



# ARABIAN AEROSPACE

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

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# LIBYAN LEGACY

THE INSIDE STORY OF THE BATTLE TO REGAIN AND REPAIR TRIPOLI'S AIRPORT

**PAGE 78**

#### AIR TRANSPORT

Turkey's revival plans for Dornier 328

**PAGE 19**



#### DEFENCE

Turbo charges ahead in the ME

**PAGE 54**



#### AIRPORTS

Transit catches the train to the future

**PAGE 81**



# THE NEW METRICS OF SUCCESS

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## The heat is on...

**A**s summer sweeps across the Middle East and north Africa it is more than just the sun that is causing temperatures to rise.

From the west, there is increasing heat being turned on the Gulf carriers as competitor airlines from the United States and Europe look to their governments to halt the ambitions of Etihad, Emirates and Qatar Airways.

Emirates, the largest of the three, has issued a robust defence against the accusations of unfair subsidy that, in truth, has plagued the airline since that small group of dedicated professionals and a hugely supportive government launched the Dubai carrier exactly 30 years ago.

As we discover in this issue, the ‘seeding’ money invested at that time to launch Emirates was probably less than the American carriers are spending today on the campaign to hold up the growth.

Emirates’ transparency in its response is based on fact. It would be good to see both Etihad and Qatar produce similar documents.

Even rival Middle Eastern carriers have been critical of some of the advantages the ‘big three’ enjoy but, as Adel Ali, the CEO of successful low-cost carrier Air Arabia, says in this issue, defending liberalisation of the air is far more important. “Open sky is tougher, but it is good for the consumer and good for the overall business.”

What passengers understand – but perhaps the US carriers are reluctant to admit – is that the Gulf carriers and their supportive governments have made quantum leaps in developing passenger experience in the air and on the ground.

As early embracers of technology across the region from Turkey to Oman to Morocco, we are seeing new aircraft, new ideas for cabin comfort and connectivity and the utilisation of modern e-enabled airports. We



Sheikh Ahmed, now a respected aviation leader, joins Alan Peaford and Access Group's Clive Richardson at the Aviation Africa event in Dubai.

celebrate some of those developments in this issue.

Where we have lagged behind is in cooperation over the utilisation of our airspace. A unified air traffic management system is going to be essential to meet the demands of the growing traffic across the region as a whole and it was reassuring to hear Ahmed Al Jallaf, the vice chairman of the Gulf Cooperation Council’s air navigation committee claim that the start of an airspace restructuring project for the six GCC states is imminent.

But, while we count the positives, there are also great concerns. Defence in the region is being stepped up as instability and conflict spreads. Tunisian carriers are now affected by the latest terrorist actions and, as our cover story shows, such actions in Libya have halted the industry in its tracks.

I hope you enjoy this issue and wish you a cool summer.

Alan Peaford, editor-in-chief  
*Arabian Aerospace*

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COVER: Carnage at Tripoli Airport . Picture by Tom Westcott.

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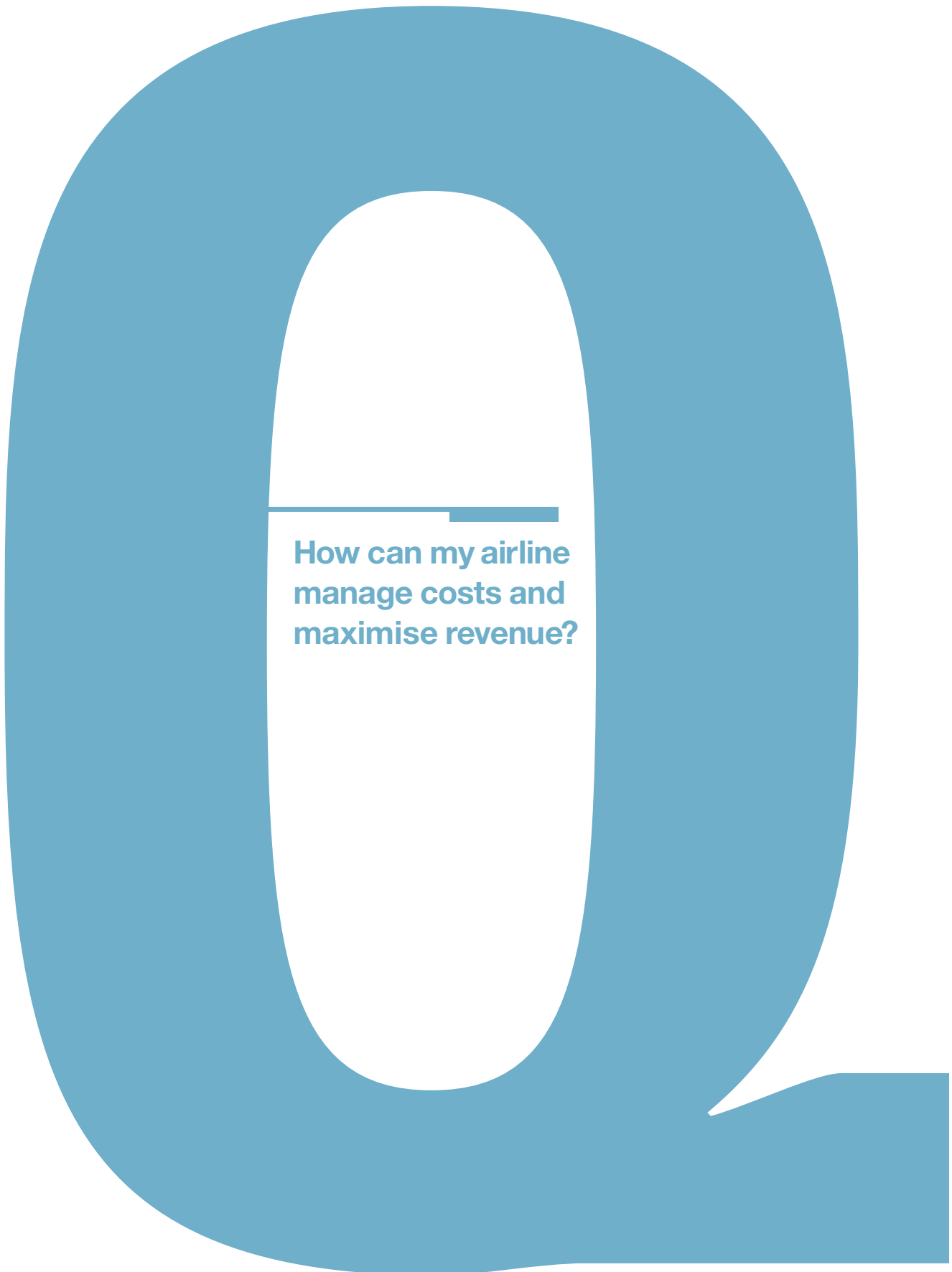
328 Support Services GmbH (28)	12	Embraer Aircraft Customer Services	IFC	Saudia Aerospace Engineering	
Abu Dhabi University	106	Embraer Executive Jets	67	Industries	OBC
ACCL FZE	115	Engine Alliance	28	Sofitel The Palm, Dubai	113
Airbus	2, 3	Farnborough International	63	Spectrum Aeromed	73
Alitalia Maintenance Systems	22	Airshow 2016	41	Starair	36
Alsalam Aircraft Company	48	FlightSafety International	41	TECNAM	59
Aviall	8	Gulf Aviation Training Event	119	Textron Aviation	4, 51
Aviation Festival Mena 2015	83	(GATE) 2015	64	Thales	89
Avtrade	44	Gulfstream	15	Turkish Aviation Academy	45, 80
Axis Flight Training Systems	68	Jeppesen	25	Virus Guard Ltd	105
Boeing Commercial Airplanes	16, 17	Lufthansa Technik AG	99		
Bahrain International Airshow 2016	96	MECCTI	18		
CAAI	100	Moog Inc.	7		
Cedar jet center – MEAG	36	NEXUS	11		
CFM International	27	Pratt & Whitney	30, 31		
Cubic Middle East, Inc.	35	Rockwell Collins' ARINCdirect			
Dassault Falcon	77	Rolls-Royce			
DC Aviation	70	Saudi Airshow - The First Saudi			
Dubai Airshow 2015	104	International Civil Aviation Exhibition	86		

