



# ARABIAN AEROSPACE

THE MAGAZINE FOR AEROSPACE PROFESSIONALS IN THE MIDDLE EAST, NORTH AFRICA AND TURKEY

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## QATAR'S DREAM DELIVERY

PAGE 18

### TRAINING

High flyers are looking for direction

PAGE 85



### FOCUS ON LIBYA

Special report on the rebuilding of a nation

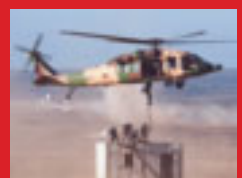
PAGE 67



### SPECIAL OPERATIONS

The rising importance of SO units in the region

PAGE 99





*Azul Linhas Aéreas has revolutionized air travel in Brazil by using E-Jets for new markets serving cities with less-congested airports.*

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Published by



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Printed in the UAE by Emirates Printing Press.



The Arabian Aerospace digital team (from the left): TV director Ian Billingham, publisher Mark Brown, radio producer Steve Nichols, Editor-in-chief Alan Peaford and deputy editor and radio news editor Marcella Nethersole.

## From Dreamliner to a digital dream...

Qatar's new Boeing 787 Dreamliner, making a preview appearance at the Farnborough Airshow, marks the start of a new era for the Gulf carriers.

As the first airline in the MENA region to take delivery of the composite aircraft, all eyes will be on its performance and customer reaction in the same way they were several years back when Emirates brought the Airbus A380 into service,

While there are kudos attached to bringing a new type to the market, there is also a concern about the entry into service.

The ongoing saga over the cracks in the wings of the Airbus superjumbo is a case in point. And of course, Boeing knows only too well that the subtle criticism from the Dubai carrier dished out to Toulouse, is nothing compared to what will be in store for them should the demanding Qatar CEO, Akbar Al Baker, be faced with teething problems, let alone any further delays in the delivery schedule.

Like the other carriers in the Gulf, Africa is very firmly in Qatar's sights as the dark continent begins to see double digit growth plans with investment from the Arab world and from the Chinese.

We will be there too. In January we will see the

launch of a new title African Aerospace, produced by the same team that brings you *Arabian Aerospace*.

For all of those people interested in the aerospace industry across Africa, this will be a must-read. Watch out for the website too at [www.africanaerospace.aero](http://www.africanaerospace.aero).

I started off by mentioning excitement at the Farnborough Airshow. We had some excitement too with the *Arabian Aerospace* team winning the title for the best digital media.

We faced the world's most famous aerospace international publishing houses on the shortlist – and were thrilled to be recognised for our achievements with *Arabian Aerospace* TV, radio, online and of course the e-version of this magazine.

My colleague Marcella Nethersole achieved a much deserved short-listing as the best young journalist and *Arabian Aerospace* itself was on the shortlist for the best international magazine.

To have achieved such recognition in less than four years is a great achievement and on behalf of the whole team, we thank you for your support.

Safe landings.

Alan Peaford, Editor-in-chief  
 Arabian Aerospace

COVER: Qatar's new Dreamliner at Farnborough. Picture Stuart Purfield, Billypix.

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 Bombardier  
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 Civil Aviation Authority of the Cayman Islands

95 CTC Aviation  
 95 Dassault Falcon  
 10 Dubai Airshow 2013  
 10 Embraer Commercial Jets  
 117 Engine Alliance  
 37 Ernst & Young  
 2, 3 EuroAvionics  
 78 FlightSafety International  
 129 Flywell Power UK Ltd  
 96 Gözen Air Services  
 28 Group Handling Services Ltd  
 17 Gulfstream  
 84 Hawker Beechcraft Corporation  
 66 JETSTREAM Aviation Academy  
 87 Lufthansa Consulting  
 34 Maximus Air Cargo  
 92 MEBBA 2012  
 48, 45 Middle East Business Aviation  
 26 Association (MEBAA)  
 29 Munich Airport  
 62 NEXUS  
 Pratt & Whitney

90 Ramco Systems Ltd. 81  
 53 Recaro Aircraft Seating GmbH & Co.KG 20  
 15, 101 Saudi Aerospace Engineering Industries OBC  
 14 IFC  
 79 Saudia Private Aviation 13  
 53 Signature Flight Support 8  
 109 SIM Aerotraining 127  
 82 Spectrum Aeromed 16  
 11 Sprung Instant Structures 72  
 49 TAG Aeronautics Ltd. 75  
 105 TAV/CC/Arabtec 113  
 54 TRANSEARCH 52  
 98 Turkish Aviation Academy 7  
 89 Universal Weather and Aviation 46

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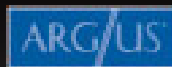
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## 09 **business brief**

News from around the region as we look at what has been making the headlines.

### AIR TRANSPORT

#### 25 **MAXING out**

The latest in the Boeing 737 family – the MAX – has great prospects for the region.

#### 27 **Turbulent start up**

A new Tunisian airline is in the air, but the CEO tells us that the start up hit some rough air.

#### 30 **Growing planes**

Research from Ernst & Young has highlighted growth challenges facing airlines.

#### 32 **Blowing the Horn**

Eastern Express gets underway with new routes to the Horn of Africa from the UAE.

### DEFENCE

#### 35 **Saudi train in motion**

Saudi Arabia agrees a \$3billion training deal involving BAE Systems' Hawks and Pilatus PC-21 aircraft.

#### 39 **Yemen on guard**

Airbus Military has delivered its first CN-235 transporter to help counter terror activities in Yemen.

#### 42 **Peace of the action**

Delivery of Turkey's latest AEW&C aircraft the Peace Eagle is due for delivery.

#### 44 **Tractor's Attraction**

Probably the UAE Air Force's smallest aircraft, but the Air Tractor could be going places.

### BUSINESS AVIATION

#### 47 **Geneva Giants at EBACE**

See panel

#### 55 **Signing Signature**

Why the gap in FBO giant Signature's global ambitions is about to be filled.

#### 57 **Throwing in the Beech towel**

What effect will Hawker Beechcraft's financial crisis have on its customers in the region?

#### 60 **MD in the hot seat**

MD helicopters has hot and high operations firmly in its sights.

#### 63 **Offshore hook**

Business jet registration with offshore registries could make operations simpler.



## FARNBOROUGH

Farnborough Airshow: pushing to be the world's number one aerospace event, the UK show saw plenty to excite its Middle East participants.



**18 JOLLY GOOD SHOW**  
Abu Dhabi's role in new maritime aircraft, orders for air transport and a new trainer for Turkey were among the show highlights.

**21 DREAM TICKET**  
Qatar's latest addition – the B787 Dreamliner makes an impressive debut.

**22 HIGH HOPES**  
Farnborough participants Virgin Galactic and Speedtwin Developments on why the Middle East has so much to offer.

**23 DEFENSIVE MANOEUVRES**  
Show boosted by Gulf's thirst for defence equipment.

## EBACE REPORT

Europe's business aviation show, EBACE, had plenty to offer the Middle East including new aircraft, new organisations and new services, all covered in our five-page special report starting on Page 47.



## SPACE

### 65 Home landings

The UAE is becoming the region's space centre and Virgin and Satcom set up shop.

## PROPULSION

### 77 Focused on Reduction

Engine-makers are addressing environment issues by reducing fuel needs, noise and emissions.

## TRAINING

### 83 Qatar spreads its wings

A UK training specialist holds a key role in supplying pilots to the world's number one airline.

### 85 Control and Command

Gulf airlines visit the Royal Aeronautical Society conference to look into the future.

## INTERIORS

### 91 Food to fly for

A look at changes for on board catering

## FINANCE

### 93 Onset of Offset

Offset finance provides a major opportunity for contractors keen on business in the Middle East.

### 97 Capital asset

Grant Rogan, CEO of offset consultants, Blenheim Capital, explains why offsets are the real deal.

## AIRPORTS

### 111 Scoring from Midfield

The Abu Dhabi flagship airport project is finally given the go ahead and contracts are signed.

## EVENTS

### 114 The Road to Marrakech

Exhibitors explain why the Moroccan air show is now an important part of the calendar.

### 118 Summit hits the heights

Review of the inaugural Global Aerospace Summit which took place in Abu Dhabi.

### 124 Gearing up for growth

Dubai's Airport Show saw local firms showcasing their skills, services and products.

## PEOPLE

### 126 Appointments

Who's gone where in the region's top industry jobs.

### 128 All in a Day

Francois Chazelle, the Dubai-based vice president of Airbus corporate jets business.

# LIBYA FOCUS



### 67 REBUILDING A NATION

A look at investing in Libya – and why it is worth it.

### 68 ASSESSING THE DAMAGE

Libyan Airlines CEO Khaled Taynaz talks about the challenges of climbing back.

### 70 RISE AND FALL OF LIBYA'S DEFENCE

The Libyan air force has been decimated. But what can be done now to rearm the nation?

### 73 GATEWAY TO GROWTH

Airport developers are keen to get back to building in Tripoli despite the dangers.

# SPECIAL OPERATIONS

### 99 KEPT IN THE DARK

Special forces in the region are providing a cost effective military effect that is spreading to law enforcement and civil operations. We look at the background.

### 102 DOUBLE DASH

Maritime patrol often sees civil airframes converted for military use. The UAE has taken delivery of two former regional turboprops to protect the waters around the Gulf country.

### 104 SMALL FRAMES BIG BUSINESS

Airplanes more familiarly found on the small landing strips for general aviation are proving to be a new breed of special mission aircraft. Marrakech airshow saw the unveiling of several new types.

### 106 SOFEX SUCCESS

Jordan is home to the region's major special operations show. We review this year's successful edition.







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## Solar aircraft lands in Morocco

Morocco played host to the world's first solar powered aircraft when the Solar Impulse aircraft of Bertrand Piccard and André Borschberg completed its flight to Morocco's capital Rabat and then the southern region of Ouarzazate.

It had flown from its home base in Switzerland via

Madrid and Rabat on its first "intercontinental" flight as part of its preparations for the first non-fuel, round the world flight next year.

After a flight lasting a total of 17h20min and 683 km, Borschberg safely landed the solar aircraft in Ouarzazate International Airport.



## Qatar sets up airline for Saudi

Qatar Airways has stolen a march on its competitors for a slice in the potentially lucrative Saudi Arabian market by registering an airline in the Kingdom.

The Saudi government has already said it would be looking to external airlines to help boost its domestic air transport network as with more than 25 airports the Kingdom is set for a massive transportation expansion.

Emirates from Dubai and Gulf Air from Bahrain were already widely believed to have been studying ways of entering the domestic market and linking to their hubs for international flights.

Last year Qatar Airways was in talks with Saudi Arabia's independent airline Nasair about the Riyadh carrier providing feeder services.

But now Qatar has changed the game.

Chief executive officer Akbar Al Baker held talks

with HRH Prince Fahad bin Abdullah Al Saud to discuss opportunities arising from the Kingdom's newly-launched aviation liberalisation policy.

After those talks Al Baker said the Kingdom is a key growth area with a market that is "underserved and keen for greater domestic air services."

But Al Baker took Prince Fahad to task over excessive fuel charges in the Kingdom and the government's policy of controlling domestic air fares which, he said, were not in the interests of the travelling public nor airline operators.

Al Baker said such factors were detrimental to airlines as fuel represented a major cost of operations.

Capping airfares, he said will never allow any airline to operate commercially in the Kingdom. He stressed that other airlines operating domestic flights within Saudi Arabia were facing the same problem of rising costs, pointing out these needed to be seriously addressed.

## FAA boost for Jet Aviation Dubai

Jet Aviation Dubai has received approval from America's FAA to perform base and line maintenance on Bombardier Challenger 604 and Airbus A318/A319/A320/A321 series aircraft.

The FAA awarded the MRO outfit, based at Dubai International Airport, approval to support light scheduled maintenance (A checks) on Airbus A318/A319/320/321 series aircraft and base maintenance on Bombardier Challenger 604 and 605 aircraft.



## Water welcome for Dreamliner

The Boeing 787 Dreamliner touched down at Abu Dhabi International Airport and was welcomed to a traditional water cannon salute.

The visit to the capital was the last stop on the seventh and final leg of the Dreamliner's global Dream Tour.

Aircraft ZA003 had previously visited Australia, New Zealand, Uzbekistan and Morocco before touching down in the UAE.

Since launching the Dream Tour in December 2011, the aircraft has visited 40 cities around the world, demonstrating its capabilities to more than 60,000 guests.

## Oman orders eight Airbus Military C295

The Royal Air Force of Oman has signed a contract with Airbus Military for the acquisition of eight C295 aircraft; five of them configured as tactical transports and three as maritime patrol aircraft. They will be delivered from next year.

## Emirates repays sukuk bond

Emirates airline has announced that it has repaid a \$550 million sukuk bond in full on its maturity date June 18 2012.

The sukuk bond, listed on the Luxembourg Stock Exchange, was originally issued in 2005 with a seven-year term.

The \$550 million bond was the first of its kind to be issued by Emirates representing its commitment to utilising a diverse range of funding tools, including Islamic financing.



## UAE gets JAA flight school

Jeppesen has teamed with Dubai-based Emirates Aviation College to offer the first Joint Aviation Authorities (JAA)-licensed pilot training programme in the UAE.

The first class of ab-initio cadets have begun the 16-month program with ground school and theory training, as the first step toward earning an airline transport pilot license (ATPL) or a commercial pilot license with single-engine and multi-engine instrument ratings.

Cadets in the Jeppesen-backed Emirates Aviation College licensed pilot training program will complete eight months of ground and theory training in Dubai, followed by eight months of practical flight training in Lisbon, Portugal.

## Etihad takes stake in Virgin Australia

Etihad Airways has acquired a 3.96% stake in Virgin Australia Holdings.

The UAE national carrier said it "believes that this equity investment in Virgin Australia's domestic operations significantly strengthens the 10-year strategic partnership forged by the two carriers in August 2010 and will enrich the commercial benefits which the alliance already provides for both airlines, as well as increasing the benefits to Australian consumers and visitors to Australia".

## SAFA's new base

The Saudi Aviation Flight Academy (SAFA) has moved to its permanent home at Thumamah

Airport outside of Riyadh.

The new location is within the compound of Saudi Aviation Club at the King Khalid National Park in Thumamah, and will serve as a temporary base of operations until the permanent school is completed in mid-2013.

## Saudia joins SkyTeam alliance

Saudi Arabian Airlines has been formally renamed Saudia and has become a full member of the SkyTeam alliance, while at the same time confirming the first stage of the long-awaited privatisation has begun.

Saudia has become the 16th team member.

■ Middle East Airlines (MEA) followed Saudia to become the second of the

region's airlines to join the SkyTeam airline alliance.

The Beirut-based airline's chairman Mohammad Hout predicted passenger growth would follow.

"Becoming a part of SkyTeam will allow MEA to increase the number of passengers and increase its revenues by at least 10%," Hout said.

## Rotana Jet in UAE switch

Abu Dhabi business jet operator Rotana Jet could be offering interlined flights from the northern emirates of Ras Al Khaimah and Fujairah and from the oasis city of Al Ain within months.

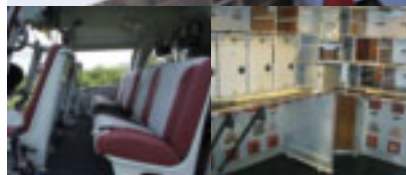
The company has switched its Embraer ERJ145 regional jet from private charter shuttle services to public transport register.

Aeropair Ltd based close to Glasgow Airport have now opened facilities in UAE at Dubai Industrial City close to the new Dubai World Central Airport.

Aeropair has over the past 14 years built an enviable reputation for innovation and customer focus, with OEM's, MRO's and Airline Operators, achieving high levels of customer satisfaction and schedule adherence, for all manufacturing and repair contracts and all matched with the quality you would expect from a company with a worldwide customer base and a supplier to all tiers within the aerospace supply chain, supported by our approvals EASA PART21G EASA PART145, AIRBUS, BAE SYSTEMS, BAE REGIONAL JET, HAWKER BEECHCRAFT & AS9100 RevC.

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## Iran space centre '80% complete'

Iran's new space centre, which will be used to launch both its own and other Islamic nations' satellites, is now 80% complete, according to news reports.

Iranian defence minister, Brigadier General Ahmad Vahidi, has not provided any timeline for its completion.

He also failed to announce the location of the new centre, which will be named after the Islamic republic's founder Ayatollah Khomeini.

According to the official IRNA news agency, Vahidi said the first satellite to be launched from the new centre will be the Tolo, which will be carried into orbit by the Iranian-made Simorgh light booster rocket

Currently, Iran has two space exploration facilities – a launch centre near Semnan, 200km east of Tehran, and a satellite-monitoring site outside Mahdasht, about 70km west of the Iranian capital.

Iran is keen to progress its space programme. In February 2010 it announced it had successfully launched a menagerie of animals – including a mouse, two turtles and worms – into space on a research rocket. An attempt to send a live monkey into space in Autumn 2011 failed. The Kavoshgar-5 rocket carrying a capsule with the monkey aboard was launched sometime in



## Gulf Air award is child's play

Gulf Air is officially one of the world's most child-friendly airlines. The Bahrain carrier won a 'Best Family Friendly Airline' award from US News Travel.

The latest study of international airlines by the publication found that Gulf Air offers the best family friendly experience for passengers travelling with their kids, especially on long haul journeys.

The other top airlines in the study included Emirates, British Airways,

Lufthansa, Qantas, Virgin Atlantic and Singapore Airlines.

The publication mentions Gulf Air's Sky Nanny service as one of the highlights of its family friendly aspects that not only takes care of kids both on the ground and in the air but also lets parents enjoy a stress-free flight while the nannies look after the younger ones.

In March this year, Gulf Air won the best Family Friendly Airline Award in an online Facebook poll by US-based Kid's First Fund.

August or September but the exact date is not known.

Iran says it plans to put a man in orbit within the next 10 years.

The country launched its first commercial satellite in 2005 on a Russian rocket in a joint project with Moscow and Russia is said to be transferring space technology to Iran.

## ADAT awarded seven-year contract

Abu Dhabi Aircraft Technologies (ADAT) has been awarded a seven-year contract to provide integrated component solutions (ICS) to Ethiopian Airlines' fleet of Boeing 737NG aircraft.

The agreement covers 19

aircraft – 11 in the airline's existing fleet plus eight new aircraft on order – providing repair cycle management and pool access coverage. This will be supported by the combined integrated component solutions capabilities and experience of both ADAT and SR Technics.

## Izmir terminal works start

Turkish airport operator and constructor TAV Airport Holdings has started work on the new terminal at Izmir – the country's third largest city – after winning the contract last November.

TAV will build its new domestic terminal and operate it over 20 years while paying a concession of €610 million to the government. The new domestic terminal is designed to service 25 million passengers a year. Completion is planned for 2014.

## On-line boost for Eastern Express

UAE start-up airline Eastern Express has entered a strategic partnership with UK airline reservation system provider Videcom.

The deal allows Eastern Express to sell its tickets worldwide over the internet and enhances the quality of ticket sales for its customers at the various travel agencies, a priority in the model of Eastern Express and its plans for routes across the Horn of Africa.

At the same time, Eastern Express and its strategic partners are able to offer each-other's products online.

## Dubai Show award

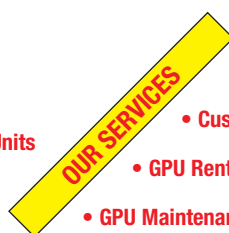
Dubai-based F&E Aerospace won the Best Exhibition award for the Dubai Airshow at the Middle East Event Awards 2012.



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## Emirates moves into the ICE age

Emirates - winner of the Skytrax award for world's best IFE - now has the world's largest economy class seatback screens thanks to a major upgrade of on its new Boeing 777 fleet. The new ICE system is featured on bigger, much wider, and digitally-enhanced screens throughout the aircraft.

The award-winning entertainment is now screened on 27-inch in First Class, 20-inch in Business Class and 12.1 inch in Economy Class - an increase from the 10.9 inch screen-making the latter the biggest in the world. Additionally, Emirates' new screens feature high definition (HD) resolution, developed by Panasonic.

## World recovery first for Qatar

Qatar Airways has enhanced its operations with the acquisition of comprehensive aircraft recovery equipment – the first airline in the world to own the complete state-of-the-art kit.

There are just 11 complete kits globally but parts within each kit are owned separately by individual airlines and airports worldwide. The full equipment is the first of its kind anywhere in the world.

The Qatar Airways aircraft recovery kit is transportable and capable of recovering the world's largest passenger aircraft, Airbus A380, from incident sites anywhere in the world, in addition to any other aircraft types.

At an investment of \$3.2 million, the equipment enables the airline's Doha hub to be capable of recovering equipment parts of any aircraft type following an incident that renders an aircraft non operational.

## Gulf Air fleet management switch

Gulf Air is bringing its fleet technical management (FTM) responsibility back in house.

The airline said the move underscores its engineering expertise and technical capabilities to undertake base-maintenance of its entire fleet completely in-house, bringing in a range of cost-saving and operational benefits for the airline.

Gulf Air CEO Samer Majali said: "In-sourcing is a key part of our overall business strategy as it allows us to refocus on our engineering and maintenance systems and processes so that we achieve technical self-reliance and self-sufficiency."

## Yahsat takes control of Y1B satellite

Astrium has successfully completed launch and early orbit phase operations of the Y1B satellite, conducted



## Aeropair's Dubai facility

Aeropair, the Glasgow, UK-based manufacturer and repairer of aircraft interior products, has opened a second, fully EASA-approved, facility at the new Dubai World Central Airport. Managing director Stephen Findlay said: "We wanted to grow our operation outside of Europe. As a further part of our expansion plans we have now added full aircraft recycling and engine tear down primarily from the new Dubai facility."

Aeropair manufactures a wide range of composite, plastic, electrical and machined components on all aircraft types for a wide range of worldwide customers.

from its spacecraft control centre in Toulouse, France, and passed control over to the Al Yah Satellite Communications Company (Yahsat). Astrium and Thales Alenia Space (TAS), co-prime contractors of the Yahsat satellite telecommunications system, will continue to support the Emirati satellite telecommunications operator during payload testing before entry into service.

## Saab system live at Dubai International

Saab Sensis has achieved operational status from the Dubai Air Navigation Services (DANS) for its surface multilateration system at Dubai International Airport.

The system provides DANS air traffic controllers with comprehensive, precise surveillance of aircraft operating on the ground at the airport.

The system, the first such use of the technology at DXB, covers all runways, taxiways and gate areas of the airport.

## Etihad confirms stake in Aer Lingus

Etihad Airways has acquired a 2.987% stake in the Irish airline Aer Lingus.

The airline said the purchase reflected its desire to forge a commercial partnership with the Irish national carrier.

Etihad operates 10 flights a week from Abu Dhabi to Dublin and has carried more than 750,000 passengers between the two capitals since it began flying the route in July 2007.

## UAE receives fifth C-17 Globemaster

A fifth Boeing C-17 Globemaster III airlifter has been delivered to the United Arab Emirates air force. A sixth will be added to the UAE fleet later this year.





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## Sharklets for new Etihad A320 fleet

Etihad Airways has signed a contract with Airbus to equip 17 of its future A320s on order with fuel-saving sharklets. The new wingtip devices replace the aircraft's current wingtip fence and will reduce fuel burn particularly over longer sectors.

Deliveries of the sharklet-equipped A320s to Etihad will begin in the third quarter of 2013.

Offered as an option on new-build aircraft from the end of 2012, the devices increase payload-range and improve take-off performance. They result in around 3.5% reduced fuel burn over longer sectors, corresponding to an annual CO2 reduction of around 1,000 tonnes per aircraft.

## New military engine facility for Riyadh

The Middle East Propulsion Company (MEPC) has opened a new maintenance facility at King Khalid International Airport in Riyadh. The "landmark" 18,000sqm workshop was officially opened by HRH Prince Khalid bin Sultan bin Abdulaziz Al Saud, the deputy minister of defence.

The facility provides space for the Saudi joint venture company to provide new advanced technologies and technical services alongside the maintenance of some of the world's most modern military engines.



## ACI sees dramatic growth in Africa

Dubai-based Air Charter International (ACI), the aircraft charter and leasing company, has reported a dramatic increase in the number of charters from Africa and notes a growing trend for charters involving unusual or complicated requirements.

"Business is up by 20% compared with this time last year in this particular segment of the market and we've seen charter requests from the African continent raise by 25%," said ACI's Caroline Jongma.

## ADB scores airport hat-trick in Oman

ADB Airfield Ground Lighting Solutions is modernising the air infrastructure of three categorised airports in the Sultanate of Oman.

For the new Sohar Airport, ADB has supplied airfield ground lighting equipment (AGL), AGL services, and its advanced airfield lighting control system (ALCS).

At the Ras al Hadd Airport, the company will install the ground lighting system for both the taxiway and runway. The installation includes LED-based

LTS/LTC inset lights. After Adam airport this is the second installation of this technology in the country.

Finally, at the Al Duqm Airport, ADB will deploy an end-to-end runway lighting system, including a fully automated light intensity measurement system to increase runway safety. In this case it will also provide training and maintenance services for three years.

## Nexus takes next step into Europe

Saudi-headquartered flight operations business, Nexus, is continuing its international expansion programme.

Following the establishment of Nexus Africa and Nexus India, the company is now launching in Europe in partnership with FlyTrans of The Balguerie Group.

## GAA celebrates IATA award

Bahrain-based Gulf Aviation Academy (GAA) has been recognised as a top ten IATA-authorized training centre for the Middle East.

The award, which was presented to GAA during the IATA Training Partner Congress in Istanbul, is in recognition of the academy's outstanding contribution in

developing human capital by reaching out to the next generation of leaders in the evolving air transport industry in the MENA region.

## Adventure regional office in Dubai

Adventure Aviation, an ASA-100 accredited aviation parts and services company, has opened a new regional office in Dubai.

It is located inside Dubai's Airport Free Zone (DAFZA) area allowing Adventure, which is headquartered in Atlanta, USA, to better serve customers in the Middle East, North Africa, and Indian sub-continent markets.

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**DUBAI AIRSHOW**

## Bahrain ATM system goes live

Bahrain's new air traffic management system is now operational.

Thales, working with Bahrain company Mena Aerospace, has now handed over the system to the Bahrain Civil Aviation Authority (BCAA).

The new system is based on Thales TopSky-ATC, one of the world's most advanced air traffic management solutions.

The project was delivered on time after an 18-month development, and includes a state-of-the-art automation system located at the BCAA control centre.

This system includes dual area control centres (ACC) and dual approach (APP) controller positions, as well as a complete ATM

system in the two control towers on the Bahrain International Airport.

## Alsalam secures Max Air contract

Riyadh-based Alsalam Aircraft Company has signed a contract with Nigerian air carrier Max Air to carry out maintenance on its fleet of Boeing 747-300 and -400 airplanes.

## Gulf Air disaster recovery centre

Gulf Air has set up a disaster recovery centre (DRC) to further strengthen its IT infrastructure.

The new centre is located 15km from its Muharraq headquarters, where the main data centre is housed.

The centre has been designed to ensure the

continuity of the airline's daily functions and provide a convenient temporary workspace for Gulf Air staff should the main facility not be available in emergency situations. It is secured with guards and monitored by CCTV cameras.

## Emirates and GE go with the flow

Emirates has selected GE Aviation to provide its airline-based flow management system for a 16-month validation at Dubai International Airport.

The Emirates 'flow project' will allow the airline to reduce fuel and delay costs and improve its hub passenger-connection schedule by sequencing and spacing the company's arrivals according to commercial priorities.



## Royal Jet turns to NATS

Abu Dhabi private jet operator Royal Jet is working with NATS, the global provider of air traffic management solutions, to improve the environmental performance of its flights in UK airspace.

The partnership will see the two parties work together to improve the airline's flight efficiency as well as reduce fuel burn and CO2 emissions. NATS is providing Royal Jet with actual data to monitor its flight profiles travel using a system known as the three dimensional inefficiency score (3Di). It is the first meaningful airspace flight efficiency metric. This system is already in use, measuring the efficiency of every flight in the UK, and it is currently being rolled out to other international markets.

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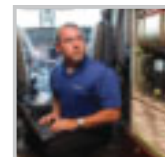
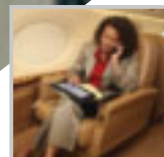
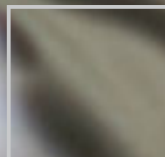
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While the presence of the first Dreamliner 787 set for the Middle East (see story page 21) made the headlines at this year's Farnborough International Airshow, it was not alone.

The MENA region's aerospace activities have risen higher up the global agenda and now hold a place at the top table of show announcements.

Abu Dhabi's Mubadala is beginning to see results from its investment in Italian manufacturer Piaggio as Abu Dhabi Autonomous System Investments (ADASI), a subsidiary of Tawazun, signed a deal with Piaggio Aero for the development of a new special missions surveillance aircraft, the Piaggio Aero MPA multirole patrol aircraft.

**Comprehensive contract**

The comprehensive contract covers the complete development of the MPA aircraft, including the roll-out of two prototypes with first flight scheduled for 2014.

Sweden's Saab has been selected as the systems supplier, having joined forces with Piaggio to develop and integrate a full suite of sophisticated airborne sensors and surveillance systems.

The aircraft is an evolution of the Piaggio Aero P-180 Avanti II platform.

It will feature an enhanced airframe, increased maximum take-off weight, additional fuel tanks and a new aerodynamic configuration with a reinforced wing, providing an increased surface and higher aspect ratio.

It will be able to fly up to 41,000ft (12,500metres,

# JOLLY GOOD SHOW!

*There may have been storm clouds over Farnborough Airshow in July – but the underlying message was one of optimism.*

*We look at the year's big aerospace event.*

with an endurance of more than 10 flight hours, a maximum range of 3,300nm (6,100km) and a cruise speed of 350kt (648km/h).

Turkish Aerospace Industries (TAI) chose the show to introduce its new primary Hurkus, a two-seat, single-engine turboprop being developed from the KAI KT-1 trainer. It is being built

principally to meet the requirements of the Turkish Air Force and will be used to execute basic pilot training, instrument flying, navigation training, and weapons and formation training missions.

The first flight is expected to take place in April 2013.

Kuwait's airplane leasing company, ALAFCO, played its part in helping Boeing pass the 10,000 aircraft mark for its 737 family with an order for 20 MAX 8s valued at \$1.9 billion at current list prices.

**Highest growth regions**

"This is the first commitment for the 737 MAX from the Middle East, which

is one of the aviation industry's highest growth regions," said Boeing Commercial's CEO Ray Conner.

"We are proud of the confidence that ALAFCO has placed in the 737 MAX, which will deliver unsurpassed fuel efficiency in the single-aisle market as well as improved environmental performance."

As well as the Dreamliner, the daily flying display had plenty to offer. Agusta Westland flew its AW139, AW169, and AW189 together as a family outing and the V-22 Osprey impressed.

One real highlight was the Yak 130 trainer. Fully loaded with armaments, it showed it could be a real contender for future trainer programmes.

With Rolls-Royce announcing a new variant for the Trent, and Bell showing off the Relentless (The 525R) there was also plenty of innovation to keep the many Middle Eastern visitors interested.



The Yak 130 has thrown down the gauntlet to the other trainer manufacturers with its "one plane airforce".

**INSETS:**  
(Top) The Agusta Westland family;  
(Bottom left) TAI introduced its new trainer Hurkus.  
(Bottom right) Plaggio's new MPA for the UAE.

PICTURES: PAUL DOPSON



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# Dream becomes reality for Qatar

**Alan Peaford**

*introduces the star of the Farnborough show.*



**E**ven hardened aerospace professionals stopped in their tracks as the Qatar Airways Boeing 787 began its take-off roll on Farnborough's runway 24.

The aircraft had been flown in to the Hampshire, UK business airport for the air show and it remained for three days before heading back to Seattle for final preparation before its handover to the Doha-based airline.

It is actually the second of Qatar's 787s, with the first due to be delivered as *Arabian Aerospace* was going to press. The star of the Farnborough show is scheduled to follow soon afterwards.

The Dreamliner, Boeing's new flagship aircraft, will begin service with Qatar on intra-Gulf routes during entry-into-service testing before starting long-haul commercial services between Doha and London.

### Demonstration flights

The daily seven-minute demonstration flights showcased the sophisticated engineering and visual appeal of a first-hand glimpse of the Qatar Airways' Dreamliner in flight.

It has been more than 30 years since manufacturer Boeing took part in a major airshow flying display with its commercial aircraft. Chief executive Ray Connor seemed impressed with the reaction and there were suggestions that Boeing could begin reviving the displays, such was the impact.

While showcasing its new, spacious and hi-tech cabin, Qatar Airways was rightfully boasting about being the first Middle Eastern airline to take the 787 – a point not lost on analyst Saj Ahmad.

The sight of the 787 Dreamliner adorning the skies is not just a coup for Boeing, given the long absence it has had from participating in aerial displays, it also gives Qatar Airways the chance to show off the first all new revolutionary airplane to customers, trade officials and



other industry executives," he said. "With 30 firm orders and 30 options on the cards, Qatar Airways is acutely aware of how important the 787 is to its financial success.

The airline is also looking at the stretched 787-9 to mitigate the expected delays in the A350-900, so having operational experience with the 787-8 soon will be likely to assist in any future procurement.

"Qatar Airways has waited a long time for the 787 but now it is all but in the airline's hands and it had a wonderful venue via the air show to show off what is arguably the best aircraft in its class that has no competitor at all."

During the Farnborough show, Qatar won the Skytrax award for the world's best airline, so there was a lot of focus on the cabin.

### Custom-made seats

The seat design is revolutionary and proprietary to the airline. Qatar worked closely with Boeing to have custom-made seats fitted on the aircraft – providing space and comfort as part of the carrier's renowned award-winning five-star experience.

Business class is configured 1–2–1, featuring seats that convert into fully flat horizontal beds, while economy class has a 3–3–3 cabin layout. It has 254 seats in the two-class configuration of 22 in business and 232 in economy.

Passengers can catch up on their sleep on board with fully flat 80in long and 30in wide business class seats, while economy offers 32in pitch seats providing a new

level of comfort in the skies.

Keeping in line with technological advances, Qatar Airways has included an award-winning Thales iTouch touch control unit, through which more than 1,000 movies, programming and audio entertainment options are accessible, together with an iPort, USB port and remote data outlet for the discerning tech-savvy traveller.

**Showstopper: The new Qatar B787 from the flight deck to the business class and economy cabin - is build for comfort.**



## EVENTS

### Virgin Galactic's new satellite launch vehicle

Virgin Galactic's Sir Richard Branson announced a new approach to getting satellites into low-earth orbit at the Farnborough Airshow with its LauncherOne project.

The air-launched LauncherOne rocket will be carried aloft underneath the WhiteKnightTwo mothership before being released. A rocket engine will then ignite, taking the launcher and its payload on into space.

Virgin Galactic said LauncherOne could enter commercial service in 2016.

"Virgin Galactic's goal is to revolutionise the way we get to space," Branson said. "I'm immensely proud of what we have already achieved as we draw near to regular sub-orbital flights on SpaceShipTwo.

"Now, LauncherOne is bringing the price of satellite launch into the realm of affordability for innovators everywhere, from start-ups and schools to established companies and national space agencies."

Virgin Galactic announced a number of private companies have already put down deposits as future LauncherOne customers, expressing their intent to purchase a total of several dozen launches.



Sir Richard Branson at the launch.

At the same event, Sir Richard said that plans for Virgin Galactic's Spaceport Abu Dhabi were coming together. "As the space vehicle is built in the US we have got to get the final approvals ticked by the American authorities, but that shouldn't be a problem," he said.

Once built, Spaceport Abu Dhabi, which is backed by investment company Aabar Investments, will be a hub for space tourism, scientific research missions

and education. He added that he company has now accepted deposits for sub-orbital flights on SpaceShipTwo from 529 future astronauts worldwide, more than the total number of people who have ever been to space.

Meanwhile, flight and rocket tests are continuing with passenger flights likely to begin towards the end of 2014.



Malcolm Ducker and the Speedtwin.

### Middle East favourite to manufacture all-terrain Speedtwin Comet

An aircraft that is offered as a lower-cost alternative to UAVs and a capable multi-engine trainer or light combat aircraft could be manufactured in the Middle East.

The aircraft is the two-tandem seat Speedtwin Comet, described as an 'all-terrain' twin because of its short field performance and rugged capabilities.

The aircraft was making its debut at Farnborough, having been built on the English-Welsh borders. But the company that develops Speedtwin believes it could continue into production in the MENA region or Asia.

Malcolm Ducker, the aircraft's display pilot, who on the ground doubles as the manufacturer's managing director, relished the opportunity to demonstrate the aircraft's handling and performance to the huge international audience at the Farnborough show.

"The Speedtwin is ideal for countries and

international corporations that require efficient and reliable equipment and its outstanding manoeuvrability and performance makes it the obvious choice for discerning, budget-conscious organisations," Ducker said.

