last month, a replica BE2, the original of which first flew 100 years ago and was designed by Geoffrey de Havilland and built at the Royal Aircraft Factory, returned to Farnborough skies, flown by Matthew Boddington.

It was parked in front of the original RFC headquarters, now the museum of Farnborough Air Sciences Trust (FAST), alongside the famous Black Sheds, where so many early RFC squadrons were based. An exhibition at FAST highlights the RFC era at Farnborough and runs through the year.

## Pet project

Press releases from fixed-base operations often boast of their VVIP facilities and state-of-the-art crew lounges. One of the priorities for Dallas Love Field-based Business Jet Center, however, is the convenience of its four-legged clients.

The FBO has opened a pet area (below), complete with manicured lawn and fire hydrant. The job of cleaning up



All part of the job



Bygone biplane: replica of de Havilland's BE2 at Farnborough

Richard Gardner



I'm still lost

falls to Business Jet Center's director Bill Moltenbrey, who describes his pooper scooper duties as "all in a day's work".

## Eating early

British Airways' claim that its predecessor Imperial Airways invented airline meals – reported by Straight & Level in 1 May – has not gone down well with George Banks, author of *Gourmet and Glamour in the Sky – A Life in Airline Catering*.

Lunch baskets, he says, were first served in 1918, on Handley Page transports between London and Paris and Brussels, "and were charged at 3 shillings". He adds: "Imperial Airways also charged for sandwiches, chocolate biscuits and drinks – but started at a later date."

Anyone know of an older in-flight meal? Sadly, history does not record if a peckish Orville Wright managed to grab a bite of his packed lunch during his airborne 12sec in 1903.

## Cheesy pleas

You will have heard the expression "holes in Swiss cheese" to describe the series of occurrences that often conspire to cause an air accident. The US National Transportation Safety Board, however, has used the cheese metaphor to get another message across (see picture left).

"We recognise our website used to present a challenge, and that many people have memorised the path through the maze or bookmarked the information they need," it explains.

"Unfortunately, due to the new organisation of our website content, those trails of breadcrumbs and bookmarks will no longer work. We apologise for moving the cheese at the end of the maze, but we think you'll have a much easier time finding the information you need."

## Water great job

A press release from a US manufacturer informs us of its appointment of a "sales director for mid-Atlantic region".

On this side of the pond, that sounds like a pretty manageable territory, albeit not the easiest to drop into for a passing visit: the Azores, Tristan da Cunha, Ascension and St Helena.

## US air corps urged

Persistent questionings in the US Houses of Parliament

**100 YEARS AGO**

appear to have at length awakened the US War Office to the present

position of military aviation. The Secretary of War presented a report that outlines the proposal for the organisation of a flying corps for the US Army.

## Full throttle

Incidentally, this may be a good moment to remind ultra-

**75 YEARS AGO**

light aeroplane pilots that indefinite full-throttle flying is

not good for any engine. The reminder applies especially in this case, because the temptation to over-drive a little fellow is so much greater.

## Military jubilee

Message from the Chief of the Air Staff, on the occasion of

**50 YEARS AGO**

this month's Golden Jubilee of UK military aviation: The

history of air power is not just a British affair; but Britain has taken a very special part, and no country has a finer roll of honour. Our part is not played out, nor is the roll now closed. Air power is on the threshold of a new leap forward.

## Airport for the City

"It is new, unique, and building it is a 'fast-track' operation,"

**25 YEARS AGO**

says John Douthwaite, airport director of the new London

City Airport. The airport's whole raison d'être is proximity to the City, and it is important City men should be able to come to the airport to meet clients.



**100 YEAR ARCHIVE**

Every issue of *Flight* from 1909 can be viewed

online at [flightglobal.com/archive](http://flightglobal.com/archive)



## FLIGHT INTERNATIONAL

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The opinions on this page do not necessarily represent those of the editor. Letters without a full postal address supplied may not be published. Letters may also be published on [flightglobal.com](http://flightglobal.com) and must be no longer than 250 words.

### Misidentified model

Re: "Greek court jails Helios bosses" (*Flight International*, 1-7 May). The Boeing 737 was a -300, not a -200. This is a basic error which a magazine like yours should not have made.