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## 09 **business brief**

News headlines from across the MENA region.

### AIR TRANSPORT

#### 19 Regional Resurrection

Turkey is to re-launch production of the Dornier 328 regional airliner.

#### 23 Oman with an Open mind

Though smaller in scale than its Gulf rivals, Oman Air's business plan is no less ambitious.

#### 29 Emirates at 30

Three decades on the airline has broken innumerable records and is set to keep on growing.

#### 37 Adel's Ambitions

How its Jordan venture epitomises Air Arabia's regional plan.

#### 39 Algeria's Flag is rising

Air Algeria's new CEO Mohamed Bouderbala shares his dreams for his airline's revival.

#### 42 Home truths in domestic battle

Alan Dron takes an in-depth look at the battle for passengers in Saudi Arabia

#### 46 Nile spreading



Nile Air CEO Ahmed Aly outlines the company targets in its 'pivotal' year.

#### 47 Max factor

Maximus puts its woes behind it with new aircraft plans.

### DEFENCE

#### 49 Rafale Rejoices

Dassault adds Qatar to its growing customer list for Rafale.

#### 52 Saudi-Ukraine partnership

How Ukraine and Saudi Arabia will jointly produce a new aircraft derivative for civil and military use.

#### 54 The Caravan Club



The Cessna GA aircraft is finding increasing popularity among Middle East air forces.

#### 57 Global warming

Qatar is to buy four Boeing C-17A Globemaster III transport aircraft. We find out why.

#### 60 Angel wings

Iomax has delivered the first of 24 new Archangel aircraft to the UAE.

#### 62 Problem Solved

Boeing F-15SA Eagles to the RSAF are now imminent as fly-by-wire issues are resolved.

Continued  
on Page 6

## BUSINESS AVIATION



#### 65 SIX OF THE BEST

Al Jaber Aviation's six years experience in Abu Dhabi has put it in a good position for the next stage of growth according to COO Dr Mark Pierotti.

#### 71 FLUSH GORDON

Royal Jet's acting CEO Patrick Gordon talks about the new directions on the cards for the Abu Dhabi operator.

#### 69 SUPERSONIC SURGE

Aerion is quickly forging ahead in the race to offer the first supersonic business jet.

#### 74 GULF CLUB

Qatar Executive's confidence in the latest model from Gulfstream is good news for the Savannah manufacturer.

#### 76 SWISS ROLE

EBACE in Geneva saw Middle East business aviation's finest in action buying, selling and looking at what's new.

## SPACE

#### 91 THE NEW FRONTIER

How US space giant Lockheed Martin is teaming up with Saudi Arabia to open new frontiers for the Middle East.

#### 92 NEW AGENCY OPENS

UAE's space agency is launched with support from the legendary Buzz Aldrin.

#### 93 FORUM HIGHLIGHTS

News from the Global Space and Satellite Forum held in Abu Dhabi.



## AIRPORTS

### COVER STORY

#### 78 Libya's legacy

How Libya's crippled aviation sector is taking up the fight to rebuild.



#### 81 The Rail thing...

Rail is playing a key part in the growth of air transport. We look at how airports are benefitting from the latest transit technology.

#### 84 Remote control

How remote tower technology could play a role in the Middle East.

#### 87 Airport show review

A look at the latest technology ideas.

## MANUFACTURING

#### 101 Ready to fly



We go behind the scenes at Boeing to see Flydubai's latest model prepare for take-off.

## AIRCRAFT INTERIORS

#### 102 Virtually reality

Opening minds was the key message at this year's AIX in Hamburg with new technologies to the fore.

#### 105 The Avant guard

Two Gulf carriers have moved to Thales' Avant system to reshape IFE activities.

## PEOPLE

#### 116 Job Market Strength

Why business is still booming for expats – and recruitment agencies.

#### 118 Appointments

Who's going where – a look at the region's job moves.

#### 120 All in a day

Ben Griffin, regional director Middle East and Africa for Inmarsat, tells his story.

## ATM & REGULATORY

#### 97 TIME TO TALK

Collaboration vital to airspace harmony warns GCAA.

#### 98 WATCHFUL EYES

How advances in satellite-based tracing aids safety and cuts costs.

#### 99 DON'T SHOOT THE MESSENGER

Promoting a 'Just Culture' is essential to support a safety culture.