With a capability to fit weapons or surveillance equipment, the Speedtwin can operate as a light-combat aircraft, intelligence, surveillance and reconnaissance aircraft, or as a multi-engine trainer.

In its pre-production form, Speedtwin needs a take-off roll of just 200metre (656ft). Ducker believes that by the time it is in production, it will be closer to 100metre.

As the aircraft does not require a prepared runway surface, it has obvious tactical advantages. "It can be based right next to oil or other industrial installations and provide immediate and constant economic surveillance," Ducker said.

The former Royal Air Force fighter pilot and latterly a training captain with Cathay Pacific, before buying the Speedtwin Development company, believes the Middle East could be the right place.

The aircraft was certified in the UK at the end of last year and the pre-production prototype was impressive in its displays at the show.

"We are ready to move into production," he said. "The Middle East would be ideal with its growing industrial base. We are looking for an investment of around \$10 million to get us to the next stage. Because the aircraft is so versatile – and so safe – there is a huge amount of potential

"For an aircraft that is the only twin certified for intentional spinning and with handling capabilities that will make it one of the safest aircraft in the market, I think it could be a sound investment," Ducker said.





The T-50, Typhoon and Gripen over Farnborough.

## Farnborough full of Middle Eastern promise

*The roar of the fast jets over Farnborough is a key component of the show.*

**Jon Lake** reports on the defence sector highlights.

**F**arnborough has become a largely civil aerospace-oriented show in recent years and military activity was even more restrained than normal with defence budgets slashed across the world and the global defence industry experiencing one of its worst downturns in recent history.

Northrop Grumman did not attend the show at all, while other major players scaled back their exhibits and reduced the extent of their hospitality.

Against this backdrop, more buoyant Middle Eastern military markets were a real focus for many of the exhibiting companies, and numerous delegations from the GCC nations and from the wider Middle East demonstrated that, while the rest of the world may be tightening its belt, many Middle Eastern air forces are still shopping for aircraft and equipment.

Fighter competitions continue to be hard-fought in the Middle East, so it was perhaps surprising that some of the contenders in this hotly-contested market were absent altogether (like the Dassault Rafale) or barely represented (Boeing's F-15).

Boeing did display an F/A-18E/F Super Hornet each day and briefed on the aircraft's capabilities, while Eurofighter aggressively promoted its Typhoon, displaying the aircraft in the air, and mounting a series of briefings that did a great deal to finally address concerns as to the credibility of plans to integrate an AESA radar and more advanced air-to-ground weapons capabilities.

### Frontline pilots

The four-nation consortium even ensured that it had frontline pilots from all six customer nations on hand to talk to interested parties, including one pilot from the Royal Saudi Air Force. Major Abdulaziz al Shareef is an instructor with the RSAF's Third Squadron, and a former F-15 Eagle pilot and instructor. He described Typhoon as "really fantastic – a very big enhancement in all aspects", and remembered thinking: "Is this a dream?" after his first flight.

Many Middle Eastern eyes at Farnborough were directed at the various advanced trainers on show. Korea's KAI T-50 Golden Eagle was present; with three aircraft from the Black Eagles display team – one in the flying display, one in the static, and one in reserve.

The Black Eagles arrived fresh from winning the best team

awards at the Waddington International air show and the Royal International Air Tattoo at Fairford.

The T-50 looks surprisingly like a 'baby F-16' and offers supersonic performance and good weapons training capabilities. It is being aggressively marketed to Iraq, Poland and the Philippines.

The rival Aermacchi M-346 Master was not present, though the Yak-130 from which it was developed was shown at Farnborough.

BAE's Hawk AJT (recently selected by the Royal Saudi Air Force) was shown statically, allowing potential customers to see the type's advanced cockpit, which is fully representative of new generation fighter types, and which features accurate emulation of modern fighter radar, datalink and DASS capabilities. This allows the smoothest possible transition to frontline aircraft, including the F-35 and Typhoon, and even allows some training to be downloaded from operational conversion training on those types. The RAF, for example, is already looking at taking some air combat and basic radar training from the Typhoon operational conversion unit and conducting it on the Hawk T.Mk 2.

### Tanker contenders

Surprisingly, Farnborough was the first major air show for some years not to see participation by Boeing's 737 AEW&C, nor the rival Northrop Grumman E-2D Hawkeye. Saab's Erieye wasn't on show and nor were the major tanker contenders. This may have been a disappointment for some Middle Eastern delegations, since Airborne Early Warning/Battle Management and air-to-air refuelling are capabilities that many air forces in the region are looking to gain.

But one capability area that was represented was maritime reconnaissance. Saab showed its 340-based maritime surveillance aircraft demonstrator, and promoted the larger Saab 2000 Swordfish, which would be equipped with a Selex Galileo Seaspray 7500 maritime surveillance radar, an Ultra Electronics active acoustic system and a FLIR Systems high-definition electro-optical/infrared sensor pod.

Boeing briefed on its 737-based P-8 Poseidon, and on a company-funded (but as yet unnamed) maritime aircraft that would integrate the core capabilities of the P-8 and integrate on a 'super mid-sized business jet'.

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# MAX packs a low-cost punch

*A combination of market factors is pointing towards a healthy future for low-cost carriers (LCCs) in the Middle East, according to a senior Boeing executive. Alan Dron reports.*



**T**he mix of a large, youthful population, growing incomes and vast numbers of guest workers in the region means that the LCC model is being very successful in the Middle East, according to Randy Tinseth, Boeing Commercial Airplanes' vice-president, marketing.

LCCs traditionally favour single-aisle designs and Tinseth was speaking at a briefing at London's Royal Aeronautical Society on progress with the Boeing 737 MAX.

Boeing says it has "more than 1,000" orders and commitments for the 737 MAX. Of that total, fewer than 600 have been publicly allocated to named operators, with 11 as-yet unidentified operators that have placed orders or commitments. 20 aircraft are assigned to Kuwaiti lessor ALAFCO.

It is known, however, that fast-expanding LCC flydubai has had discussions with Boeing on the MAX as it evaluates it together with Airbus's competing A320neo. CEO Ghaith Al Ghaith said in January he anticipated making a decision around a year from then.

A flydubai deal for the 737-8 variant of the MAX "will be firmed up sooner, rather than later – especially as Boeing keeps selling slots to other customers", according to industry analyst Saj Ahmed.

"The airline cannot afford to slow its growth by not having new aeroplanes in place, otherwise the drive for profitability could slide by several years and it needs more fuel-efficient aircraft to mitigate against continued rises in oil and fuel costs."

Tinseth did comment, however, that all the unidentified buyers had put down deposits on their planned aircraft and "we're working to finalise those deals". The mystery airlines represented "a good mix of business models and regions".

During his briefing, Tinseth accepted that some years ago Boeing had "got behind the curve" in the region, particularly in the single-aisle market, which had allowed rival Airbus to pick up a string of orders.

However, Boeing had pumped greater resources into the region over the past couple of years, he said, including new

sales personnel and an Arabic-language website. New orders had also helped restore the balance.

Boeing has done particularly well in selling its 777 into the region, with Emirates Airline buying the type in large quantities.

Tinseth added that Boeing expects 23,370 new single-aisle aircraft to be required globally in the 2011-2030 timeframe, with 5% of that number – around 1160 – being required by the Middle East market.

Boeing's 737MAX, which will be produced in -7, -8 and -9 variants that will follow on from the current 737-700, -800 and -900 versions respectively, is due to have its configuration finalised next year. That will allow detailed design to proceed through 2014, with construction starting the following year, first flight taking place in 2016 and service entry in 2017.

## Lighter than its Airbus competitor

Boeing claims that the 737-8 will be 10% lighter than its Airbus A320neo competitor, adding that 75% of total operating costs are affected either directly or indirectly by weight. This, said Tinseth, will give the 737-8 an 8% advantage in seat mile costs over its European rival.

Fuel efficiency would be 13% better than the A320neo, he claimed, with around 11% coming from the new CFM Leap-1B powerplant. Exact thrust levels had still to be decided but Boeing was in "the last phase of wind tunnel testing" and was about to finalise the type's maximum take-off weight – which, in turn, would determine range.

Among aerodynamic tweaks over current 737 variants is the type's distinctive 'dual feather winglet concept', which Tinseth said Boeing had been studying for some years. Combined with a raked wingtip this should reduce fuel burn by an extra 1% over short-haul routes, increasing up to a maximum 1.5% at ranges out to 3,000nm. They are also designed to fit within current space constraints at airport gates.

## MAX ORDERS

**ALAFCO became the first MENA customer to order the MAX when it bought 20 at the Farnborough Air Show in July.**

**Boeing says it holds "more than 1,000" orders and commitments for the 737MAX. Confirmed customers at the time of writing were US carriers American Airlines (100) and Southwest (150), with a further 100 from Norwegian. The biggest single customer was Indonesia's Lion Air (201). Lessor Aviation Capital Group had signed up for 35. This leaves somewhere in excess of 415 aircraft assigned to 11 as yet unidentified carriers.**

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Syphax is regarded by many Tunisians as one of the first economic achievements of the country's move away from its authoritarian past.

Left: The carrier's two Airbus A319s are named Karama (Freedom) and El Horria (Dignity) in honour of the Arab Spring, which began with the Tunisian Revolution.

# Bumpy start for new Tunisian airline

*Mohammed Frikha set up an airline to help promote economic development of his home region of Tunisia – but encountered severe turbulence when it took to the air. Alan Dron reports.*

**W**hen you've spent 10 months getting an airline off the ground, announcing a suspension of services on the day of its official launch seems an odd course of action.

Mohammed Frikha did precisely that on April 29 when his brainchild Syphax Airlines met opposition from Tunisair ground handling staff at Tunis's Carthage Airport, who refused to check in Syphax passengers.

According to Tunisian media reports, Tunisair had welcomed Syphax's market entry but problems had arisen when the new airline had expanded its operations to Tunis at short notice.

"We encountered some resistance from local unions, who were scared for the effect of our new services on Tunisair," said Syphax commercial director Paul Sies.

A week before Frikha's dramatic announcement, Tunisia's transport ministry had agreed that Syphax could operate from all Tunisian airports and called on both airlines to work together at Tunis airport 'to avoid competition that could undermine the national fleet'.

"We had to re-think our network quite rapidly and make changes to the existing schedule, which destabilised our position in the market for a few weeks," admitted Sies. "The good news is that, just in front of the high [summer] season, load factors are really starting to pick up."

It was a tough introduction to life for Tunisia's first privately-owned scheduled airline. Frikha, one of Tunisia's most prominent businessmen and CEO of

Continued  
on Page 28

CONTINUED FROM PAGE 27

on-board systems manufacturer Telnet, embarked on the project in an attempt to bring more air services to his home city of Sfax, midway down the North African nation's Mediterranean coastline. Residents of the city and surrounding area had long felt that their region was neglected by the Tunisian authorities and lacked sufficient connections to the outside world.

Matters came to a head in 2011 when Frikha was visited in Telnet's offices, which overlook Tunis Airport, by a group of businessmen, including a former government minister and banker, Monsour Moalla, who, like Frikha, has his origins in Sfax.

According to Syphax's marketing manager, Mohamed Elfekih, the group's conversation gradually moved to the topic of air services and ended with Frikha declaring: "I think we're going to start an airline."

"It was the first big [business] project launched after the Tunisian revolution," said Elfekih. As such, it became emblematic of the democratic uprising.

In June 2011 consultants were commissioned to undertake studies on passenger traffic that confirmed there was a ready market in Sfax. Based on this, Frikha approached the country's civil aviation authorities for approval to create a new airline.

#### Gauge the potential

More studies were conducted at the nation's airports to gauge the potential for a new airline, while 5000 travellers at Tunis Airport were interviewed to discover their journeys' starting points and destinations.

These interviews revealed that around 35% of passengers transiting Tunis came from Sfax and the surrounding region.

This all took time. By the time Sies and other senior management personnel joined Frikha's planned airline it was late autumn 2011. Sies, with 30 years in the airline industry under his belt, was shocked to hear Frikha declare that he wanted to launch services in March 2012.

"I still have nightmares about setting up the airline," admitted Sies. "I said it was impossible. Normally you need 12-15 months to do a good set-up, from business plan to flying. Mohammed said, 'The aircraft are arriving in March and I want to be in time to capture the high season'."

The senior managers put their heads together, said Sies, to identify the biggest obstacles to achieving this timetable. Getting the necessary licences from Tunisia's aviation authorities would be a fundamental



**Syphax founder Mohammed Frikha is one of Tunisia's best-known businessmen and Group CEO of Telnet, Tunisian aerospace consultants and manufacturers of onboard systems. He created Telnet in 1994.**

step in getting Syphax up and running.

"We put our heads together and said, 'OK, if we can get over these hurdles, we can do it'." Solutions or work-arounds were sought. Getting an Air Operators Certificate was one of the first priorities, in order to move forward with IATA.

"We were fortunate to work hand-in-hand with the authorities here to get that lined up very early in the process."

Preparations went surprisingly well and in March two leased Airbus A319s, formerly operated by Air Berlin but released by the German company as part of its recent extensive reorganisation, were delivered to Syphax. The aircraft are only two years old.

Trial services began in mid-April, only slightly behind Frikha's initial timetable, but the clash with Tunisair ground staff at the capital's airport two weeks later seemed to put the entire project in jeopardy.

Sies said that the CEO's threat to close the fledgling airline was borne out of his passion for the project and concerns that his dream would be wrecked. The fact that some of his countrymen were working against him was "very difficult to understand and handle". He said, "OK, if they don't want to work for the future of the country, then I have no choice but to close down the airline".

"The matter is now resolved, insofar as we have virtual freedom to fly out of Sfax, Djerba and Monastir, but don't have full freedom to do what we want out of Tunisia. We redesigned the network around the limitations we have there."

Ironically, this limitation may have worked in

Syphax's favour: "We've seen that the regional flights are really popular. Perhaps the need to fly out of Tunis is much less than we thought."

Any closure would have particularly disappointed the younger generation of Tunisians, added Sies, because "Syphax is seen as part of the liberation". Its emphasis on selling seats online, as well as by more traditional distribution channels, is also popular with the younger generation.

Frikha chose a hybrid business model for his airline, with low costs but high standards of service. "We basically run the airline at operational level as a low-cost carrier (LCC), with high aircraft productivity, and we outsource as much as we can to the best providers [of services] at the best cost. Staff-wise, the airline is very lean."

However, very little of this low-cost approach should be visible to the passengers, said Sies, with Syphax offering a full service on board. He likened the operational model to that of US carrier Jet Blue.

#### Point-to-point route network

The airline operates a point-to-point route network from Sfax, Djerba and Tunis to several French destinations – Paris Charles de Gaulle, Nice and Marseille – as well as Istanbul in Turkey and over the Libyan border to Tripoli.

Historic links with France mean that the north-south flow of Tunisians living in the European nation is important for Syphax. This is especially so especially during the summer holiday period and before Ramadan, when many emigrants travel home to see their families.

During those periods, flights from France are "absolutely packed. Traffic leaving Tunisia for Europe is more of a challenge." At Eid, the flow is reversed.

To keep the company's aircraft busy, Syphax undertakes flights for tour operators in and out of the popular holiday resort of Monastir.

Future plans call for the fleet to expand to five aircraft in five years, although this is open to change. "The A319 for us at the moment is ideal aircraft because we can operate it out of smaller airports. But we have to choose in the next few months on our future direction." This could be in the form of larger A320s or A321s.

Whatever Syphax's future course, Mohammed Frikha and his team will doubtless be hoping to encounter less turbulence than in the young airline's first weeks of life.

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**A**irlines are traditionally relatively low margin businesses, hostages to the state of the global economy and the price of jet fuel. In recent years, the industry has been hit hard by both the global financial crisis and sustained high oil prices.

Business models that worked during the good times but were ultimately long past their sell-by dates are failing. Already in 2012, carriers such as Spanair, Malev and Air Australia have folded, unable to adapt business models sufficiently quickly to changed economic realities.

The situation for the industry as a whole is not about to get any easier.

Tony Tyler, director general and CEO of IATA, earlier this year predicted a net income for the industry in 2012 of US\$5.5 billion, down by almost half from US\$6.9 billion in 2011.

He said high oil prices and Europe's sovereign debt crisis hang over the industry like "the sword of Damocles".

And yet, against this backdrop, some carriers are continuing to grow and generate profit.

At the start of this year Ernst & Young carried out a comprehensive survey of 600 senior executives at companies and corporations around the world that have performed well despite the economic downturn.

The findings of the Growing Beyond market analysis, as germane to the aviation industry as to any other, underscore the increased importance during tough market conditions of reaching customers, containing costs, inspiring stakeholder confidence and ensuring operational agility.

#### **Increase investment**

They also suggest that companies that increase investment – albeit with considerable focus – during a crisis of liquidity are more likely to succeed than those that merely focus on cutting costs.

During the downturn, high performing airlines have demonstrated a willingness to innovate to capture increased market share, whether through product launches or incentivisation of staff, with a marked emphasis on breaking into the lucrative emerging middle class markets of the BRIC economies.

The airline industry has not seen stability or stagnation among the market leaders during the global financial crisis; rather it has seen fierce competition amongst carriers to take the best offering to market, resulting in increased R&D and capital expenditure.

In the past 12 months, for example, the multi-million dollar roll-out of new seats has been a trend among high performers, as has the installation or retrofitting of on-board connectivity on aircraft. One Gulf carrier has even introduced on-board chefs.

In the MENA region, on-board connectivity is now offered by all of the major players: Emirates, Qatar Airways, and Etihad Airways.

In the Far East, Cathay Pacific has recently updated products across its fleet, installing brand new seating and seating concepts; for example,

*Toby Stokes, Ernst & Young's aviation sector leader Europe, Middle East, India and Africa, explains how the aviation industry's leading players are continuing to create growth through focused innovation and investment.*

# How airlines have found an upside in the downturn

the introduction of a premium economy class and the redesign of business class.

And in Europe, carriers such as Virgin and Lufthansa have gone to considerable lengths to reinvigorate their offerings to premium customers with the redesign of the upper class cabin and the introduction of a new flatbed, respectively.

Seemingly counter-intuitive in a downturn, these examples are all indicative of the airlines' desire to not only compete aggressively for international traffic, but to ensure they have not been left behind when the economic storm clouds finally part.

They demonstrate, too, top-performing airlines' unwillingness to change strategy by placing heavy emphasis on providing lower price range products: customers prepared to pay premium prices for travel still, then, remain a cornerstone of the foundations of high-achieving carriers' business models.

It is a strategy that is bearing fruit. IATA figures show premium traffic across the industry in February having increased by 6.3%, compared to the same month a year ago and continuing the positive trend started at the end of 2011.

Another area in which surveyed executives from high-performing companies said they placed increased importance in the corporate effort to capture market share during a downturn was staff incentivisation.

Incentivisation schemes designed to align

individual goals with corporate goals and to empower staff to make decisions while utilising their ideas or their insights into customer feedback were more vital than ever before.

Successful companies, our research showed, had their staff on board, pulling in the same direction, because they felt not only incentivised financially but also part of the project.

On the flipside, companies whose workforce cowered beneath the ever-present threat of cutbacks and redundancies were lacking in dynamism and desire to out-perform.

#### **Emerging economies**

Perhaps the most important trend in terms of long-term customer reach identified in the Growing Beyond report was the effort being made by market-leading airlines to break into emerging BRIC economies. Between now and 2030, the number of people in the global middle class will increase from 1.8 billion to 4.9 billion, the majority of whom will live in Asia and the other high growth markets.

Etihad Airways, for example, has recently begun operations to Chengdu, an industrial city in the southwest Sichuan area of China with a catchment population of some 20 million people.

Qatar Airways, too, has recently started operating to the Chongqing in southwest China, a conurbation with some 35 million residents – more than either Shanghai or Beijing – and considerable European manufacturing activity.





**Toby Stokes: The findings of the Growing Beyond market analysis underscore the increased importance during tough market conditions of reaching customers, containing costs, inspiring stakeholder confidence and ensuring operational agility.**

These efforts to break new ground and tap new traffic flows are not limited to China; Gulf carriers in particular are making heavy investment to launch Africa routes – notably to Libya but also to Kenya, Uganda and the Rwanda in recent months.

Moreover, most high performing international carriers have shown considerable interest in launching or in operating increased services to India and South America.

The trend is emblematic of a desire identified in the Growing Beyond report, shared by high-performing corporations, to broaden their search for new customers regardless of financial downturn.

Agility in recession is vital. The ability to change tack or to find effective ways to overcome or circumvent regulatory constraints barring or hindering access to markets was a constant in the characteristic makeup of high-performing airlines we surveyed.

Protectionist government policies designed to stop foreign carriers entering markets on an open competitive basis have long frustrated international airlines. Recently, carriers that lead the market have shown a high degree of innovation to get around constraints.

Alliances, in particular, have grown in popularity as a means of circumventing regulation, common in many countries, that prohibits M&A activity or the full purchase of airlines.

Alliances, often in the form of codeshare

agreements, have proved an effective means by which, at low risk, airlines can generate revenues on routes to which, in some cases, they do not even fly, while simultaneously finding a way around bilateral constraints designed to restrict the frequency of their ability to operate.

Ethihad Airways, the national carrier of the United Arab Emirates, has, for example, recently largely predicated its long-term business model on alliances and codeshare agreements, a strategy it believes will enable it to generate scale quickly while allowing it to maximise access to vast markets across Asia, Europe and the United States.

Emirates, too, the Gulf's most famous carrier, has recently signed a codeshare agreement with American operator Jet Blue that it believes will facilitate considerable penetration into new US markets.

Equity deals have also seen a rise in popularity. For example, BA, American Airlines and Iberia today operate a joint venture on all trans-Atlantic routes as a result of government regulation precluding an actual merger. The joint venture is widely regarded as a 'synthetic' merger.

In Europe, the trend in recent years is marked with players such as Lufthansa, BA, Iberia and KLM-Air France making acquisitions as they jostle for market share.

Ethihad Airways' swoop for a 29.9% stake in airberlin, Europe's sixth largest carrier, in December 2011, is a good example of a carrier

gaining vastly increased access to large European markets at the stroke of a pen, for the cost of one mid-sized aircraft.

Agility, of course, is not only about acting quickly to find ways around barriers, it is also about ensuring operational flexibility is rapid and decision making is decentralised when it needs to be.

The Growing Beyond survey found repeatedly that high-performing airlines were those that cultivated a culture of decision making close to the ground or to regional markets. Traditionally, airlines have tended to be centralised, not devolving power to outstations.

Today, that trend is being reversed, with greater freedoms being granted to regional sales forces or regional financial controllers. The result is a markedly improved ability to react quickly to changed circumstance.

Operational flexibility is also an enabler of speed; one that high performing airlines are achieving through, increasingly, outsourcing of procurement and ground-handling operations, or allowing revenue accounting to be undertaken by a third party in places such as India.

#### Minimise costs

Effective outsourcing allows carriers to respond quickly to changing volumes and to minimise costs. The Growing Beyond survey found companies that have struggled have been those that have clung to fixed processes.

Differences in attitude to cost cutting were marked between high-performing companies and the rest. High-performing companies and carriers placed considerably less importance on reducing headcount and more on improving efficiency across the company with better processes. Their priority was about controlling costs at an optimal level that would allow them to continue with their business strategy effectively and efficiently.

Non-high achieving companies were more enthusiastic to halt or defer expenditure until business picked up.

Market leading airlines, in the MENA region and beyond, all demonstrated high levels of execution in areas such as re-engineering back office processes to improve performance, outsourcing, mastering tax efficiencies, optimising working capital, forecasting and providing decision makers with optimal market intelligence.

Ernst & Young believes it is in these areas that companies looking to improve their cost containment ability must look to make adjustments. Management must be prepared to ask itself questions such as: how confident is it that it has full visibility of cost bases and key value drivers? How confident is it that it has sufficient capital to achieve growth strategies?

Continued  
on Page 32

## CONTINUED FROM PAGE 31

Surveyed high-performing companies again and again turned out to be those in which management demonstrated laser-like focus on details and preparedness to confront brutal truths.

During a downturn, communication with stakeholders – from owners and investors, to staff and customers – takes on increased importance. Maintaining and retaining confidence is critical, not only to push through change or retain talent, but also to ensure restricted liquidity does not dry up entirely.

Winning companies, the survey showed, are communicating much better than companies that are struggling or standing still.

When third parties were asked about the relative performance of high- and low-performing companies in communicating with stakeholders, the difference was immediately apparent with 42% more respondents believing high-performing companies were communicating their current performance and forecasts to their stakeholders better than low-performing companies. Likewise, 37% more respondents said they saw better communication from high-performing companies on the issue of long-term reputation management.

It is natural for people to put their head in the sand when times are tough, or to become non-communicative. It is vital, however, that management does not allow it to become corporate practice.

**More prepared to talk**

The survey found that high-performing companies were markedly more prepared to talk in both broader and granular detail terms, with more coverage of non-financial KPIs, and put considerably more effort into identifying and managing risk.

Doing so was a major factor in high levels of confidence in market leading companies; confidence that ultimately will prevent talent from dusting off CVs and make investors feel sufficiently comfortable to inject liquidity.

Confidence, too, of course, is paramount for attracting customers.

The Growing Beyond survey provided strong insights into the habits of successful companies and the manner in which those companies have maintained their dynamism despite difficult market conditions.

At Ernst & Young, we believe these practices are by no means a luxury that comes with top performance; rather they are mechanisms through which excellence is delivered.

Like all best practice, they are worth considering closely, and then implementing.

Success, perhaps now more than at any time in the last 30 years, is not a matter of luck.

Success in 2012, and the ability to grow beyond the changed economic realities of modern times, is about being prepared to invest, both in people and in product, while making sure your company is optimally prepared for the future in terms of management of costs and communication to stakeholders.



Mike Carvath - the region is underserved.

## Eastern books its ticket to Africa

*While the launch of domestic flights in the UAE is still tied up in red tape, Fujairah-based Eastern Express has begun operations from Sharjah to the Horn of Africa, using a second base in Djibouti. Jill Stockbridge reports.*

**E**astern Express is serving a detailed itinerary with twice-weekly flights from both Sharjah and Djibouti to Somalia and weekly from Nairobi to Somalia.

The Somali destinations include the underserved Puntland states including Bossaso and Garoe and allow the local population much needed connectivity to the MENA region and beyond through Addis Ababa, Djibouti, Nairobi and Sana'a.

Mike Carvath, business development officer, explained: "We are launching operations using a leased 46-seater ATR42 from Portugal. The region is underserved and while it still has its challenges, it is looking to develop."

The risk of the endeavour is shared in a partnership with the local Puntland government, which has bought a block of seats on each flight out of Puntland to the major African cities. The government approached Eastern Express for its international knowledge, expertise and uncompromising attitude to safety.

Alex de Vos, CEO, said: "The local Somali economy is in dire straits and historically Somalia is not the safest place in the world. Consequently,

some local airlines have been adhering to questionable safety practices.

"There have been a number of accidents due to shortcuts in safety. The government approached us to fix that safety record and provide better services. We believe through this partnership and with these destinations it will work."

The launch date for flights from Fujairah to Abu Dhabi is still unknown.

The company is poised to begin flights and believes it can be operational within two weeks of receiving approval but the wait continues, despite the team working to fulfil all the requested criteria.

"We had originally planned to wet lease an aircraft but in meetings with the GCAA we were informed that only airlines with national carrier status are able to lease aircraft," de Vos revealed.

"Our investors were very supportive and we have agreed to purchase a Jetstream 41. However, we are still waiting inspection of the aircraft by a GCAA approved party and there may be other official requirements. Final approvals could come at any time but we are not in a position to say when."



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# Saudi catches the UK train

*Saudi Arabia and the UK have reached agreement on a new \$3 billion programme to provide the Royal Saudi Air Force (RSAF) with cutting-edge officer and aircrew training. Jon Lake looks at the details.*

**A**nouncing the deal, the British Government warmly welcomed the Saudi decision to confirm UK support for its officer and aircrew training requirements which, it said, highlighted Saudi confidence in the UK's "ability to continue to meet Saudi Arabia's legitimate defence requirements".

The new programme is intended to introduce an advanced aircrew training capability that will raise the standard of graduating students in terms of both capability and readiness, and is particularly intended to support the introduction and operation of the RSAF's growing fleet of fourth generation Typhoon fighter aircraft.

Under the terms, the RSAF will receive 22 BAE Systems Hawk Advanced Jet Trainers (AJT), broadly similar to the RAF's Hawk Mk 128 or the Indian Hawk Mk 132 (previously known as the Mk 115Y).

Saudi Arabia will also take delivery of 55 Pilatus PC-21 advanced turboprop trainers and 25 as yet unspecified primary training aircraft, as well as initial spares support. The contract will also cover the provision of a variety of advanced aircrew training devices, and upgraded training facilities.

The overall value of the deal has been estimated at US \$5 billion, with the Hawks accounting for perhaps \$800 million.

The Royal Saudi Air Force currently operates about 40 Hawk 65/65A aircraft of the 50 ordered in 1985 and 1994 under the Al Yamamah programme (30 Mk 65s and 20 Mk 65As). These aircraft are operated by No.s 21, 37, 79 and 88 Squadrons of the RSAF's 7 Wing at King Faisal Air Base, Tabuk. No.88 Squadron operates as the RSAF's Saudi Hawks demonstration team.

It has been said that the Hawk AJTs (no 'mark number' is yet known for the new Saudi Hawks) will replace the RSAF's current fleet of 'Heritage Hawk' Mk 65/65As, representing a welcome expression of confidence in the new generation Hawk's capability, viability and relevance from a long-standing and experienced operator of the original variant.

Apart from the fact that the new Saudi Hawks will be based on the latest generation Hawk AJT which was, in turn, derived from the Mk 120 LIFT (lead-in fighter trainer) supplied to South Africa and the Mk 127 LIF (lead-in fighter) used by the Royal

**The Saudi order reaffirms the Hawk as the trainer of choice for the region.**

Continued  
on Page 36

Australian Air Force), little is known about the exact standard of the Saudi aircraft. It is not known, for example, whether the RSAF will opt to retain a live weapons training capability, or whether it will follow the RAF's example with its Hawk T.Mk 2s and opt for an 'all synthetic' weapons training model.

Like the other next generation Hawks (120, 127, 128 and 132) the Saudi Hawk AJTs will have only 10% commonality with the first generation legacy Hawk aircraft, and will feature a new wing, a new forward and centre fuselage, as well as a new fin and tailplane. The aircraft will enjoy a four-times longer fatigue life than first generation Hawks.

This is a particularly interesting question, as the Hawk will represent a smaller proportion of the overall basic/advanced training fleet than it does at present, which may indicate that more of the present Hawk training syllabus will be 'down-loaded' to the new PC-21s, leaving the Hawk to concentrate on the more advanced aspects of the 'advanced' training syllabus, including tactical and weapons training.

Selection of the PC-21 represents much more than a direct replacement of the PC-9, since the new aircraft enjoys improved performance, as well as more 'jet-like' handling, and has a glass cockpit that is more representative of new-generation frontline types. With its sloping nose, short wings, single power lever and glass cockpit, the PC-21 offers a remarkably realistic simulation of a fast jet, and this could allow the PC-21 to be used for some parts of the training syllabus that are now taught on the legacy Hawk.

#### King Faisal Air Academy

The RSAF currently operates about 47 Pilatus PC-9s, of 50 aircraft that were originally acquired (via BAE Systems) as part of the Al Yamamah arms deal with the UK. These equip No.s 9 and 22 Squadrons that form part of the King Faisal Air Academy, which is based at Riyadh King Khaled Air Base, the home of the RSAF's 4 Wing.

Deliveries of the Pilatus PC-21s will begin in 2014. The Hawks will be delivered from 2016. BAE Systems is understood to be helping the RSAF to identify a candidate aircraft to meet its requirement for a primary training aircraft, which would be used for screening and for elementary flying training.

The traditional RSAF preference for following RAF practice may prove impossible, as the fibreglass Grob Tutor may not be entirely suitable for Saudi operating conditions.

There has been speculation that pending the delivery of its own Hawk AJTs, the RSAF might borrow some RAF Hawk T.Mk 2s, or that it could send some pilots through the RAF training machine.

Plans to disband the Hawk T.Mk 1-equipped No.208 Squadron are understood to have been cancelled, so that RAF pilots will continue to receive advanced flying training on the Hawk T.Mk 1 with 208, before progressing to No.IV



Pilatus PC-21 takes over the basic role for the Saudi pilots.

(Reserve) Squadron and the Hawk T.Mk 2, instead of going 'straight through' on the Hawk T.Mk 2. This will create extra T.Mk 2 availability, which could be exploited by the RSAF.

BAE Systems said the new trainer deal was aimed at "meeting the growing demands of a world-class air force", thereby neatly highlighting one of the questions raised by this news.

Though the RSAF is acknowledged to be 'growing' (and many respected analysts and observers, led by David Ignatius in the Washington Post, have predicted that the RSAF will double in size), the new training fleet is actually significantly smaller than the one it is intended to replace.

Even assuming an increased reliance on 'synthetics', and assuming a more efficient utilisation of training aircraft, the new fleet of 55 PC-21s, 22 Hawks, and 25 (unspecified) primary training aircraft does not seem sufficient to service the RSAF's existing training needs – which stretch the existing fleet of 47 PC-9s, 40 or so Hawks and 25 primary trainers.

#### Needs are growing

The RSAF currently fields 11 fast jet squadrons, plus another dozen squadrons of transports, helicopters, AWACS and ISTAR aircraft, and its training needs are growing as it absorbs a new generation of combat aircraft, including 72 Typhoons and 154 new F-15SAs, to say nothing of whatever aircraft underpin the planned expansion to 20 or so fast jet squadrons.

Analysts and observers are, therefore, already speculating as to whether this is merely an initial step in recapitalising the RSAF's training machine, and ask whether the RSAF will soon be buying further trainer aircraft, or possibly whether the Saudis might retain some of their existing trainers. Certainly, the RSAF has often 'staged' the purchase of new aircraft in the past, as it did with the Tornado and Hawk, and as it seems likely to do with the Typhoon. This could mean that we will see a further order for more PC-21s and Hawk AJTs a few years down the line.

There has been some speculation that the RSAF may see the new Hawk AJT trainer aircraft as being solely intended to train aircrew for the Typhoon and Tornado aircraft, and that an alternative trainer could be selected to prepare pilots for the new F-15SA Eagle, perhaps waiting to see what decision the USAF makes when selecting an aircraft to meet its TX trainer requirement. This could see the RSAF operating different LIFT aircraft for its Typhoon/Tornado and Eagle forces.

Alternatively, the RSAF could be aiming to keep some of its existing Hawks and/or PC-9s in service. It is quite conceivable, for example, that some Hawk Mk 65/65A aircraft could be retained by the Saudi Hawks aerobatic team, or even to augment the new Hawk AJTs, especially if the older aircraft were to undergo an upgrade of the kind that has been mooted for some time by BAE Systems. Such an upgrade would give the Saudis a more modern cockpit at reasonable cost, perhaps allowing a PC-21 (basic)>Hawk 65/65A (advanced)>Hawk AJT (LIFT) training syllabus.

'Progressing' in training from the PC-21 to a Hawk 65 would require such an upgrade, since the analogue Hawk 65 would otherwise represent a backward step from the PC-21, except in terms of performance.

Alternatively, some or all of the existing PC-9 aircraft could be retained for a PC-9 (basic)>PC-21 (advanced)>Hawk AJT (LIFT) syllabus.

The Saudi order represented a welcome and much needed boost for both the Hawk and the PC-21, since although both are widely regarded as being excellent, class-leading trainers, both have been struggling to find the orders that would allow them to remain in production.

For Pilatus, before the Saudi order, PC-21 production looked set to end after the delivery of the final aircraft of 25 ordered by the UAE, probably in early 2014. The situation for the Hawk was even more critical, with UK production having ended with the final RAF Hawk T.Mk 2 (Hawk 128), though the Hawk 132 remains in production in India.





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**Pratt & Whitney**  
A United Technologies Company





Yemen's C-235 aims at counter terrorism.  
 PICTURE: ANTONIO MUÑIZ ZARAGÜETA



## Yemen set for new counter-terror aircraft

*A single CN-235-300M medium-range twin-turboprop transport aircraft destined for the Yemen Arab Republic Air Force has been undergoing flight-testing at Airbus Military's facility at Seville San Pablo airport. Jon Lake reports.*

**C**N-235-300M is the latest transport version of this Spanish-designed aircraft and is a derivative of the preceding 200/220 series, with a new Honeywell International avionics suite, improved pressurisation and provision for an optional twin-nosewheel installation.

The original GE CT7-7A-engined CN-235-10 was built in small numbers, before production switched to the CN-235-100/110, which introduced GE CT7-9C engines in new composites nacelles.