**Peter Magill**

Via email

**Editor's note:** Apologies for our mistake.

### Swimming without sharks

It is quite funny that under the title "Airbus shows sharklets" (*Flight International*, 1-7 May), the Airbus picture was trimmed NOT to show the sharklets!

**Bernard Gloux**

Stavanger, Norway



Once more – with sharklets

#### PRIVATE FLYING

### Engaging disaffected youth

I read your article 'Who's Flying' with interest (*Flight International*, 17-23 April). Along with costs, which are affecting the number of people taking up private flying, there is also increased bureaucracy and often onerous security requirements. It is also my belief there is a fundamental shift in the attitudes of younger generations towards being a pilot.

When not flying for an international airline, I operate a pair of ex-military trainers from an airfield in regional Australia, attached to a colourful aircraft museum. We have been there for two years. Next door, through an always-unlocked gate, is a secondary education college. Despite our efforts, the number of teenagers who have wandered in for a closer look at the aircraft or the museum, let alone shown any interest in becoming a pilot is... nil. Zip. Nada.

The days of the kid with the bicycle leaning against the GA airport fence are long gone. And going into the (ever-reducing) numbers of hobby shops reveals mainly pathetic grey-heads like myself, who still make model aircraft; very few youngsters today feel any desire to leave their keypads and screens and actually *build* something.

I am sure this trend is as evident in Europe and North America as it is in Australia. General aviation will continue to decline unless some way can be found to get young people interested in aircraft again, and away from their computers.

**Mark Carr**

Creighton's Creek, Australia



Better than building something?

### Place power in the right hands

I wrote recently about the perils of CRM-induced first officer empowerment (*Flight International*, 17-23 April) and immediately we see yet another classic example of this insidious movement towards government by the least experienced and least able – something we see in modern politics too.

A Canadian aircraft is flying along quite serenely and under full control, when an opposing aircraft appears.

In the "good old days", a concerned first officer may have shouted "Captain, I think that

aircraft is at our level" and gained the fatherly reassurance of an experienced captain that all was well.

However, under the new policy of CRM-induced empowerment, the inexperienced first officer pushes forwards like some crazed fighter pilot and pins passengers and trolleys to the ceiling, causing serious injuries.

And this is not an isolated incident. We have an Indian first officer who loses control of the aircraft while the captain was in the toilet; a Japanese first officer who opens the door with the trimmer; and two French first officers who cannot understand why their aircraft is falling when

they are pulling 14 degrees of pitch at 35,000ft.

To return to a position of rationality and safety in Western aviation, we need to implement two radical new policies. Firstly, to limit the extent of CRM, and ensure that the pilot with the most experience is the commander of the aircraft. Secondly, to require every command course to include a three-week gliding course. We cannot afford to have an entire generation of new captains who cannot fly with a stick and rudder.

**Rod Elliott**

Knutsford, UK

### Running the numbers

The claim that GippsAero has reached a major milestone with GA8 Airvan number 175 being "the most produced Australian designed and manufactured aircraft ever" is far from correct (*Flight International*, 24-30 April). In 1940, the newly created Commonwealth Aircraft Corporation of Fishermen's Bend, Victoria, commenced production of their uniquely designed CA-6 Wackett Trainer and by 1942 had built 202. In 1942, the same company designed the CA-12, -13 and -19 series Boomerang fighter and by 1945 had built 250.

If the word "civil" had been included, the claim would still not be correct as the locally designed and manufactured Jabiru ultra-light two- to four-seater aircraft series (including four-, six- and eight-cylinder engines) accounts for 1,800 aircraft and 6,000 engines built. Production continues.

**Mike Stacy**

Linden Park, Australia



Read the article that prompted our lead letter at [flightglobal.com/whosflying](http://flightglobal.com/whosflying)

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### 24-26 June

**Routes CIS 2012**  
Ekaterinburg Koltsovo, Russia  
routesonline.com/events/149/  
routes-cis-2012

### 7-8 July

**Royal International Air Tattoo**  
RAF Fairford, UK  
airtattoo.com

### 8-9 July

**The Airline Strategy Awards**  
The Honourable Society of Lincoln's Inn,  
London, UK  
Tel: +44 20 8652 8036  
sharon.webb@flightglobal.com  
strategyawards.com