## TECHNOLOGY

**107 GETTING PERSONAL**  
SITA's annual air transport IT summit finds personalization is the next big thing.

**114 FUELING AMBITIONS**  
Abu Dhabi's BioJet project is making ground with a commercial bio fuel industry.

**110 THALES TALES**  
Europe's technology giant has plenty to offer the aviation and defence industries.

**115 EMERGING PROSPECTS**  
The market for avionics is boosted by emerging markets.







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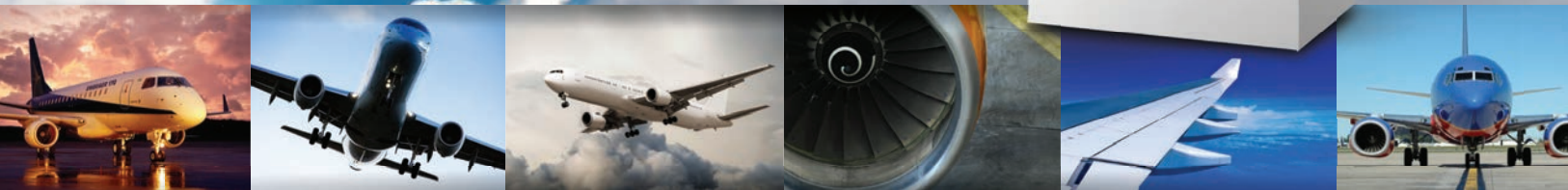


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## Jetman Rossy at dizzy heights

Daredevil and former Swiss pilot, Yves Rossy, known as 'Jetman' – the first man in the world to fly a jet-fitted wing – and his protégé, Vince Reffet, took flight over Dubai's Palm Island on May 12. Rossy said he always knew he wanted to break free from the cockpit, which led to him developing a jet pack with wings to help him fly among the clouds. "We're just very lucky guys," said Rossy.

## Change to Kuwait privatisation plans

Kuwait looks set to abandon the existing privatisation process for its flag-carrier in favour of a watered-down flotation that will leave 75% of the airline under government control, chief executive Rasha Al Roumi said.

Al Roumi said that MPs have already voiced strong support.

Asked what this meant for long-running efforts to find a strategic investor, she said: "It's off. It will be cancelled. The government will keep control of Kuwait Airways."

In May, rival Kuwait-based low cost carrier, Jazeera Airways, offered to acquire 35% of the flag-carrier under the terms of the original privatisation plan, which had envisaged 40% of the airline being listed on the stock exchange, 5% going to staff and 20% being retained by the government.

But MPs are now being asked to consider a new ownership structure, where the government will retain a 75% stake, 20% will be

listed on the stock exchange and 5% will go to staff.

Talal Al Tamimi, head of strategic planning at Kuwait Airways, said he doubted whether the private sector had the wherewithal to assist the flag-carrier.

## ExecuJet acquired by Luxaviation

Luxaviation has acquired ExecuJet Aviation Group of Switzerland, making it the second largest corporate aircraft operator in the world.

ExecuJet, which has fixed base operations (FBO) and aircraft management in the Middle East, will retain its

identity, management team and operational independence but will be led by Gerrit Basson, newly appointed CEO.

Niall Olver, the founding CEO and chairman of ExecuJet, stands down but continues in an advisory capacity.

## DAE sells holding in StandardAero

Dubai Aerospace Enterprise (DAE) has sold 100% of StandardAero to an affiliate of Veritas Capital. Terms of the transaction were not disclosed.

DAE managing director, Khalifa AlDaboos, said:

"StandardAero is one of the world's largest independent maintenance, repair and overhaul (MRO) platforms, with clients in more than 70 countries. This transaction will allow StandardAero to accelerate its growth by leveraging Veritas' global relationships and in-market presence.

"DAE will now redeploy capital and refocus its efforts on building a world-class aerospace footprint anchored in Dubai. We will focus on both organic and inorganic opportunities. DAE Capital will also aggressively acquire aircraft assets to expand its aircraft leasing portfolio

with a current net book value of \$3.7 billion," he added.

## Etihad's \$73m profit

Etihad Airways has achieved its strongest financial results to date in 2014, posting a net profit of \$73 million on total revenues of \$7.6 billion, up 52.1% and 26.7% respectively over the previous year.

## High standards

Abu Dhabi Airports has announced that it has successfully achieved the ISO 27001:2013 standard of information security across all of its IT systems.



## Cleopatra's fleet grows

Egypt's Cleopatra Group signed a deal at the Paris International Airshow for a G600 large cabin long-range business jets.

The Cairo-based conglomerate is already a long-term Gulfstream owner with a fleet of two G550s, one GIV-SP and a G650. It also has a second G650 on order. It plans to take delivery of the G600 in 2019 – shortly after its entry into service – and will use the twin-engine aircraft for employee transportation.

## Medina Airport new terminal opens

Saudi Arabia's latest airport terminal at Prince Mohammad Bin Abdulaziz International Airport (PMIA), in Madinah Al-Munawarah, has opened for business.

This major project consists of a 156,940sqm terminal space on three floors, 16 aircraft stands served by passenger boarding bridges and 20 remote apron stands.

## AAR wins Afghan support contract

AAR, a provider of aviation services, has been awarded a five-year, complete logistics support (CLS) foreign military sales (FMS) contract, worth around \$72 million, to sustain a fleet of C-130H aircraft on behalf of the Afghan Air Force.

## Flydubai/Lumaxis extend partnership

Dubai-based airline Flydubai has announced that it will continue to use the award-winning fiber-to-the-screen (FTTS) in-flight entertainment system for its follow-on order of 11 Next-Generation Boeing 737-800 aircraft on order for 2016 and 2017.

Daniel Kerrison, Flydubai's vice president in-flight product said: "Being the launch customer for the FTTS system, we were very happy with what it had to



## No kidding, it's uniforms for youngsters

The Emirates Official Store launched cabin crew and pilot uniforms for children in its spring/summer 2015 collection.

Aspiring cabin crew and pilots, aged 3 to 8 years old, can now play dress up as the exclusive collection is available at the store and online.