The CN-235-200/220 introduced structural reinforcements to allow higher operating weights and there were aerodynamic refinements to the wing leading-edges and the rudder. The new version had better short runway performance and increased range with maximum payload.

The aircraft will join a growing fleet of the type in the MENA region, with six aircraft operational in Morocco, four in Royal Saudi Air Force service (at least one in VIP fit and an all-white colour scheme), and two with the Royal Oman Police.

### Configured as gunships

Two CN-235s, configured as gunships, are also due to be delivered to Jordan. Turkey took delivery of 50 CN-235 transports, plus nine CN-235 ASW/ASuW MPA aircraft, equipped with the Thales airborne maritime situation & control system (AMASCOS) as well as three similarly equipped CN-235 MPA aircraft with the Turkish Coastguard.

The Yemeni order for a single CN-235 was revealed on May 13 2011, when Airbus Military announced its first quarter results. It subsequently became apparent that the aircraft was being purchased with funding from the USA.

Section 1206 of the 2006 National Defense Authorization Act allows the US Department of Defense to use up to \$200 million of its own appropriations for the training and equipment of foreign national military forces engaged in counter-terrorist operations.

In mid-2010, when the CN-235 was funded, Yemen was the largest global recipient of section 1206 funding, receiving \$252.6 million, including an estimated \$38 million for the CN-235.

Yemen is the frontline in the fight against Al-Qaeda in the Arabian Peninsula and the new CN-235 will be used to transport its special operations units, improving the operational reach and reaction time day and night, and even in 'hot and high' conditions.

There has been speculation that the aircraft could also have an intelligence, surveillance, target acquisition, and reconnaissance (ISTAR) role, and even that Yemen may have approached US-based ATK to discuss a possible gunship conversion. Pakistan was the second biggest recipient of Section 1206 funding.

### Highly specialised units

The US prefers to directly fund small, elite, and highly specialised units that are directly engaged in counter-terrorist operations than to provide funding for Yemen's armed forces as a whole, which are seen as being corrupt and poorly trained, and which are engaged in operations against Houthi rebels in Yemen's northern provinces where heavy-handed execution (for example during Operation Scorched Earth) might offend domestic US sensitivities.

In addition to the Yemeni CN-235, Section 1206 funding was also used to support a \$27 million contract which saw Bell Helicopter supplying four commercially designated Huey II (UH-1H) helicopters, as well as a package of spares, and support, including a dedicated team of support representatives including a pilot and maintenance technicians and training for 12 Yemeni pilots and 32 maintenance staff.

The Huey II (UH-1H-II Super Huey) is an upgrade configuration based on the proven Bell UH-1H helicopter. It is fully re-wired and has a new navigation and communications suite.

The aircraft incorporates all-new commercially certified dynamic components, with new main and tail rotor hub assemblies and blades. It is powered by a 1,800shp Honeywell T53-L-703 engine (as used in the UH-1J), giving a significant increase in hover performance. The new engine permits operation at higher gross weights and giving lower direct operating costs.



# Morocco unveils its

*Morocco's new Advanced Block 52 F-16 fighters are now in service with the Escadron de Chasse 'Falcon' at Base Aérienne des Forces Royales Air 6 at Ben Guerir, near Marrakech. Two further squadrons, 'Spark' and 'Viper' will stand up at the same base. **Jon Lake** looks at the country's growing capabilities.*

**B**en Guerir was originally established in 1951 by the USAF's Strategic Air Command (SAC) to allow the rapid deployment of nuclear-armed B-47 Stratojet bombers.

It was one of five air bases constructed in northwest Africa for SAC, and was closed in 1963. More recently it was better known as a transatlantic abort-landing site for the Space Shuttle, finally de-activating in 2005.

However, the proximity to Marrakech, the long runway and NASA-installed Microwave landing aids and TACAN, made the base an attractive candidate for rebuilding and remodelling to house the new F-16s.

It is thought that the arrival of the F-16s may allow a reduction in the size of the Moroccan F-5 force, which could be relegated to advanced and lead-in fighter training duties.

The Moroccan Mirage F1 force should remain at its present two-squadron size, with 27 Mirage F1CH, F1EH and probe-equipped F1EH-200 fighters being upgraded to MF2000 standards under the F1 renovation programme. This will see

the aircraft gaining Mirage 2000-5/9 avionics and defensive systems, and a Mirage 2000-derived Thales RC400 (RDY3) multi-mode pulse Doppler radar.

The Mirages will be equipped with Mica AAMs and a range of air-to-ground weapons, including the new AASM Hammer precision-guided, stand-off, rocket-boosted bomb, the ARMAT anti-radiation missile, and the MBDA AM39 Exocet anti-ship missile.

#### **Now in service**

The first four F-16s were delivered on July 30 2011 and all eight of Morocco's two-seat F-16Ds are now in service, together with about five of the 16 F-16Cs ordered by the North African kingdom.

Four former Royal Moroccan Air Force F-5 pilots underwent F-16 conversion training with the Arizona Air National Guard's 162nd Fighter Wing, the USAF's international F-16 training unit at Tucson International Airport. Each averaged three sorties per week and accumulated more than 150 F-16 flying hours, qualifying as

flight leads and as instructor pilots, graduating in time to deliver the first four of Morocco's 24 F-16s in July 2011.

Six further Moroccan pilots underwent the basic F-16 course in Tucson, graduating in September 2011. Together, these two courses of pilots formed the cadre of the new F-16 unit in Morocco and began training further pilots in-country.

Two F-16s were displayed in the static park at the recent third Marrakech airshow at Marrakech-Ménara, and four F-16Cs took part in the flypast.

The last of the 16 F-16Cs and eight F-16Ds ordered under Morocco's May 30 2008 contract first flew on March 15, and was ceremonially handed over at Fort Worth on April 3. This aircraft was actually the 4,500th F-16 built, and it is one of two Moroccan aircraft that will be retained in the USA until sometime in 2013. One of these last two aircraft will be used for integration tests at Edwards Air Force Base, with the other acting as a spare. The remainder of the Moroccan F-16s should be delivered by December 2012.

Morocco's F-16 buy came as a surprise, as an earlier attempt to acquire 20 Block 15 F-16s (funded by the UAE and Saudi Arabia) during the early 1990s fell through, and many had expected Morocco to order the Dassault Rafale.

Successive modernisations of Algeria's fighter arm (first with some 100 MiG-29s, and subsequently with the introduction of Su-30MKAs and Su-24 fighter-bombers) gave the Moroccan hunt for a new fighter extra impetus.





F-16 impresses in Moroccan colours.

# new kids on the Block

The French Government made an initial offer of 18 Rafales at a cost of \$3.3 billion. The US counter-offered up to 36 second-hand F-16s at a cost of just \$1.4 billion. France revised its bid, offering either 12 Rafales and 12 Mirage 2000 aircraft, or 24 Rafales for \$2.85 billion. In the end, a US offer of 24 next generation Advanced Block 52 F-16s at a total programme cost of \$2.4 billion proved more compelling. With the delivery of its first F-16s in July 2011, Morocco became the 25th country to own and operate F-16s.

The complete \$2.5 billion deal for the F-16s included the aircraft, their Pratt & Whitney F100-229 engines and Northrop Grumman APG-68(V)9 radars, and a comprehensive package of weapons, including the latest Raytheon AIM-120C7 AMRAAM beyond visual range air-to-air missiles, short-range AIM-9M Sidewinder air-to-air missiles, and both laser- and GPS-guided precision-guided munitions.

Subsequently, Morocco has requested a possible purchase of an initial 20 Raytheon AIM-9X Sidewinder air-to-air missiles, training and support to equip its new F-16s, and the US Defense Security Cooperation Agency notified Congress of this in mid-May 2012. The deal would be worth \$50 million.

Morocco is also understood to be seeking AGM-65 Maverick air-to-surface missiles and Paveway II laser-guided bomb kits for the new fighters.

The F-16 procurement raised a reaction from Morocco's enemies, with the Polisario Front – the

guerrilla movement fighting to achieve the independence of Western Sahara from Morocco – issuing a statement expressing “deep concern about the dangerous path adopted by Rabat” in the wake of the first F-16 deliveries.

Some observers took the statement as being part of a media war being waged by proxy on behalf of the Algerian government.

Though the F-16 procurement and Mirage F1 upgrade will not redress the quantitative imbalance between Moroccan and Algerian air power, it promises to give Morocco a vital qualitative edge, enhancing and safeguarding Morocco's security for decades to come.

## Resurgence in popularity

The F-16 Fighting Falcon is enjoying something of a resurgence in popularity, not least in the Middle East, with recent orders from Egypt, Iraq and Oman.

The first of 20 Block 52 aircraft for Egypt made its maiden flight on April 6 2012. The aircraft was the first of 16 F-16Cs and four F-16Ds ordered under a March 2 2010 contract, as part of Operation Peace Vector VII.

The existing orders from Iraq, Egypt and Oman should keep Lockheed Martin's Fort Worth production line open through 2015, though the company is looking for new opportunities that would allow it to keep the line busy through 2016-17, giving a smoother transition to the (delayed) higher rate F-35 Joint Strike Fighter production.

Iraq is pressing for the supply of 18 Block 60 F-16s in addition to the first batch of 18 F-16s that it already has on order, while Qatar is understood to have turned its attention away from the Rafale and towards the F-16, and Bahrain is believed to be trying to obtain more F-16s for the Royal Bahrain Air Force. The F-16 is also one of the options being considered by the Libyan Air Force.

In addition to these opportunities for new-build F-16s, there are a number of requirements for upgrades, including for the USAF (where up to 300 may be upgraded) and in Indonesia, Singapore, South Korea, and Taiwan.

In an attempt to win new orders, Lockheed unveiled a new F-16 variant, the so-called F-16V (V for Viper) at the 2012 Singapore Airshow. This new model, which could be produced by retrofit of all but the oldest existing legacy F-16s, or by new production, is broadly equivalent to the Block 60 F-16E/F Desert Falcons used by the UAE, with an AESA radar, an upgraded mission computer, and an improved cockpit layout with new displays.

Which AESA radar will be integrated remains uncertain. The Block 60 F-16E/Fs operated by the United Arab Emirates are equipped with Northrop's APG-80 AESA radar, while the Raytheon advanced combat radar (RACR) and Northrop Grumman scalable agile beam radar (SABR) have been mooted as alternatives.

The F-16V has already attracted interest, and the UAE Air Force is now said to be favouring the F-16V over the Rafale, F-15 and Eurofighter.

*Turkey is expecting to receive the first of its Peace Eagle Boeing 737 AEW&C aircraft into service by the end of this year with the three remaining to be delivered in 2013. Jon Lake looks at the programme.*

# Turkey's Eagles have (almost) landed...

All four Turkish Air Force Boeing 737-7ES airborne early warning and control (AEW&C) Peace Eagle aircraft are now flying and in the country at various stages of development. Two are fully equipped and preparations for service entry are now under way.

There have been delays and the aircraft missed its planned 2008 service entry, most recently because Israel held up the delivery of electronic support mechanism (ESM) sub-systems ordered from Elta.

The Boeing Company has begun an extensive maintenance training programme for mission support and maintenance personnel, with instructors from Boeing Defence Australia and Boeing Training and Flight Services providing classroom training for ten personnel from the Turkish Air Force (Türk Hava Kuvvetleri) and two from Turkish Airlines.

In total, 81 students are scheduled to take the same systems maintenance courses with Boeing over the next ten months and another 85 will undergo training at the Peace Eagle main operating base at Konya.

## Project Wedgetail

A further 20 Turkish Air Force personnel are undergoing mission crew training at a Boeing facility in the Seattle area.

The Boeing 737 AEW&C was originally designed to meet Royal Australian Air Force (RAAF) requirements under 'Project Wedgetail'. The aircraft was subsequently selected by the Turkish Air Force under 'Project Peace Eagle' – Barı Kartalı in Turkish – and by the Republic of Korea Air Force under 'Project Peace Eye'.

The aircraft is being marketed widely and has been evaluated by the United Arab Emirates.

The Boeing 737 AEW&C is twin-engined and based on the commercial 737-700 airliner. Though dubbed AEW&C, the aircraft is actually a more powerful and versatile tool than that name



suggests, serving as an airborne surveillance, communications and battle-management system.

Fitted with a fixed, electronically scanned radar, rather than using a rotating radar antenna like the 707-based Boeing E-3 Sentry, the 737 AEW&C's Northrop Grumman multi-role electronically scanned array (MESA) radar incorporates integrated identification friend-or-foe capabilities and the 35.5ft long, 11ft high antenna (which weighs more than three tonnes) giving 360° coverage out to ranges of more than 370km.

More than 3,000 targets can be tracked simultaneously, including airborne and maritime targets.

The system is based around a flexible, open architecture for cost-effective future upgrades, and the aircraft features an extensive communications suite and a nose-mounted receptacle confers an air-to-air refuelling capability.

By basing the AEW&C aircraft on the proven 737-700 airliner, Boeing produced a cost-effective advanced technology military aircraft with 21st century avionics, navigation equipment

and flight deck, which requires minimal downtime for maintenance and which enjoys a worldwide network of suppliers, parts and support equipment.

The Turkish Air Force ordered four Peace Eagle aircraft in May 2002, with an option for two more, along with the necessary ground support systems. The United States approved the sale in September 2003, when the total value of the contract was put at \$1.6 billion.

## Modified and tested

Boeing Integrated Defense Systems in Seattle modified and tested the first aircraft, 'Peace Eagle 1', while the remaining three aircraft 'Peace Eagles 2', '3' and '4' were modified and tested by Turkish Aerospace Industries (TAI), the primary subcontractor for the Peace Eagle parts production, aircraft modification, assembly and test programme.

TAI undertook the work at its facility in Ankara, Turkey, with the participation of Boeing and a number of Turkish companies, including Ankara-based HAVELSAN, responsible for system





Preparations are underway for entry into service. PICTURE: MAURICE O'DONOGHUE.

analysis and software support, and for delivery of the programme's ground support segment.

HAVELSAN is the only foreign company licensed to receive critical source codes.

Local participation was always a crucial element and a three-phase \$930 million industrial participation programme was agreed with Turkey's Ministry of National Defense Undersecretariat for Defense Industries, involving collaboration with Turkish airlines, government departments and academic institutions as well as industry.

Boeing completed the first phase of the programme in 2006 and announced completion of the second in February 2010, exceeding the \$270 million phase 2 requirement by \$21 million.

Boeing is confident that it will complete the programme successfully and boasts of supporting more than 1,000 direct jobs and of placing more than \$1.2 billion of work in Turkey through 2013, boosting Turkish technology and small-business activities.

The company also supported a NATO airborne warning and control system industrial participation programme in Turkey.

The first modified Boeing 737 flew on September 6 2007, after installation of the MESA antenna in March 2006. A successful first mission system flight test followed on December 12 2007, when Boeing and Turkish industry engineers tested the aircraft's internal and external communications system, establishing links with a ground-based Boeing system integration lab and local air traffic control towers.

On June 4 2008, it was announced that Turkish Aerospace Industries had completed modifications to Peace Eagle 2 at its facilities in Ankara. The first flight followed on July 16 2008.

#### Mission simulator

Boeing and HAVELSAN have also been installing vital Peace Eagle ground support centre hardware at Konya, completing installation of the mission simulator and mission support centre hardware in October and November 2009, with a software support centre following in 2010.

The Peace Eagle mission simulator featured ten consoles, with instructor operator stations and aircraft equipment rack assemblies.

The mission support centre was designed for

loading software on to the Peace Eagle aircraft and for providing initial data analysis following an operation. The hardware included mission and flight planning terminals, replay terminals, and electronic support measures workstations.

HAVELSAN designed the sub-systems, acquired the equipment and performed the three installations, while Boeing provided technical guidance and oversight.

Turkey's first Boeing 737 AEW&C aircraft made its UK debut at the Farnborough Airshow in 2010 and was subsequently shown at Dubai in 2011. One of the four aircraft is scheduled to appear at this year's Farnborough show.

The four aircraft will serve with 131 Filo at 3 Ana Jet Üssü (main jet base) at Konya, and will use the call sign 'Ejder' (dragon). They will have a flight crew of two with a mission crew of between six and ten depending upon requirements.

The Türk Hava Kuvvetleri is considering the 737 to meet its requirement for a stand-off electronic support and attack aircraft. If the 737 were to be selected, TAI and Askeri Elektronik Sanayi would convert four aircraft.



# UAE's Tractor Factor

*As Air Tractor AT-802Us continue to be delivered to the UAE, Jon Lake looks at the aircraft and its possible uses.*

**T**he UAE Air Force and Air Defence received an initial batch of 10 Air Tractor AT-802Us between November 2010 and May 2011, and further aircraft are now being delivered.

One was flown to the UAE in January 2012 and another followed in March. As many as six more have now been registered to Air Tractor, prior to delivery, almost certainly to the UAE.

The Stockholm International Peace Research Institute (SIPRI) commented that the UAE's purchase was "a remarkable low-tech choice for the high-tech UAE, and therefore possibly acquired to hand on to a less developed ally".

Certainly the aircraft does not seem to fit comfortably alongside the UAE's sophisticated Mirage 2000-9s and F-16E/F Desert Falcons.

The new AT-802Us are, however, not going to the regular air force, but to a shadowy new Special Forces air support unit being established as part of the UAE's Special Operations Command. They are based at a new airport at Falaj Hazza camp on the outskirts of Al Ain.

The Air Tractor AT-802U was developed in response to the United States Air Force's light attack/armed reconnaissance (LAAR) or light air support (LAS) programme, which was intended to provide a light ground attack and reconnaissance aircraft, though it became a requirement as a training aircraft for allied counter intelligence and close air support forces. Air Tractor estimated that its aircraft would cost half as much as other competitors.

#### Export requirement

While the USAF requirement stimulated the development of the AT-802U, it was always clear that there was a growing export requirement for such a light irregular warfare aircraft, and the AT-802U demonstrator was, therefore, displayed at the 2008 Paris Air Show.

In 2010, Lee Jackson, the chief designer at Air Tractor, announced that the company had launched production of the AT-802U surveillance, precision strike and utility aircraft for an undisclosed foreign customer. It was subsequently revealed that the UAE had become the first military buyer.

The AT-802U is a dedicated two-seat (tandem) military version of the basic Air Tractor agricultural aircraft, which has been built in a large number of sub-types, with more than 340 delivered to date.

The AT-802 is said to be the largest agricultural aircraft in

production and in its AT-802F/AT-802AF and amphibious Fire Boss forms, the aircraft is claimed to be the world's most successful single-engine fire-fighting aircraft.

Armoured versions of the AT-802 have been used by the US Department of State for counter-drug operations, spraying narcotics production facilities with herbicides and defoliants. Despite taking more than 200 small calibre hits, Department of State AT-802 aircrews have maintained a 100% safety record with no injury.

Like its agricultural forebears, the AT-802U was built to be operated from unimproved airfields, dirt roads, and even farm fields and to be maintained from the back of a truck. As such, it is able to provide direct support to ground troops operating close to the frontline, and can fly in extreme heat and dust conditions.

#### Massive fuel capacity

The aircraft's payload capability and the space conferred by the former 'hopper' provide massive fuel capacity, which could be further expanded through the use of drop tanks on wing/fuselage hard points. Even without external fuel, the AT-802U can remain on station for up to ten hours, long after other fighters or ground attack aircraft would have had to return to base or go to the tanker.

The AT-802U is configured with tandem cockpits and full dual controls. It does not have ejection seats or pressurisation.

The airframe has a reinforced wing spar (certified for 12,000 flying hours) and some nine, 11 or even 15 hardpoints under the wings and fuselage for the carriage of up to 8,000 pounds of payload, including 500lb Mk 82 bombs or GBU 12 laser-guided bombs, GAU-19/A three-barrel 12.7mm gun pods, M260 seven-round rocket launchers, AGM-114 Hellfire missiles or DAGR laser-guided rockets.

The aircraft also uses the new Moog Mini-Talon GPS/INS precision-guided stand-off glide bomb.

A retractable L3 Wescam MX-15Di sensor turret system is installed under the nose and the aircraft has a militarised, NVG-compatible glass cockpit. An optional ROVER-compatible CMDL allows live video to be streamed from the aircraft to controllers, other aircraft, or an air operations centre. The aircraft is also fitted with a Wulfsberg Flexcomm tactical modular multi-band airborne FM/AM/UHF radio communications system, which allows the pilot to communicate with practically any radio system used by ground units.





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*The 2012 European Business Aviation Convention and Exhibition (EBACE) took place in Geneva, Switzerland, from May 14-16. Alan Peaford was there to assess the impact on companies in the MENA region.*



## Longitude looks set to be an East/West winner

Cessna has added a new top-of-the-line aircraft to its product offerings with a super-midsize business jet called the Citation Longitude.

And, according to the new vice president for Europe, Middle East, Kriya Shortt, the aircraft will be ideal for Middle East owners and operators with a range capability of Dubai to London and beyond.

The Citation Longitude is an eight-passenger \$25.9 million aircraft and will sit at the top of Cessna's 16-aircraft product line, above the high-speed midsize Citation Ten. "Having a product in this sector will help us to keep loyal customers within the Citation family as they move up through our business aircraft family," Shortt said.

The Longitude will be pitched against other super-midsize models, including the Gulfstream G280 and the Hawker 4000 but Shortt said the aircraft's aggressive pricing coupled with its 4,000nm (7,410km) range will give it a competitive edge.

The aircraft will be powered by two 11,000lb

(49kN) Snecma Silvercrest engines (see sidebar) and also has a newly designed 87ft (26.5m), 30° swept wing with winglets.

The Longitude sees the introduction of a Garmin integrated avionics package to this class of aircraft. Already having made major inroads to the lighter end of the market, Cessna's decision to move away from Rockwell Collins is seen as a surprise move and a reinforcement of Garmin's ambitions to move further up the avionics food chain.

The new aircraft is scheduled to make its first flight during 2016 with certification and service entry earmarked for the third and fourth quarter of 2017 respectively.

### Snecma begins Silvercrest engine certification

Snecma is due at any time to start running the first of eight 11,000lb (49kN) Silvercrest turbofans taking part in the engine certification programme for the Longitude.

The engine will feature a 5.9:1 bypass ratio using a 1.08m (42.5in) diameter 20-blade Snecma-built fan, a four-stage axial compressor built by Techspace Aero,

### Technical specification

- 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 77in (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)

\*from forward pressure bulkhead to aft pressure bulkhead.

\*\* at full fuel payload, NBAA IFR fuel reserves (average cruise speed Mach 0.82)

a single-stage centrifugal compressor built by Turbomeca and a single-stage high-pressure turbine and four-stage low-pressure turbine, both built by Snecma.

The French company will also build the full-authority digital engine controller (FADEC) for the turbofan.

**Sitting pretty is kids' stuff for Gama** ➤

Sharjah-based Gama Aviation was in the news at the show with the business aviation launch of the world's first and only infant seat certificated for take-offs and landings.

Created by its UK engineering business, Gama Engineering, the child seat is already flying with airlines Cathay Pacific and Virgin Atlantic but Gama is now offering it to the business aviation fraternity.

"Designed to fit seamlessly with all new aircraft seat design trends, it is compliant with the requirements of TSO-C100b and is approved for installation under EASA STCs for carriage on most business jets," the company said.

■ EBACE's youngest visitor – three-year-old William Gordon – got the chance to try it out.



The Arab Wings team at EBACE.

**Biz aviation group for Africa**

Business aviation operators in North Africa now have a different association to support following the launch of African Business Aviation Association (AfBAA) at the show.

"Africa's business aviation community will have a unified voice to relay its importance to the continent's drive for growth and prosperity," said Tarek Ragheb, the founding chairman.

Ragheb, who was also involved in the formation of the Middle East Business Aviation Association (MEBAA), set out the new organisation's goals as raising safety and operational standards and creating a single voice to lobby the continent's regulators.

The new association is applying to become a member of business aviation group umbrella organisation the International Business Aviation Council (IBAC).

Jack Olcott, the former president of NBAA and former advisor to MEBAA, is acting as a consultant for the new association. "We don't see the African Business Aviation Association as competition with other groups, but rather as a collaboration," he said.

AfBAA will establish its office in Rwanda.

**Chance to eye up Arab Wings Vision**

Jordanian charter operator Arab Wings showed off the first Middle Eastern Bombardier Global 5000 to be fitted with a Vision flight deck, powered by the Rockwell Collins Pro Line Fusion avionics suite.

Speaking at the show the company said that it had taken delivery of the new variant in April and had found the aircraft to be satisfactory in service, with only minor nuisance issues reported such as a faulty smoke alarm.

The Global 5000 joins Arab Wings' rapidly growing fleet of business jets. The company launched in 2005 with two aircraft and its fleet has expanded to 20 since then.



The African business aviation group AfBAA gets underway at EBACE.





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■ **Flexible friend for Qatar Executive**

Qatar Executive could be carrying more Americans thanks to a unique deal signed by its parent, Qatar Airways, and Bombardier fractional and charter provider Flexjet.

Qatar CEO Akbar Al Baker was in Geneva to sign the partnership deal that means the airline will 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 around 80 Bombardier Challengers and Learjets.

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 and then elsewhere in the region through Qatar Executive.

Al Baker also said negotiations are continuing for 10 new-generation Bombardier Global 7000 and 8000 ultra-long-range jets for Qatar Executive.

■ **Legacy 650 delivery**

Embraer announced at the show that it has delivered the first Legacy 650 to operator FAL Aviation in Saudi Arabia.

“Following on from the type’s introduction in Jordan and the UAE, this is a clear endorsement of the market acceptance for our aircraft in the region,” said Colin Steven, Embraer vice-president, marketing and sales, Europe, Africa and Middle East.

Boasting a range of 3,900nm (7,220km), the Legacy 650 can fly non-stop to London or Beijing from Riyadh.

Owned by Sheikh Fahad al-Athel, FAL was one of the first operators of the super midsize Legacy 600.

■ Embraer said at the show that it is expecting first flight of the new Legacy 500 in the third quarter of this year. The manufacturer is developing two new models – the Legacy 450 and 500. The 500 has already carried out taxi runs and is conducting ground vibration tests, while the super-light Legacy 450 has entered its joint definition phase.

■ **Happy happy with link**

Happy Design Studio is teaming up with customised automobile specialist Brabus and Ruag to offer what it described as “exclusive business jet cabin designs, matched with ‘extraordinary’ exterior paint jobs.”

CEO, Bodo Buschmann, said: “We have been approached by a number of customers asking us to design and outfit their private jets.”

Brabus said it is focusing on the Bombardier Global Express and Challenger families, as well as Dassault’s Falcon family.

■ **SR Technics completion deal**

SR Technics has signed a second airliner completion contract for an undisclosed Middle Eastern customer.

The Mubadala-owned MRO specialist, based in Zurich, only took on its first VIP project for another Middle Eastern owner last year.

SR Technics says the Airbus aircraft will receive a full cabin refresh and refurbishment as well as IFE upgrades and a full C check.



**Record entrance for Gulfstream G650**

The world’s fastest business jet made a record-breaking debut at Geneva.

The Gulfstream G650 took time out from its test programme to meet potential buyers – many from the MENA region.

The aircraft made its first trans-Atlantic crossing flying the 3,780 nautical miles non-stop in just 6 hours and 55 minutes – which pilot Scott Buethe said should be a city-pair record.

“The aircraft’s first trans-Atlantic crossing represents a milestone in flight test and certification,” said Pres Henne, senior vice president, programs, engineering and test. “Its squawk-free performance demonstrates that the aircraft is meeting the substantial objectives we – and our customers – set for it.”

The aircraft cruised at Mach 0.90 to Mach 0.92 throughout the flight and at the 43,000ft cruise altitude, the pressurisation system maintained the cabin altitude at a comfortable 3,700ft (1,128metre).

■ Pictured, clockwise from left: Scott Buethe, senior experimental test pilot; Ahmed Ragheb, senior production test pilot; David Chalk, flight test engineer; and Rick Gowthrop, senior production test pilot.







**< Swiss roll-out new look**

Jet Aviation is to transform all of its FBOs and major MROs worldwide to introduce a fresh corporate look and feel, along with many other customer-focused enhancements.

The company – which has FBOs in Dubai and Saudi Arabia – said at EBACE that it will integrate the same design style in all lobby areas, including the reception desk, textures, colours and flooring.

The roll-out will begin in Switzerland and will move worldwide in 2014.

“These facility upgrades will provide maximum style and comfort to ensure a premium customer experience,” said Heinz Aebi, senior vice president of group marketing and communications. “Regardless of which Jet Aviation facility customers visit worldwide, they’ll recognise the Jet Aviation design and feel welcome and relaxed.”

Left: The design for the lobby for Jet Aviation’s FBOs.

**Wraps come off entry-level Learjets**



Bombardier is replacing its entry-level Learjets with two new models – the Learjet 70 and 75.

The replacements to the Learjet 40 and 45 will feature a new Garmin avionics suite, a new cabin management system (CMS) and interior, as well as an upgraded Honeywell engine, which gives the new models extended range over their predecessors. Only the airframes remain the same.

“We have preserved the look and feel of our existing Learjets but with a lot of features similar to those you would find in our Learjet 85,” said Ralph Acs, the company’s vice-president and general manager.

The replacement programme had been kept under secure wraps with the test programme already well under way. Production on the 40 and 45 will end during the first half of next year when the Learjet 75 enters service. The smaller sister should enter service towards the end of 2013.

The new aircraft’s touch-screen Vision flight deck will use Garmin avionics but will be similar to the system used on the Global 5000 and 6000.

Honeywell unveiled a derivative of the TFE731 turbofan engine to power the new Bombardier aircraft and will install winglets on the 75.

The 3,850lb (17.1kN) TFE731-40BR adds 10% more power compared with the 15.6kN TFE-731-20BR installed on the Learjet 40/45 series, said Mike Bevans, Honeywell’s technical sales director. The first two examples of the new engine have already been delivered to Wichita for the flight test programme.

The TFE731-40BR’s extra power is obtained using an identical fan and compressor sections to those of the previous model. The extra thrust extends the range from “just over 1,900nm (3,515km) to cross the 2,000nm mark”, said Acs. “It means we can get in and out of 1,524m runways comfortably and it really opens up more city pairs, especially out of hot and high locations.”



Double whammy from LearJet with replacements for the Lear 40 and Lear 45.

## Falcon 50 makes winglet debut

The first Dassault Falcon 50, fitted with Aviation Partners' blended winglets, made its debut at EBACE.

The aircraft was taking a break from winglet certification flight-testing to make the appearance.

The 'High Mach' blended winglets are a revolutionary new design optimised for higher cruise speeds. They provide a drag reduction and a corresponding range increase of 5% at Mach 0.8 and more than 7% at long-range cruise.

Joe Clark, API founder and CEO said: "We are excited to be showcasing the rebirth of the Falcon 50 here at EBACE. Blended winglets make one of the greatest business jets ever produced even better."



## Personal touch for Iacobucci seat



Iacobucci unveiled a new 21in (53cm) reclining seat for midsize business aircraft at the show.

The Italian firm had worked on the project with BMW DesignworksUSA.

The seat uses a lightweight aluminium and composite construction, can be reclined and features a USB port for charging mobile devices.

Iacobucci group marketing director Riccardo Palmeri Lolli said the seat could be customised. "There's a trend towards ever-more luxurious new jets and yet customers are getting fed up with excuses as to why things aren't possible. They want the best-looking plane and that's why you need to be able to personalise everything."

Right: Lolli looks ice cool in the new Iacobucci seat.



## Indian boost for JetAviation

The Jet Aviation Dubai maintenance operation has received CAR-145 approval from the Directorate General of Civil Aviation in India, allowing it to perform repair work on a selection of Indian-registered aircraft types.

The approval covers line and base maintenance on the Gulfstream GIV-SP, GV-SP, G200, G500, G550; Embraer 135; Dassault Falcon 900EX and 2000; and line maintenance on the Falcon 7X.

Meanwhile, the Dubai site has secured US Federal Aviation Administration approval to perform base and line maintenance A checks on Bombardier Challenger

## Crew training complete

Training company CAE announced its partner, Aircare Solutions, had completed the first round of crew member emergency procedures training in Amsterdam for customers entitled to receive the three-day courses when buying Bombardier business jets.

Bombardier began offering the safety courses with Global Express purchases in 2002. Aircare's newly-completed Amsterdam base, which operates in tandem with CAE's Challenger training operations and full-flight simulators there, includes crew training for emergency cabin egress on land and in the water, in-flight smoke and fire, in-flight medical emergencies and hypoxia awareness.

Owners of new Challengers and Global jets receive three places on the course.

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## Signature prepares for Middle East signings

*Signature Flight Support is the world's largest FBO chain with 100-plus facilities worldwide but, so far, the Middle East has been an arid region for the company. Now, as James Wynbrandt reports, all that is starting to change.*

**S**ignature Flight Support has been making quiet, steady inroads into the Middle East market and redoubled those efforts with two recent initiatives – an expansion of its Europe-Middle East-Africa (EMEA) handling support, and the launch of Signature Select, an affiliate programme that will add the company's name, training and technology to independent FBOs.

Orlando-based Signature, a BBA Aviation company, laid out its Middle East strategy at MEBA 2010 in answer to when it would open an FBO in the region.

The company said it would first need to have sales personnel in the area to build relationships, develop an understanding of the market, and then find a proper partner and promote the brand. Barely two months later, in early 2011, Signature opened a Middle East sales office in Bahrain. This April, the company announced a "further evolution, extension of that concept", adding sales offices at Luton Airport in the UK and Le Bourget, Paris, to assist Middle Eastern operators in Europe.

### Importance of the region

"The fact that the Middle East sales office in Bahrain was the first of the three sales offices thus far should speak to the importance we place on that region," said Joe Gibney, vice president and managing director for Signature's EMEA regions.

The added staff and footprint is intended to further expand the company's customised fuelling, ground handling, concierge and aircraft storage solutions.

"We can be face-to-face with customers on the same time zone," said Gibney. "We can offer seamless access from that sales representative to the global network, one phone call to the sales rep, and that person can make available our entire global network."

Karl Bowles, sales manager Middle East, based in Bahrain, is responsible for managing customer relationships for the region. He is currently developing a unique pricing programme for his customer base.

The Signature Select programme, launched in October 2011, is an affiliation scheme that will bring the Signature name and service standards to independent FBOs worldwide.

FBOs that join the programme will get training and technology from Signature to ensure the facility can meet the standards and deliver the services Signature's customers expect. The FBOs will retain its independent branding but will have a service mark denoting its affiliation with Signature, and be part of the company's marketing programme.

"We think there's going to be a lot of opportunity in the Middle East for this product," Gibney said. He offered no clues to when a Signature Select partner in the region would be named, or how many the Middle East could ultimately support, calling such information "fairly proprietary".

### Rarefied ability

Of course Signature Flight Support doesn't have to be in the Middle East to provide its FBO services to Middle Eastern aircraft, and the company touts its rarefied ability to routinely handle transport category VIP aircraft as a means of drawing traffic from the Middle East to its facilities around the world.

"One of the unique elements of the Middle East demographic is they tend to have large aircraft, in particular a lot of Boeing and Airbus products – and not just the BBJs and ACJs but more traditional transport category aircraft, up to Boeing 747s," Gibney said. "It's quite important for the handling company to have that capability and Signature has a full complement of expertise across the board in dealing with transport category aircraft." Gibney singled out Signature FBOs at Le Bourget, Heathrow and Newark as locations that handle VIP aircraft as large as 747-400s, frequently from the Middle East, on an almost daily basis.

The company expects its new TailWins customer loyalty programme will also help attract business from transient aircraft from the Middle East. Aimed at pilots, TailWins will award points for fuel and handling service purchases redeemable for merchandise from a regionalised online catalogue.

Signature has also been developing the understanding of the region it talked about acquiring in 2010. A prayer room at its FBO in Le Bourget is one illustration the company points to.

"Any company that's truly global in nature will tell you it's important to understand the regional cultural differences," said Gibney. "We certainly do that, across our entire network."

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# GOING FOR BROKE

## WHAT HBC'S BANKRUPTCY COULD MEAN FOR THE MIDDLE EAST

*Hawker Beechcraft Corporation's (HBC's) Chapter 11 bankruptcy filing in early May left owners, operators and prospective buyers of Hawker business jets and King Air turboprops wondering what happens now? James Wynbrandt reports.*

**S**uperior Aviation Beijing's (SAB's) planned purchase of Hawker Beechcraft Corporation (HBC), announced in early July, and HBC's bankruptcy filing in May, have left owners, operators, and prospective buyers of Hawker business jets and King Air turboprops around the world wondering what the bankruptcy and potential sale means for them. Those questions may echo more loudly in the Middle East, where Wichita's HBC has made a concerted effort in recent years to raise its profile and increase its sales. Other than the purchase price (\$1.79 billion), publically disclosed elements of the acquisition by China's SAB are sketchy, and the deal is far from done. But the more immediate impact of the bankruptcy on HBC's operations were addressed at the annual European Business Aviation Convention and Exposition (EBACE) in Geneva in May. HBC turned its press conference at the expo into a tutorial of American bankruptcy law, capital financing, and HBC's prospects going forward.