### 9-15 July

**Farnborough International Airshow**  
FIVE, Farnborough, UK  
Tel: +44 1252 532800  
farnborough.com

### 23-25 July

**Aviation Outlook Australia Pacific**  
The Hilton, Sydney, Australia  
terrappinn.com/aviationoutlook

### 23-26 July

**Aviation Outlook Africa**  
Sandton Convention Centre,  
Johannesburg, South Africa  
Tel: +27 11 463 6001  
terrappinn.com/conference/  
aviation-outlook-africa/

### 23-29 July

**EAA AirVenture Oshkosh**  
Wittman Regional Airport, Wisconsin  
airventure.org

### 6-9 August

**AUVSI's Unmanned Systems North America 2012**  
Las Vegas, Nevada, USA  
auvsishow.org

### 15-17 August

**LABACE 2012**  
São Paulo, Brazil  
abag.org.br/labace2012

### 11-16 September

**ILA Berlin Air Show**  
Berlin ExpoCenter Airport, Germany  
ila-berlin.de

### 17-18 September

**Flight Safety Conference**  
Hilton London Heathrow Airport Terminal 5  
Tel: +44 20 8652 8818  
hannah.bonnett@rbi.co.uk  
flightglobalevents.com/flightsafety2012

### 26-27 September

**Ascend Aviation 2020 Finance Forum**  
Conrad Tokyo, Japan  
Lizzie Law  
conferences@ascendworldwide.com

### 9-14 October

**Japan International Aerospace Exhibition 2012**  
Port Messe Nagoya  
japanaerospace.jp/english/

### 9-11 October

**MRO Europe**  
Amsterdam RAI, the Netherlands  
events.aviationweek.com

### 30 October – 1 November

**NBAA Annual Meeting & Convention**  
Orlando, Florida, USA  
routesonline.com/events/146/  
routes-europe-2012



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## EDITORIAL, ADVERTISING, PRODUCTION & READER CONTACTS

### EDITORIAL +44 20 8652 3842

**Quadrant House, The Quadrant,  
Sutton, Surrey, SM2 5AS, UK  
international@flightglobal.com**

**Editor** Murdo Morrison +44 20 8652 4395  
murdo.morrison@flightglobal.com

**Head of Content/Flight Daily News Editor**  
Andrew Doyle +44 20 8652 3096  
andrew.doyle@flightglobal.com

**Managing Editor** Niall O'Keefe  
+44 20 8652 4007  
niall.okeefe@flightglobal.com

**News Editor** Dominic Perry +44 20 8652 3206  
dominic.perry@flightglobal.com

**Deputy News Editor** Kerry Reals  
+44 20 8652 3837 kerry.reals@flightglobal.com

**Acting Deputy News Editor** Martin Rivers  
+44 20 8652 8534 martin.rivers@flightglobal.com

**Air Transport Editor** David Kaminski-Morrow  
+44 20 8652 3909  
david.kaminski-morrow@flightglobal.com

**Business Editor** Dan Thisdell +44 20 8652 4491  
dan.thisdell@flightglobal.com

**Defence Editor** Craig Hoyle +44 20 8652 3834  
craig.hoyle@flightglobal.com

**Operations/Safety Editor** David Learmount  
+44 20 8652 3845  
david.learmount@flightglobal.com

**Business & General Aviation Editor**  
Kate Sarsfield +44 20 8652 3885  
kate.sarsfield@flightglobal.com

**Air Transport/MRO Reporter** Michael Gubisch  
+44 20 8652 8747  
michael.gubisch@flightglobal.com

**Magazine Enquiries** Dawn Hartwell  
+44 20 8652 3315  
dawn.hartwell@flightglobal.com

**EUROPE/MIDDLE EAST**  
Israel Correspondent Arie Egozi  
Russia Correspondent Vladimir Karmozov

**AMERICAS**  
Americas Managing Editor Stephen Trimble  
+1 703 836 8052 stephen.trimble@flightglobal.com

**Americas Editor** John Croft  
+1 703 836 3084 john.croft@flightglobal.com

**Deputy Americas Air Transport Editor** Ghim-Lay Yeo  
+1 703 706 9474 ghimlay.yeo@flightglobal.com

**Americas Air Transport Reporter** Ned Russell  
+1 703 836 1897 edward.russell@flightglobal.com