"We work hard to find creative ways to delight our customers, who already have a great affinity for the Emirates brand. We continually refresh our range of branded merchandise for our global customers and also aspiring globalistas," said David Staff, merchandising manager of the Emirates Official Store.

offer and we look forward to rolling out the new fourth generation of the system, which will enter service with us from May 2016."

## Kuwait close to F-18 decision

Kuwait is believed to be close to signing a deal for F-18 Super Hornets with US manufacturer Boeing.

Boeing Defense, Space & Security president, Chris Chadwick, said he believed that Kuwait was close to making a decision.

It would make Kuwait the third nation after the US

and Australia to procure E- and F-model F/A-18s.

Kuwait is also understood to be considering the Eurofighter Typhoon, which has been bought by both Oman and Saudi Arabia.

## Qatar signs in Unison

Unison Industries has signed a 10-year material services agreement with Qatar Airways in support of the carrier's unprecedented fleet growth rate.

The agreement extends through 2024 and covers external Unison new parts and component repairs for all

engine lines in the Qatar Airways fleet, which includes the CF6, CFM, V2500, GENx, GE90 and GP7200.

## Jordan picks Thales for radar extras

Thales has been selected by the Jordanian Armed Forces to provide further I-Master synthetic aperture radar/ground moving target indicator (SAR/GMTI) radars for the Royal Jordanian Air Force (RJAF). The selection follows the successful delivery and installation of the radar on RJAF's AC-235 aircraft in 2014.

## Qatar doubles its C-17 fleet

Boeing and the Government of Qatar has confirmed a new agreement for the purchase of four more C-17 Globemaster III airlifters. Qatar was the first Middle East customer to order C-17s, receiving two in 2009 and two more in 2012.

## Alafco opts for Rockwell avionics

Kuwait aircraft leasing and finance company, Alafco, has selected a suite of Rockwell Collins avionics for its order of 85 A320neo aircraft. The package includes MultiScan ThreatTrack weather radar and multi mode receiver (MMR).

Alafco is also planning on featuring Rockwell Collins' PAVES overhead broadcast and PAVES wireless content distribution in-flight entertainment system.

Deliveries begin in 2017.

## Kuwait Airways lands first A330-200

Kuwait Airways has taken delivery of its first A330-200, becoming a new operator for the type.

"The delivery of our first A330-200 marks a key milestone towards enhancing our fleet," said Al Rasha Al Roumi, Kuwait Airways chairperson.

"The addition of this highly efficient aircraft to our fleet ultimately translates to unbeatable operating costs, best-in-class services, unrivalled comfort, and will maintain our schedule integrity and assist in increasing our load factors."

## Royal partnership

Qatar Airways and Royal Air Maroc have announced the launch of a strategic joint business agreement on their services between Qatar and Morocco.



## C295Ws heading for Saudi Arabia

Airbus Defence & Space has identified Saudi Arabia as the customer for four C295Ws, with the medium transports to be operated by the nation's interior ministry.

The Royal Saudi Air Force currently operates four earlier-generation CN235s, with the transports having been produced in 1986 and 1987. It also has three A330-based multi-role tanker transports.

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## Emirates on the charge

Emirates customers can now stay fully charged with the launch of 30 wireless charging trays for most smartphones in its first class and business class lounges in Concourse A, B and C in Dubai.

## Topping up services

Jet Aviation Saudi Arabia has added a new nickel-cadmium (Ni-Cd) battery shop to its facilities at Jeddah. Operational in June, it is able to check, charge and overhaul most battery models at its facility rather than outsourcing the work.

## Fuelling big savings

Aviation Partners (API) has announced that its blended winglet technology has saved the world's commercial and business jet operators an estimated five billion gallons of jet fuel.

This represents a global reduction in CO2 emissions of more than 107 billion lbs (or almost 54 million tons).

Aviation Partners-designed winglets are now flying on more than 6,100 individual jets and over 20 different aircraft types worldwide.

## Africa's ITF first

Morocco became the first African nation to become a member of the International Transport Forum (ITF). The organisation's top decision-making body, the Council of Ministers of Transport, unanimously agreed to the accession of Morocco, along with Argentina and Israel.

## Ameco again

Ameco has started line maintenance service for Iraqi Airways at Beijing Capital International Airport. Last September, Iraqi Airways selected Ameco for the same service in Guangzhou.



## More home pilots for Oman Air

Oman Air is to train more Omani pilots, with the intention of increasing employment and career progression opportunities for citizens of the Sultanate.

The move is part of a broader programme of training and development for employees throughout the company.

The programme will provide opportunities for young Omanis to showcase their abilities and contribute to the national development process.

It is being put into action with the enthusiastic support of Oman's Ministry of Manpower.

Oman Air's department of training and development, part of the airline's support services unit, will oversee its roll-out.



Badr Al Olama: "The next five years will be a transformation."

## North Africa target for Strata

Abu Dhabi aerostructures business Strata is eyeing potential manufacturing bases in North Africa, the company's CEO said at the Paris International Airshow.

Chief executive of the Mubadala subsidiary, Badr Al Olama, said "the next five years will be a transformation as the company adds contracts, customers and competencies".

Al Olama said that the company could develop its own engineering design service and open a low-cost subsidiary in North Africa, possibly in Tunisia or Morocco. "The advantage of setting up there is that they are very close to Europe, the education system is excellent and they speak French and Arabic," he said.

The composites specialist was launched five years ago and Al Olama said is now looking at expanding into technologies such as additive-layer manufacturing and making its own pre-preg materials.

## Qatar Executive goes for Gulfstreams

Qatar Executive has agreed to purchase up to 30 Gulfstream aircraft as part of a memorandum of understanding (MoU) originally announced in October of last year.

The original sale called for Qatar Executive to purchase up to 20 Gulfstream aircraft, including the all-new Gulfstream G500. The recently signed final agreement increases the purchase to 30 firm orders and options that are a combination of both of Gulfstream's new clean-sheet, wide-cabin aircraft, the G500 and G600, and the flagship G650ER.

and now this world-class team is building the future with the first 737 MAX," said Keith Leverkuhn, vice president and general manager, 737 MAX. "Achieving this milestone on schedule is a testament to the success of the 737 and our integrated design and build team."

## Flynas' new in-flight safety standard

Flynas has set new standards by adding Virus Guard disinfectant wet wipes and sprays to its in-flight hygiene to protect passengers from any known threats from dangerous viruses, including Ebola, Avian Influenza, and Middle East Respiratory Syndrome (MERS).