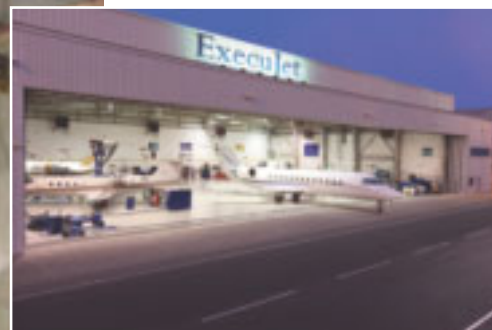
At HBC's EBACE press conference, Sean Vick, executive vice president of customers noted that "Chapter 11 protection should not be confused with liquidation or insolvency. There is simply too much value in Hawker Beechcraft, its people, products and brands to allow that to happen."

But how did the bankruptcy happen in the first place? That stems from investment firms Goldman Sachs' and Onex Partners' purchase of Hawker Beechcraft in a leveraged buyout in 2007, leaving the company with \$2.5 billion in debt and \$125 million annual interest payments. At the time of the purchase annual business jet sales amounted to some 1,600 units, with projections of 15% annual growth. But in the aftermath of the 2008 financial collapse, sales plunged 65% and aren't expected to recover to 2008 levels until late in this decade. Vick said HBC's problems had deepened over the previous three to four months, as some suppliers, concerned about the company's solvency, cut back or stopped deliveries, bringing some production lines to a half.



**Sean Vick: "Chapter 11 protection should not be confused with liquidation or insolvency. There is simply too much value in Hawker Beechcraft, its people, products and brands to allow that to happen."**

Continued  
on Page 58



The production line in Wichita continues despite the financial crisis.  
Top: ExecuJet in Dubai is the service centre for HBC. Below: The HBC corporate centre.

#### CONTINUED FROM PAGE 57

"Someone asked how many parts it takes to build an airplane." Vick said, before adding dryly: "All of them."

HBC's Chapter 11 bankruptcy has allowed the company to continue operating while restructuring its debt and financing and entertaining offers from potential buyers. Under the terms of the Chapter 11 reorganisation, creditors will exchange their debt for ownership of the company, and have also extended \$400 million to finance ongoing operations while the restructuring is concluded.

"Investors who know Hawker Beechcraft best, trade debt for equity, but lend even more," Vick summed up. "That's confidence in the long term value of Hawker Beechcraft. Now that we have entered Chapter 11 - a well-defined and structured process - we're well positioned for the future."

#### Service centre

For now, Goldman Sachs and Onex, which each owned 49% of Hawker Beechcraft, retain small positions in the company. Vick said in the near term the company will "continue to operate and to meet all customer commitments; restore our supply agreements; operate our production line; develop and finalize our reorganisation plan; and emerge from bankruptcy."

That's welcome news in the Middle East, where since 2008 HBC claims some 34% of the region's turbine sales with its Hawker line of business jets, and about 88% of turboprops through its King Air series aircraft - an almost quadrupling of its sales

over the previous five years. Last year HBC awarded full Authorized Service Center (ASC) status to ExecuJet Dubai, adding more than \$3 million in parts to its inventory, helping to ensure faster parts deliveries to customers in the region.

Asked about the impact the bankruptcy would have on support for HBC aircraft, Mike Berry, managing director of ExecuJet Middle East, said, "We are committed to meeting the needs of Hawker Beechcraft owners in the region and will be monitoring developments to ensure the fleet is supported appropriately." Berry said work on HBC products accounts for "between 12 and 15% of our MRO business," adding, "We have seen no impact to our MRO business supporting Hawker Beechcraft in the Middle East since the Chapter 11 filing."

Arambasco in Jeddah, Saudi Arabia is also an HBC authorized service centre. In addition to authorized service facilities, HBC recently enhanced its backoffice support capabilities in the region, opening an expanded office in Dubai's Jumeirah Lake Towers and adding a contracts specialist, technical representative, vice president of sales, and two sales associates to its staff.

Concurrently with its increase in sales, HBC has raised its profile in the region through sponsorship of events such as the Emirates Airline Invitational Pro-Am Golf Tournament in Abu Dhabi and the Abu Dhabi Grand Prix. HBC told *Arabian Aerospace* it will continue its sponsorships in the region.

As to what will enable the company to survive in an era of reduced sales, whether under SAB or

some other new owner, Vick said the company has been transformed into a much more competitive organisation over the past three years, having made significant investments in lean manufacturing and employee training, and having reached critical labor agreements with its workforce.

He also pointed to bright spots on the horizon: the Hawker 400XPR and 800XPR upgrade programs are on schedule, with the first flight of the Hawker 400XPR taking place on May 3rd, the same day as the bankruptcy filing.

#### Preparing to bid again

Meanwhile the company is preparing to bid again on the U.S. Air Force contract for a light air support aircraft with its AT-6, following the Air Force's cancellation of its contract with Sierra Nevada for 20 Super Tucanos made by Brazil's Embraer.

If the SAB sale isn't consummated, HBC has other suitors. Textron, Cessna's parent company, and Brazilian airframer Embraer are among the companies that have expressed interest in Hawker's assets. Bids have already been received by the bankruptcy court for various portions of HBC but have not been made public. HBC lawyer Patrick Nash Jr. told a federal bankruptcy court in May, "Depending on what [offers] we get, this case could become even more interesting." But given the value of the brands and their unique capabilities, owners and operators in the Middle East can remain confident that whatever happens to the company, the Hawker and King Air lines will remain alive and well supported.



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# HOT PROPERTY

## MD Helicopter interest in Middle East heats up

It's the much-vaunted ability of MD's light single- (MD 500E; 530F; 520N; and 600N) and light twin-engine (Explorer) helicopters to handle high and hot conditions that appears to make the Middle East the perfect target.

"We definitely see the Middle East as a growth area. Our helicopters are suited for that environment," said Benjamin Weiser, executive VP, business development and sales, MD Helicopters.

"On hot, 40 degree centigrade days in Qatar, our helicopters are able to take off and fulfil their missions."

As part of its regional marketing initiative, a dedicated Middle East sales director is scheduled to join the company by this July. "We're putting our money where our mouth is and we're going to unleash him on the Middle East," Weiser said.

### Military markets

MD will concentrate initially on emergency medical services (EMS) and military markets. As for potential VIP sales, Weiser noted: "We have very luxuriously appointed VIP corporate copters, with leather seats and carpeting, DVD players and wet bar."

But he added that the great majority of such purchases are made for use in dense urban regions where ground transportation is challenging citing Sao Paulo, Rio and New York as examples. "When you look at the Middle East, that's not that big of a problem. When those guys invest money [in an aircraft], it is more in

*Arizona-based company MD Helicopters is targeting the region as a key market. James Wynbrandt finds out why.*

business jets. But I definitely think that is a market that could expand."

For the EMS market, the company is touting its light twin 902 Explorer, featuring a wide door for getting patients in and out, and wide cabin and flat floor. Several improvements are in the works. A lightweight modular interior built by Austria-based Air Ambulance Technology (AAT) will reduce weight and increase utility, and in February the company received FAA certification for installation of Garmin G500H glass panel avionics suites, available for both new aircraft and retrofit installations.

Significant performance enhancements are also forthcoming: extended range (430-450nm vs. current 290nm), endurance (4.0-4.5 hrs.), and an increase in maximum gross take-off weight to 6770lbs from the current 6500lbs. The increase will apply retroactively to all MD 902s.

Improvements will be implemented in 2013-2014. "We're doing the engineering right now," Weiser said. "We are investing a lot in our Explorer."

The company had anticipated notching more sales in the region's EMS arena by now. At HAI's HeliExpo in February 2011, MD president and CEO Lynn Tilton reported the company was

close to signing a ten-year contract with a six-nation Middle East EMS provider for 50 to 75 MD 902 helicopters and aftermarket support, and had advanced its sales agent "good faith" money to help consummate the sale. (Presumably this publically acknowledged payment was in full compliance with US Foreign Corrupt Practices Act.) At HeliExpo this year, Tilton said the deal had fallen apart for reasons the company was still trying to determine and that it was trying to recover the money it had advanced.

Weiser confirmed the funds had yet to be returned and had no comment as to whether the company would pursue legal action for recovery.

### Opening a path for sales

One of MD's successes of 2011, its Department of the Army Rotary Wing Primary Training Aircraft contract to supply the US Army with six 530F trainers for the Afghan Air Force, is opening a path for military sales in the Middle East.

The six contracted helicopters arrived at Shindand Air Base in Herat Province in December; the delivery completed four months ahead of schedule.

MD also provided two Merlin Flight Simulation Group flight training devices, constructed three hangars for the aircraft at their base, and continues to provide logistics support as part of the contract. As of early June the six aircraft had surpassed 830 hours and the Army reported a 100% fleet availability rate since entering service, according to MD.





With a growing reputation for hot and high performance, MD is looking to expand in the MENA region

The US Army contract includes an option for 48 additional 530Fs (total value with all the options exercised of \$186 million), with 12 of the optional aircraft earmarked for the Saudi Air National Guard. The deal with Saudi Arabia is now far enough along that MD is “already leaning forward, starting to build those up”, according to Weiser.

Contract signing for the 12 Saudi 530Fs was expected as *Arabian Aerospace* was going to press. Helicopter deliveries would be likely to begin in late autumn this year and the contract would include provisions for establishing training facilities. US Army flight instructors would provide training assistance, as they do for Afghan helicopter pilot trainees.

The location of the Saudi base has yet to be determined, Weiser said. Some Saudi pilot training will be conducted at MD’s facilities in Mesa, Arizona.

More significantly for military sales, the company unveiled an armed upgrade of the 530F, the MD 540F, in April at the Army Aviation Association of America conference in Nashville.

A cross between the 530F and the heavier MD 600, the 540F is the first new aircraft launched by MD Helicopters since Tilton’s private equity firm, Patriarch Partners, acquired the company in 2005. Designed to compete for the US Army’s armed aerial scout (AAS) programme, the platform will be likely to appeal to foreign militaries seeking a low-cost, reliable armed reconnaissance helicopter.

Armaments could include Hydra 70mm

rockets, laser-guided rockets, Hellfire missiles, 7.62mm minigun and 50caliber machine gun.

Based on the 530F airframe, the 540F will have a flight display and weapons management system from Elbit Systems. The six-blade rotor (as opposed to five on the 530F) will be driven by a Rolls-Royce 250-C30HU turboshaft engine with full authority digital engine control (FADEC) and heavy-duty skid landing gear from the MD 600 to accommodate a 4,000lb max take-off weight – 900lbs better than the 530F.

The cockpit will feature dual multifunction displays. A helmet display and tracking system will enable pilots to operate the aircraft’s targeting FLIR with a laser designator.

#### Lethal package

“We’re offering a very lethal package,” Weiser said. “We want to make sure there is minimal collateral damage. It will be a very precise aircraft.”

As for its performance benchmarks, “first and foremost, 6,000ft at 95 degrees hover capability with full mission load”, Weiser said. “That’s why we need the better lift of six blades and a beefier engine.”

The company expects certification in Q1 2013. In the interim, MD is also looking at bringing some of the 540F’s lethality to the 530F. “The 530F is a very capable helicopter, we’re offering that around the world, and many of the [540F’s] weapons we can put on the 530F,” Weiser said.

MD also plans to highlight its no tail rotor (Notar) technology used in the MD 520N and 902, which the company – and many in the

industry – see as a major selling point. The anti-torque, FOD-resistant directional control system uses vented engine exhaust gas to counteract the torque of the helicopter’s main rotor, thus eliminating the need for a tail rotor.

“The facts are that 21% of all helicopter-related accidents are due to the tail rotor,” Weiser said. “Just by buying a Notar [helicopter], one-fifth of potential accidents are gone. You combine that with the reduced maintenance benefits. A tail rotor is another dynamic component that causes stress on the airframe and can malfunction, and adds to your total life-cycle costs.

“The third benefit is the smoothness and quietness of the ride,” Weiser continued. “A rotating rotor will add vibration. Notar helicopters are very quiet and smooth.”

Even without the anticipated uptick from Middle East sales, MD appears on a growth path. Weiser said the company has expanded its workforce by more than 20% and is doubling its deliveries this year. It anticipates further hiring in 2013.

The growth in the workforce is attributable solely to increased production and not to the insourcing efforts the company has promoted in the past several years in an effort to gain greater control over production, Weiser said. He declined to cite sales figures for its various models but said the single engine line as “doing really, really great.”

Sales to the twin 902s may follow suit, now that the company has the Middle East in its sights. “There is no doubt the Explorer is the best helicopter for that region,” said Weiser.



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The Cayman islands have a lot to offer and are looking to attract the big fish from business aviation.



# Why the small fry attracts the big fly

**Liz Moscrop**  
*examines  
different  
options for  
business jet  
registration.*

**W**hy register your business jet offshore when you could opt for a ticket from your own country's authority?

Other than saving money, there are several good reasons why owners may choose a different jurisdiction.

Several owners in the Middle East have selected reputable states such as Aruba, the Bahamas, Bermuda, the Cayman Islands, Malta and even the Isle of Man as their registry of choice.

Offshore registration permits owners to form a corporation in the registering country that can own and operate the aircraft without any requirement that it be based and primarily used in the issuing country. Such flexibility means that in recent years Bermuda, the Cayman Islands, the Bahamas, and Aruba have become recognised business addresses for corporate aircraft for many multi-national companies; and the number of types such as Gulfstream IVs and Boeing Business Jets registered under their auspices is increasing.

According to James Cooling, a US-based aviation lawyer,

the aviation authorities in these offshore countries are knowledgeable, friendly, and fluent in English.

Bermuda and the Cayman Islands operate under the UK Overseas Territories Civil Aviation regulations. Although Aruba became constitutionally autonomous from the Netherlands in 1986, the Aruba Aviation Act is in the Dutch language, with an English translation available upon request. According to David Colindres, VP international projects for Aruba, it is also the only offshore registry that has recognised the Cape Town Convention – an international agreement that provides additional security to lenders.

Depending on the citizenship of the aircraft owner, and where the aircraft will be based, there can be tax advantages to offshore registration.

Value Added Tax of 20.5% in Europe on a Boeing Business Jet is a lot of money in anyone's books. However, registering in a country such as the Cayman Islands is beneficial in that its jurisdiction imposes no income, profit, sales or usage taxes.

There are other benefits to offshore

Continued  
on Page 64

### CONTINUED FROM PAGE 63

registration for certain types of aircraft. For example, if an aircraft has not been certified to European Aviation Safety Agency (EASA) standards, it cannot be registered in an EEC country. However, it could be registered offshore, if it were certified by the FAA and is eligible for an FAA certificate of airworthiness (CoA).

Any aircraft registered on an offshore ticket must meet either US FAA or EASA standards, and maintenance must be performed by an FAA-approved Part 145 or EASA Part 145 maintenance organisation. This helps with resale values.

Noise pollution can be another factor lending itself to offshore registration. Some countries do not allow Stage II aircraft and Stage I over 75,000 MW on their aircraft registry. The EU has pledged to ban future registration of certain large commercial hushkitted and re-engined aircraft. However, Aruba, for example, does not have the same noise regulations as the US or European communities.

#### Liability exposure

According to Cooling, offshore corporations that own offshore registered aircraft may also reduce their liability exposure in the event of an incident. He stressed, however: "Aircraft owners should consult with their own liability counsel regarding their individual circumstances."

There are certain guidelines to adhere to when registering offshore. An application to register an aircraft in Bermuda has to come from a Bermudan resident or corporation registered on the island. Many aircraft on the Bermuda registry are owned or leased by companies formed solely for the purpose of owning and operating an aircraft under a Bermudan ticket. These are generally referred to as "exempted companies" because they are exempted from local ownership requirements.

All aircraft must meet CoA standards. Generally the director of civil aviation will accept US FAA, Canadian or EASA standards. Costs to register are based on the aircraft's weight. A Bermuda-registered aircraft may be purchased and based outside of Bermuda. Registration marks are prefixed VP-B or VP-Q and followed by



**Richard Smith: "The CAACI procedures are not unduly complicated and the fees involved are competitive."**

the two letters assigned to the specific aircraft.

The registration process for the Cayman Islands is very similar to the Bermudan process. The Civil Aviation Authority of the Cayman Islands (CAACI) accepts aircraft only operated in the "private category", which is very similar to the FAR Part 91. Applications take two to three weeks to process and the CAA performs an airworthiness inspection at the place where the aircraft is located, which does not have to take place in the Cayman Islands.

Director-general Richard Smith said: "The CAACI procedures are not unduly complicated and the fees involved are competitive. However, it is the CAACI's assistance and professionalism in abiding by and ensuring adherence to the standards set which makes the real difference. This has afforded us the excellent reputation we enjoy internationally today."

Cayman-registered aircraft must be maintained by an approved FAA or EASA Part

145 maintenance facility. Registration marks for the aircraft are prefixed VP-C and followed by the two letters assigned to the specific aircraft. Operators interested in conducting commercial operations should contact CAACI for information concerning application for an air operator's certificate (AOC).

The registration requirements in the Bahamas are coordinated by the Department of Civil Aviation. Registration is very similar to Bermuda and the Cayman Islands, but is much cheaper. The registration marks for the aircraft are prefixed C6 and followed by the three letters assigned to the specific aircraft.

Aruba is an overseas territory of the European Union. Although it is situated in the south-western Caribbean, it is officially part of the Netherlands. The Department of Civil Aviation in Aruba has a similar registration policy to its offshore counterparts, and has proved such a popular flag that the Aruban government has opened an office in Miami, Florida. Registration marks for the aircraft are prefixed P4 and followed by the three letters assigned to the specific aircraft.

The Isle of Man Aircraft Registry is now five years old and home to 500 aircraft, including 259 business jets from all the world's business jet manufacturers, plus airliner variants from Airbus and Boeing. Business aviation makes up the lion's share of aircraft on the IoM ticket. Some 17% come from countries outside Europe, or other offshore registrations.

#### International reputation

The country has an international reputation as a tax-efficient but responsible and co-operative jurisdiction and appears on the OECD 'white list' of countries complying with the global standard for tax cooperation and exchange of information.

Like the other authorities mentioned, it offers high regulatory standards; high service levels and quality international reputation; and a neutral nationality registration prefix. Financially, the IoM is a secure mortgage register, with no insurance premium tax. It also offers a professional infrastructure with experience in aviation finance, and is a Standard & Poor's and Moody's AAA-rated jurisdiction.

Malta, meanwhile, is not an offshore jurisdiction; rather it is an EU country. Yet it still offers tax efficiencies for those choosing to register aircraft there. It does not impose a withholding tax on lease payments if the lessor is not a tax resident of Malta, and also boasts no insurance premium tax.

Smith concluded: "The Cayman Islands registry observes various treaties and implemented legislation to meet with internationally accepted anti-money laundering and due diligence standards. Such advances have been balanced against preserving the privacy of clients and provide the assurance and peace of mind sought after when selecting the jurisdiction that is right for registration of an aircraft."



**Offshore registration offers professional service and access to areas that some national registrations don't.**



## Virgin announces plans for Spaceport Abu Dhabi

Virgin Galactic is to set up Spaceport Abu Dhabi in the UAE – its first spaceport to be set up outside the USA.

Announcing the venture at the Global Aerospace Summit, Virgin Galactic chief executive George Whitesides said that the UAE-based facility would become a hub for space tourism, research and education in the region.

The plan now is to find a suitable location and start the regulatory processes needed to allow space flights to take place. Steve Landeene, Virgin's director at Spaceport America from 2009 to 2010, will oversee the task as chief adviser on the project.

Virgin Galactic's New Mexico spaceport will be finished in about 12 months and flights are likely to start in 2014. The new spaceport in the UAE is a logical step as the company's biggest backer is Abu Dhabi-based Aabar Investments, with which it paired in 2009.

Whitesides also said it has partnered with Abu Dhabi's Zayed University on a new intern programme. This summer its first student, an unnamed young woman, will work with the brand team at Virgin Galactic's London Office.

"Just as the Apollo programme inspired youngsters to want to study maths and science, we want to inspire the next generation of would-be astronauts," Whitesides said. "Perhaps one day we will see a future generation of our spaceships fly from here in Abu Dhabi to New Mexico in no more than an hour," he added.

Virgin Galactic has now signed up its 500th passenger for its future \$200,000 sub-orbital flights out of the USA. It has also signed its first space research agreements, one with NASA, and is producing parts for another spaceplane.



## Satcom Direct to open office in Dubai

Florida-based Satcom Direct is to open a new office in Dubai to better service the growing demand for airborne connectivity in the MENA region.

The office, at Business Bay, Burj Khalifa District, will offer consultancy, training and support services.

The company supports Inmarsat, Iridium and ViaSat Yonder satellite connectivity and is also a reseller of SITA's VHF data network.

Supported services include Inmarsat's "classic" Aero-H, Aero-I and Swift-64, as well as Inmarsat's L-band SwiftBroadband.

Satcom Direct has also been appointed as a distribution partner for Inmarsat's future Global Xpress Ka-band service, which will begin launch in 2013 with full implementation in 2014.

David Greenhill (left), president and co-owner of Satcom Direct, said the company is seeing significant growth in the use of airborne satellite connectivity.

"In 2008/2009 business was tough, as it was for all of us, but in the last couple of years we have seen tremendous growth, especially with SwiftBroadband," Greenhill said. "The data traffic for business aviation has doubled."

The company also specialises in satcom integration – enabling cabin network hardware and software to work together.

The new Dubai office follows the official opening of Satcom Direct's other new office at Hangar 2 at TAG Farnborough Airport in the UK in June. Greenhill said that the Farnborough office will offer support and consultancy services and act as a springboard for Satcom Direct's further expansion into Europe.

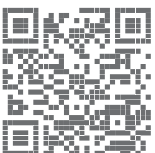
The company is to open another office in Sao Paulo, Brazil within the next couple of months and have a facility in Hong Kong within a year.



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*While Libya is still a hotspot following the NATO strikes that drove out the Gadhafi regime, it is now slowly picking up the pieces.*

**Marcella Nethersole** reports.

# REBUILDING A NATION IN RUINS...

**A**ccording to Dr Yousuf Al Wahaishi, the minister of transport for Libya's interim government, change is not an overnight thing.

But the war-torn country's government is now looking at future developments, which include the infrastructure at its airports, and the possible merger of its airlines.

National carriers from countries around the MENA region and Europe are beginning to open up routes to Tripoli and the new "hot town" of Benghazi as the business pathfinders make their way to north Africa.

The tourists and workers will not be far behind.

Dr Wahaishi was the key speaker at the 'Future Libya Development Forum 2012' in Dubai in June where he addressed potential investors and entrepreneurs.

"UAE companies want to move fast to establish themselves in Libya before rivals from other Gulf states and the rest of the world pile into a country that has a lot of oil revenue," he said. "On the political situation in Libya, life will stabilise.

"To reform a whole country will take some time, even a few years. It cannot be done in a few months.

"There is no trade agreement yet and that will take some



time but there is a lot of goodwill and the Government is keen to see the country transform.

"Strategically, Libya sees itself as a regional hub between the Arab world, Africa and Europe, and the new authorities are anxious to build long-term relationships that will help them fulfil this aim."

Continued  
on Page 68





CONTINUED FROM PAGE 67

Part of this regional strategy is that Tripoli airport is being rebuilt with a focus on working as a hub airport, carrying passengers and goods through Libya, rather than as a destination in its own right.

"Work on Tripoli International Airport will restart within a few months," said Al Wahaishi. "And we will have an open skies policy when we get going."

Huge investments are likely in banking, finance, infrastructure, oil, gas, power, health, education and agriculture sections – but they also will need long-term operators.

"We will start to look for strategic partnerships that will operate for 10 to 15 years. We will welcome companies with acknowledged skills in managing ports," said Wahaishi, who added that several of Libya's ports, like Misrata and Benghazi, needed major restoration after the impact of the recent revolution.

Once the skies are open again, the country can look forward to welcoming visitors and already route developers are looking carefully at the prospects.

At the moment, business travellers still account for the majority of visitors with the oil industry regrouping but the new government hopes the doors will soon swing open safely for tourists, too.

Before the regime Libya did receive tourists – but only as part of an organised tour. This might well be the case again in the foreseeable future. Libya is a vast country covering many different terrains, so venturing out alone should not really be considered.

Libya's history dates back to the Stone Age, starting between 10,000 BC and 2000 BC. There is evidence of life during these times on paintings and engravings on stones inside mountain caves, which are mainly located in the south of the country.

The country is home to some of the most important and richest ruins of ancient Roman and Greek cities.

Five areas have been declared as world heritage sites by UNESCO, including: Sabratha, Cyrene, Ghadames, the prehistoric paintings of Akakus, and the most famous site of all, Leptis Magna – which was founded by the Phoenicians in the 10th Century BC.

Bordered by five other countries, Libya also sits on the Mediterranean. Its coastline is a huge 2,000km and offers beautiful pristine beaches, the best being found near the cities of Zwara and Telil, on the northern coast, and Farwa Island Beach located in Sabratha city, which is covered with velvety white sand and swaying palm trees.

Of course, Libya is accustomed to idyllic sand scenery. It is home to the mighty Sahara desert, with 90% engulfing the country. Visitors can look forward to experiencing the desert and visiting old oasis towns such as Ghadames and Ghat, as well as visit the extinct volcanoes at Waw al-Namus, where black sand surrounds multi-coloured lakes.

*Libyan Airlines is battling back after the devastation of the country's uprising. Martin Rivers talks to the man leading the recovery – CEO Khaled Taynaz.*

# Airlines begin the climb back

Of all the images broadcast during the Libyan uprising, few encapsulated the chaos of war more than the charred tailfin of an Afriqiyah Airways Airbus A300 – caught in the crossfire as rebel fighters descended on Tripoli International Airport.

Alongside the grave humanitarian toll of the eight-month conflict, Libya's fledgling civil aviation infrastructure was razed almost beyond recognition.

Just two of Afriqiyah's aircraft emerged from the war unscathed and sister flag carrier Libyan Airlines fared no better at escaping the carnage.

The older state-owned airline lost one A300 and one Bombardier CRJ900, in addition to suffering gunfire and mortar damage on its remaining seven CRJs and four Airbus A320s.

## Repair work

However, Libyan Airlines CEO Khaled Taynaz says repair work on the fleet is now nearing completion.

"The A300 was completely destroyed. It turned into ash," Taynaz confirmed. "We have fixed five CRJs with Lufthansa but unfortunately one of them was beyond repair. By the end of March we should have seven CRJs flying to the deserts – we have already signed contracts with the oil companies for them."

Additional repair work on the A320s has since been completed by Air France Industries KLM Engineering & Maintenance. The MRO firm inked a five-year deal to service those aircraft, as well as two ATR 42s and three yet-to-be-delivered A320s, two of which will arrive this year. Another two Airbus A330s will enter service in 2013, Taynaz said.

With the flag carrier making swift progress in restoring its fleet, the CEO has begun turning his attention to future plans – including a possible CSeries order.

"We had an offer from Bombardier, who said



**Khaled Taynaz: "Europe will be the most suitable region to build our future network."**

we might replace our current CRJ900s and substitute them with the new CS100 and CS300," he said. "The holding company [Libyan Afriqiyah Aviation] asked me to make a study, and it's a very nice aircraft. So I find this a very good offer and a good deal for us. But not before 2015."

For now, Taynaz insisted, Libyan will focus on restoring its pre-conflict route network and completing its long-awaited merger with Afriqiyah.

In its heyday during the 1970s and early 1980s, Libyan Arab Airlines (LAA), as it was then known, served an array of European cities with its former fleet of Boeing 707s and 727s.

The airline underwent a dramatic contraction following the terrorist bombings of Pan Am Flight 103 over Lockerbie, Scotland, and UTA Flight 772 over the Sahara Desert. With the international community holding Libyan dictator Muammar Gaddafi responsible for those atrocities, United Nations Security Council Resolution 748 imposed heavy sanctions on the country in 1992.

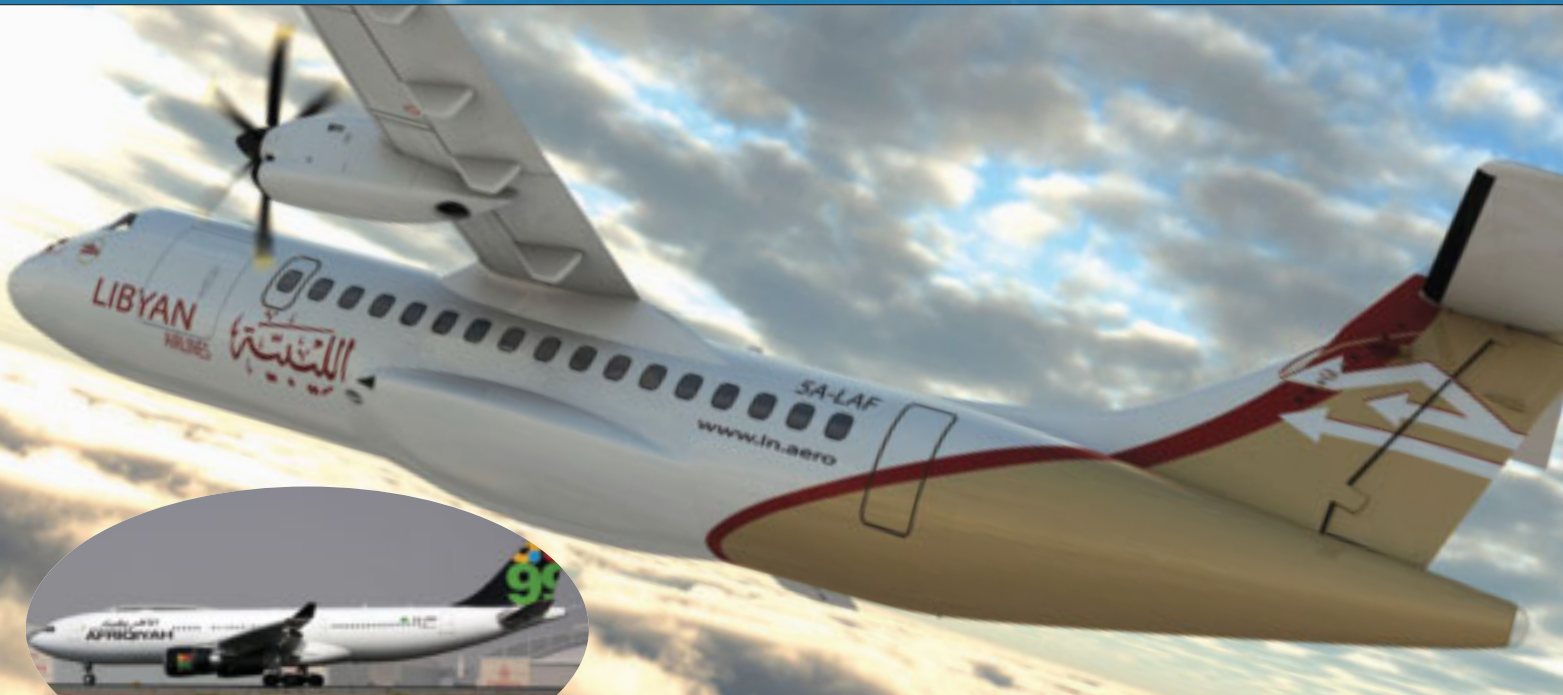
## Bridge-building

For almost a decade, trade embargos prohibited western aircraft purchases and denied LAA landing or over-flight rights to any international destinations. The airline became a solely domestic operator and it was not until 1999 that a new era of bridge-building allowed LAA to resurrect overseas flights and acquire new Airbus, Bombardier and ATR aircraft.

Though some European cities had re-entered its route network in the years preceding the Arab Spring, Gaddafi's decision to create a second flag carrier, Afriqiyah, slowed such progress. With the dictator now gone, Taynaz said a wholesale return to Europe is on the cards.

"The first thing we want to do is re-establish our old network, which was stopped during the war,"





Although many aircraft - such as the ATR - survived the war there was plenty of collateral damage for the two Libyan airlines.

he confirmed. “Our fleet development plan will see us go to most major European capital cities and then move east towards the Asian continent.”

Popular pre-war routes such as London, Manchester and Paris are top of the list, Taynaz said, followed by other key business destinations like Zurich, Frankfurt and Warsaw.

However, restoring the network will take time. The CEO said connections with Turkey and East Asia must be first developed – facilitating an influx of foreign labour to help re-build the war-torn country – after which time the spotlight will fall on European business centres.

“Economically, Europe will be the most suitable region to build our future network,” Taynaz affirmed. “Of course, that will also work on the political side.”

Others point out that for Libyan to re-claim its former glory, significant investment must be made in the country’s long-neglected airport infrastructure.

Though little can be achieved before a permanent government is in place, there are positive signs coming from the National Transitional Council (NTC). Interim transport minister Yousef El Uheshi has said reviving the country’s transport hubs will be a top priority for the new authorities, raising expectations that a 2007 plan to expand Tripoli Airport will be resurrected this summer.

That blueprint would see the gateway balloon to an annual capacity of 20 million, up from just three million, and yet for now NTC forces do not even have control of the airport. At the time of going to press, it remained in the hands of the Zintan rebel fighters who had expelled Gaddafi’s army.

Another priority for the new government will be the merger of Libyan and Afriqiyah. Taynaz was tight-lipped about the process, insisting that the transport ministry will ultimately decide how best to combine the flag carriers. But he confirmed that the new airline will retain the Libyan brand, adding that a study by IATA predicted the merger will take “at least 18 months” to complete.

“It’s not an easy task to merge two companies like this,” Taynaz warned. “Around 18 months is just an estimate. Afriqiyah’s offices all burned during this war, so it’s very difficult.”

With so many challenges on the domestic front, it is little wonder that the NTC was eager to court foreign airlines when its airspace re-opened in October.

**Flag carrier**

Regional carriers Turkish Airlines, EgyptAir and Royal Jordanian were among the first to return, along with Alitalia, the flag carrier of Libya’s former colonial power. Other European airlines have since joined the rush. Lufthansa and Austrian both now serve Tripoli, while British Airways and bmi are due to launch flights by this summer, and KLM later in the year.

The influx of foreign carriers had fuelled concerns the NTC was granting landing rights too hastily, leaving Libyan and Afriqiyah at a competitive handicap due to their fleet repairs. But Taynaz recalled how it was one of the Middle East’s most ambitious airlines, Qatar Airways, which provoked the strongest test of Libya’s weakened aviation sector.

“Qatar approached Libyan Airlines with a big project to make Benghazi a hub for Qatar

Airways,” he explained. “They said they intended to help Libyan Airlines become bigger, but under the umbrella of Qatar Airways.

“Of course we couldn’t accept that, because we are an independent country. It’s not good for the Libyan people. We can do it ourselves with our money.”

Rather than surrendering its second hub to a foreign flag carrier, Libyan is instead conceiving a skeleton plan, which will ultimately see it rival the scale of the formidable Gulf carriers. “That is what we are looking forward to,” Taynaz confirmed. “We have the money to be like Qatar Airways eventually.”

With that goal in mind, signing open skies treaties is unlikely to be a priority for the incoming authorities. Afriqiyah CEO Rammah Ettir has spoken about how decades of under-investment will have left the flag carriers at a disadvantage in fully liberalised sectors. Taynaz agreed, saying bilateral agreements will only come once Libyan has re-established its network.

Amid all the talk of hub expansion and competitive regulation, it is easy to forget that Libya remains a long way off restoring peace and stability.

On-going militia activity was highlighted in dramatic fashion last November when armed men surrounded a TunisAir flight on the tarmac at Tripoli Airport – a stunt designed to exert pressure on the interim authorities. In January, a crude bomb was allegedly found aboard a Libyan plane in Cairo, though the CEO expressed doubts about the authenticity of that report.

Notwithstanding such challenges, the very fact we hear about these incidents bodes well for the country’s democratic aspirations. “This is the new Libya,” Taynaz concluded. “Nothing is hidden.”



# THE RISE AND FALL OF



The Royal Libyan Air Force (Al Quwwat al Jawwiya al Malakiya al Libiyya) was established in 1951, when Libya gained independence.

Initially equipped with three Lockheed T-33 trainers and six Douglas C-47 Dakota transports, the air force received its first frontline fighters in 1967, in the shape of eight Northrop F-5As and two F-5Bs.

Eight further aircraft were to have been delivered in 1970 but this was cancelled following the September 1969 coup, which saw Colonel Gaddafi overthrow King Idris and form the new Libyan Arab Republic.