**UAV & Spaceflight Editor** Zach Rosenberg  
+1 703 836 7442 zach.rosenberg@flightglobal.com

**Military Reporter** Dave Majumdar  
+1 703 548 4706 dave.majumdar@flightglobal.com

**ASIA/PACIFIC**  
Asia Managing Editor Siva Govindasamy  
+65 6780 4311 siva.govindasamy@flightglobal.com

**Deputy Asia Editor** Greg Waldron  
+65 6780 4314 greg.waldron@flightglobal.com

**Reporter** Mavis Toh  
+65 6780 4309 mavis.toh@flightglobal.com

**Australia Correspondent** Emma Kelly

**FLIGHTGLOBAL AIRLINES**  
Editor Airline Business  
Max Kingsley-Jones +44 20 8652 3825  
max.kingsley-jones@flightglobal.com

**Managing Editor** Graham Dunn  
+44 20 8652 4995 graham.dunn@flightglobal.com

**Content Editor** Alex Thomas  
+44 20 8652 3184 alex.thomas@flightglobal.com

**EDITORIAL PRODUCTION**  
Head of Design & Production Alexis Rendell  
+44 20 8652 8127 alexis.rendell@rbi.co.uk

**Global Chief Sub-Editor** Lewis Harper  
+44 20 8652 4958 lewis.harper@icis.com

**Chief Sub-Editor, Europe** Dan Bloch  
+44 20 8652 8146 dan.bloch@icis.com

**Chief Sub-Editor, Americas** Fred Seelig  
+1 713 525 2649 fred.seelig@icis.com

**Global Production Editor** Louise Murrell  
+44 20 8652 8139 louise.murrell@rbi.co.uk

**Deputy Global Production Editor** Rachel Kemp  
Global Art Editor Dominic Ray

**Designer** Lauren Mills

**Group Information Graphics Editor** Gareth Burgess

**Senior Editorial Artist** Tim Bicheno-Brown

**Senior Technical Artist** Giuseppe Picarella  
joe.picarella@flightglobal.com

**Consulting Technical Artist** Tim Hall

### FLIGHTGLOBAL.COM

**Head of Web**  
Michael Targett +44 20 8652 3863  
michael.targett@flightglobal.com

**Deputy Editor** Stuart Clarke +44 20 8652 3835  
stuart.clarke@flightglobal.com

**Content Editor** Barbara Cockburn  
+44 20 8652 4248 barbara.cockburn@flightglobal.com

**Digital Production Editor** Colin Miller

**Web Production Editor** Andrew Costerton

**DISPLAY ADVERTISEMENT SALES**  
Quadrant House, The Quadrant,  
Sutton, Surrey, SM2 5AS, UK.

**Sales Director** Shaun Barton  
shaun.barton@flightglobal.com

**Group Display Sales Manager** Stuart Burgess  
stuart.burgess@flightglobal.com

**Sales Support** Gillian Cumming  
+44 20 8652 8837  
gillian.cumming@rbi.co.uk

**EUROPE**  
Sales Manager Shawn Buck  
+44 20 8652 4998 shawn.buck@flightglobal.com

**Key Accounts Manager** Mark Hillier  
+44 20 8652 8022 mark.hillier@flightglobal.com

**NORTH & SOUTH AMERICA**  
Vice-President, North & South America  
Rob Hancock +1 703 836 7444  
robert.hancock@flightglobal.com

**Regional Sales Director**  
Warren McEwan +1 703 836 3719  
warren.mcewan@flightglobal.com

**Sales Executive**  
Rachel Sunderland +1 703 836 7445  
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**Sales Manager**  
Steven Kulikowski +1 630 288 8034  
steven.kulikowski@flightglobal.com

**Reed Business Information**, 333 N. Fairfax Street,  
Suite 301, Alexandria, VA 22314, USA

**ITALY**  
Sales Manager Riccardo Laureri  
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Laure Associates SRL, Via Vallazze 43,  
20131 Milano, Italy

**ISRAEL**  
Sales Executive Asa Talbar +972 77 562 1900  
Fax: +972 77 562 1903 talbar@talbar.co.il

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**ASIA/AUSTRALASIA**  
Sales Manager Michael Tang  
+65 6780 4301 michael.tang@flightglobal.com