## Dassault unveils newest Falcon

Dassault's newest Falcon was rolled out at Merignac, Bordeaux in June.

The 5X has the largest cross-section of any current business jet – and Dassault claims it will also feature the most advanced digital flight control system as well.

## L-3 buys CTC

L-3 Communications has bought UK-headquartered CTC Aviation for around \$210million.

CTC has developed multi-crew pilot licence (MPL) training for Qatar Airways and supported other Gulf airlines, such as Flydubai, with flight crew control system resourcing.

## Boeing starts on first 737 MAX

Boeing has started building the first 737 MAX on schedule.

"Employees in Renton are the best in the world at building single-aisle aircraft

## TAV increases profit

TAV increased its revenue by 20% to €227 million (\$254m) in the first quarter of 2015. Consolidated net profit of TAV Airports increased 51% and reached €31 million.

## Speaking your language

Turkish Airlines has created a call centre to attract more Arabic-speaking customers from 10 Middle Eastern countries.

The centre, launched at an awards event in Amman, Jordan, will be manned by 50 Arabic-speaking employees. It will serve customers in the UAE, Saudi Arabia, Qatar, Bahrain, Oman, Jordan, Egypt, Algeria, Tunisia and Morocco.

## Passenger protection on cards for UAE

Aviation authorities in the UAE are planning to introduce a passenger protection programme.

Mohamed Abu Baker Farea, director, aviation development & planning at Abu Dhabi's Department Of Transport said: "We have to work with other emirates to bring this into effective and we are working closer to set regulations for consumer protection.

"It is a very consultative process and it will be across the board for all types of air traffic."

## Relentless first flight success

Bell Helicopter has announced the successful first flight of the Bell 525 Relentless. The maiden flight of the super-medium helicopter took place at the company's aircraft assembly centre in Amarillo, Texas.

Matt Hasik, Bell Helicopter's executive vice president of commercial programs, said: "The marketplace has been awaiting the transformational capabilities of the Bell 525 and we continue to see growing customer demand from around the globe for this aircraft."



## Etihad butlers polish off training

The second group of Etihad Airways butlers has completed the intensive Savoy Butler Academy training programme in the UK.

The course was conducted by the London School of Hospitality and Tourism at the University of West London, in conjunction with the legendary Savoy Hotel.

The elite group of talented hospitality personnel are now fully qualified to perform their duties, catering to the needs of guests staying in The Residence by Etihad, the airline's recently launched private living space on the upper deck of its fleet of Airbus A380 aircraft.

## Dessert that's very rich...

On Air Dining, a UK-based culinary concierge company, has created a new dessert for its private jet clients that costs between \$550 and £1,000. Called Wild Kopi Luwak Coffee Coconut and Gold Dessert, it's made of the world's rarest coffee beans, which cost between \$1,600 and \$48,500 per kilogram.

## Safi Airways signs Joramco agreement

Afghani-registered Dubai-based operator, Safi Airways, has reached a maintenance agreement with Jordan-based Joramco, which will provide heavy airframe maintenance solutions for three A320 aircraft operated by Safi during 2015.

Maintenance services to be provided include A and C check tasks as well as some airworthiness directives (Ads) and service bulletins (SBs).



Alpha Star's CEO Salem Al Muzaini (centre) with ACJ's Benoit Defforge and Airbus' John Leahy.

## Star continues to rise

Riyadh-based Alpha Star has become the first in the world to announce a commitment for an Airbus ACJ319neo, consolidating its role as the largest VVIP charter operator in the Middle East.

Delivery of Alpha Star's ACJ319neo is planned for the second quarter of 2019. Selection of engines and cabin definition will follow later.

Airbus' newly launched ACJneo family features new, more efficient, engines, wingtip-mounted sharklets, improved cabin-comfort and upgraded fuel and baggage capacity.

"Middle East customers already recognise and appreciate the greater comfort, capacity and capability of Airbus corporate jets, so new and improved versions are a natural next step when it comes to investing for the future," said Alpha Star CEO Salem Al Muzaini. "Being first in the region with the Airbus ACJneo family will also help us to maintain our lead in VVIP charters," he added.

## Salalah expects tourism boost

The new Salalah Airport, which began operations on June 15, is an expansive infrastructure project that features state-of-the-art technology, with the chief objective of improving air traffic movement, providing greater connectivity throughout the region and facilitating easier access to Salalah, especially to the Dhofar region.

The new airport is scheduled to receive 28 international flights and 56 domestic flights in a week.

## Etihad selects SR

SR Technics has been selected to provide integrated component services for Etihad Airways' new Boeing 787 fleet and is in advanced discussions on further maintenance, repair and overhaul (MRO) contracts.

The agreement, worth more than \$150 million, will see SR Technics provide the national airline of the UAE with component maintenance support for what is set to be one of the largest Boeing 787 fleets in the world, with 71 aircraft in operation by 2023.

## Latitude certification

Cessna Aircraft Company has announced that the Citation Latitude business jet has achieved type certification from the US Federal Aviation Administration (FAA).

Deliveries are scheduled to begin in the third quarter of this year.

According to the company, the new Citation Latitude represents the perfect balance of comfort and efficiency and is the first business jet to combine a roomy, flat floor, stand-up cabin, with a midsize price and good value operating costs.





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The resurrected 328 will have new engines, flight deck displays and a refreshed passenger cabin.



# Turkey breathes new life into Dornier family

It's not often that history records a particular moment when a new industry was born. One of them occurred on May 27 when Turkey's Prime Minister, Ahmet Davuto lu, announced that his country intended to create a civil airliner-manufacturing sector.

Building passenger aircraft is one of the most complex industrial enterprises that a nation can undertake, with the huge supply chain, technological expertise and sums of money that such an industry requires. Turkey believes it is ready to take that step.

It already has experience in military aircraft development and assembly, with Turkish Aerospace Industries (TAI) producing the Lockheed Martin F-16 Fighting Falcon, CN-235 light transport and other types under licence, and modifying the Agusta A129 Mangusta attack helicopter into the T129 ATAK. But it has not previously ventured into full-scale civilian aircraft manufacture.