Libyan relations with the USA and the UK declined rapidly and the USA withdrew its F-5 training detachment and a Northrop support team in June 1970.

By then, France had stepped into the breach, signing a contract to supply the first of an eventual total of 110 Dassault Mirage 5s in January 1970.

Replacing a planned force of 18 F-5s with more than 100 Mirage 5s would seem extraordinary, but Libya always intended to transfer large numbers of these aircraft to Egypt, for use in a war against Israel.

The next 40 years or so witnessed a rollercoaster

*In the aftermath of the 2011 civil war Libya was effectively left without an air force and the nation is only now taking the first, hesitant steps towards re-establishing something appropriate for its new situation. Jon Lake reports.*

ride for the air force, including the (Yom Kippur) War with Israel in 1973 when 495 combat missions were flown; new aircraft orders to, among others, the Soviet Union, Czechoslovakia and Italy; interventions in Uganda during that country's liberation war of 1978-79 and also into Chad in the late 70s and 80s; confrontation with France, the former colonial power in Chad, which led to the cutting off of support for Libyan Mirages and to the impounding of a number of Mirages that were undergoing overhaul in France; skirmishes with the USA over in the Gulf of Sidra in 1981, 1986 and 1989 where Libyan aircraft were shot down and patrol boats sunk; and, of course, the terrorism links that led to the Lockerbie bombing in 1988.

However, by 2011 and before the civil war, Colonel Gaddafi's Libyan Arab Air Force had built itself back into a large and impressive (at least superficially) force, with 18,000 personnel

and a notional inventory of nearly 400 combat-capable aircraft at 10 major bases.

When he briefed journalists in July 2011, the RAF's Air Marshal Greg Bagwell said that Libya had been the third largest African country in terms of defence spending, which had grown from 1.1% of GDP in 2001 (\$339 million) to a peak of 3% (\$1,740 million) in 2007.

The Air Force had, he said, 229 fighters (MiG-21, MiG-23, MiG-25 and Mirage F1), seven Tu-22 'Blinder' bombers and 113 attack aircraft, as well as more than 85 military transports and 250 combat-capable trainers. Libya also boasted 216 air defence missile systems, including Dvina (SA-2 'Guideline'), Niewa (SA-3 'Goa'), and S-200 (SA-5 'Gammon') SAMs.

But the disparity between the numbers of aircraft delivered and the number of aircraft actually in use was massive.



# A MIGHTY AIR FORCE



## Pre-Revolution Air Order of Battle

### OKBA IBN NAFA

1015 Squadron\*  
1032 Fighter-Bomber Squadron\*\*  
1347 Heavy Transport Helicopter Squadron\*\*\*  
2nd Squadron - Air Defence Command Tripoli Sector\*\*\*\*  
1st Army Helicopter Squadron

\*some sources named this as the 1st Fighter Bomber Squadron, others as 1012 Squadron. It moved to Metiga before the revolution.  
\*\* 1032 Squadron moved to Sirte before the revolution.  
\*\*\*AFM say 1347 Squadron was based at Metiga.  
\*\*\*\*There was probably just one Mirage F1 squadron, with about six Mirage F1AD, F1BD and F1ED.

Dassault Mirage F1AD/BD  
Sukhoi Su-22M3  
Elcoterri Meridionali CH-47C+  
Dassault Mirage F1ED/BD  
Mi Mi-24

### METIGA (Umm Aitqah)

1023 Squadron - Air Defence Command Tripoli Sector  
1024 Squadron  
1039 Squadron\*  
1226 Medium Transport Squadron 'Green'  
1230 Tactical Transport Squadron  
1235 fire-fighting Squadron  
1274 Tactical Transport Squadron  
1276 Heavy Transport Squadron\*\*  
1314 Helicopter Squadron  
1328 Medium Transport Helicopter Squadron  
1347 Heavy Transport Helicopter Squadron  
Police Aviation Squadron

\*Some sources say 1039 was based at Sirte.  
\*\*AFM say 1039 was based at Jufra.

Mikoyan MiG-23ML/UB  
Mikoyan MiG-23MS/MF/JUM  
Aero L-3920  
Antonov An-26, Let L-410UVP-E  
Lockheed C-130H  
An-32P Firekiller, Mi Mi Mi-14PZ  
Antonov An-74TK, Yakovlev Yak-40  
Ilyushin Il-76  
Mi Mi-14PL  
Mi Mi-8/-17  
Elcoterri Meridionali CH-47C+  
AgustaWestland A109

Probably the oldest of Libya's military airfields, Metiga (Mitga) was originally built by the Italian Air Force in 1923 when it was known as Mellaha Air Base. Subsequently used by the Luftwaffe and the RAF's Desert Air Force, the base was soon handed over to the USAAF. It was redesignated as Wheelus Army Air Field in 1945, and later became Wheelus AFB. In USAF hands it was used as a transport and training base, and as a forward base for Strategic Air Command bombers and tankers, with runways and infrastructure upgraded accordingly. The base was handed back to the Libyan government on 11 June 1970. The base was briefly and confusingly known as Okba Ben Nafi Airfield. Metiga is quite separate from the military enclave of Tripoli International Airport, 35 km further south, which is sometimes referred to as Tripolis-Tarrabulus AB.

### MISURATA (Misratabh)

1090 Squadron - Air Defence Command Tripoli Sector\*  
1210 Unidentified Counter Insurgency Squadron  
1121 Unidentified Counter Insurgency Squadron  
1st Army Helicopter Squadron  
Unidentified unit

\*some sources name this as the 1st Fighter Squadron  
\*\* some sources name the Galeb units as the 1020<sup>th</sup> and 1021st Squadrons. The 1021st/1121<sup>st</sup> moved to Sirte before the revolution  
Post-war Google Earth images show Misratabh's aprons packed out with about 48 Galebs and 12 MiG-23s. There is little hangarage, and no hardened aircraft shelters.

Mikoyan MiG-23MF/MS/UB  
Soko G-2/3-1 Galeb  
Soko G-2/3-1 Galeb  
Mi Mi-2, Mi Mi-24  
SIAT SF260W

### SIRTE (Ghardabiya-Sirte or Ghurdabiya-Sirte)

1023 Fighter Bomber Squadron\*  
1039 Squadron\*\*  
1055th Squadron - Air Defence Command Hun Sector  
1124 Bomber Squadron  
1308 Squadron  
1335 Squadron\*\*\*

\* some sources name this as the 1st Fighter Bomber Squadron  
\*\* AFM say 1039 was based at Metiga  
\*\*\* some sources name this as the 1st Coast Patrol Squadron  
A modern, hardened airfield near the town of Qasr Abu Hadi. Google Earth imagery shows 76 HAs - one demolished entirely, and all of the rest with their doors blown off. The Su-22s of 1032 Fighter-Bomber Squadron moved to Sirte before the revolution.

Sukhoi Su-22M3  
Aero L-3920  
MiG-25  
Su-24MK  
Mi-8/17  
Mi-24

### SEBHA/SABHA (Zawia)

Air Force Academy\*  
Air Secondary School  
Advanced Flying Training School  
\*The Academy includes the Al Fatah Aerobatic Show Team (AFAT).  
Though it was home to the LAAF's flying training school, Sebha was already under development as a civil airport before the revolution. With a small cross runway in addition to the main runway, Sebha is planned to receive a new terminal with a capacity of 3 million passengers per year though development was halted by the war. Post war satellite imagery showed about 40 revetments, protected by sand 'berms', and some seven MiG-25s. These were presumably left over from the 1st Squadron which may have divided its operations between Sebha and Al Jufra.

SF260W  
SF260W  
L-3920

### AL JUFRA (Al Jufra-Hun)

1276 Squadron  
1st Squadron - Air Defence Command Hun Sector  
1025th Squadron - Air Defence Command Hun Sector  
Post war satellite imagery showed 26 HAs, 12 large revetted handstands (six occupied by Tu-22s) and 34 smaller revetments, suitable for a tactical fast jet. About seven Tu-22s, seven MiG-25s, and a number of An-26s and G222s were left abandoned in the open.

Ilyushin Il-76  
MiG-25  
MiG-25

### BENINA (Benghazi)

1040th Squadron - Air Defence Command Benghazi Sector\*  
1077 Squadron  
1211 Squadron  
1377 Squadron  
1377 Squadron

\* some sources name this as the 1st Squadron  
The International Airport also functioned as a military airfield, with dispersed pans for military aircraft, and eight hardened aircraft shelters. Five MiG-23s were visible in post war satellite imagery, together with eight stored G222 transports.

Mikoyan MiG-23  
Mikoyan MiG-23BN  
Mikoyan MiG-21  
LET L-410UVP  
Mi Mi-8/17  
Mi Mi-14  
Mi Mi-24

### EL BEIDA (LABRAQ)

1073 Squadron\*  
1079 Squadron  
\* some sources name this as the 2nd Fighter Bomber Squadron  
Before the revolution, El Beida was virtually inactive, its MiG-23BN grounded. There may have been an unidentified second fighter bomber unit at the base, or a small squadron? 16 x MiG-23

Mikoyan MiG-23BN  
Aero L-3920

### AL BUMBAB NORTH (Bombah)

1021 Squadron  
1050 Squadron\*  
1077 Squadron Air Defence Command Tobruk Sector \*\*  
1338 Squadron  
\* some sources name this as the 1st Fighter Bomber Squadron  
\*\* some sources name this as the 2nd Squadron  
Of broadly similar layout to Okba Ibn Nafa, Al Bumbab is an all military air base near the coast, East of Derna. It has four HAS complexes at the runway ends (with three, 12, 12 and five shelters).

Mikoyan MiG-21bis/MF/JUM  
Mikoyan MiG-23  
Mikoyan MiG-23/UB  
Mi Mi-8/17

### GAMAL ABDEL NASSER (Frontier AB)

1021 Squadron\*  
1060 Squadron - Air Defence Command Tobruk Sector  
1377 Squadron\*\*  
\* AFM reported that 1021 is based at Al Bumbab. Some sources name the based MiG-21 unit as the 2nd Fighter-Bomber Squadron. Whatever its designation, the MiG-21 unit moved from GANAB/Tobruk to Sirte in late February 2011. There may also have been a second unidentified fighter-bomber unit at Gamal Abdel Nasser.  
\*\* some sources name this as the 1<sup>st</sup> Border Patrol Squadron

Mikoyan MiG-21  
Mikoyan MiG-23/UB  
Mi Mi-24

GANAB base was known as Royal Air Force Station El Adem until 21 March 1970, when the British withdrew. Originally built by the Italians, the British rebuilt it with three runways, and extensive infrastructure including hangars, though only one runway appears to be serviceable. Post war satellite imagery showed ten MiG-21s and about 16 HASs.

Some sources list Martubah and Ghadames East as active military airfields, but neither has infrastructure beyond runways, taxiways and aprons, and do not appear to be capable of hosting permanently based aircraft.

In some cases, whole fleets of aircraft had been grounded and had not been airworthy for some years. This was the case, for example, with the MiG-25 'Foxbat' interceptors and reconnaissance aircraft, the Tupolev Tu-22 'Blinders', the MiG-23BN 'Flogger-H' fighter-bombers and the Aeritalia G222 transports.

In other cases, a small proportion of the overall number of a particular aircraft type remained airworthy, with the rest grounded, sometimes for a very extended period. In the case of the Mirage F1, for example, Libya had received a total of 38 aircraft but only 14 remained airworthy, 12 of which had been selected for refurbishing and upgrade in France in a programme that began in 2005. Of these, just four had been returned to service when the war began.

In other instances, Libya had deliberately bought more aircraft than it required, storing a large proportion of a given fleet for future contingencies - reportedly including Gaddafi's dream of a 'war of liberation' against Israel. Thus, when Libya acquired 50 MiG-23MS interceptors, just 24 of these were put into service with two squadrons (No.1050 and 1051) at al-Bumbab air base, while the others were stored.

Opposite: MiG-21s were captured from Gaddafi's forces, used by the rebels and now see a new dawn for today's airforce.

Above: An L39 and a Mi-25 helicopter in the colours of the old regime.

PICTURES: ALAN WARNES

Continued on Page 72



In some cases, the grounding of aircraft was a direct consequence of the UN sanctions imposed after the destruction of Pan Am Flight 007 over Lockerbie in 1988. These sanctions were suspended in 1999, after Libya agreed to hand over two of its nationals for trial before a Scottish court, and were finally fully lifted in 2003, after compensation was paid to the Lockerbie relatives.

The imposition of sanctions dramatically curtailed Libyan air operations and by the time they were lifted in September 2003, the by now renamed Libyan Arab Air Force was a shadow of its former self. Just six MiG-23MFs were still operational and some other frontline and support fleets were no longer flying.

**Huge quantity of spares**

After September 2003 some aircraft were sold off, including 12 of the surviving CH-47C Chinooks, which were sold to the UAE in 2003. The remaining 50 Mirage 5 fighters and a huge quantity of spares (including some 150 engines still in sealed packaging) were sold to Pakistan the following year, most destined to be broken up for spare parts to support the PAF's own Mirage fleet.

However, with significant oil revenue, Libya did begin a programme of returning some of its aircraft types to service, dispatching various MiGs and Sukhois for overhaul and upgrade in Russia.

The Galebs were overhauled at the Taminhint centre in Sabha by teams dispatched from Serbia, while the Libyan Italian Advanced Technology

The Su-22s and SU-24 flew ineffective attack missions.



Company (LIATEC) worked on the SF260WLS and six of the eight remaining Chinooks. OGMA in Portugal began overhauling and refurbishing some of the LAAF's long dormant Hercules transports.

The final swansong of the LAAF came in March 2011, when it began operations against opposition forces during the early stages of the rising against the Gaddafi regime. Su-22s and

Su-24s from Ghardabiya-Sirte flew ineffective low-level attack missions against abandoned army bases and ammunition depots in Agedabia and Mersa el-Brega, presumably to deny them to the rebels, while MiG-23s and L-39s from Mitiga and Mil Mi-24s operating from a number of bases, flew ad hoc sorties against rebel positions in Misrata, al Zawiya, and Zintan.

The LAAF increased its operational tempo from March 6 and began operating at medium level, dropping heavier weapons with greater effect, and its targets were widened to include oil installations at Ras Lanoof. It also made use of Schiebel Camcopter UAVs and An-26s and An-32s for reconnaissance missions. The Mi-24s supported the Army's offensive on the ground.

**Regime's offensive**

Helicopters and fast jets supported the regime's offensive against rebel-held Benghazi, losing an Su-22 during attacks on Benina air base before the UN no fly zone came into force on March 19. Subsequent Allied air operations saw the destruction of both aircraft and infrastructure, destroying the LAAF as an operational entity.

Though the LAAF was an elite branch of Libya's armed forces, and though it was largely composed of those who were most loyal to the regime (with members of Gaddafi's own Gadhafda tribe and the allied Magariha tribe given preference in selection and promotion), some pilots, engineer officers and ground crew did switch sides to join the rebels, and a small number of pilots ejected or defected to Malta. Others deliberately missed their targets.

Using aircraft found intact at captured bases (especially at Benina and El Beida-Labraq), the rebels did form a 'Free Libya Air Force' and flew some sorties with MiG-21s, MiG-23s, and Mi-24s. They lost a number of aircraft in action, including a MiG-21 and at least one MiG-23. Some of those aircraft, however, are still flying today.

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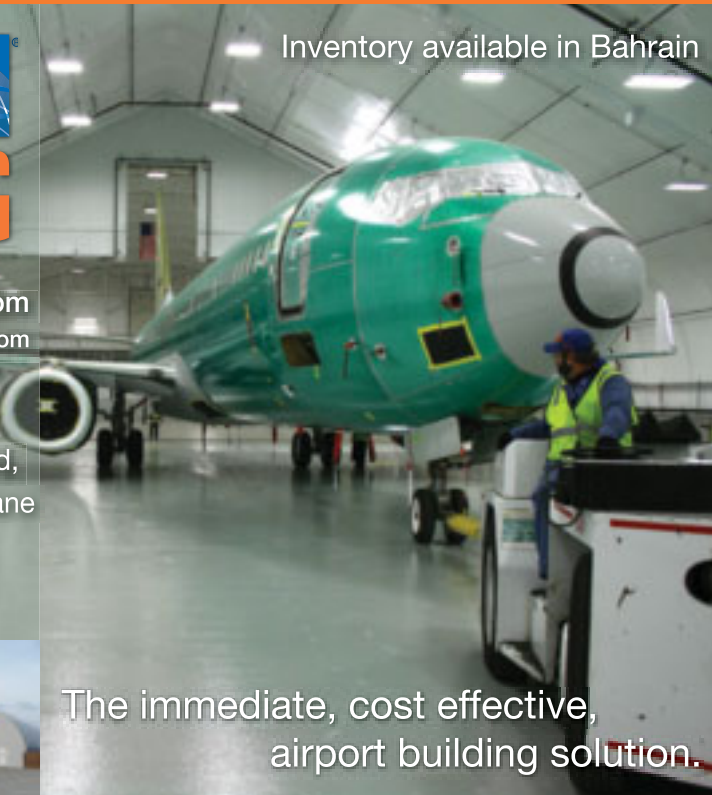


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*The full restoration of air services in Libya is critical and despite ongoing concerns over safety, airport developers are keen on completing their rebuilding plans and getting the job done. Keith Mwanalushi reports.*



**Above: Designs by ADPI are behind the majority of ongoing projects in Libya such as Tripoli International Airport.**

**Left: The sands of time have created a need for a rebuilt Tripoli Airport.**

# Reopening the gateways

**J**ust as soon as capacity was nearly restored at Libya's main airports following the lifting of the no-fly zone imposed back in March 2011, Tripoli International Airport was once again under siege.

This time, a rival Libyan militia group took over the airport in early June 2012, forcing the cancellation of all flights.

The occupation was short-lived and operations were soon restored but the event added ammunition to the belief by some that the resumption of air services after the civil war was hasty, and created concerns over safety and security.

Libya's international traffic levels fell by more than one million passengers in 2011 compared to 2010, according to analysts CAPA. However, most international carriers have almost fully resumed services, including British Airways and Lufthansa, in the hope that the country will



**Ümit Kazak: construction of the new Tripoli terminal building was half completed.**

recover rapidly once oil production returns to pre-conflict levels and if security is restored.

TAV Construction formed a consortium with Lebanese and Brazilian business partners in Libya to undertake the construction of a new Tripoli Airport terminal building. "It has been half completed; construction was stopped in March 2011 due to the Libyan uprising," said Ümit Kazak, general manager at TAV Construction.

The construction contract is valued at €1.5 billion and Kazak said once complete the new 4,000sqm terminal is expected to serve 20 million passengers annually. The facility will feature 160 check-in counters, 12 baggage handling carousels and 32 fixed and 64 mobile passenger boarding bridges. Tripoli Airport was about 40% complete at the start of the conflict.

UK-based temporary works specialist RMD Kwikform was also working on Tripoli and

**Continued on Page 74**



CONTINUED FROM PAGE 73

Benghazi airports prior to the revolt and, like several other UK businesses, looked at the return to Libya from a practical basis since it was not immediately clear what kind of damage had been done. "What is clear is we see there is a major role for RMD Kwikform in the country moving forward," said the company.

For RMD Kwikform the focus was on supplying formwork and falsework equipment and engineering support for the construction of the main terminal buildings, baggage-handling areas and in excess of 1km of utility tunnel running alongside the concourses.

Formwork can be best described as a structure that is usually temporary but can be whole or part permanent. It is used to contain poured concrete to mould it into required dimensions and support until it is able to support itself.

Falsework is a temporary structure used to support a permanent structure during the erection until it becomes self-supporting.

**Solutions for foundations**

In fact, RMD Kwikform is supplying the majority of formwork and falsework to the project, including solutions for foundations, utility tunnels, walls, columns, beams and slabs.

RMD engineers first had to focus their attentions on the construction of the 162,000sqm terminal buildings and completion of the baggage-handling hall. The need to incorporate complex mechanical and electrical services made early completion of the 9.5m high baggage handling hall the most critical part of the project to date – however, it's not immediately clear how much of this infrastructure survived the revolt.

Kazak said considering the recent political developments in Libya, the company is anticipating that the project will go on in near future. "As a matter of fact, we are in contact with the interim government in Libya regarding the recommencement of our project in the shortest time possible and the parties have mostly agreed upon the concerned road map. Ensured safety in the country is a vital factor for us regarding the future of the project," he added.

Earlier this year, UK Trade & Investment (UKTI) and the British Aviation Group hosted a conference in London that gave an overview of



**Massimo Garbini: Bringing back normality.**

**Italians help put Libya back in control**

**Libyan airspace has now been re-opened following an agreement between the country's Ministry of Transport and the Italian Air Navigation Service (ENAV).**

**In December last year the ministry signed a memorandum with ENAV in order to provide training and mentoring for the eventual reopening of Libya's skies.**

**"Following the closure of the Libyan airspace during the recent war, Libyan air traffic controllers lost the certification that allowed them to exercise their profession," explained ENAV CEO Massimo Garbini.**

**The immediate aim of the agreement was the provision of training courses for Libyan air traffic controllers. The programme also tackled the continued development of the country's air navigation assistance services, an upgrade of ground technology and the air traffic management system.**

**Garbini said ENAV began the course structured in a series of stages. "This has allowed 130 Libyan air traffic controllers to regain the certification necessary to operate and, therefore, bring the country's air traffic back to normality. Moreover new training courses are currently being developed."**

**He further confirmed that ENAV had now successfully brought the Libyan instruments for air traffic control back to full functionality by sending a dedicated aircraft, from within its own fleet, on an inspection and calibration mission conducted with radio electric measurements.**

**"ENAV will also provide support for the development of services dedicated to the assistance of air navigation in Libya," he added.**

the condition and situation at the various Libyan airports – including the requirements and equipment needed.

The Libyan delegation included representatives from the Libyan Airports Authority and the four international airports, including Benghazi Benina International Airport general manager Gamal Saleh Said.

One of the two runways at Benghazi was reportedly destroyed during the unrest. During the conference Said mentioned a three-step plan to upgrade the airport for the short, immediate and long term.

The long-term plans, according to Said, are for a new terminal at Benghazi designed by Aeroports de Paris, (ADPI) with a capacity for five million passengers per year within the first three to four years. Construction works on the new terminal were already underway but halted during the conflict.

There is considerable French interest in Libya. The French transport minister, Thierry Mariani, told a press conference recently: "Our mechanisms and airline companies will work to activate and rehabilitate Libyan aircraft. Tripoli International Airport will become a connecting link between Africa and Europe and the companies that were present in Libya will be activated and willing to operate again in the reconstruction of Libya."

**New runway and apron**

In 2008, Canadian company SNC-Lavalin was awarded a contract for terminal works, a new runway and apron at Benghazi, in a project valued at C\$500 million. The company reports that it is monitoring the situation before returning to the project.

TAV is also involved in a joint venture with the Consolidated Contractors Group (CCC) in the expansion of Sabha International Airport, a project which, prior to the uprising, was due to be completed by 2013. TAV remains optimistic that this work will resume. It will have a capacity of three million passengers and, like the new terminals at Tripoli and Benina International, will be designed by ADPI.

While airlines have taken a much quicker pace at reinstating operations in and out of Libya, it's clear that airport developers and other infrastructure-related firms are taking a cautious view on a speedy return. However, oil will prove to be a magnet for foreign investment and considering the turn out at the recent UKTI Libya conference there will be many foreign interests ready to invest in capital works – and a substantial part of these will almost certainly be in aviation infrastructure.

Kazak stressed that safety is paramount and the key factor in ensuring the successful completion of current projects in the North African country. "We hope that our roadmap will be clarified in accordance with the developments in 2012. We will keep on taking the necessary steps to proceed with our project in a positive manner," he concluded.



**ENAV successfully conducted inspection and calibration tests on Libyan ATC instruments using dedicated aircraft.**

PICTURE: ENAV





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# EMISSIONS: THE BIG ISSUE

*Driven by ever-increasing oil prices and growing environmental concerns, the world of commercial aerospace is moving into a new and exciting era of research and development.*

**Geoff Thomas** reports.

**W**hile an airliner's engines produce the thrust that enables flight to happen, it's those self-same noisy and relatively smoky fuel-guzzlers that create many of the negatives in the industry. Without them there would be no commercial flying – but with them there are distinct perceived disadvantages.

Although many believe the vigorous response of the naysayers to be disproportionately negative (for political and publicity reasons), both noise and emissions have been under the environmental spotlight for many years. Consequently, addressing these issues is at the centre of thinking by the engineers, who are working on creating game-changing technologies and entire powerplants.

It's likely to be at least a decade before anything that provides the level of fuel saving that airlines crave – or the quieter and less polluting engines demanded by the

environmentalists – actually takes to the skies. However, improvements are introduced regularly with each new development and upgrade.

Ever since the turbojet engine was first developed in the 1930s and 1940s, progress has been extraordinarily fast. And since the development of the high-bypass ratio turbofan engine around half a century ago, improvements in fuel burn have worked out on average at around 1% per year.

Aviation currently accounts for only around 2% of man-made CO<sub>2</sub> emissions but it's true to say that the sector's growth – along with the adoption of low-carbon technology in other sectors – means that commercial aviation's production of this so-called 'greenhouse gas' will increase in both absolute and relative terms over the coming decades.

And despite the fact that scientists confess to not fully understanding the impact of

Continued  
on Page 78

CONTINUED FROM PAGE 77

high-temperature generated oxides of nitrogen (NOx) on the atmosphere (where, incidentally, one of the larger sources is lightning flashes, each one resulting in around 7kg of NOx being produced) it's generally accepted that the gas is not a good thing.

However, trading this off in engineering terms against reducing fuel-burn is a complex issue, as one of the best ways of decreasing the use of kerosene is to increase the temperature of the engine's core and it's this, in turn, that increases the production of NOx, which is a product of high temperatures.

So while NOx emissions undoubtedly contribute to air quality concerns near airports, and noise is an issue for people who live close to major airports, these interlinked environmental concerns present a highly complex design problem. The means of reducing one impact can lead to increasing challenges in other areas.

**Track record**

The aviation industry has a strong track record of reducing these impacts, investing consistently in product technology over the past six decades. Aircraft today are 75% quieter and use 70% less fuel (when calculated on a passenger-per-kilometre basis) than the earliest jet airliners like the de Havilland Comet and the Boeing 707.

British engine OEM Rolls-Royce claims that its Trent 1000 engine, that flew for the first time on the Boeing 787 Dreamliner in December 2009



Rolls-Royce Trent family is seeing continual development.

and is now in service around the world, is 25% more fuel efficient than its RB211 jet engine that powered the Lockheed Tristar. It was that engine, coincidentally, that led directly to development of today's family of Trent engines and bankrupted Rolls-Royce in its earlier manifestation.

The Advisory Council for Aeronautics Research in Europe (ACARE) has published targets that are running in parallel to similar ones in the USA, and are set to be achieved by 2020.

From a 2000 baseline, Europe is aiming to: Reduce CO2 emissions per passenger kilometre by 50%; reduce NOx emissions by 80% and reduce perceived aircraft noise by a half.

The ACARE NOx target includes total NOx emissions produced over a flight. Improvements in engine technology are expected to deliver three-quarters of the 80% with the balance coming from the overall reduction in fuel burn as a result of improved efficiencies in engine, airframe and operations.

Meeting the CO2 target requires improvements of 15-20% for engines, 20-25% for aircraft and 5-10% from air traffic management.

Since the first Trent engine entered service 15 years ago, Rolls-Royce has introduced five additional members to the family. The Trent 1000 is 12% more fuel efficient than the Trent 800 and the latest variant, the Trent XWB for the Airbus A350 airliner, will give a 16% improvement in fuel efficiency when compared to the first Trent in service.

**Wholly new families**

Like all the world's engine OEMs, Rolls-Royce aims continually to improve on engine efficiency and it has announced a decision to target two wholly new families of two-shaft and three-shaft turbofan engines in the 2020s. In the longer term, it continues to see 'open rotor' technology as a potential step change in performance and in conjunction with new partner in this arena, Pratt & Whitney, is currently targeting entry into service for towards the end of next decade for this technology.

However, the integration of open rotor into the airframe will present new challenges for the industry. Rolls-Royce's engine product strategy for 2010-2025 means that it will have engines entering service that, on average, will reduce the fuel burn of aircraft replaced in that 15-year period by at least 15%.

A conventional turbofan aircraft engine generates most of its thrust from a large front-mounted fan, enclosed in a fan-case and nacelle. Engines can be made between 10% and 15% more fuel-efficient (than a future advanced turbofan) by dispensing with the fan-case and designing the fan to operate as an open rotor. The open rotor concept, therefore, uses large unducted fan blades, creating a powerplant with much of the fuel-efficiency of a turbo-prop engine.

The Derby-based company



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## CONTINUED FROM PAGE 78

began wind tunnel tests for its open rotor system in 2008 and 2009 in the Netherlands and the UK and these surprisingly showed that, as well as being more efficient, the engines were quieter than existing types and would meet future noise legislation.

But it's not only in the UK and Europe that research into the next generation of commercial engines is bearing fruit. Both GE and Pratt & Whitney are developing ground-breaking designs and concepts – in P&W's case, the geared turbofan engine, now known as the PW1000G, that is slated to power Bombardier's CSeries, the Mitsubishi Regional Jet (MRJ) and the Irkut MS-21 (all newly-developed single-aisle airliners) and is also being offered as an option on the Airbus A320neo.

In the case of the PW1000G, the engine has a gear system to drive the front-mounted fan at an ideal speed more suited to improved economy and lower noise.

But it's not only within the realms of civil aerospace that improvements to commercial engines are created.

**World's most popular engine**

In the case of the world's most popular engine (the CFM56 family that powers Boeing 737s and the Airbus A320 family of airliners) it's the subtle combination of the US Navy and Air Force that stand to save more than \$2-billion after jointly developing an engine modification that will keep critically important aircraft flying for years – technology that's bound to find its way into older

airliners that are still flying in many parts of the world.

The two services and industry worked together to develop and field a modification to CFM International's CFM56-2 (F108) engine, allowing them to restore exhaust gas temperature (EGT) margins, increase fuel economy and extend time between overhauls from 10 to 15 years.

The CFM56 engines are used on the Navy's E-6B Mercury command and control aircraft and the Air Force's C-135 series tankers and reconnaissance aircraft.

CFM International (CFM), the engine's maker, received FAA certification of the modifications a couple of months ago.

**Lost engine efficiency**

Both the US Navy and the Air Force were struggling to reclaim lost engine efficiency after first overhaul with only half of the engine life being regained.

About four years ago, the Navy CFM56 engine team, having exhausted all known means to reclaim lost engine performance, asked CFM to make design improvements. That effort paid off and resulted in submitting a proposal for commercially proven design improvements used in newer models of the CFM56 engine family.

Realising that incorporating these improvements were too costly for the Navy to implement on its own, it approached the USAF and the subsequent coordination resulted in a plan advantageous to both services with costs and ground testing being shared.

Over the next few months, the updated engine would be tested, overhauled and tested again four times. This extensive barrage of ground testing helped reduce the amount of flight test time required and provided CFM engineers with a controlled environment to capture FAA certification data. When the ground tests were complete, the engine was rebuilt and certified ready for flight tests by Navy and CFM engineering.

This joint service engine upgrade programme will provide both the Navy and Air Force with huge cost savings over its life and now the team is involved in coordinating acquisition and logistics to incorporate design improvements into the engines at the Oklahoma City Air Logistics Center during depot-level overhauls for Navy and Air Force aircraft next year.

Earlier this year, CFM International, along with other key aviation leaders, co-signed a declaration to broaden the industry's commitment to action on climate change with a goal to advance and strengthen the interdependent pillars of sustainable development.

**Revolutionary technologies**

Like the other major engine OEMs over the past 35 years, CFM has introduced revolutionary technologies to improve engine performance. With its CFM56 engine family, the company has established a track record of continuous innovation and improvement that has helped set new performance standards.

This tradition seems set to continue with the introduction of the advanced LEAP engine family. This all-new engine will help establish even higher standards for aircraft engine noise and emissions without any compromise in economics, giving operators better fuel efficiency and economical operating costs.

CFM claims that for each old aircraft replaced, its LEAP engine can eliminate as much as 11,000 tonnes of CO<sub>2</sub> emissions per year, depending on the age of the engines being replaced.

The major engine builders' on-going investment in engine technologies will help support the industry's commitment to meet the 2020 goal of carbon-neutral growth, while at the same time developing longer-term technologies, including engine architectures like the open rotor, which could help address the ambitious target of a 50% reduction in carbon emissions by 2050.

The joint declaration that brought together 'thought leaders' from across the industry, will support a global collaborative structure that can accelerate collective ability to meet the environmental challenges of the future, said Jean-Paul Ebanga, president and CEO of CFM International.

He continued: "We know that this kind of global partnership is critical and we are happy to lend our full support and expertise to the Air Transport Action Group (ATAG) initiatives."



Even the military has become environmentally aware as well as cost conscious with its powerplant programmes.



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*Pilot shortage is one of the biggest threats to the air transport industry and particularly the Gulf airlines, which have massive expansion plans. Alan Peaford looks at how Qatar Airways has chosen a UK-based training company to help it meet the challenge.*

## Qatar spreads its wings in search for future pilots

**Q**atar Airways is one of the world's fastest growing airlines and feeding the demand for growth has brought about its own special challenges to find enough pilots of the right calibre to support the airline's rapid expansion plans.

The Doha-headquartered airline has gone to the UK and selected airline training specialist CTC Aviation to help it supply those vital human resources to see it through the predicted boom.

Currently operating 108 aircraft, the airline has orders worth more than \$50 billion for Boeing 787s, 777s, Airbus A350s, A380s and the A320 family of aircraft. As a result, Qatar Airways has significant pilot recruitment campaigns taking place around the world.

Like other Gulf carriers, today's pilots are as likely to have come from Buenos Aires as Brisbane.

But as well as the experienced captains from other airlines, and local talent coming through the ab-initio route, Qatar has identified a need for something in between and has called for a supply of graduate pilots from CTC's world renowned CTC Wings programme, which the airline said will form a key part of the intake in future years.

### Tremendous rate

Qatar Airways chief executive Akbar Al Baker said: "As an airline growing at a tremendous rate and with orders for more than 250 aircraft due for delivery over the next few years, we will require a large number of pilots to join the organisation.

"CTC is a key partner for Qatar Airways to deliver the pool of professional pilots that we need to meet our operational requirements."

Lee Woodward, director of business development for CTC Aviation, said: "We are delighted to now be able to count Qatar Airways among our list of CTC Wings partner airlines. This is a great opportunity for our graduate pilots to forge a strong future career with an airline that maintains high standards of safety and customer service and in a region that is promising some significant growth in the coming years.



**CTC's Lee Woodward - Qatar is creating great opportunities for you graduate pilots.**

"This contract has been tailored to provide a mutually beneficial package for both the airline and the CTC Wings pilots. Qatar Airways has demonstrated its willingness to support its future cadet pilot intake and we are very pleased to have been chosen to work alongside another forward thinking airline, committed to investing in future pilot supply."

The first 18 CTC pilots selected by the airline completed their A320 type rating training at CTC's United Kingdom airline training centre during April and May and are now ready to start line operations with Qatar flying out of Doha.

One CTC Wings graduate pilot is Laura Elliott, who has joined Qatar Airways as a first officer after completing her type rating training in May.

She said: "I wanted to train with CTC for an opportunity exactly like this; to join the world's best airline.