Fax: +65 6789 7575  
1 Changi Business Park Crescent,  
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**RUSSIA & CIS**  
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**ADVERTISEMENT PRODUCTION**  
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**MARKETING**  
Marketing Director Fiona Benharrosh  
+44 20 8564 6711 Fiona.benharrosh@rbi.co.uk

**Senior Marketing Manager** Ben Colclough  
+44 20 8564 6722 Ben.colclough@rbi.co.uk

**Head of Marketing** Georgina Rushworth  
+44 20 8652 8138 Georgina.rushworth@rbi.co.uk

### DATA TEAM

**Head of Data** Steve Butler +44 1788 564 817  
steve.butler@flightglobal.com

**Commercial Aviation** Ashley Wileman  
+44 1788 564 835  
ashley.wileman@flightglobal.com

**Fleet & Contacts** Geoff Machin  
+44 1788 564 823  
geoff.machin@flightglobal.com

**Defence & GA** Jon Underdown  
+44 1788 564 828  
jon.underdown@flightglobal.com

**PUBLISHING MANAGEMENT**  
Managing Director Jane Burgess

**Publishing Director** Melanie Robson

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## WORK EXPERIENCE YVES ROSSY

# My dream of flying like a bird

Yves Rossy, aka Jet Man, is an airline pilot who wants to fulfil his dream of making personal powered flight a reality, using a custom wing, thrust from four model aircraft engines, and his body as the control surfaces

## When were you first interested in aviation?

I've always wanted to fly since I was a child. My inspiration has always been to make my dream come true.

## Describe your career path.

I did an apprenticeship in engineering and was a Mirage III pilot. I was flying a supersonic fighter jet for 17 years while indulging my love of historic aircraft in my spare time. After six years as a professional fighter pilot, I became co-pilot for Swissair, on DC-9 and 747 aircraft. I am currently captain on an Airbus A320 with Swiss International Air Lines, and am on sabbatical leave to devote all my free time to my passion and life-long project: flying like a bird with the minimum of instruments but with jet power to allow me to soar in the sky.

## What was your first idea for a flying adventure?

I had the idea to build a wing after discovering skysurfing when I was 30. I enjoyed it and I wanted to keep the same feeling, but with a real flight instead of a fall. At first I could only glide with the wing. The next step was to motorise the wing, so I went to JetCat in Germany, a world leader in model jet technology, and as my first and most important sponsor they made it possible for the wing to have power and engines.



Rossy trained in engineering and was a Mirage pilot

## How have you developed the special Jet Man suit?

The first wing was based on an aerodynamic model from Kiev University in Ukraine. It was an inflatable wing, which over the years – through trial and error – I have modified into a solid wing.

I have developed about 15 prototypes over the past 15 years! The first time I used a wing was in 1992. I have been working on this prototype (with four engines) for more than three years and I never stop trying to improve it. A big step forward was achieved after the wing tunnel tests with RUAG Aerospace in 2008. A new wing shape was developed and built by their team, improving stability and agility as well as lowering weight, leading to the current wing I now have on my back.

## What are the main challenges and how do you overcome them?

The main challenge is to keep persevering in moments of doubt and discouragement. An inner strength, faith in the project and the support of my family enable me to continue and move forward. What I have done so far is beyond my expectations.

## Are you thinking of leaving the airline job?

Yes, I am thinking about it. The decision will depend on many external elements, such as the financial aspect. I will have to make a choice at the end of the year.

## What's next?

My first aim is to keep optimising my wing. I wish to create a new prototype with much more powerful engines that will give me the freedom to fly in three

dimensions. Vertical flights and more advanced aerobatics are also a goal. The idea is to have as much thrust as weight – that would be total freedom! I would also like to put in place a new parachute system that would let me fly as low as 200m, as right now I open my chute at 800m.

I want to share my invention with my friends so that we can eventually fly in formation with several wings. I am advancing the technology to allow me to launch from a cliff-edge. My ultimate goal is to share this project with everyone.

## How often are you asked to sell wings commercially?

I receive this request every month. Nevertheless, my wing at this stage is still a prototype and I need to optimise it before thinking of commercialising it.

## What's your least favourite part of the project?

The administrative tasks that take over my business and demand more and more paperwork. This is a reflection of our society. ■



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