## Ceased production

Its path to joining the ranks of airliner manufacturing nations is intriguing. It intends to cut its teeth by restarting construction of the Dornier 328, which ceased production early in the last decade following the collapse of the famous German aircraft company.

Even more intriguing, Turkey intends to build both the initial turboprop version and the later turbofan-powered model. The new versions of the two variants will be labelled the T328 and TRJ328 respectively. Under a tight timetable, first flight is due in late 2017/early 2018, with deliveries later that year.

*Turkey is to re-launch production of the Dornier 328 regional airliner, some 11 years after the last example rolled off the production line.*

*A clean-sheet '628' design will follow it as the nation bids to join the world's civil aircraft manufacturers.*

**Alan Dron in London and Dave Calderwood at the Paris International Airshow, report.**

Turkey's partner in restarting production of the 328 will be US-based Sierra Nevada Corporation (SNC), which now holds the intellectual property for the type, having acquired 328 Support Services earlier this year. 328 Support Services is the type certificate holder for both the turboprop and jet versions of the original Dornier aircraft.

It is not generally known that Germany-based

328 Support Services had been in dialogue with the Turkish authorities for five years over the possibility of restarting production, "This didn't come out of the blue," said 328's managing director, Dave Jackson. "It's been quietly working in the background while Turkey evaluated potential partners. The Turkish Government has been talking to various manufacturers to see what programme they could partner with that made sense for the markets and for technology transfer."

Meanwhile, across the Atlantic, SNC had been 328's largest customer since 2009. SNC has also set up a business in Turkey in the past couple of years.

SNC's acquisition of 328 Support Services earlier this year "brought all the stars into alignment and we recognised there was a business case to harness all these elements together", said Jackson.

## New subsidiary

The US company will set up a new subsidiary, TRJet, to develop and build the aircraft. It will be based near Ankara, although a site for the production facility has not yet been agreed. Under a memorandum of understanding (MoU) between Turkey's Ministry of Transport, Maritime Affairs & Communications and SNC – whose founding chairman and CEO are the Turkish-American couple Eren and Fatih Ozmen – SNC will transfer the intellectual property rights for the 328 to Turkey.

In the Government's efforts to widen indigenous participation in the new sector, Turkish Aerospace Industries will be a major subcontractor, together with companies such as Aselsan,

Continued  
on Page 20

The new '628' design will have some commonality with its predecessor and will fill a large niche in the marketplace, its backers believe.



### CONTINUED FROM PAGE 19

Havelsan, Alp Aviation, Kale Aviation and Turkish Cabin Interior.

Some equipment from 328's facility at Oberpfaffenhofen, near Munich, will be transferred to Turkey to help get the new factory under way but this does not mean that the German site will be diminished. On the contrary, said Jackson, "We will be expanding the operation here to support the TRJet operation," handling areas such as global customer support.

"I often hear the comment that the 30-60 seat market segment is dying but there are nearly 5,000 of them still operating worldwide," said Jackson. "Why are they still being operated? Mainly, I think,

because there's no direct or current replacement. Nobody apart from ATR [with the 48-seat ATR 42] is doing that.

"That figure of 5,000 is purely the replacement market for current, in-service aircraft. My view is that a number of people have bought aircraft that are larger than they need because of the lack of aircraft in this category and have then struggled with load factors.

"Many of the Dash 8s and Saab 340s are there today because they fulfil a route network requirement and there's no obvious replacement. I was at San Francisco airport recently and at nearly every gate there were Embraer 135s, Jetstreams and Dash 8-300s still operating essential services for

many people.

"So, when you're looking at that replacement opportunity, you don't need to take much of that market to have a viable business opportunity. We would like to build around 250 aircraft in the 328 sector." They remained the ideal aircraft to open and develop new routes, he said.

Both versions will undergo a 'refresh', with the main updates being to the engines and avionics.

The TRJ-328 will probably receive an updated version of the existing Pratt & Whitney Canada PW306B turboprop, while the turboprop version's current PW119 will probably be replaced with the PW127, which will increase maximum take-off weight by 1.5 tonnes to 15.6 tonnes, but which will deliver increased output.

## Certification could be greatest challenge

With an economy that has grown substantially over the past decade, Turkey has sizeable aerospace ambitions. It is one of the 'MINT' countries – Mexico, Indonesia, Nigeria and Turkey – that are held up as the next wave of rapidly developing nations.

Indonesia already builds military transport aircraft under licence and Mexico has a growing aircraft components sector.

The greatest problem Turkey is likely to face is not the manufacturing process for the 628, but the aircraft's certification; as China has discovered in recent years with its ARJ-21 regional jet and C-919 narrow-body, that path is fraught with difficulties.

However, Sierra Nevada Corporation (SNC) president Eren Ozmen believes that its experience will lead to rapid certification of the new aircraft "based on the D328's proven technology and our aviation certification expertise".

SNC believes that the 628 will not only satisfy a

domestic requirement but also provide Turkey with an export capability.

Talking about the project after its May launch, Prof Dr Ismail Demir, Turkey's Undersecretary for Defence Industries, said that production of a regional airliner had been adopted as Turkish state policy, with an intermediate stage needed before it could design an aircraft from scratch. "We want the project to progress dynamically and at a rapid pace."

With this in mind, the government did not want to be too closely involved in the project's decision-making process, "because we want to get results".

Demir pointed out: "The aircraft industry is a driving force in technology. Also it has an economic multiplying effect up to seven or 10 times."

He estimated the cost of the project at around \$1.5 billion. This would include bringing the 328 back into production, installing a production facility, plus the cost of the initial 50 examples.

### Glass cockpit

Talks are currently under way with both Honeywell and Rockwell Collins over the supply of a glass cockpit, while the cabin will undergo a cosmetic upgrade.

TRJet will restart production of the turboprop-powered version of the aircraft first, "Simply because it was the last one in production [and] to get the supply chain up and running" and because the travelling public's perception is more favourable towards jets, said Jackson. And, as the Turkish Government has signed a tentative deal for 50 examples of the jet version, initially for creating new services between secondary Turkish cities, "it makes a lot of operational sense".

The turboprop version will follow on and the company has already received enquiries about this, he noted. The turboprop version is particularly



The deal to restart production of the Dornier 328 has been five years in the making, said 328 Support Services managing director, Dave Jackson.

suiting for unimproved runways and the special mission market.