### Career development

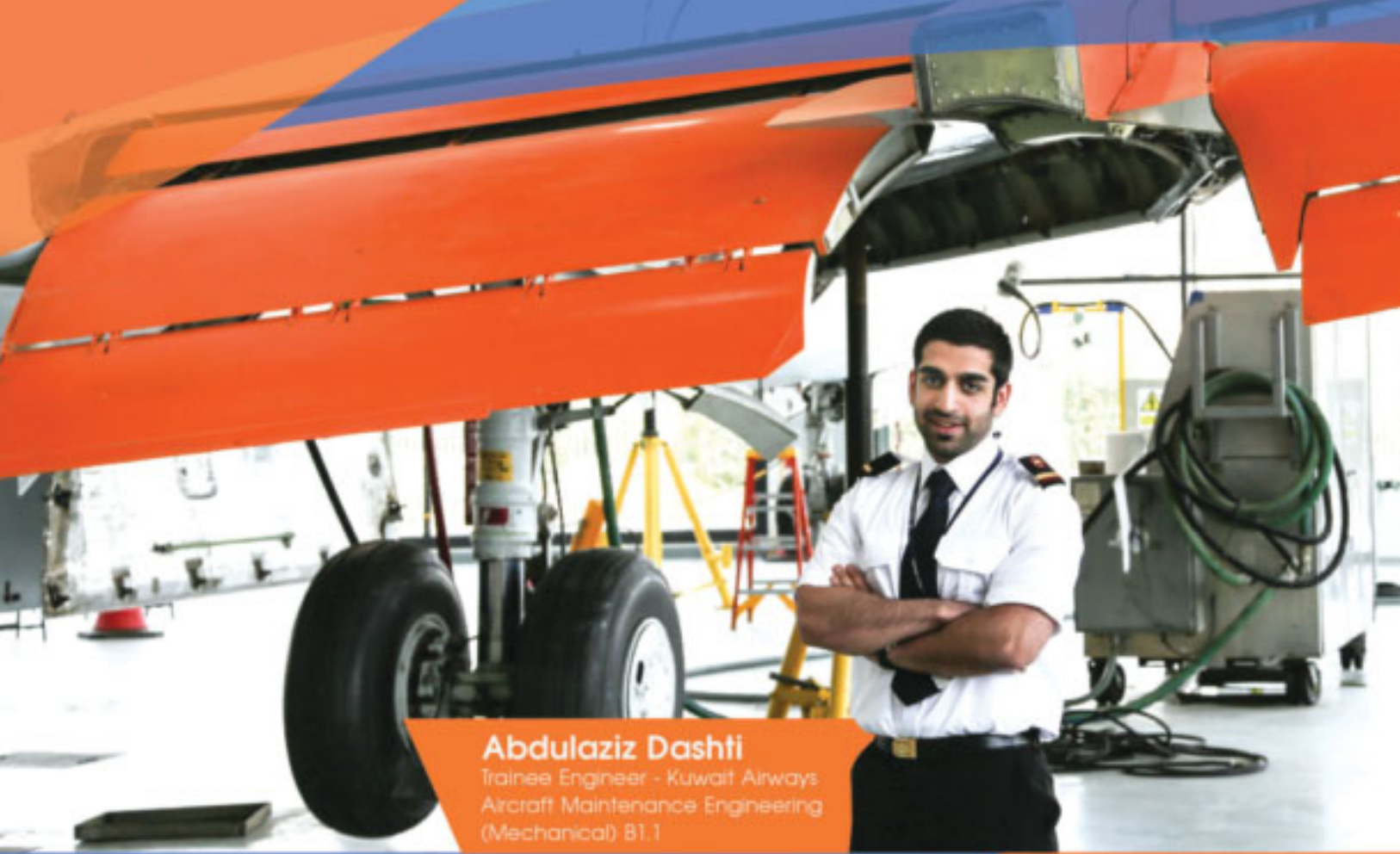
"The prospects within Qatar Airways for career development are second to none.

"To be given this chance at such an early stage in my career is precisely what I've been working so hard for throughout my training. I am very grateful that CTC has forged this new partnership with Qatar Airways, allowing me and my fellow cadets to further realise our potential."

As part of CTC's philosophy to work in partnership with its client airlines, a CTC type rating examiner has been working alongside the Qatar Airways team in Doha to ensure that the training for the new pilot intake is accurately tailored to incorporate the company's standard operating procedures and culture.

"As an airline training provider, we believe this is just one of the factors that sets us apart from our competitors," said Captain Woodward.

CTC Aviation has centres in the United Kingdom and New Zealand and trains around 2,000 ab-initio and experienced pilots each year for approximately 50 airline clients around the world.



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# PILOTS AT THE CROSSROADS

*As cockpit technology evolves relentlessly, are pilots equipped to deal with it? Do current and future intakes of pilots have the same sort of qualities as their predecessors to handle emergencies in the air?*

**Alan Dron reports.**

**A** two-day conference, 'The Aircraft Commander in the 21st Century' held at the Royal Aeronautical Society in London, looked at many of the challenges facing airlines and flightdeck crew and threw up several concerns – not least the growing shortage of pilots worldwide and differing personal qualities of many joining the profession.

One such concern, the audience heard, was the diminishing quantity of ex-military pilots making the transition to the civil industry, due both to shrinking air arms and deteriorating salaries and conditions for airline pilots.

Military pilots, with their inbuilt qualities of discipline and leadership, were fast becoming a minority in airline crew rooms, the conference heard.

On the technology front, the ever-increasing complexity of aircraft systems meant that crews could become buried in trying to dig down through layers of data in their attempts to solve problems when common sense was sometimes the more appropriate approach.

This last point was a theme of the keynote address given by Captain David Evans of Qantas, who was flying as supervising check captain on Airbus A380 Flight QF32 from Singapore to Sydney on November 4 2010 when one of its Rolls-Royce Trent 900 powerplants exploded.

One of the biggest problems the flight crew had to deal with, said Evans, was handling the avalanche of warning messages generated by the aircraft's ECAM monitoring system, which attempts to prioritise alerts.

More than 60 warnings flashed up on the cockpit displays. One of the first warned 'Wings not balanced' and recommended the crew cross-transfer fuel from one wing to the other – despite the fact that this would have increased fuel loss by pumping it through obviously damaged plumbing.

The crew worked through the ECAM warnings that seemed essential and ignored others that were not, said Evans. "We simplified things by looking at what [systems] we had, rather than

Continued  
on Page 86



what we hadn't. There was a lot of ECAM 'white noise'. But we knew we had four hours' flight time despite losing fuel, which gave us options.

"The job of the 21st century commander is to sort out problems with the help of technology, not depend on it. What needs to be brought back is healthy scepticism of technology, not reliance on it."

The prime lesson from this incident, said Evans, was that common sense and airmanship remained prime qualities in pilots.

Answering questions afterwards, he agreed with audience members that basic flying skills were leaching out of the younger piloting community as technology became more complex. "During my Airbus training everything comes to you as a procedure. I think perhaps we have to question that. The understanding of how something works in a modern aircraft is probably beyond a pilot and it's not necessarily vital for him to know that."

Throughout the conference several speakers warned of the dangers of increasing complexity of cockpit systems and pleaded for manufacturers both to reduce the amount of information presented to flightdeck occupants and to make what was presented to them more easily understandable.

Captain John Monks, British Airways' regulation and development manager, recalled that when he was a young pilot on the Boeing 737-200: "You had to go hunting for information. In a modern aircraft, it throws



**Captain David Evans: "The job of the 21st century commander is to sort out problems with the help of technology, not depend on it."**

information at you and keeps on throwing it at you." This made the ability to prioritise what they were looking at vital for today's pilots.

Captain Scott Martin, experimental test pilot with business jet manufacturer Gulfstream, added: "Automation is not supposed to transfer responsibility away from the pilot. We need to get the pilot back to being the decision-maker." Automated systems should be treated as a third crew member, he said, and challenged if they did something that seemed wrong. And aircraft manufacturers needed to keep the avionics simple and ensure they provided pilots only with the information they really required.

"A captain's role is to bring his aircraft and

passengers home safely and efficiently, whether or not the automation works," said Lufthansa captain and International Federation of Airline Pilots Associations' official Uwe Harter. "Highly automated systems can be very convenient but are difficult to understand in depth."

The slow erosion of traditional handling skills meant that when things went wrong pilots were increasingly at risk of being unable to correct the situation. "I'm an A320 pilot and it's good to do manual flying. It keeps me in the loop. Don't try to match humans to technology but technology to humans. The Apple iPhone is a good example of this – it's very intuitive to use."

Pilots needed to be 'designed in' to the system, said Harter. "Who would want to work somewhere if he's not needed? If we're just observers, then please put a decent espresso machine in the cockpit, because it's so boring to just sit and watch!"

Whereas virtually every previous generation of youngsters has regarded a pilot's job as glamorous, this was no longer the case, said Qantas's Evans. Security considerations meant young people were no longer allowed into the cockpit where flight crews could share their passion and instil in them an interest in aviation. The cost of self-funding training was very high and the financial rewards of being an airline pilot were not as substantial as in previous decades. "Clearly," he said, "we have to make the job more attractive."

Continued  
on Page 88





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# PROS AND CONS OF THE COSMOPOLITAN COCKPIT

The rapid growth of some airlines, combined with the layoffs elsewhere, has led to some cockpits becoming increasingly cosmopolitan.

Nowhere is this more apparent than at Emirates Airline, whose 3,200-plus pilots are drawn from no fewer than 89 different countries. Just 7.5% are Emiratis, while 53% come from English-speaking nations and a further 24% from other European countries.

In 'Training for Command in a Multi-Cultural Environment' the carrier's senior vice-president, flight training, Captain Martin Mahoney talked of the challenges involved in creating a coherent cadre of aircrew from such a wide range of national, professional and organisational cultures.

"From Emirates' perspective, we can't afford to have different outcomes because of different cultures," he said.

Longstanding psychological research had shown differences between nationalities. Some Asian nationalities were more comfortable with a clear hierarchy in the cockpit. Others (such as British and Scandinavians) had a more relaxed, egalitarian attitude and were less rigid about following standard operating procedures.

The latter trait among pilots need not be a fault, said Mahoney. They were frequently pragmatic individuals and would not, for example, slavishly follow automated warnings from instruments if they could see that the warnings diverged from what they were experiencing.

However, although pilot culture tended to be more muted than national culture, Emirates was still careful about rostering certain nationalities together. For example, a Brazilian captain would tend regularly to remind a first officer that he was in charge. Combine him with a Norwegian co-pilot with a more relaxed attitude to hierarchies and "That could give you a cockpit gradient pretty near vertical".



**Captain Martin Mahoney:** "We can't afford to have different outcomes because of different cultures."

In general, pilot culture tended towards the individualistic, said Mahoney; Emirates' workforce accentuated that characteristic because most of its pilots were expatriates who, by definition, had been prepared to give up their native lands, friends and perhaps even spouses to take a job in the Gulf.

Differing cultures were not the only challenges facing Emirates' new captains. They had to handle not only multi-national crews but flying to six continents, with some destinations suffering from what could politely be described as inconsistent air traffic control.

Among facets of training for commanders at Emirates was intervention training, which aimed to show it need not be a negative experience to take the controls from a first officer. Emirates was also reducing the amount of 'distance training' it undertook in favour of more classroom learning. "We don't want [pilots] to tick boxes and recurrent training questions get compromised quite quickly. We want to look them in the eye and check that they've understood what we're teaching them."

Mahoney had some strong words for an ICAO representative at the conference on the subject of standards of spoken English among some nationalities. Under ICAO rules, pilots are not allowed to fly commercially on international routes unless they have achieved a minimum ICAO Level 4 in language training (Level 6 is the highest.) Mahoney said Emirates had tested some Mexican pilots who showed the airline ICAO Level 6 documentation. "I don't know where they bought them from," said Mahoney, but their communication standards had been so poor that "We had to send them straight home."

Similarly, Emirates had put a batch of pilots from a "recently-failed European charter airline" through simulator testing and failed 50% of them "because we couldn't understand them".

## Next generation may trust computers too much

A previous major cause of accidents, controlled flight into terrain, has been significantly reduced since the introduction of EGPWS, the conference heard. Loss of control (LoC) has taken its place, with the proposed solution being improved training in 'upset prevention' and recovery training. ICAO is finalising suggested core competencies that will help pilots avoid LoC incidents.

Several speakers expressed concerns over apparent 'dumbing down' of pilot examination standards, allied to the well-known phenomenon that skill areas that were not tested tended to be ignored. Capt Terry Buckland, deputy head of flight

crew standards at the UK Civil Aviation Authority, noted that situations presented in simulators were becoming increasingly complex and that pilots enjoyed this complexity: "They take the view that this may save their bacon one day."

The next generation of pilots will be very accustomed to computers but are likely to place excessive trust in them, the conference heard. Training had to continue to emphasise abnormal situations and it would be up to instructors to instil flightdeck discipline.

A typical long-haul pilot with Air France only flies his aircraft manually for between six and 10 minutes each month, despite professional pride and the desire to switch

off the autopilot, the conference heard. However, said Captain Philip Adrian, 737 chief technical pilot and chief of regulatory affairs at Boeing, after a long intercontinental flight and indifferent weather on the approach, "perhaps it's better to let the aircraft do the landing".

Will fully-automated, pilotless passenger airliners become the norm? Perhaps not for a while yet. A US FAA study of 9,000 flights between 2001-9 found that 20% suffered some malfunction that required the pilots to intervene. These were not accidents or even incidents, but normal completed flights.

There tend to be differences in character between the



**Rhona Flin**

pilots of Boeing and Airbus products. The US airframer's models tended to attract more physically-inclined personalities, while those getting behind the controls of the European manufacturer's aircraft tended to be more cerebral and introverted.

"Present and future [cockpit] systems bring a wealth of information to the commander, but unless he

knows how to unlock the computer system it's just data, not information," noted consultant Captain Jacques Drappier.

NASA has found that the nearer to their destination, the more likely pilots were to disregard risk, said Rhona Flin, professor of applied psychology at Aberdeen University in the UK.

Sometimes captains had to pause and re-assess situations.

Professor Flin cited a senior surgeon who became frustrated with a junior colleague getting increasingly fixated with a problem during an operation, eventually shouting: "Don't just do something, stand there!"





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# Youngsters fail the personality test

Fascinating but worrying insights into the attitudes of young people entering the piloting profession were presented to the conference by Nikki Heath, CEO of UK human factors, training and assessment company Symbiotics.

For generations, youngsters entering the airline industry have been driven by the simple desire to fly and to use their professional skills.

No longer.

She revealed that a survey of future aircraft commanders ranked the top four attractions in becoming a pilot as:

- Respect and status
- Stability and career progression
- Glamour and lifestyle
- Money

Using flying skills came fifth.

Equally worrying was the sense of entitlement that young people were displaying when they came to Symbiotics for assessment on behalf of airlines.

"Kids don't like being tested," she said.

As fewer airlines sponsored or otherwise paid for the training of cadets, young pilots were

increasingly having to fund their own way through training.

This, the conference had earlier heard, could cost €100,000-150,000 (\$135,000-200,000) and the result, said Heath, was that they felt that they were the clients and did not want to be tested.

She also said that – somewhat bizarrely, given the nature of the job – young pilots increasingly did not want to travel if that meant any personal disruption: "They want to have it all, they don't want it to impact on their lives.

### Cerebral and intense

"As the job becomes more cerebral and intense, personalities become more important," added Heath, whose company was lead sponsor of the conference.

A further emerging factor was that young entrants' attention spans were very poor. This made it essential to have a clear career path, with clearly identifiable goals.

Increasingly automated cockpits meant that boredom was becoming a problem. She contrasted airline jobs with the role of military UAV pilots, whose sorties were strongly goal-

oriented and who were thus more focused on their mission.

The conference had earlier heard from Anthony Petteford, managing director of Oxford Aviation Academy (OAA), a major flight training organisation.

He lamented the fact that security considerations meant cockpit visits that could inspire a youngster and ignite their passion to fly were now ruled out.

The result, he said, was that there was "a much smaller pool of people with command potential because many people don't know about flying".

The huge costs of putting themselves through training further reduced that pool.

Like Heath, he commented on the attention and focus skills of trainee pilots: "You would be amazed at the number of people who fail to read the instructions before answering assessment questions."

And many of the youngsters seen by OAA seemed simply less aware of the world around them than their predecessors: "You'd also be amazed how many people don't have opinions on current affairs."

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# Food to fly for...

*Are the days of poor aircraft food almost over? Marcella Nethersole discovers that some airlines can safely answer 'yes' to that question.*

Let's face it; passengers' thoughts on aircraft food often tend to be less than favourable. The idea of cardboard potatoes, chewy meat, slimy vegetables and lumpy gravy doesn't exactly get your taste buds going but many commercial airlines have already put a stop to it.

Today, airlines don't just want to get passengers from A to B safely, they want passengers to enjoy the flying experience with them – which includes providing a tasty meal.

To achieve this, some airlines are working hard to improve menus by using fresh ingredients and offering varied options for passengers in all classes. The airline will work directly with catering companies and chefs to come up with menus that will suit all passengers and match the airlines' route network.

Emirates Flight Catering recruits chefs with bespoke experience in culinary traditions in line with the demands and tastes of its customers.

A Japanese chef creates a regional range of sushi for the Japanese routes; an Indian specialist prepares a myriad of different curries to cater for Indian sub-continent flights; and a chef from the US advises on best menu options for flights to America.

Oman Air, which recruits 228 international chefs at its facilities in Muscat, uses the same method.

## Inspired

Earlier this year British Airways chose its Dubai route to unveil the new British-inspired menus that will be served on board during the summer period.

The menus have been created by Michelin-star chef Simon Hulstone, who spent the past year being mentored by TV culinary expert Heston Blumenthal as part of the BA Great Britons programme, which supports British talent.

Many other major flight operators have also sought out prestigious chefs to help create that special dining experience.

Celebrity Michelin-star chef Gordon Ramsay has previously advised Singapore Airlines on its premium in-flight menus and 26-star Michelin chef Joel Robuchon is the mastermind behind Air France's carte de jour for business-class passengers.

Airlines, including Turkish Airlines, Gulf Air and Etihad Airways, are going one step further and bringing chefs on board to cook and prepare meals in flight.

Turkish Airlines uses international catering company Do&Co, which also attended the World Travel Catering & Onboard Services show.

"Turkish Airlines started the 'chefs on board' programme almost three years ago and has more than 200 chefs on board, making it the biggest flying chef fleet in the world," said Attila Dogudan, company chairman of Turkish Do&Co and the man behind the 'chefs on board' programme.



Airlines that use Do&Co include Emirates, Royal Air Maroc and Royal Jordanian.

"An increasing number of airlines are relying on the world's only gourmet brand product for the airline industry to provide their customers with an incomparable on-board experience," said Dogudan.

"There is nothing frozen in our kitchens. Even the red peppers are individually roasted – nothing is processed. We are all about using top quality ingredients that are freshly cooked and transferred to the aircraft within six hours. Passengers then receive some of the best food in the world," said Dogudan.

While airlines are introducing new menus and on-board chefs, they are also very aware of cutting costs and not wasting food.

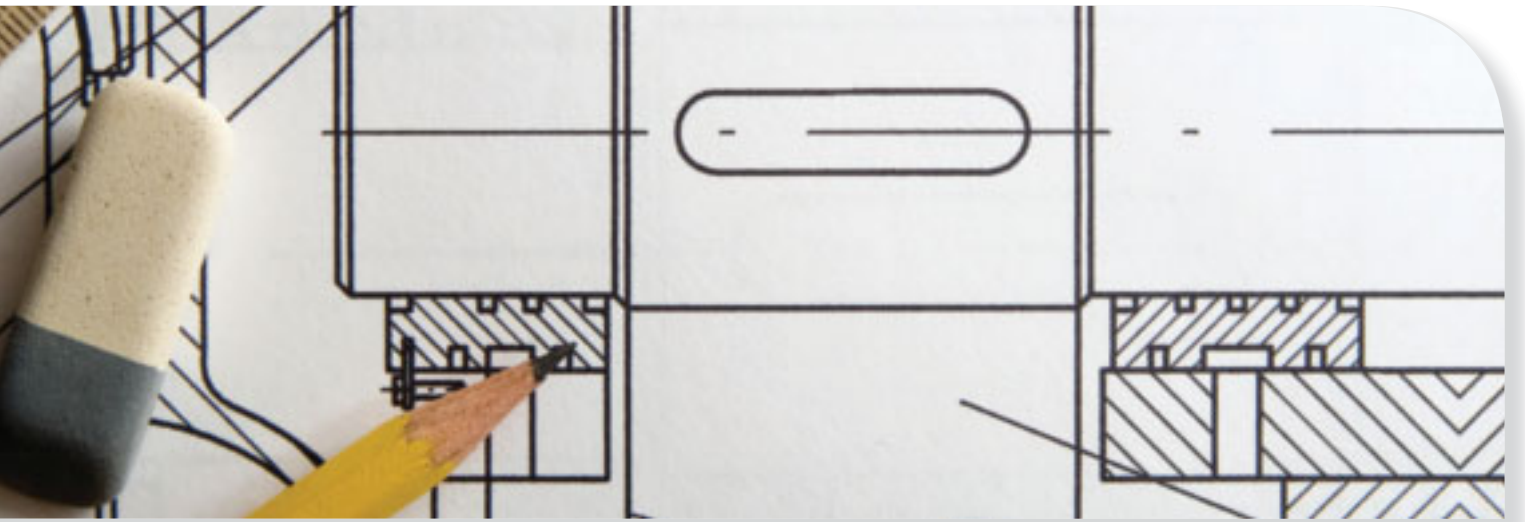
Etihad Airways has recently introduced Sabre software, following the billion-dollar technology agreement signed by the two companies last year.

## Enhanced

Lee Shave, Etihad Airways' vice president for guest experience, said: "This allows us to better manage, audit and analyse important processes such as meal forecasting and equipment demand. The enhanced control means we should make savings in excess of \$5 million per annum, while continuing to provide a world-class and award-winning guest experience on board."

"Using the software, the airline can more accurately cater for in-flight meals, special requests, and centrally control the on-board product requirements to improve consistency across the network. Etihad Airways will also make savings by reducing meal wastage through improved forecasting, and by better auditing of caterer invoices."

Maher Koubaa, Sabre Airline Solutions' vice president in the Middle East and Africa added: "The technology brings together what is currently a multi-layered manual process into a fully automated single platform for the entire in-flight service supply chain. This helps to streamline operations and reduce operational complexity."



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Offsets evolved



*The use of offset clauses in defence contracts is an important aspect of increasing the capacity for indigenous design, development and manufacturing in-country.*

**Claire Athorp** looks at the situation in the UAE.

# BEHIND THE ONSET OF OFFSET

**T**echnology transfer deals can significantly boost a domestic nation's research and production capabilities and inject valuable investment into defence industries hungry for a share of export-led growth in the worldwide market.

It is also, vitally, an invaluable way for those countries benefiting from strengthening economies and relaxed US and European export laws, to fast-track the establishment of their own skills and manufacturing base by taking advantage of a market hungry for new customers.

As one of the fastest growing defence markets in the world, the Middle East is shaking up its offset practises in government defence contracts.

The work being done in the UAE was the focus of a conference held at Eurosatory 2012 in June, where the wider framework within which government offset operates was discussed by representatives from the European Club for Countertrade and Offset (ECCO), an association that brings together European companies and individuals involved in offset and countertrade; the Tawazun Economic Council (previously the UAE Offset Programme Bureau); and Tawazun Holdings, the investment vehicle of the Tawazun Economic Council established in 2007 to develop profitable ventures with international partners that add to Abu Dhabi's industrial

manufacturing layer in the areas of defence, manufacturing and technology.

The Tawazun Economic Council is the organisation mandated to oversee implementation of the UAE's offset programme and was established to promote industrial partnerships, facilitate technology and knowledge transfer, as well as build capacity in specialised fields – in particular defence systems and components for land and naval systems, munitions and weapons systems, autonomous systems, aerospace systems, and advanced materials. The group has seen a number of high profile successes, and has partnered with world-class manufacturers to create multi-million joint ventures (JVs) in the UAE.

Overall the aim of offset is to enforce the establishment of infrastructures that directly contribute to the development of a nation's economy and industry; more specifically this can relate to products, equipment, technology or activities directly linked to the purchase contract, that may include transfer of technologies related to the product; a subcontract to include a minimum share of the contract to local companies; or to train the end-user to effectively use and maintain the product purchased.

Offset contracts usually include definitions of work that will be performed

Continued  
on Page 94



by foreign and local suppliers, as well as the conditions of such performance, such as the value to be added, timeline, stakeholders and penalties for under-performance.

As a result, establishing offset agreements is about more than the end goal; it relies on a strong amount of talent and skills in-country to ensure the agreements can be created and carried through effectively.

There have been a lot of changes recently in the UAE in terms of the defence offset policy as the country's defence industry gathers pace, with new guidelines adopted last year. Speaking at the symposium, Matar Al Romaithi, chief officer IDU, Tawazun Economic Council, spoke about putting the new guidelines into practice, and gave insight into the council's vision with regards to its goals.

"The council's programme is all about creating an economic balance, guiding defence contractors to create partnerships with local companies in order to create economic benefits," he said. "Our objectives are to develop a modern defence industry in the UAE through building the required infrastructure and also to help, promote and facilitate modern technology transfer and employment opportunities for UAE nationals."

Outlining the procurement process, Romaithi said: "It is very important to start working early with the council in order to get initial plans into place to ensure that all obligations can be fulfilled. In the past we got involved at a later stage, after the supply contract had been signed with our armed forces; now we figure if we can start earlier in the negotiation phase we can help guide contractors towards the most suitable partners to do business with."

With a threshold of \$10 million dollars over a period of five years, the UAE's new offset requirement is 60% of the supplied contract value. The programme runs for seven years, during which time the contractor is expected to have established a JV with a local company, the performance of which will be evaluated over the period with annual milestones to be reached. The JV needs to fulfil 5% of the total obligation in the first year and this amount rises throughout the period until complete fulfilment in the seventh year.

A goodwill grace period may be issued at the start of the programme, during which there is time for the contractor to establish facilities and there will be no evaluations, but there is an expectation that the JV will be making progress. Any grace period issued will be determined by the



**Top: South African contractor Denel, manufacturer of the G5 Howitzer, signed with Tawazun Holdings during Eurosatory 2012 for the marketing and production of the DRACO system. DRACO is a vehicle mounted version of the company's 76 mm naval multipurpose gun.**

**Above: OTO Melara signed an MOU with TAWAZUN during Eurosatory 2012 for the marketing and production of the DRACO system. DRACO is a vehicle mounted version of the company's 76 mm naval multipurpose gun.**

complexity of the project and how many phases it will require.

The model used to evaluate the offset project by the council is a hybrid that consists of input and output. The maximum the defence contractor can input in terms of obligation is 30% (equity contribution that may include capital contributions for cash investments and tangible assets). Input elements are evaluated on three fronts: industry enablers, knowledge empowerment and equity contribution.

The output of the JV is measured in terms of profit (net profit/export sales) and the hiring of UAE nationals in order to sustain projects in the long run and build capability.

In the case of underperforming there are penalties. "But this is a last resort," Romaithi said. "We try to find solutions before it comes to that."

It used to be that in the case of underperforming, the contractor paid a penalty that discharged the entire obligation.

Now, a penalty of 8.5% will be applied on the shortfall amount, but this will discharge only 50% of the shortfall.

The remaining 50% will be placed in a default account where it will remain until the end of the programme, at which point, if the contractor has generated credits that satisfy and exceed its obligation, those credits may be used to fulfil the outstanding obligations of the default account, and the penalty will be repaid. If there is not enough to cover the default account, a new

programme will be signed to fulfil obligations.

As the council pushes forward with its objectives, Tawazun Holdings will focus on key areas for the 2012-2013 period, including creating new projects within the ammunition, automotive and aerospace sectors.

For ammunition, to develop individual local facilities capable of producing, assembling, testing and supplying customers locally and internationally with a range of munitions, as well as bringing parts of existing

supply chains into the UAE to lessen external dependencies; for automotive, to expand 4x4, 6x6 and 8x8 vehicle production and customer support in the UAE; and for Aerospace, to expand build-to-print capabilities in aero structures, as well as increasing work on UAV air-ground components.

The defence sector is expected to make up 80% of efforts as the country moves towards a strong, growing market with diversification from traditional areas, toward a future where the UAE has a world-class defence industry able to compete at the international level.





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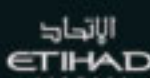


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*Offset consulting firm Blenheim has provided consulting, advisory and transaction services to governments and corporations across the MENA region. Founder Grant Rogan shares his views on how offset programmes are providing a major opportunity for regional development.*

## Why offsets are the real deal



**Grant Rogan is the founder and CEO of the Blenheim Capital Group.**

**He became heavily involved in countertrade and offset transactions in Switzerland, Korea, Spain, Turkey and Saudi Arabia in the late 1970s, which resulted in the establishment of his own advisory firm in the mid 1980s. Over the past 28 years he has further developed offset and financial investment opportunities for a host of multinational corporations and has advised several governments with a primary concentration in the Middle East and Far East.**

**A**s anyone who sits at a major equipment negotiating table in the Middle East and Gulf States knows, getting deals done in the current climate is challenging.

It's not just that the competition among suppliers increasingly reliant on export sales is tougher than ever, or that budgets are under pressure as governments seek to address the wider needs of their people, there is also an enhanced requirement for sellers to support financing and to be seen to be contributing to the economy they are supplying.

The ability to deliver a full lifecycle commitment to the purchaser is an increasingly important success factor.

What many people don't realise is that well considered and properly managed offset programmes can help all parties achieve what they are striving for, and it's worth exploring further whatever side of the negotiating table you sit at.

In the second half of 2012 it's estimated that there are \$100 billion of offset obligations outstanding around the world. In the MENA region alone this is expected to reach \$150 billion by 2017 and \$500 billion globally. For the governments and companies that harness offsets to their full potential, the value of these can be multiplied many times in actual benefit. For those who do not, the loss to economies and future deal pipelines can never be recovered.

In all the years that I've been involved in the offset field, I believe these are the most exciting for three reasons:

\* Firstly, in a world where there are ever increasing calls for national resources, offsets provide an opportunity to bring together the requirements for national defence and major civil investment, with those of health, education, skills development and long-term employment.

\* Second, a truly beneficial offset project can develop deep, long-term relationships between buyer and seller, which can serve to enhance the opportunities available for OEMs. Indeed, as shareholders become increasingly focused, values as well as value, demonstrating a long-term

sustainable approach, can have quick benefits in home markets too.

\* Finally, at a time when there are so many reasons for contracts and projects to be put on hold or cancelled, offsets provide a mechanism to keep them on track, securing jobs around the world in equipment manufacture, as well as development in the purchasing markets.

For governments the key to realising these opportunities lies in fully aligning offset programmes with national economic and strategic objectives, and ensuring they are set up to encourage investment – often easier said than done.

### Increased transparency

For companies the challenges of offsets are often seen to outweigh the benefits but this need not be the case. Increased regulation is driving increased transparency in the offset sector; this not only provides a clearer operating framework but brings with it the opportunity to build and celebrate the economic benefits of long-term partnership as well as securing jobs.

Just as they are being used to providing low-cost funding for major non-carbon energy projects such as solar and wind based renewable, offsets can and are being used to support education and sustainable job creation. Success lies in having long-term shared ambitions, not short-term obligations, thinking about the whole economy, not just the immediate requirement.

Having recently attended the World Economic Forum to discuss how offsets can be used to achieve these goals, and about to depart for the Rio+20 conference where offsets are being considered as a tool to support sustainable development, I am more convinced than ever that offsets can tip the balance in favour of better, more productive outcomes from national equipment and infrastructure spending.

For all of us at the negotiating table, now is our chance to secure these benefits.

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SPECIAL MISSIONS



# The Special Ones...

*The steady rise in importance of special forces has been an international phenomenon.*

**Jon Lake** looks at some of the various units operating in the Middle East.



**S**pecial forces provide a cost-effective, highly discriminatory means of delivering appropriate military effect with great precision.

They are especially useful for countering unconventional and asymmetric threats and also provide useful deterrent against current threats to the security and economic interests of many formed states.

Such is the popularity and ubiquity of special forces that they have become 'fashionable', spawning imitators within law enforcement and police forces, many of whom now sport the kind of uniforms and carry the kind of weaponry that have become emblematic of the military special operations community.

And nowhere are special forces more fashionable than in the MENA region, where a variety of factors have led to a rapid growth in their size and importance.

This should hardly be surprising. There has been a long history of using special operations forces in the region dating back to the Second World War, when Britain's Special Air Service (SAS) and Long Range Desert Group (LRDG) pioneered modern modes of operation.

Special forces history continued to be made in the Middle East post-war, not least in Oman, where UK special forces fought a long counter-insurgency campaign during the long-running Dhofar rebellion (1962-1975).

The heavy use of special forces by Israel also spurred the formation and development of similar capabilities among Arab armies, with Egypt taking an early lead and using commandos for 'cross canal' raids during the 'War of Attrition' (1967-72) and during the Yom Kippur War in 1973.

#### Launched an assault

Subsequently, in 1978, Egyptian special forces launched an assault against a hijacked aircraft (carrying Egyptian hostages) at Larnaca Airport, Cyprus. The mission was a failure, the Egyptian commandos being mistaken for terrorist reinforcements by the Cypriots, who engaged them in a long and bloody fire-fight, destroying the Egyptian C-130 Hercules in the process.

In 1985, Egypt's Task Force 777 was dispatched to deal with a hijacking at Luqa Airport, Malta, successfully killing one terrorist (one had died during the hijacking) and capturing the leader, though many of the

passengers were also killed during the operation.

Today, Task Force 777 is supported by a dedicated Mil Mi-8 helicopter unit, believed to be based at Cairo-Almaza as part of 533 Helicopter Brigade.

Nowadays special forces in the region are more focused on anti-terrorist and internal security operations than they are against the Israeli threat. The Middle East is on the frontline of the global war against terror and has become progressively more engaged in multi-national operations against Al Qaeda and extremist Islamist groups, frequently using special operations forces to contribute to US-led coalition operations.

The Gulf Arab states have been contributing to the US/NATO-led coalition forces in Afghanistan for the duration of the war. Few of the Gulf states have the manpower to be able to sustain a continuous presence for a full year's deployment and have, instead, rotated their special operations forces more quickly, with contingents from more than one of the Gulf Arab states 'sharing' a one year deployment 'slot'.

Special operations air assets are most obviously required for deployment, mobility, resupply and insertion and dedicated aircraft are typically more

Continued  
on Page 100



**FLIR cameras are now equipped on all sizes of special mission aircraft.**

**CONTINUED FROM PAGE 99**

lavishly equipped than those used by 'normal' tactical transport aircraft. They are more likely to be equipped with FLIR, terrain following radar, and other equipment designed to meet the needs of covert penetration, and to be fitted with advanced defensive systems.

But the current generation of radio-frequency countermeasures systems do not necessarily protect such aircraft against the small arms, machine guns and rocket-propelled grenades that are currently proving most dangerous to them. Some forces have reacted by using heavier defensive weapons to try to provide suppressive fire, while others have sought to provide better armour and ballistic protection. Many believe that the best solution will be an accurate and reliable hostile-fire indicator system and a number of companies are working on just such a solution.

But aircraft and helicopters used by special operations forces will not always be well equipped military types, as they do not always want to draw attention to themselves, or to appear overtly 'military', and they may use aircraft painted in anonymous quasi-civil colour schemes.

Looking ahead, the special operations community is paying great attention to the new developments in rotorcraft technology that promise faster speeds and longer range, from new generation tilt-rotors to aircraft like the Piasecki Speedhawk and the Sikorsky X-2.

"I think that speed and range are very important when you are dealing with non-state actors and fleeting targets," said Colonel Clayton M Hutmacher, commander of the US Army's 160th Special Operations Aviation Regiment.

Special forces are increasingly demanding their own dedicated close air support (CAS) capabilities and these can be provided by attack helicopters, fixed wing light attack aircraft and even by gunships.

Gunships remain rare, though there are signs that this is changing – with ATK's CN-235 gunship modification for Jordan, and with the US DoD's C-130J-based Harvest Hawk and Dragon Spear gunship conversion programmes.

Such dedicated capabilities are undoubtedly nice to have but they are also easy to provide from the main air force inventory, either by attack helicopter (though with range, firepower and vulnerability constraints) or by using fixed wing fast jets.

With the growing ubiquity of datalinks and other equipment to facilitate communications between airborne assets and ground forces, including FACs etc, the provision of CAS for special operations forces is becoming easier. New equipment like the remote optical video enhanced receiver (ROVER) allows the transmission of sensor imagery without requiring ground forces to carry impractical, bulky or heavy equipment.

**Reliant on air vehicles**

Special operations forces are also reliant on air vehicles for intelligence, surveillance, target acquisition, and reconnaissance (ISTAR), and there is an increasing emphasis on the use of UAVs – especially the smaller, lighter, and more portable unmanned vehicles.

Dedicated special forces aviation components are relatively rare, even among more advanced air forces in the developed world, outside of the USA, and the UK. Most nations use 'ordinary' tactical transport and support helicopter units to support special forces, or use assets whose primary mission is combat search and rescue (CSAR), like the French Eurocopter EC725 Caracals.

Despite this, some Arab nations have (or in some cases, since special operations are traditionally surrounded by a veil of secrecy, may have) dedicated special forces aviation components.

Jordan and the UAE lead the field in this area. Jordanian special forces can call on dedicated UH-60L Blackhawk and MD530FF helicopters, and are soon to receive a pair of gunship-configured CN-235 transports.

The UAE's special forces have a dedicated air support unit in the form of 18 Group at Sas al Nakhil. This operates a DHC.6-300 Twin Otter, UH-60M Black Hawks, CH-47C/D Chinooks, AS.550C3 Fennecs, Cessna 208B Grand Caravan IIs and is taking delivery of Air Tractor AT-802U close air support aircraft.

In Bahrain, the Special Security Force Command relies on air support from the RBAF and the Police air wing.