That latter sector was growing and “we’ve only scratched the surface of it. The 328 seems to have found itself a niche in areas such as medevac and surveillance; we see a lot more opportunity there with the 328.”

In recent years, the 328 has also found a niche as an executive aircraft. While not as fast as some business jets, second-hand versions provide a Gulfstream V-sized cabin for a relatively modest price.

The TRJ-328 will be manufactured as a 32-seater, with a speed of 750km/hour and the ability to take off from airstrips as short as 1,400 metres. The T328 turboprop will be able to fly at 620km/h and be capable of using a 1,000-metre runway. Both versions will be able to be used not only as passenger aircraft but also in the air ambulance, maritime patrol, VIP and military cargo roles; they will also be able to be used for intelligence-gathering missions.

It is significant that SNC is on record as saying it hopes to sell the aircraft to the US Government.

Over the past few years, 328 Support Services and SNC have respectively sourced and modified turboprop 328s for the US Air Force, which is now the world’s largest operator of the type with around 17 in service, where the aircraft is known as the C-146A Wolfhound and operates as a small tactical transport for the US Special Operations Command.

These are frequently operated in Africa for the discreet transport of personnel, where the aircraft attracts less attention than more obvious military types.

“The US Government is a big user of the

aeroplane and would like more of the type,” said Jackson. “Up to now we’ve been using aircraft taken from the marketplace, but that is obviously a finite number. We would hope they would buy more in the future.”

Building on the experience gained with the 328, Turkey then plans to embark on a ‘clean sheet’ design, to be known as the T628 (turboprop) and TRJ628 (jet), for the 50-70-seat market segment.

Initial artists’ impressions show an aircraft with a similar high-wing design to the 328, but with the tailplane set around two-thirds of the way up the fin, rather than as in the 328’s T-tail arrangement. First flight is scheduled for 2023.

#### Design philosophy

There will be “a fair amount of commonality” between the smaller and larger types and the design philosophy will be similar, said Jackson, with the 628 embracing the rugged and reliable approach taken by the 328 and with the ability to operate into rough strips if necessary.

The 628 will probably have a four-abreast configuration, which will give the option of incorporating a business-class cabin

TRJet hopes to provide an aircraft that will be competitively priced and use many of the same component suppliers as the 328: “When you have credibility with vendors, it helps immensely when you want to talk to them about a new programme.”

The 628 will be small enough to be used in route development, gradually adding frequencies as traffic grows, and he expects that a mix of 328s and 628s will be used on the domestic route network that Turkey wants to create.

## Aspirations unveiled to the world in Paris

Turkey’s first regional airliner aspirations were given a global unveiling at the Paris International Airshow in June, where US company Sierra Nevada Corporation (SNC), announced the details of the wholly-owned subsidiary, TRJet Havacilik Teknolojileri Anonim Sirketi (TRJet), following the signing of an MoU involving Savunma Teknolojileri Muhendislik (STM) and the Turkish Ministry of Transport.

“We believe that the combination of technology, research, collaboration and decades of experience is the right recipe for TRJet’s future success in Turkey and around the globe,” said SNC president Eren Ozmen.

“We are confident that TRJet, working with our partners in Turkey, and the commitment and support of those involved in the Turkish regional aircraft project, will be successful in producing aircraft that change the face of transportation in Turkey,” she continued.

Dave Jackson, the British managing director of SNC-owned 328 Support Services, said the project had been “bubbling under” for a while.

“We expect the facility in Turkey to be ready in 18-24 months. We hope to have the 328 cockpit upgrades certified in 12-24 months, and to start building aeroplanes in Turkey in 18-36 months. We’ll be looking to ramp up to 20-30 aeroplanes per year within 4-5 years.

“The replacement market is where we’d like to go but we have to stimulate that market because they’ve all assumed they can’t replace their 30-50 seat aircraft as no one is making anything.

“The other interest is special mission – maritime patrol, air ambulance, coastguard and border patrol. Countries like our aeroplane but have restrictions, which mean they can’t buy old aircraft. The unimproved runway performance lends itself to Africa, Middle East and other emerging markets.

“The new aircraft, the TRJ628, will follow a similar design philosophy as the 328, although it will be a clean sheet design,” continued Jackson. “It will be high-wing, have unimproved runway performance and the option for different powerplants, jet or turboprop. We will maintain a level of composite structure similar to the 328 in the region of 20-30%.

“We’re looking to take advantage of the latest technology but will be building it around existing technology already in the supply chain, including a geared turbofan engine.

“Part of the mission with Turkish Government is to create an indigenous aeroplane. It’s about training people, building credible relationships and certifying the aircraft to sell it globally, not just in Turkey.

“TRJet will be a stand-alone commercial company operating in Turkey, so we’ll be going to the market looking for competitive pricing with a competitive product.

“I’ve had many years working in Turkey and it’s a pleasure to be back. They’re clear on what they want to do and relatively quick to make decisions. Clearly they’ve taken a considered view and a number of years to arrive at this point.”

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*Though smaller in scale than its Gulf rivals, Oman Air's business plan is no less ambitious. Martin Rivers meets chief executive Paul Gregorowitsch.*

# OMAN ON A MISSION

In the deteriorating war of words between America and the Gulf countries over bilateral traffic rights, it is easy to forget that European capitals have long imposed ceilings on the number of flights that Emirates, Etihad and Qatar Airways can operate to their airports.

The restrictions are not solely targeted at the 'big three' Gulf carriers. Even mid-sized operators such as Oman Air – which no-one seriously accuses of capacity dumping – have had their wings clipped on the continent.

Oman's flag-carrier currently serves Paris Charles de Gaulle Airport four times weekly from its home base of Muscat. Repeated attempts to make the route a daily service have been rebuffed on the French side, prompting chief executive Paul Gregorowitsch to say he feels "discriminated against" by closed-skies policies.

Europe, he argues, has adopted a misguided approach to civil aviation that rewards legacy incumbents while handicapping emerging players from the Gulf.

#### State support

"Yes, I admit we are getting state support but it is because we are developing our infrastructure. Our airline is still young," Gregorowitsch said during an interview at the International Air Transport Association (IATA) annual meeting in Miami. "I think that some other governments, for instance in Europe, should look at how the combined efforts made in the Middle East are strengthening and supporting national carriers.