In Kuwait, the Ministry of the Interior has a special forces counterterrorist unit, the Army includes the 10th Commando Battalion, and the Navy has a fast attack unit, but air support is provided by the Air Force.

In Oman, the Royal Oman Police hosts one squadron of the Sultan's Special Force (SSF). This unit (known as the Cobras) is tasked with counter terrorism and is supported by the CASA CN-235-100s, Dornier 228-100s, and the AgustaWestland AW109s and AW139s operated by the Royal Oman Police.

In Qatar, there are military special forces and the Lekhwiya (the Qatari special forces for internal security), and these have been committed to operations in Libya and more recently in Syria, but they lack dedicated air support.

Little is known about the air support available to Saudi Arabia's expanding special forces. The Airborne Brigade at Tabuk includes three special forces companies, while there may also be special forces elements within the Saudi Arabian National Guard.

In the Yemen, special forces use four Huey II helicopters and a single CN-235 transport.





# THE WORLD IS COMING

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The Dubai Airshow moves  
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*Shannon Airport in Ireland saw the arrival of two Bombardier Dash-8 Q300s, configured as maritime patrol aircraft (MPA) on their way to the UAE Air Force and Air Defence. Jon Lake looks at the images captured by photographer Maurice O'Donoghue and gives his view on the aircraft modifications and the background to the deal.*

# DOUBLE DASH

The paperwork for the two Bombardier Dash-8 Q300s that touched down at Ireland's Shannon airport in an early morning haze a month apart showed the aircraft were acquired by Abu Dhabi Aviation and had been converted for their new role by Canada's Provincial Aerospace, of St Johns, Newfoundland.

The journey to their new Gulf owners and operators saw the aircraft routing to the UAE via Labrador, Shannon and Palermo in Sicily.

The 'second' aircraft (the former A6-ADG, wearing UAE military serial 1321) was delivered first, arriving at Shannon on March 9. The 'first' (1320, formerly A6-ADF) followed on April 15.

Though acquired from Abu Dhabi Aviation, both aircraft had also been used by Caribbean Star Airlines, with A6-ADF wearing a gaudy 20/20 cricket tournament colour scheme.

The identity of the first aircraft was not unexpected, as the various models shown by Provincial at successive Dubai Airshows had always been marked as A6-ADF.

A recent job advertisement revealed that the two aircraft will be operated on behalf of the UAE Air Force by a local "military MRO" organisation, and that an ex-military Dash-8 experienced captain was being sought to act as a "pilot mentor/training Captain".

Provincial Aerospace received a \$290 million (AED1.071 billion) contract for the two aircraft on February 27 2009, covering the modification of a pair of Bombardier Dash-8 Q300s,

converted for the maritime patrol role. The contract included the design of the necessary modifications, as well as the incorporation and integration of new role-specific equipment. The contract also covered training and integrated logistics support for an unspecified period.

Although previously its experience was limited to the modification of just two Dash-8s for the Netherlands Antilles and Aruba Coast Guard (while Toronto-based rival Field Aviation has received 30 orders for such aircraft from Surveillance Australia, Tenix LADS Australia, US Customs and Border Protection, the Japan Coast Guard, the Swedish Coast Guard and the Icelandic Coast Guard), the Newfoundland company has been operating and modifying maritime patrol aircraft for more than 25 years.

#### Mission time

In doing so, Provincial has already amassed more than 130,000 hours of mission time on its fleet of ten MPAs (five King Air 200s, two Dash-8 Q100s, and three UAVs), which operate in 30 countries and add 10,000 hours per year to the company's tally.

Provincial also has years of experience in acting as a designer, modifier and integrator of special mission aircraft solutions across a diverse range of aircraft platforms including Beech King Airs, Bombardier Dash-8s, Canadair CL415s and Swearingen C-26s among others. It has designed and managed the installation and integration of

tactical management systems, maritime radars, and sensor suites.

The UAE's trade is still heavily dependent on shipping and the Emirates needs the commercial waterways of the Gulf for imports and for vital oil exports, while there are also important fisheries to protect and monitor (for pollution and illegal activity), and there is a real requirement for maritime search and rescue. Consequently, maritime patrol in the Arabian Gulf has become an increasingly important priority.

The UAE has had a long-standing requirement for a long-range maritime patrol aircraft and, in 1998, it was widely reported that it had placed an order for four Indonesian-developed CN-235 MPA aircraft that would have enjoyed some commonality with the air force's fleet of seven CN-235 tactical transports.

These were expected to feature the Thales AMASCOS 300 airborne maritime situation control system with a Thales/EADS Ocean Master 100 radar, a Thales Optronique Chlio thermal imager, and a Thales Gemini navigation computer, as well as a CAE AN/ASQ-508 magnetic anomaly detection (MAD), an Elettronica ALR 733 radar warning receiver.

But the CN-235MPAs never arrived and, by 2007, it was clear that the nine-year-old requirement remained unfulfilled, and that a competition was still under way.

At the Dubai Airshow that year, Provincial showed a model of a Dash-8 Q300 in maritime





The first of the UAE's new maritime surveillance aircraft flies into Shannon for refuelling en route to the Gulf.  
Picture: Maurice O'Donaghue.

configuration and wearing UAE Air Force markings, placing it prominently in front of a poster advertising the AMASCOS mission system.

After what Keith Stoodley, Provincial's senior vice president for marketing and sales, called "an extensive and exhaustive competition involving many of the world's largest aerospace and defence companies", Provincial was selected to modify two Dash-8s to maritime patrol configuration. Many pundits expect the eventual requirement to be for four such aircraft, since long before the contract was awarded, there had been a number of reports that four of the eight DHC-8-315Q aircraft operated by Abu Dhabi Aviation were expected to undergo maritime surveillance aircraft conversion and, of course, the CN-235 order had been expected to be for four aircraft.

The configuration on the UAE aircraft has been kept secret. We do know the Dash-8s used by Provincial to fulfil the Netherlands Antilles and Aruba Coast Guard requirement are relatively modestly equipped, with a 360 degree maritime search radar, a nose-mounted searchlight, an under-fuselage FLIR, extended range fuel tanks, and a drop hatch. The latter incorporates a windbreak and is designed to deploy search and rescue kits. It is pressurised, reloadable, and can be operated from the cockpit.

These sensors and systems are integrated with Provincial's proprietary airborne data acquisition

and management (ADAM) tactical management system. When a UAE maritime Dash-8 was first shown in model form, it seemed to have much the same fit, although it was expected that the aircraft would use the Thales AMASCOS mission system, incorporating sensors and equipment from Thales, surveillance equipment from FLIR Systems (in the form of a gyro-stabilised forward-looking infrared turret, electronic countermeasures equipment from Elettronica Spa, and secure telecommunications equipment from Rohde & Schwarz, as well as unspecified items from Honeywell and from Saab Systems in South Africa (probably Saab Avionics).

#### Tight-lipped

None of this can be confirmed as Provincial has remained tight-lipped about the details of the UAE conversion and about the equipment that has been installed.

In Provincial's marketing brochure it could be construed that the UAE aircraft may have an anti-submarine warfare capability, using sonobuoys, radar and side looking airborne radar (SLAR) for the detection, classification, localisation and tracking of surface and sub-surface targets. The aircraft features a high bandwidth satellite communications system integrated with the on-board mission system and the ground-based mission data repository, providing real time access to data, video and audio.

The aircraft may also incorporate a signals

intelligence gathering capability, allowing it to intercept communications from targets of interest, either airborne or on the surface.

Certainly it has a profusion of antennas and radomes on the forward and rear fuselage, as well as prominent SLAR fairings along the sides of the lower fuselage and what appears to be chaff/flare dispensers mounted above the rear fuselage. There does not appear to be a MAD system fitted.

It was expected that the aircraft would feature a new fully openable air operable door and searchlight (located inside), similar in some respects to the openable door design incorporated on some field Dash-8 conversions, with a built-in windbreak to allow the airborne dispersal of larger life rafts, survival supplies or even paratroops. These doors were designed to allow the mounting of searchlights for the illumination of surface targets. But in the event, photos of the aircraft on delivery do not appear to show an air operable door and, instead, searchlights are housed in Plexiglas domes under each wing root, perhaps indicating that there is no longer an air operable door facility, though an under-fuselage drop hatch is clearly fitted.

The aircraft appears to have a night photography system; with the distinctive twin windows fitted in the starboard lower rear fuselage, and may also be fitted with an infra red linescan in the belly.

But for the full details of the conversion, only time will tell.

# Keeping an eye on the

*A number of companies saw the Marrakech Airshow as the perfect opportunity to display their maritime surveillance offerings. Kelly Green looks at who was there.*

**A**ustria-based Diamond Airborne Sensing, a 100% subsidiary of Diamond Aircraft Industries, returned to the Marrakech Airshow this year to introduce its fully equipped maritime surveillance patrol aircraft to the African market.

Equipped with a combination of maritime radar, an EO/IR camera, an automatic identification system (AIS) and a data-link, the remote sensing platform DA42 MPP Guardian is now able to fly off-shore missions.

Diamond Airborne Sensing developed a special SAR pod for the maritime radar that is mounted under the belly of the aircraft. "The radar application is brand new but the aircraft has been on the market since 2006," explained Markus Fischer, marketing & sales director.

Using Scotty – a beyond-line-of-sight satellite transmission – it is possible to transmit data from the aircraft to wherever the customer wants to have the picture. "It's fully secure, so people can't decode the messages we send. You can do voice, HD pictures, live media or chat; you can send this from the aircraft to the ground, or the other way round," explained Fischer.

"The whole world is fighting with budget cuts and we are actually offering a very cost-effective solution, especially in places like Africa where it's important to have a simple solution that is reliable," said Fischer.

## Important target market

He continued: "North Africa is a very important target market. We are fuel-independent and this is what they are looking for. The aircraft is also very easy to maintain and that's also very important because helicopters are difficult to maintain. Sometimes to build up a maintenance shop takes a lot of time and is very complex. This is not what customers are looking for; they want to fly all the time."

Diamond hopes that the company's complete package offering will appeal to the African market. "We can do everything in-house, we are independent. So the customer has us as a single point of contact, which is also important to military organisations or police forces, because they don't want to talk to lots of different suppliers," said Fischer.

"Training, maintenance training, spare parts, ground stations, satellite communication – we offer the whole thing. We are now ready to set up a mission management system on ground and the air unit as well."

The aircraft includes a number of special



features for carrying out missions. "The aircraft is powered by our own diesel engine, which we have developed. It's a fully-faded control, so it's very simple to fly, which is very important if you fly missions, because the pilot has to look outside and work for the mission as well," explained Fischer.

The DA42 MPP Guardian also features an on-top exhaust system. "We changed the exhaust pipe from looking downwards to looking upwards and it's mixed with a muffler," Fischer explained. "We're mixing hot air from the exhaust with cold air and that reduces the infrared signature of the aircraft to a level where people on the ground can hardly detect the aircraft. If you fly at 1,000ft then the aircraft is making less noise than a passing car, so if you fly at the typical mission altitude of 6,000-12,000ft, there's absolutely no chance people will hear the aircraft using the on-top exhaust system.

"There are two approaches to surveillance. The first is to be very noisy and very active so people know that you're there and don't do anything bad, or you be very quiet and don't let the people know

that you're there – and that is our approach."

The MPP will also come in a completely new grey military look, designed as another way of decreasing the risk of detection. "The aircraft is fully painted grey, which is more-or-less a military option because it is reducing the sun reflection," said Fischer.

Another next-generation airborne maritime surveillance platform on display was the Tecnam MRI (multi-sensor reconnaissance and identification).

## Security and defence solutions

The aircraft has been developed by global advanced technology security and defence solutions company INDRA, in partnership with Italian aircraft manufacturer Tecnam, SELEX Galileo, FLIR Systems and Airborne Technologies, the Austrian-based remote sensing and sensor integration company. "With Indra and our partners we have developed a solution for maritime patrol aircraft and this is the market launch – the first time we are showing the aircraft here – because the African market is a very important market to us," said Tecnam MRI's Alejandro Martinez Recasens.

Specifically developed to patrol those maritime zones currently kept under surveillance by coastguards utilising medium-size helicopters and large maritime patrol aircraft, the Tecnam MRI offers a smaller alternative for maritime security and coastal patrol missions.

"The idea is to use a small aircraft for maritime surveillance, which is cost-effective and easier to



# surveillance market

maintain and to fly,” Martinez explained.

Also on display was Daher-Socata's TBM-MMA multi-mission configuration – a TBM 700B modified to serve as a multi-mission aircraft (MMA) demonstrator – which was being shown for the first time in Africa.

“This year's Marrakesh show provides an excellent opportunity to present the TBM-MMA for Africa, where the multi-role aircraft is perfectly tailored as a highly affordable, cost-effective multi-mission airborne platform for both security and governmental operators,” said Nicolas Chabbert, senior vice president of the Daher-Socata airplane division.

“It is based on the proven TBM very fast turboprop aircraft product line – which has an excellent operational and maintenance record, especially in service with the French armed forces.”

In its intelligence, reconnaissance and surveillance (ISR) configuration, as it was shown at the event, the TBM-MMA is outfitted with a



**A multitude of sensor equipment can be installed on aircraft that are more often recognised for general aviation and business use.**

gyro-stabilised multi-sensor turret located under the aircraft's aft fuselage. This electrically-driven system is fully-retractable and accommodates up to four latest-generation sensors, including infrared and electro-optical systems, along with a

laser rangefinder and a laser designator to mark targets.

Control of the turret is performed from inside the cabin with a portable operator's console that displays video images and also handles signal processing. A data recording function is available for the processing of sensor information, which can be performed aboard the aircraft or downlinked to an operational ground control station via a data transmission system.

For medical evacuation missions, the TBM-MMA is equipped with a stretcher and patient loader system, with the ability for rapid cabin reconfiguration to passenger seats for liaison duties.

Daher-Socata believes that the TBM-MMA is well suited for armed forces, governmental agencies and contract operators, providing an answer to needs as diverse as urban security, the fight against trafficking and pollution, border and coastal surveillance, aerial detection of forest fires, medevac and other applications.



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*The ninth Special Operations Forces Exhibition & Conference (SOFEX) was held at the King Abdullah I Airbase at Marka, near Amman in Jordan in May.*

*Jon Lake reports.*

# Jordan lays down a Marka...

**M**arka is the home of the Prince Hashim Bin Abdullah II Aviation Brigade, Jordan's Special Forces air support unit, which includes 28 Squadron (equipped with Hughes 500Es and MD530FFs), 30 Squadron (equipped with Sikorsky UH-60L Blackhawks) and 31 Squadron (notionally equipped with three An-32s).

The status of the Jordanian An-32s is uncertain. Only one (3010) of the three supposedly delivered has actually been seen and this had been moved to the Royal Jordanian Air Force (RJAF) 'museum ramp' by the time the 2012 SOFEX exhibition opened.

The exhibition highlights the key role that special operations forces play in protecting the citizens of every nation and in safeguarding growth and prosperity, and helps to provide such forces with the kit, technology and solutions they require to fulfil their vital responsibility.

SOFEX is a biennial four-day event supported by the Jordan Armed Forces and held under the royal patronage of His Majesty King Abdullah II. It is chaired by HRH Prince Feisal Bin Al Hussein.

## Vital gathering

SOFEX was founded by King Abdullah in 1996 and has grown to become a vital gathering for international special operations, counter-terrorism and homeland security decision makers, high-ranking defence officials and the industries that support the sector. It is the only exhibition and conference of its kind in the MENA region but is rapidly gaining a global significance.

The conference and exhibition provides a useful opportunity for networking – attendees included 70 official delegations from 33 countries, heads of state, defence ministers and their officials, and high-ranking military and government decision makers.

This makes SOFEX an ideal platform for



**Top: Airbus A300 from KASOTC on display at Marka. Below: The Jordanians also had an impressive array of rotorcraft at the event.**

manufacturers to present the new and innovative equipment and solutions that are required in the face of today's increasingly complex and ever growing security challenges.

The event attracted sponsorship from an impressive array of local and international sponsors, including the Jordanian King Abdullah II Design and Development Bureau (KADDB); investment group KIG; and Northrop Grumman, backed up by Royal Jordanian Airlines, Arab Ready Meals, Orange, DRS Technologies and Lockheed Martin.

This year's SOFEX opened with a special operations commanders' conference and was followed by a world-class three-day exhibition, showcasing ground-breaking special operations

equipment and technology, much of which was being displayed for the first time in the Middle East.

Amer Tabbah, managing director of SOFEX, expected this year's event to be the biggest and most successful edition to date and highlighted the achievements of his all-Jordanian team which, he said, had been working tirelessly to ensure the event would be "yet another success story for Jordan and its people".

The exhibition was officially opened by the king on Tuesday May 8, the official 'Delegations Day', in the presence of several members of the royal family and a host of VIP guests.

King Abdullah, the son of the late King Hussein, is a qualified Cobra attack helicopter pilot who served as a tactics instructor with the Royal Jordanian Air Force's Helicopter Anti-Tank Wing.

## Qualified frogman

His Majesty is also a qualified frogman and free-fall parachutist, and is an avid gun collector.

First and foremost, he was a professional Army officer, with a particular affection for and long-standing link with special operations. After serving in a number of armoured and aviation appointments, he served as deputy commander of the Jordanian Special Forces on promotion to Colonel in January 1993, and subsequently becoming commander in June 1994 after being promoted to the rank of Brigadier General.

He was subsequently appointed Commander of the Special Operations Command in October 1997. SOFEX is, thus, very much King Abdullah's event.

The opening ceremony was followed by a special operations force role demonstration. This began with a simulated airfield attack by four F-16s, before an MD530FF from 28 Squadron made mock attacks, clearing the way for an assault by four UH-60L Blackhawks from 30 Squadron. Some special forces troops rappelled





**Demonstrations of the special ops activities gave delegates a taste of why the equipment on show is so important.**

on to the roof of a mocked-up airport departures building, before they and other troops assaulted the building. A dog then attacked an escaping terrorist before a C-130H from 3 Squadron demonstrated a tactical landing to recover the special forces troops.

The UH-60Ls demonstrated at SOFEX are dedicated to special operations, with large 'SO' prefixed serial numbers on the rear fuselage, and on the engine nacelles. The aircraft have the prominent hover IR suppression system (HIRSS) characteristic of the UH-60L, designed to cool engine exhaust gasses while hovering and in forward flight. They also have a nose-mounted radome, similar to that originally fitted to the Mitsubishi-Sikorsky UH-60J, and believed to house a colour weather radar.

The UH-60Ls were supported by a pair of MD530FFs, which also wore prominent special operations badges on the fuselage and tail, but

which lacked the 'SO' prefixed serials.

The MD530FF is a hot and high version of the MD500E powered by a 650shp (485 kW) Allison 250-C30B turboshaft engine, with main-rotor blades six inches longer than those of the MD 500E, and with the tailboom extended eight inches. The tail rotor blades are lengthened to provide increased thrust and improved directional control at high altitudes.

#### **Tactical displays**

The 'Delegations Day' was followed by two further trade days. The Royal Jordanian Falcons displayed on all three days and there were also ground/air mobility and tactical displays.

On days three and four there were small calibre live firing demonstrations at the King Abdullah II Special Operations Training Centre (KASOTC). This is a one-of-a-kind, \$200 million facility located on a 25sqkm site in a former quarry near Amman.

The range operations control (ROC) centre is connected to hundreds of cameras, microphones, battlefield effects and target systems, and a wide variety of simulators via a comprehensive fibre optic network. This allows real-time tracking of forces undergoing training and provides the means for detailed post-mission analysis and debriefing. This all makes KASOTC a fully integrated, cutting-edge, advanced technology training centre manned by elite instructors.

The centre includes shooting and driving ranges, simulated urban areas, and a two-storey 'shooting house' with an adjacent five-storey tower for live firearms training, and for instructing in room-to-room combat techniques and combined assaults. There is also a 'method-of-entry facility' and even an airport control tower and real, full-scale Airbus A300 airliner. The aircraft is fully instrumented and its seats contain

Continued  
on Page 108

target dummies that can be remotely controlled to stand up or sit down.

KASOTC claims that it offers the best reality-based training in the world for special operations forces, counter-terrorism and law enforcement units, and makes its facilities available for hire for tailored training packages, or in-house training or joint exercises, with accommodation for up to 1,000 personnel.

Immediately before SOFEX, KASOTC played host to the annual Warrior competition, with 33 special forces teams from 16 nations (Afghanistan, Austria, Brunei, China, France, Germany, Italy, Jordan, Kazakhstan, Saudi Arabia, Lebanon, Palestine, Qatar, Spain, the USA and Uganda) competing. Teams from Algeria and Iraq were withdrawn before the competition started and Oman and the UAE sent observers. One US team was from a civilian sheriff's SWAT team from Alameda County, California!

The four-day competition tested a wide variety of special forces disciplines, skills and techniques, from planning to weapons handling and marksmanship and even communications, with a special King's Challenge, which saw the competing teams tackling a 10km relay course with various shooting challenges along the way. The winning team was from Germany's elite GSG9 counter-terrorism unit (GSG9 celebrates its 40th anniversary this year), with last year's winners, Austria's Einsatzkommando Cobra, taking second place.

Though primarily showing small arms, vehicles and equipment for land forces, SOFEX has always had an aviation flavour as well and helicopters, small fixed-wing aircraft and UAVs have always formed an essential part of the mix.

#### Operational requirements

Eurocopter highlighted its dedication to meeting the operational requirements of governments, armed forces and special mission operators across the Arab world, displaying two full-scale helicopters in the shape of an EC635T2 of the Jordanian Police and a Royal Jordanian Air Force AS350B3, together with models of the AS565 Panther and the AS550 Fenice.

Jordan has operated Eurocopter helicopters for more than 30 years. The Royal Jordanian Air Force runs ten AS332M1 Cougars for troop transport and search and rescue, as well as three ex-UAE AS350s for pilot training and VIP duties. Jordan has also taken delivery of 13 EC635s, the military version of the light twin-engined EC135 helicopter, nine of them EC635T1 versions serving with the RJAF and four of them EC635T2s serving with the Jordan Public Security (police) Air Wing. Olivier Lambert, Eurocopter's senior vice president for sales and customer relations, explained that the company had an extensive footprint in Arab nations with more than 650 of its helicopters currently flying across the Middle East and the Arabian Gulf – more than 80% of them in military use fulfilling combat, transport,



A special mission An-32 attracted a lot of attention at SOFEX.

SAR, counter-terrorism, special operations and training missions.

Eurocopter hopes for new and expanded business opportunities in the region, both for fleet renewal, but also to meet new requirements with a growing need for helicopters for counter-terrorism, internal security, border patrol and other missions.

The company also expects a growth in civilian rotorcraft operations resulting from the opening up of previously restricted airspace.

Eurocopter's display of a scale model AS565 Panther reflects the type's suitability for Middle East operations – the Panther is already in use in the United Arab Emirates, Morocco and Saudi Arabia for coastal protection, SAR and offshore economic zone surveillance. Fast and agile, the twin-engined AS565 is also well suited to security, special operations and defence missions.

#### Defence budget funds

The RJAF remains committed to purchasing 18 Boeing AH-6i attack helicopters, for which a letter of intent was signed at SOFEX 2010. However, there has been a delay with the Arab Spring and unrest in Syria causing some diversion of Jordan's defence budget funds.

The RJAF continues to operate 33 AH-1F Cobra attack helicopters but it is not yet clear whether the new AH-6i helicopters would augment, support or replace the ageing Cobras, or whether they would be dedicated to special forces support duties.

Surprisingly, no AH-6i was present at SOFEX this year.

Another notable absentee was Jordan's new CN235-100M gunship. The two ex-Spanish Air Force aircraft were both seen test flying at Seville last year, fully painted in a smart dark grey colour scheme, with Jordanian national markings and serials, 'Jordan Special Operations Aviation' titles and large special operations badges on the nose and under the port wing.

The gunship version of the CN235 was designed by the Special Mission Aircraft division

of Alliant Techsystems (ATK), in conjunction with KADDB and was based on ATK's light gunship special mission aircraft capabilities package and STAR mission system.

ATK has considerable expertise in mission systems architecture and design and in the integration and certification of complex sub-systems, which it is now leveraging on 'weaponised' aircraft. The company integrated light attack and ISTAR capabilities on two Cessna Caravans for the Iraqi Air Force two years ago. The RJAF also operates the Caravan.

ATK's CN235-100M gunship conversion provides a robust day/night ISR solution, combined with real precision strike/close air support capabilities. The aircraft is to be fitted with a side-firing M230LF 30mm chain gun (a low recoil weapon also used by the AH-64 Apache helicopter), firing through the rearmost cabin window on the port side, and will have outrigger stub wings fitted with hardpoints to allow the carriage of AGM-114M/K Hellfire laser-guided air-to-surface missiles, and 70mm/2.75in rockets.

At the other end of the size spectrum, Turkey's Eastern Security Services promoted its Aeroseeker Aero-405, a new lightweight unmanned aerial surveillance system, previously seen only in model form.

The air element at SOFEX extended beyond manned and unmanned aircraft, however. AdvanTac Technologies, for example, displayed its new Air Ace survival vest. This features a SnapTrack modular attachment system, which allows a variety of different pockets (from a choice of more than 40) to be attached to meet the demands of different missions and requirements. The Air Ace vest has been tested at more than 600kts on an ejection seat test bed sled.

SOFEX looks set to continue to provide special operations and law enforcement forces with the equipment and solutions they need in order to deliver swift, decisive and effective solutions, which will in turn help to maintain the security and safety of their respective countries in the Middle East and around the world.





# SITUATIONAL AWARENESS

In the last decades several sensors and systems have been developed to enhance flight safety. We have systems on board to avoid storm cells, avoid mid-air collisions, Controlled Flight Into Terrain (CFIT), crashing into obstacles, etc. Still, with these systems available, analysis of numerous accidents show that in a lot of cases the pilot is the victim of a very intangible ghost: lack of Situational Awareness.

The basis of "Situational Awareness" is an understanding on the position and orientation with regards to possible hazards to flight. A comprehensive Moving Map is core and the interpretation of the terrain elevation is key. On top of this, we want to see obstacles positioned on the map from obstacle databases or from active obstacle detective systems. Flight Plan and Air Navigation Data needs to be introduced as a reference. Traffic information from TCAS systems, ADS-B In equipment, AIS receivers, etc. has to be dynamically aligned to the other data. Visualizing weather (radar) information is another bonus in search for Situational Awareness. We also want the potential hazards to be monitored continuously and, in case, a relevant warning needs to be generated. To offer complete Situational Awareness this stack of information needs to be represented comprehensively in 2D and preferably also in 3D. And last but not least, for civil operations, it needs to be certified for navigational purposes.

Today, state-of-the-art graphics processing power and algorithms allow to merge database and available sensor data into an intuitive picture for the pilot. Till recently this privilege was only for the happy few that were able to invest in high-end integrated cockpit systems. This has changed. Today avionics manufacturers start to offer low cost certified solutions that really can make the difference.

*When every second counts...  
to save a life...  
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## EuroNav 7



Contact us via [sales@euroavionics.com](mailto:sales@euroavionics.com) for further information about EuroNav 7

EuroAvionics Navigationssysteme GmbH & Co. KG is the leading manufacturer of Digital Moving Map & Situational Awareness Systems

EuroAvionics develops and produces high-end TSO'd graphics map engines with integrated Terrain Warning function and with the ability to merge multiple avionics sensor inputs on top of the map image (EOS, FMS, TCAS, ADS-B, DF, AIS, Search & Weather Radar, SatCom, etc.). As such EuroAvionics offers a very complete and appreciated tool in the cockpit that improves safety and mission efficiency.

Besides numerous retrofit projects on both rotary- and fixed-wing platforms, EuroAvionics has truly become the supplier of choice for the most significant helicopter OEM's. EuroAvionics keeps on focusing on state-of-the-art performance, certification and flexibility for the customer and the end-customer.



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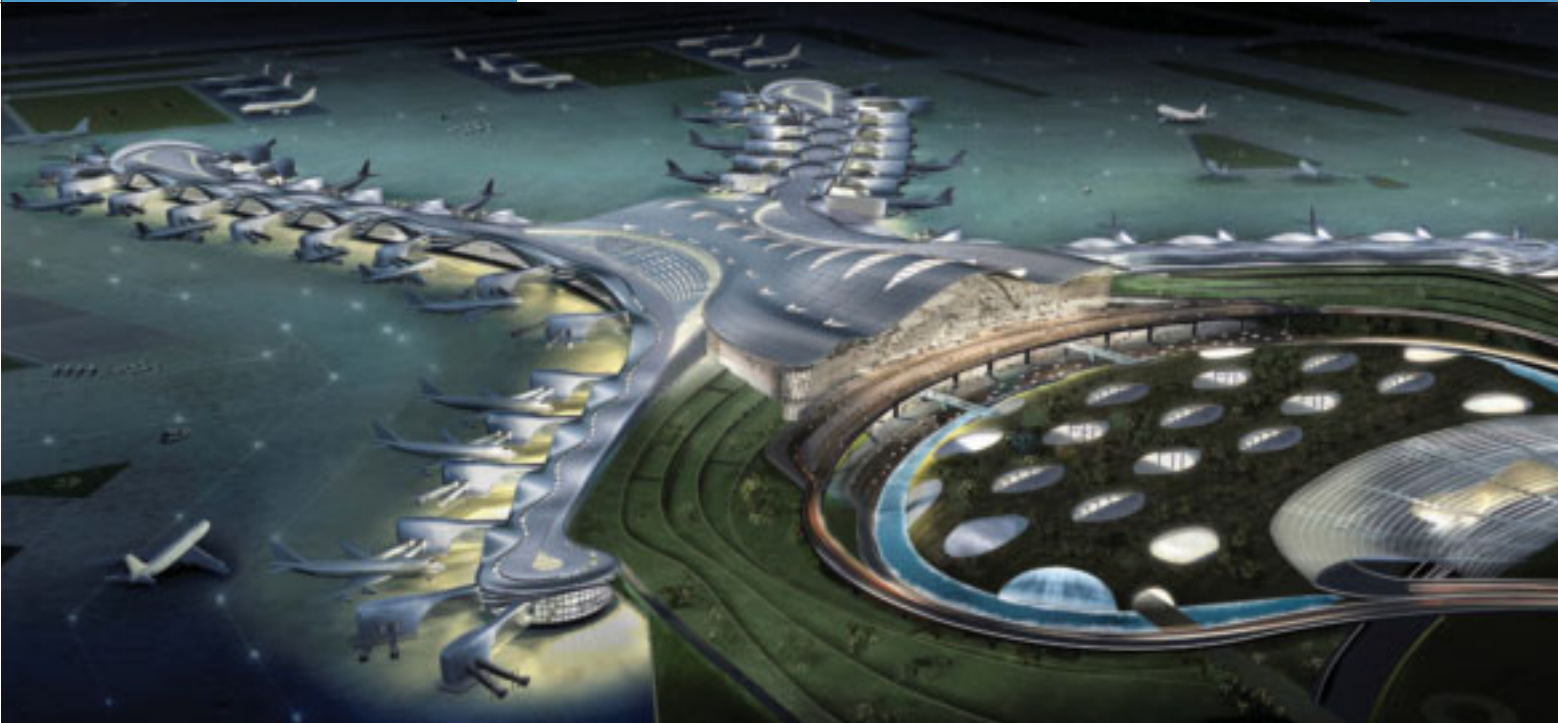
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*The construction of Abu Dhabi's Midfield Terminal Building has finally been given the green light and now the real work begins. Keith Mwanalushi reports.*

**On plan, the X-shape provides the greatest efficiencies, enabling the terminal to extend to 49 gates, which would ultimately process around 50 million travellers each year.**

# MIDFIELD'S X-FACTOR

**F**resh from winning a string of prestigious awards for Abu Dhabi International Airport, including the 2012 Skytrax "Best Airport in the Middle East" title, Abu Dhabi Airports Company (ADAC) is back in the spotlight with yet another jaw-dropping venture.

Over the next five years the construction site at the Midfield Terminal Building (MTB) in Abu Dhabi will be a hive of activity.

ADAC has been scrutinising numerous bids for the Dh10.8 billion (\$2.94 billion) project and in June the company awarded the contract to the joint-venture company created by the Turkish construction group TAV, Consolidated Contractors' Company, (CCC), and the UAE's Arabtec.

The new passenger terminal is planned to be impressive architecturally; featuring an undulating roof, inclined facade and the use

of advanced technology – this will prove to be a significant endeavour in the quest to out-class the already high-tech projections at other terminals under development in the region.

"As you know, we are currently building airports in Qatar, Oman and Tripoli," said TAV Group CEO Sani Sener. "Following the tenders we have won in Medina and Jeddah of Saudi Arabia, we are extremely happy to be awarded the Abu Dhabi Airport tender, achieving such success and adding this \$3 billion mega project to our portfolio."

Passenger numbers at the three main sixth-freedom hubs in the Middle East – Doha, Dubai and Abu Dhabi – continue to rise despite the regional disruptions that have affected travel in parts of the region. The three airports added 7.7 million passengers between them in 2011,

Continued  
on Page 112

## CONTINUED FROM PAGE 111

according to data from aviation analysts CAPA.

Combined, the three hubs had an average passenger traffic growth rate of 10.5%. This is a notably stronger performance than the rest of the Middle East, where international traffic expanded 8.9% over 2011.

Abu Dhabi International alone has recorded a growth rate of 19.7% over the last five years.

The project will include two key phases; the construction phase, followed by the operational readiness assessment phase (ORAT), where during a nine-month period thorough tests of all aspects of the terminal will take place to ensure operational and efficiency readiness from the first day of operation.

Munch Airport Consulting will perform the ORAT exercise.

One of the unique aspects of this project is the effective use of building information modelling (BIM), which enables potential problems to be predicted in a 3D working environment. BIM is a process involving the generation and management of digital representations of physical and functional characteristics of a facility.

The resulting building information models become shared knowledge resources to support decision-making about a facility from earliest conceptual stages, through design and construction, to its operational life and eventual demolition.

**Key strategic role**

The 700,000sqm terminal building will play a key strategic role. It will initially handle 30 million passengers per year and is set to become the future home of national airline Etihad Airways.

Focusing extensively on passenger experience, ADAC is adamant that the design of the terminal will meet the highest quality and service standards, including the IATA level of service 'A' (the highest levels of space allocation for passenger processing areas).

The terminal is designed to accommodate up to 65 aircraft and inside the building the check-in area will be capable of handling about 8,500 passengers per hour through 165 counters and 48 self-service kiosks. The baggage system is designed to process more than 19,000 bags per hour.

The building will be constructed using around 69,000 tonnes of steel, more than 680,000 cubic metres of concrete, nearly 500,000sqm of steel and glass cladding and 325,000sqm of natural stone flooring.

Passenger facilities will also include more than 27,500sqm of airline hospitality lounges, a transit hotel and a heritage and cultural museum. There will be 136 security-screening lanes for passengers, with a further 25 for staff.

The key to achieving and meeting the challenge for the MTB project is adaptability and being able to use the scale and scope economies very efficiently, according to Sener.

TAV Construction's business volume has reached \$11 billion in less than 10 years. He said the main factor behind this fast and balanced



**Abu Dhabi TAV Management (From Left to Right) -Gulf Regional Director Yusuf Akcayoglu, Business Development and Proposals Director Ali Haydar Ozak, TAV Group CEO M. Sani Sener, and General Manager Umit Kazak.**

growth comes from the efforts of employees across the entire operation, as well as the management model that provides the company with the ability to work under all circumstances and grow. "We will be building one of the most impressive terminals in the world through this mega project that we are undertaking together with our partners," he said.

A new cargo facility will have an ultimate handling capacity of around two million tonnes of cargo annually. Not surprisingly, Etihad will be the main user.

Close to the new cargo facilities, land has been allocated for commercial activities, business parks and property developments. Aircraft maintenance facilities will continue to be concentrated on the south side of the existing airport. The plan also sets aside land for the growth of other operators such as Royal Jet and Abu Dhabi Aviation.

**Critical element**

Meeting the needs of a rapidly expanding capital and responding to the natural environment is now a critical element of any new airport infrastructure in the Middle East. ADAC indicated that sustainable design requirements have played an important part in making the MTB an environmentally friendly building taking into account the 'estidama' approach towards sustainable design.

Estidama – meaning sustainability in Arabic – is a programme managed by the Abu Dhabi Urban Planning Council (UPC) based on a rating system that addresses seven categories; integrated development process, natural systems, liveable communities and buildings, water, energy materials and innovating practice. For each category there are mandatory and optional credits as well as weights with maximum credit points delivered to each.

The designers of the MTB made use of design elements, such as high performance and angled

glass facades to avoid heat from entering the building, making air conditioning more efficient while providing day lighting for interior spaces. Solid cladding has also been integrated in the design, further reducing the impact of the sun. Environmental design initiatives that are being pursued also include water conservation, using waste water for irrigation of outdoor plants.

Kohn Pedersen Fox Associates, (KPF) the architects behind the new terminal, said the focus was on passenger experience and environmental impact. KPF explained that the building would be raised up from the road level, giving the appearance of sitting on its own plateau. "In this context the building is the dominant and most imposing structure on the horizon, with a profile silhouetted against the sky. At night the building's illuminated interior creates a transparent structure visible from the highway more than 1,500m away," said KPF.

On plan, the X-shape provides the greatest efficiencies, enabling the terminal to extend to 49 gates, which would ultimately process around 50 million travellers each year.

As with other airport developments taking shape in the region, such grand infrastructure undertakings are triggered by the global ambitions of the incumbent national carriers – notably Etihad, Qatar and Emirates. For some time, they have been vying to attract more long-haul travellers to connect via their respective hubs – particularly between Europe and Asia.

If industry projections are right, growth over the next 20 years is forecast to be robust.

For instance, the new terminal three at Abu Dhabi opened in January 2009, a US\$ 271.9 million facility primarily developed to cater to the airport's passenger growth before the opening of the Midfield Terminal. Used predominantly by Etihad, the terminal boosted the airport's seven million passenger capacity to 12 million annually. The new terminal three also added 10 new gates at the airport, two of which are A380 compatible.





[www.tavconstruction.com](http://www.tavconstruction.com)

[www.ccc.gr](http://www.ccc.gr)

[www.arabtecuae.com](http://www.arabtecuae.com)

On 27th June, 2012 the JV of TAV Construction (TAV), Consolidated Contractors International Co. (CCC) and Arabtec Construction LLC (Arabtec), an equal partnership (TAV as a leader), signed the contract with Abu Dhabi Airports Company (ADAC) to carry out the works on the Midfield Terminal Building (MTB) for the value AED 10.8 billion (USD 2.94 billion).

*The third edition of the Marrakech Airshow – now seen as a prominent trade show for civil and military aviation in North Africa – proved to be a great success.*

*Kelly Green was there to meet some of the companies that felt it important to be at the show.*

PICTURES: MIKE DRUMMOND



# Marrakech blazes a trail

**D**assault Aviation appeared at the show for the first time, presenting its Falcon 2000LX aircraft. “We are present in the African continent and this is an interesting event so we decided to join this time,” explained Dassault Aviation’s vice-president, sales and marketing, Gilles Gautier.

Although Falcon sales have so far been concentrated in South Africa, the company believes that strong demand for oil and gas and other natural resources suggests the entire region will become a major growth area for business aircraft in the years to come.

“We remain encouraged by the potential for long-term growth in business aviation in the region,” said Gautier. “Business jets are now seen in the region as a powerful tool to enable quick and convenient access to customers within the African region and worldwide.”

Around 60 Falcon jets are in operation in the region, 21% of them in North Africa alone. Ten other aircraft are on order for delivery in 2012-13, most of them for Dassault’s flagship aircraft, the Falcon 7X.

Eight Falcon 7X aircraft are already in service in the region and three more will be delivered in the coming months. “To the emerging business class, Falcons are appreciated for their large and comfortable cabins, superior technology and efficiency and the value they add

Continued  
on Page 116







From firefighting, display and basic training, Morocco's show had plenty to see.

## CONTINUED FROM PAGE 114

to the bottom line – whether that means a flight across the globe to seal a business deal, or a multi-leg journey completed in the same day,” declared Alain Lemee, director of international sales for the region.

However, rather than showcasing the popular 7X model, it was a Falcon 2000LX, featuring the new BMW group DesignworksUSA interior conceived for the Falcon 2000S, that was on display at the show.

“This 2000 family, with the 2000LX model and the 2000S, is a very interesting model for Africa,” explained Gaultier. “It is known for its excellent fuel-efficiency and high-comfort levels – it’s a very quiet cabin.

“I think 900 and 7X are very well known; we have sold a few 2000 as well, but I think that it is good to have this aircraft selected for North Africa.”

The Falcon 2000S was introduced last year as a new low-cost option to the fleet. “I have no doubt that this new Falcon will become, like its siblings, very popular among customers and operators wishing to upgrade their fleets with cost and environmentally efficient airplanes,” added Lemee.

**Embraer**

Also making its Marrakech Airshow debut was Embraer, which showcased its Embraer 190 aircraft on static display.

“We are very proud to participate at the Marrakech Airshow with our Embraer 190,” said Mathieu Duquesnoy, vice president, commercial aviation – Middle East & Africa. “Today we have 71 Embraer jets in operation or in firm orders in Africa. We are convinced these jets, which seat 30-120 people, are very well suited to the increasing number of medium density routes opening in Africa. Embraer is also committed to further developing its customer service presence in Africa.”

**Eurocopter**

Eurocopter celebrated five decades of helicopter operations by the Moroccan Royal Gendarmerie during show, with a commemorative plaque presented to the military service.

“This year’s Marrakech Airshow underscores a 50-year relationship of Eurocopter and Morocco that has been based on a spirit of confidence and loyalty, with a full range of our products serving the kingdom – from the cornerstone Alouette to the latest EC225,” explained Loïc Porcheron, Eurocopter vice-president for Middle East and Africa.

“Eurocopter stands ready to continue supporting Morocco’s evolving mission requirements over the long-term.”

The Moroccan Royal Gendarmerie Air Squadron operates a fleet of Eurocopter rotorcraft that covers the company’s product range, with an inventory including: SA3130 Alouette II, SA315 Lama, SA316 Alouette III, SA342 Gazelle, SA330 Puma, AS355 Ecureuil,



**All the major players were at the show from Lockheed Martin in the defence sector to Boeing in the civil market.**

AS550 Fennec, EC135, EC145, EC225, EC332 Super Puma and AS365 Dauphin.

Duties performed by this fleet range from search and rescue, medical airlift and anti-crime missions to VIP transport and fire-fighting. “The Moroccan Royal Gendarmerie is an example of world-class excellence in helicopter operations and it is highly appropriate that we honour 50 years of service with its diverse Eurocopter fleet,” said Porcheron.

Presentation of the commemorative Eurocopter plaque was made at the show to Col Maj Lahcen Beraoud.

**Pratt & Whitney**

Pratt & Whitney (P&W) attended the event to show its support for the Royal Morocco Air Force, which selected the engine manufacturer to power its 24 F-16s.

“We are very proud of that and we have told them that they can count on us to make sure the programme goes smoothly for many years,” said Samir Haddad, P&W program manager – business development & international programs.

“We have representation here in our Morocco base, so we support them from here. We look forward to a long-term relationship with Morocco,” said Haddad.

**Boeing**

Another US company keen to show its support for the Moroccan aerospace industry was Boeing. “We’ve had a very long history and partnership with Morocco,” said Reggie Abel, sales director for Boeing.

“Our partners include CasaAero, which is a joint venture we have with Royal Air Maroc, and Matis Aerospace, which is a joint venture we have with Labinal, to make waterbumpers for aeroplanes.

“It’s important for us to have a footprint here in Morocco in terms of partnerships so it’s not just Boeing’s success but it’s also Morocco’s success, because that’s the real partnership that we have,” he explained.

“We’ve also had a very long relationship with Royal Air Maroc and they proudly fly Boeing aeroplanes. We delivered the 34th 737 NextGen aeroplane to them in March, and so our partnership with Morocco, not only with the airline but also with the industry here, is very long.”

With these partnerships in mind, Boeing ensured it had a large footprint at the show, showcasing both its commercial and military products. “This air show brings not just the airlines but also regional partners from North Africa and Africa, and a lot of these companies have interest in our products,” added Abel. “So it’s important for us to highlight and showcase our products, not just our commercial products but also our defence products, and also to showcase what we’re doing here in Morocco, because Morocco is certainly very special to Boeing.”



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*The aviation industry's leaders debated the challenges facing the sector at the inaugural Global Aerospace Summit, held in Abu Dhabi in April. Steve Nichols was there.*

# SUMMIT HITS THE HEIGHTS

**E**tihad, Emirates, FlyDubai and Qatar Airways management, along with other global airlines, airport operators, supply chain and maintenance providers, and original equipment manufacturers (OEMs) were at the St Regis resort on Saadiyat Island for two days of industry thought-leadership discussions and debates.

Opening the summit, HE Sultan Saeed Al Mansoori, Minister of Economy for the United Arab Emirates, said it provided “an opportunity to demonstrate the country’s progress and ambition in the aerospace, aviation and space sectors”.

He underlined the government’s support for a culture of partnerships spanning the public and private sectors, and added: “As the UAE moves from an economy that has a solid base through natural resource revenues to one that will be sustained in the long-term through a diversified,

knowledge-based approach, it is vital that we provide a platform for thought leadership.”

The theme of the first day was ‘Future Aviation’ and focused on immediate growth strategies and impending challenges to the aviation and aerospace industries.

#### Promise to grow

It looked at sectors that promise to grow in coming years, as well as environmental legislation that is changing the marketplace. Also discussed were how to overcome constraints on investment, infrastructure and regulations.

A panel session on ‘Meeting the Aviation Industry’s current and future challenges’ featured Akbar Al Baker, CEO of Qatar Airways; Homaid Al Shemmari, executive director, Mubadala Aerospace; James Albaugh, CEO of Boeing Commercial Airplanes; Marwan Lahoud, chief

strategy and marketing officer, EADS; Giuseppe Orsi, CEO of Finmeccanica; and David Hess, president of Pratt & Whitney.

Asked to look ahead to where they would be in 2020, Al Baker said he expected Qatar Airways to be twice the size it is today and serving two-and-a-half times the number of passengers.

Lahoud noted that he expected the proportion of EADS staff based in western Europe to have reduced from 97% down to 80%, with 40% of revenues coming from outside commercial aviation.

Albaugh said he expected the biggest change would be among airlines, where consolidation will continue, resulting in a total of around a dozen very large airlines that could drive efficiency and competition among airframers. He said he welcomed competition, adding that “Airbus made Boeing better”.





International civil aviation CO<sub>2</sub> emissions are part of the UN Framework Convention on Climate Change:



**Top level speakers from across the aerospace industries played a major part in stimulating future positioning for the region.**

Al Baker said don't underestimate China, adding that he would buy from the country if the deal was right and they could deliver. "I have never been sympathetic to suppliers who have delayed deliveries to me," he joked, taking a dig at the airframers present on the platform with him.

The summit's second day looked ahead to technological, supply chains, space and other long-term market changes within two streams: 'Future Aerospace' and 'Future Space'.

Commercial space travel has never been closer and satellite capabilities are also changing in the region year on year.

The summit also looked at the backbone of the aerospace industry – the supply chain – and how it will need to adapt to markets requiring local solutions while maintaining a worldwide presence.

Focused strategy sessions for specialised

audiences also took place throughout the event, under four banners: Future Aviation, Future Aerospace, Future Space and Future Air Defence.

Networking played a key role, with the summit 'Business Direct programme', which featured pre-scheduled, face-to-face meetings for VIP delegates, panellists and sponsors.

#### **Solve a problem**

A careers development programme was also incorporated, attended by the region's top 100 students. This included presentations, site visits to Mubadala companies, Adat, Yahsat and TPI. There were also workshops in which the students had to solve a problem related to engine fires. Throughout the summit, they had the opportunity to meet and socialise with company representatives, mentors, and advisers.

Students were able to access information on

different aerospace players, career choices, and programmes of study related to aerospace science, engineering and technology.

A 'Careers Direct' session with Mubadala Aerospace showed how the company is building skills capacity through education.

Already this year, 62 Emirati nationals have begun careers at Strata Manufacturing, having graduated from an intensive 10-month course to qualify them as composite aircraft technicians.

Summit delegates were also able to go on field trips to showcase aerospace and aviation developments in Abu Dhabi, including engine facilities and hangars at ADAT and to Abu Dhabi airport to view the control tower and mid-field terminal, plus Etihad's new facilities.

The next Global Aerospace Summit in Abu Dhabi is planned for April 7-8 2014.

**Continued  
on Page 120**

## No punches pulled by tough-talking Tyler

It's going to be a tough year ahead for the global aerospace industry. That was the prediction of Tony Tyler, director general and CEO of IATA, as he delivered a state of the industry address at the Global Aerospace Summit.

He said that aviation supports 57 million jobs worldwide and if it were a country it would rank 19th in the world in terms of GDP.

But he added: "2012 continues to be a challenging year for airlines. The risk of a worsening Eurozone crisis has been replaced by an equally toxic risk – rising oil prices.

"Already the damage is being felt with a downgrade in industry profits to \$5.0 billion."

He underlined aviation's importance as a catalyst for growth in the Middle East and particularly in the Gulf region, where "airports rise from the desert ahead of the demand curve, not behind it".

"Governments here work in partnership with industry through forward-looking policies that value aviation as a generator of wealth and jobs," he said. "Aviation is not treated as a sheep to be sheared by the tax collector."

### Future of aviation

He added: "When I am asked what the future of aviation will look like, I am tempted to respond that I hope it bears more than a passing resemblance to what is occurring today in the UAE."

But he said you need the right conditions for sustainable development, with a shared agenda on the joint issues of safety, security, and infrastructure.

Tyler said that 2011 was the safest ever year for aviation with 11 hull losses in the year – a 39% improvement on 2010.

But the MENA region did less well with five-and-a-half times the world average.

"This represented around one hull loss for every 500,000 flights. It also represented a sharp deterioration compared to 2010, when the MENA region achieved a rate of 0.72 hull losses per million flights," he said.

As for improving the passenger experience he said the industry needed to start differentiating when it comes to passenger security, using data collected as part of the booking, checking in and immigration process to better target those likely to cause problems.

"We want to bring in smart passenger screening without disrobing and debagging like we do now," he said. And he had high hopes that this would be taken up in the MENA region.

He also said that routing in the MENA region was less efficient than it could be and he could see a doubling of traffic in 10 years, which could create bottlenecks. IATA is working closely with governments and ANSPs to progress things as quickly as possible, but technology for technology's sake will not work, he said.

### Incorporate a vision

He added: "Any forward look at aviation must incorporate a vision of adequate airport and air traffic management infrastructure. Without it, aviation's contribution as an economic catalyst is compromised.

"The MENA region has invested more than \$100 billion on airport projects, including \$6.8 billion in Abu Dhabi, \$14 billion on the new Doha International in Qatar and \$33 billion on the new Al Maktoum International for Dubai."

Finally he was upbeat about emissions, saying that the more widespread introduction of sustainable biofuels could cut the industry's carbon footprint by 80%.

He said airlines, airports, ANSPs and manufacturers have made three sequential commitments: improving aircraft fuel efficiency by 1.5% annually to 2020; capping net CO2 emissions from 2020 with carbon-neutral growth; and cutting net carbon emissions from air transport in half by 2050 compared with 2005.

However, he warned that "a bright future is not guaranteed" and called for a shared agenda between industry and government on the issues of safety, security, infrastructure and environment.

## Glittering panel stars in space debate

On the second day, a glittering panel of experts looked at how the region could make the most of the space industry.

The panel featured Khalid al Melhi, CEO, Bayanat; Jean-Yves Le Gall, chairman & CEO, Arianespace; John Sloan, FAA/AST international program lead, FAA; George Whitesides, CEO, Virgin Galactic; Andrew Nelson, COO, XCOR Aerospace; and Dr Matt Perkins, CEO, Surrey Satellite Technology.

They all agreed that the cost of getting to space will come down, thanks to smaller lighter satellites, rising interest in reusable spaceplanes and competition from newcomers like SpaceX entering the market.

Le Gall said he welcomed competition but added that creating a successful launch company wasn't

easy. "We have had 42 straight successful launches of our Ariane 5, but that type of success comes through experience and hard work," he said.

Nelson added: "Reducing the cost of access to space will create a whole new pool of innovation. It will be a step change, offering new opportunities that we can't even contemplate as yet."

Perkins said his company had concentrated on the small satellite market, which now offered unheard of capabilities with very small payloads. He suggested that these would make it easy for the region to gain even quicker access to space, and build on the work already being done by EIAST's DubaiSat-1 and 2 projects.

Bayanat CEO al Melhi explained how the

Mubadala-owned company is set to use satellite imagery data. Bayanat was formed in 2008 as a result of the partial commercialisation of the UAE Armed Forces' Military Survey Department. He didn't like the term 'small satellites', saying it suggested they had low capabilities, which is not the case.

On the question of space tourism, all agreed that Virgin Galactic's decision to set up a spaceport in Abu Dhabi was a good move.

Whitesides said the new base would bring great financial benefits to the region.

"It will open up new markets in terms of IT, science and space skills," he added.

Continued  
on Page 122





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## Delivering efficiencies > with the latest gear

David Hess, president of Pratt & Whitney, has explained how the geared architectures in its new PurePower engines make them more efficient.

Speaking at the Global Aerospace Summit in Abu Dhabi, Hess said: "If you look at the history of engine innovation it has been characterised by step changes in developments and geared architectures are that next step. These are now bringing improvements of around 5-6% in terms of fuel burn."

For maximum efficiency the fan at the front of an engine needs to turn more slowly than the turbine at the back. The only way to do this is to connect the two with a gearbox.

But, as Hess explained: "Until recently we haven't had components that have been sufficiently lightweight, compact or durable to fit in the engine and withstand the environment."

"With an investment of a billion dollars over 20 years we've now mastered the problems and have also scaled up the technology we've developed for our turbo props. As a result we now have a workable solution."

He added that the company has already sold, or has option orders for, more than 2,000 engines – before the first one even enters service. Qatar Airways has picked the PurePower engine for its A320neo aircraft.



David Hess: "We now have a workable solution."



## Fuelling the way for sustainable greener flight

Peter Harbison, executive chairman of CAPA, leads the debate.

Can the aviation industry ever truly be carbon neutral? And will all aircraft be flying just on sustainable biofuels one day?

These were just two of the questions posed by moderator Marion Blakey, chairman, ICC Aerospace Industries Association (AIA), in a session that looked at the future.

Captain Chris Schroeder, head of corporate social responsibility, environment and fuel projects at Qatar Airways, said that it started a programme looking at biofuels in 2009. It concluded that biofuels were feasible, not only in Qatar but also globally. This led to the Qatar advanced biofuels platform project, which brought other partners to the game.

Schroeder said: "If we were to produce materials for biofuels we didn't want to shoot ourselves in the foot by using valuable fresh water or food stuffs. The result was a project looking at using algae that can grow in salt water."

"We are now building a 10-hectare open pond farm

and hope to harvest our first plants next year. If you had asked me three years ago if Qatar would make biofuels I would have laughed."

Vincent Schacter, VP research and development, Total Gas and Power, said two years ago demand for sustainable fuels was growing faster than supply.

"With biomass, our goal is to have profitable, sustainable production and Total also wants a technological advantage," he said. "We now have strategic partnerships with research institutes around the world. There are a number of efforts under way to produce biofuels and right now the jury is out on what is the best way forward."

"The cost is still an issue but where will we be in five or ten years from now? We just don't know. Also, we don't have the scalability needed to supply jet fuel in the quantities needed."

Darrin Morgan, Boeing's director sustainable aviation fuels strategy, said there are two competing cost curves – the fossil fuel cost curve going up and

the biofuel cost curve coming down.

"There is a growing spread in the difference in price between crude oil and jet fuel," he said. "This is due to two factors – the oil being found right now is heavier, which means we are getting less jet fuel from it. And the cost to transport these fuels to market is getting higher too."

"One airline is now having to transport its fuel from further away with \$20 per barrel additional transport costs. Additionally, there are more people exiting the jet fuel business than entering it."

All agreed that the elephant in the room was the EU's emissions trading scheme (ETS).

Schroeder said that politicians had lost the plot. "We are not in the business of burning fuel. We are in the business of moving people and materials from A to B as efficiently as possible. ETS is just a way of making more money out of the airline industry – a taxation. It is scam that will be applied to every airline that flies to EU territory."



## < *Evolve and adapt is the answer as the global demand grows*

How to cope with growing demand worldwide and extending reach through partnerships and acquisitions, while at the same time managing a skilled workforce, were topics in a session moderated by Aengus Kelly, chief executive of AerCap.

Marwan Lahoud, chief strategy and marketing officer, EADS, said exponential growth was being witnessed and the industry needed to adapt accordingly. "We have been doubling in size every 15 years," he said.

"And while we have been focusing on the domestic market, the industry can no longer just play at home. Globalisation is on the menu and we all need to professionalise the process."

Nicole Piasecki, chief strategy and business development officer, Boeing Commercial Airplanes, added: "Fundamentally we start with the premise that our global enterprise is a marketing advantage for Boeing."

"Competition is growing and the industry can only afford so many players. The world also has some key scarce resources and we want to access them, whether it's partners or people."

She added that going through the 787 development experience had taught Boeing a lot in terms of how to manage relationships and partnerships, citing the announcement made at the summit that it has partnered with Mubadala for composite production on fins for the Boeing 787 and 777.

Chet Fuller, SVP at Bombardier, said that further growth in developing nations was inevitable. "Three billion people are going to transition to the middle class over the next 20 years – a lot of these will be in Asia," he said.

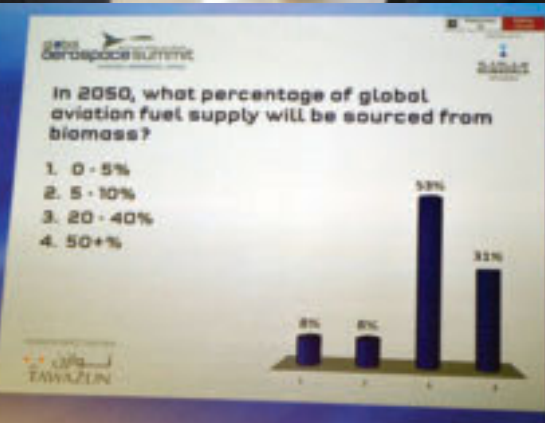
"Urbanisation is driving more air travel and it's currently tough to get around some parts of the world. As a result, we can expect to see double-digit growth in regional travel in the future."

The debate also looked at geographical shifts in the supply chain and, in particular, the long-term threat to market share posed by low-cost suppliers from emerging nations.

Eric Bachelet of Safran argued that the market is large enough to bear the threat from new competition. "The pie is growing – in an industry with 4-5% growth a year, it is inevitable that countries with large populations will access these capabilities but I think the pie is big enough to go round," he said.

Homaid Al Shemmari, executive director, Mubadala Aerospace, added: "A lot of consolidation needs to happen in the US; it must, if the industry is to remain healthy."

Nicole Piasecki, chief strategy and business development officer, Boeing Commercial Airplanes.



## *Supply chain must be all linked to change*

Tom Williams, EVP programs, Airbus moderated a panel discussion that looked at how the aerospace supply chain must adapt to globalisation and the changing needs of OEMs.

Looking at the problem were Bill Fitzgerald, VP and general manager, GE Aviation; Eric Bachelet, corporate senior VP, research and technology, Safran; Iñaki López Gandásegui, chairman and CEO, Aernnova; Christian Cornille, CEO, Aerolia; and Muaataseem Awda, CEO, Tawazun Precision Industries.

Williams said the aviation industry is extremely buoyant, with a market value of four trillion dollars over the next 15 years – two thirds of which lies in supply chain.

But he added that as a supplier, if you don't deliver you won't stay in business and there is a relentless drive to get costs down.

So what will the supply chain look like in the future?

"The Airbus A320 was designed to be hand-built by a skilled workforce over a period of time, but now we need to build one every 7.6 hours – this is a whole new ball game," said Williams.

"The type of supplier we were using 20 years ago looks nothing like the supplier we have now, and that model will change again."

Gandásegui agreed and said that OEMs will want to have fewer, but stronger, tier one suppliers.

"Emerging countries will have an increasing role in the supply chain. For this reason we have established plants in places like India and Brazil to maintain our level of service in the future," he said.

Cornille added: "We also need to have the right mix of skills – metallurgy and composites. The other battle is to deliver on time and to perfect quality; 96% of all parts passing quality control sounds good but a 4% rejection of two million components is a disaster."

Williams, added: "This is a long-term business. People have got to think about how they equip themselves in the future. I don't want to buy components now – I want to purchase complete systems."

"Take landing gear for example. We've previously bought parts and built them ourselves but in future we will want to buy the whole sub-system in one piece, ready to fit. Is that really what suppliers want to offer and can they adapt to our needs?"

*The Airport Show 2012 took place in Dubai with more than 205 exhibitors from 32 countries displaying the latest innovations and products in airport services and technologies, with particular attention being made to baggage handling. Marcella Nethersole reports.*

# WORLD OF THE NEWS

**T**he Middle East is one very busy region at the moment when it comes to aviation. Major developments and expansions are currently being worked on in Saudi Arabia, Qatar, Oman, Kuwait and Bahrain. And let's not forget the host nation of the Airport Show, the UAE.

As a whole, the UAE has pledged to invest AED500 billion over the next 10 years in upgrading and developing its aviation infrastructure, improving on connectivity, and enabling its airports to handle 250 million passengers by 2020.

So it's in these exciting times that companies from near and far, from small to large, descended on the Airport Show platform wanting a slice of the action.

One local company making its presence at the show was Eagle Industries, a privately owned and operated airport ground equipment manufacture based in Dubai Logistics City.

"Eagle Industries is a new company in the industry really," said Usama M Afana, COO. "Our first diesel tractor was commissioned in early 2011. The diesel model is the horsepower of the industry – it is the most common used on the tarmac."

The company's big attraction is the AZM tractor.

"AZM is built with fully developed technology to move luggage in the airport as well as to pull business jets. It is combined with the latest technical know-how and its state-of-the-art facilities are complemented by the highest

manufacturing quality," explained Afana.

Costing Dh 35,000, the AZM is available with a 1,134kg to 2,268kg drawbar pull capacity.

"Importantly, the AZM is ergonomically designed to provide maximum driving comfort and all-round visibility and features a heavy duty frame construction of robotically welded steel plates for durability and reliability to ensure a long operating life," said Afana.

The tractor is available with multiple options and engine packages to meet various environmental conditions.

#### **It's all about environment**

Afana added: "The trend nowadays is going green; it's all about the environment – so this is perfect. The design is exclusive to us. I designed the diesel tractor but I let the engineers take over for the AZM, as it was an exciting challenge for them. So it was all done in house but under my supervision."

The company already has seven designs to cater for the ground support equipment.

The diesel and the electric is not our limit," said Afana. "All the tractors are sized in capacity and the next one up is a bigger design. The AZM has 5000lb capacity – the next is 6000-10,000, and so on. When it comes to the 737s, 319s and 320s, they require a bigger and heavier tractor, which will be the next focus for us."

Afana is keen to point out that all the components, besides the engine, tyres and transmissions, are made in the UAE.

"While we are based in Dubai, we realise this is

the region to be in and the GCC is the region we're focusing on as it's growing at a fast rate and we're excited to be located within it."

Baggage also needs a helping hand and Swedish company Vaculex has produced an ergonomic baggage handling system.

"Originally, we were active in the general industry, lifting sacks, metal slates, wood, wooden plates, and so on," said Dale Hetherington, key account manager. "Then, about 11 years ago, we were contacted by TNT in Sweden who asked us to develop a new product for them to handle parcels – five years later we realised that if we just changed the suction foot we can lift baggage and that's how we got in to the airport field."

Vaculex offers airport baggage handling lifting equipment based on vacuum technology that replaces or is a complement to manual baggage handling and can lift up to 259kg.

"We provide solutions for loading and unloading baggage from a chute, conveyer belt, or baggage loader to carts or containers, as quick and easy as manual handling," said Hetherington, who added that the system cut time and costs for airlines and also prevented injuries.

"Airline baggage handling is a high-risk zone for muscular skeletal disorders caused by heavy weights and high frequency," explained Hetherington. "A recent ergonomics analysis shows that the risk for personal injury can be decreased by up to 80%, with maintained or higher productivity. There is also no need for extra strong working force with exceptional high





**The Eagle has landed in the UAE with local industries playing a bigger part in the supply chain.**

stamina since the baggage becomes almost weightless.”

The company currently supplies its equipment at airports in Sweden and Norway, and has a large presence in London and Frankfurt.

“The Airport Show is our first step towards the Middle East. This region has a lot happening, such as the new developments in Oman and Saudi Arabia, to begin with,” said Hetherington.

It’s inside the airport, too, that companies want to make baggage handling easier for passengers. Already we are seeing many airports and airlines install self-service bag-drop systems.

Edwin Sneekes, executive vice president of Dutch company BagDrop Systems, said: “We’re focused on improving terminal operations with efficient and innovative self-service products and services. The BagDrop unit is a single passenger touch point, enabling passengers to check in and securely drop-off baggage themselves.”

The BagDrop unit fulfils different functions through the application of state-of-the-art and proven technologies. It contains different elements, which are all integrated and aligned with each other.

“The BagDrop user interface is simple, intuitive, easily understandable and the instructions are supported by on-screen visuals as well as lighting indication at the BagDrop unit. The interface is modular and configurable for specific airport and airline requirements,” said Sneekes.

Different materials and colours can be applied for the body of the units.

Sneekes said: “In close cooperation with customers we will select the best materials for the body, taking into account our experience with durability and cleaning aspects. Specific branding can be integrated into the unit upon request.

“The shape of the BagDrop unit can be adapted

to align with your terminal design but also by using signing, displaying and lighting of the machine you can use the BagDrop for your branding.”

The company supplies the units in Amsterdam’s terminal 2 and is looking to expand in other terminals there. It also has an operation in Zurich and a local contact in Dubai.

“We want to be present in the Middle East, which is a big reason why we are here at the show. Now is an important time for us and we can build on the statistics we have achieved in Amsterdam and bring them to this region,” said Sneekes.

“At the moment, the current challenges airports face are; increasing passenger numbers, limiting terminal space and capacity, focusing on reducing operational costs, and optimising income. And the BagDrop unit helps meet these challenges like no other system of its kind. It can help an airport improve on its infrastructure.”

## Hadidi takes top job at Royal Jordanian

Jordan's former minister of industry and trade, Amer Hadidi, has taken over as president and CEO of Royal Jordanian Airlines.

Hadidi most recently held the post of adviser at the Royal Hashemite Court and head of economic and social affairs at His Majesty King Abdullah's office.

He served as trade minister between 2007 and 2011.

His predecessor, Hussein Dabbas, has been appointed as IATA's regional vice president for the Middle East and North Africa, based in Amman, Jordan.



Amer Hadidi

## ADAC board restructured

A new board has been appointed for Abu Dhabi Airports Company (ADAC).

The emirate's Crown Prince, General Sheikh Mohammad Bin Zayed Al Nahyan, issued a resolution to restructure the airport company's board.

Majid Al Mansouri, the secretary-general of the Abu Dhabi Environment Agency, has been named as chairman of the board. Other members include Abu Bakr Seddiq Al Khouri, engineer Owaida Murshid Ali Al Murar, Ahmad Ali Mattar Al Rumaithi, and engineer Mohammad Mubarak Ali Al Mazroui. The board will serve for three years with a chance for renewal.

## EXPERIENCED SULAIMAN STEPS UP FOR OMAN AIR



Captain Ali Hassan Sulaiman has been appointed acting chief officer flight operations for Oman Air, following the decision by Captain Patrick Rotsaert, chief officer flight operations, to retire from the company. Sulaiman, an Omani national, brings more than 30 years of professional experience in civil aviation to his new role.

Capt Manin bin Khalifa bin Said Al-Said, has been promoted to a new position of general manager, quality and safety. The role, which includes responsibility for emergency response planning, was previously covered by duties of Oman Air's chief officer - flight operations.

The airline has also appointed Jaffar Juma Al Lawati as country manager for Oman, making him responsible for achieving the set targets for Oman Air's hub station by optimising sales revenues and promoting the airline.

## Pillai steps up at Bahrain Air

Bahrain Air has promoted Raju Pillai, who has been with the airline since its inception in 2008, to director commercial operations.

The company said he has played a major role in Bahrain Air's continuous development and in making the airline what it is today.

## Australia, NZ for Pastrello

Etihad Airways has announced that Michael Venus will take charge of the company's corporate affairs department.

Venus, who has been the

airline's head of international media relations since June 2011, has been appointed vice president corporate affairs responsible for public affairs and corporate communications, including global media relations, social media strategy, internal communications, corporate social responsibility, environmental affairs and corporate events.

Meanwhile, the airline has also appointed Luisa Pastrello as its general manager for Australia and New Zealand and Kirk Albrow as its new general manager for Thailand.

In a separate move

Mahfood Al Harthy has been made Etihad's general manager for Oman. Mahfood joins Etihad from Gulf Air.

## Airport strengthens management team

Ras Al Khaimah International Airport (RAK) has continued to strengthen its management team with the recent appointments of Michael Coe as development director, Terry Sloan as head of operations, and Salem Hasan Al-Ghafri as head of security, control authorities and regulatory compliance.

## Munir Al-Dzhidi joins Swiss

Swiss Aviation Consulting has announced that Munir Al-Dzhidi has joined the group as manager Middle East operations, acting out of the group's Abu Dhabi-based company SWICAMO.

## Hogan named WTTC vice chairman

The president and chief executive officer of Etihad Airways, James Hogan, has been named World Tourism and Travel Council's (WTTC) vice chairman for the Middle East and Africa. The announcement was made at the 12th WTTC Global Summit in Tokyo, Japan.

## Al Baker voted on to IATA board

Qatar Airways chief executive officer Akbar Al Baker has been voted on to the board of governors of the global aviation industry body IATA.

Al Baker was selected by fellow airline executives attending IATA's annual World Air Transport Summit in Beijing. His is a newly-created position to increase representation for Middle East carriers on the revamped 10-member IATA board.

## Rizon technical role for Clarke

Rizon Jet has appointed Mike Clarke (below) as director of technical services, based in Doha. Clarke joins the Qatar private aviation company from BBA Aviation, where he served for 18 years in progressively more responsible positions, culminating in his role as sales & marketing director for sub Sahara Africa.



## FORMER ROLLS-ROYCE BOSS TAKES GAMA LEAD ROLE

Sharjah-based Gama has announced that former Rolls-Royce chief Sir Ralph Robins is to become non-executive chairman of the global business aviation and services group.

Robins was previously CEO and then executive chairman of Rolls-Royce. He is also a former president of the Society of British Aerospace Companies and chairman of the Defence Industries Council.







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# Francois Chazelle

Marcella Nethersole *speaks to the VP of Airbus corporate jets (ACJ) in Dubai*

# 1

■ What is your background in the aviation field?

After a decade with Bureau Veritas the quality, health, security and environment inspection consultancy, I joined Airbus as a sales director, initially for airlines in Eastern Europe.

Later I moved to the Airbus corporate jet side of the business, and was instrumental in our first sales to private customers in both India and China. I became head of Airbus corporate jet commercial activities almost five years ago.

# 2

■ What does a typical day involve?

It often means getting on to, or stepping off, an aircraft, because our customers are spread around the world and creating and building relationships with them is so important.

We'll also be displaying at even more shows this year – it averages out at one a month – so my team and I will spend a lot of time in and around an Airbus corporate jet, meeting with existing and potential customers. Fortunately, Airbus corporate jets have the widest and tallest cabin of any business jet, so it's a very comfortable way to do business at a show!

We've sold about 170 Airbus corporate jets and, since many of our customers have just one aircraft, that's a lot of customers and operators to keep satisfied.

# 3

■ What do you see as your greatest challenges in your position?

Two of our biggest challenges are product awareness and growth. People know Airbus for its airliners – we've sold more than 11,000 of them – but they don't always know that we are big in corporate jets, or what they have to offer.

For example, most people are surprised to learn that we fit into the same ramp space as traditional business jets while offering a cabin that is almost twice as wide.

The growing number of companies offering Airbus corporate jets for VVIP charter – there are around 15 today – and their popularity for such flights, is helping to change that, as is our larger presence on the airshow circuit.

Our customer and operator base continues to grow, which is why we formed a dedicated business unit for our corporate jets, within Airbus, at the start of this year. This regroups commercial, programmes and support activities, and is helping us to be more responsive to customers and operators.

# 4

■ With ACJ a global brand, why did you choose to be based in Dubai?

Our two biggest markets are Europe and the Middle East, so having part of the team in each gives us a presence in both.

The Middle East is also the biggest market in the world for VIP and government wide-bodies, and Dubai is accessible with a good business climate and lifestyle.

# 5

■ Have you seen a difference in the type of customer or, indeed, the number of customers you are talking to in the MENA region in the past few years?

Worldwide our customers comprise companies, individuals and governments, in roughly equal proportions.

We have a higher proportion of individual and government customers in the Middle East and North Africa and that has not really changed.

What is new is the growing importance of the Asian market – especially China and India – which has the highest rates of gross domestic product (GDP) growth in the world, and is a relatively new market for business jets.

**People know Airbus for its airliners – we've sold more than 11,000 of them – but they don't always know that we are big in corporate jets, or what they have to offer.**



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