"If you look at how Qatar, how Emirates, how Oman are developing their infrastructure,



**Europe has adopted a misguided approach to civil aviation that rewards legacy incumbents while handicapping emerging players from the Gulf.**



**CONTINUED FROM PAGE 23**

how they are putting their hands together and investing in new airports, taking care of customers instead of enforcing fines on them – these things could actually make European competition more fair too.”

Protectionism has become a recurring theme for the airline's network planners. They also face heavy restrictions in India – a key market for Oman, located on the other side of the Arabian Sea and home to the nearly half-a-million Indians who work in the sultanate.

Oman Air today operates more than 100 flights per week to 11 destinations in India: Bengaluru, Chennai, Delhi, Goa, Hyderabad, Jaipur, Kochi, Kozhikode, Lucknow, Mumbai and Thiruvananthapuram. Load factors above 95% mean that Gregorowitsch is understandably keen to add capacity. But the existing bilateral air services agreement between India and Oman ties his hands, limiting the airline's operations by aircraft type and the number of weekly seats it can offer.

**Liberal regime**

Negotiations have duly been launched with India's new government and the chief executive said he is “optimistic” that a “more liberal regime” can be agreed.

“With prime minister Modi there is absolutely the understanding that this [planned expansion by Oman Air] is not affecting the Indian economy negatively, but it can stimulate further growth and bring more prosperity,” he stressed.

“We put a lot of money in the [Indian] economy. Oman is planning huge further construction work, so we are employing a lot of Indians. The moment that the restrictions are lifted, we can deploy [larger Boeing] 737-900s and Airbus 330s to our destinations, carrying more Indian labour workers.”

As well as up-gauging aircraft and boosting frequencies, Gregorowitsch said Oman Air would consider launching new routes to Kolkata and several Tier II or Tier III cities.

India has unveiled plans to build up to 200 airports in secondary cities over the next two decades, easing congestion at existing hubs and

**“We put a lot of money in the Indian economy. Oman is planning huge further construction work, so we are employing a lot of Indians. The moment that the restrictions are lifted, we can deploy larger Boeing 737-900s and Airbus 330s to our destinations, carrying more Indian labour workers.”**

**PAUL GREGOROWITSCH**

propelling the growth of new economic centres in the country. Continued expansion in India is, indeed, a key driver of Oman Air's mid-term strategy, which envisages the 48-point route network rising to 75 destinations by 2020. Its fleet of 39 aircraft is forecast to reach 70 units over the same timeframe.

But, while the business model partly mirrors that of the ‘big three’ Gulf carriers – linking east and west over a central hub – it has two unique features.

First, the network model is pursued on a much smaller scale than market-leader Emirates, whose 234-strong fleet aims to connect every major city on the planet.

Whereas 70 million passengers last year passed through Dubai's mega-hub, Muscat Airport processed a modest but respectable nine million people.

Second, Oman has an enviable advantage over its neighbours.

Unlike the UAE and Qatar, the sultanate boasts a relatively large land mass – equivalent in size to Poland – that is rich with cultural and ecological splendour. Alongside the pristine beaches and desert safaris that you find

elsewhere in the Gulf, visitors to Oman can trek across the Al Hajar mountain range, go turtle spotting on the east coast, or visit one of four United Nations Educational, Scientific and Cultural Organization (UNESCO) world heritage sites.

Mindful of the need to diversify its economy beyond the energy sector, Oman is, thus, targeting rapid growth in tourism. One major research body expects a 3% spike in visitor numbers to 1.14 million this year, but the government has a grander target of five million tourists by 2030.

It hopes that several infrastructure projects will help turn this vision into reality. As well as lifting Muscat Airport's annual capacity to 12 million by 2017, new airports have been opened in Sohar, Duqm and Salalah over the past 12 months.

This balancing act between sixth-freedom connecting flows and high-value origin-and-destination traffic is reflected in Oman Air's route development strategy.

**Hub destinations**

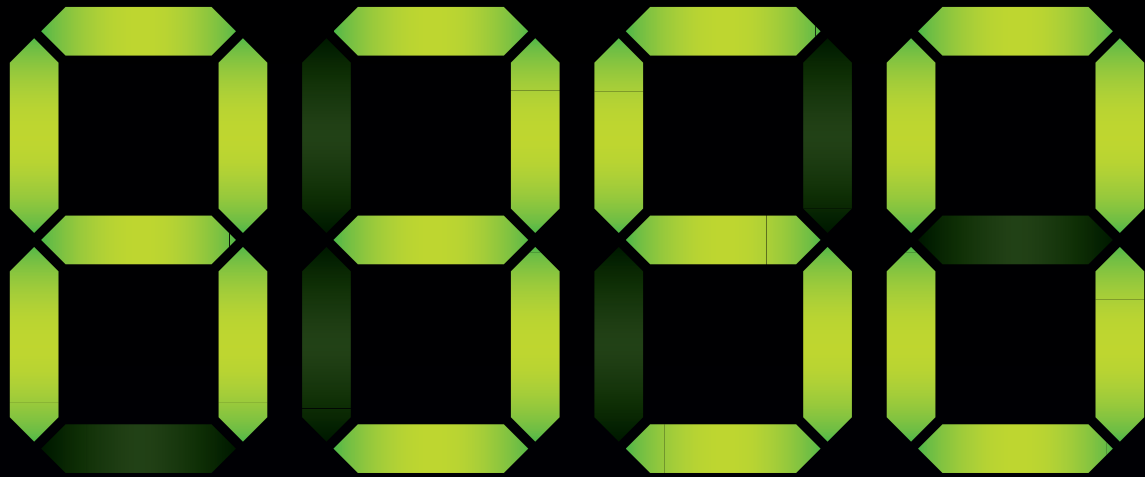
To the west, the European network comprises six hub destinations that, themselves, Hoover up traffic from across the continent: Frankfurt, London, Milan, Munich, Paris and Zurich. To the east, the Indian network is complemented by seven points in the wider subcontinent (Islamabad, Karachi and Lahore in Pakistan; Kathmandu in Nepal; Chittagong in Bangladesh; Colombo in Sri Lanka; and Male in the Maldives) plus five points in southeast Asia. They are Bangkok in Thailand; Jakarta in Indonesia; Kuala Lumpur in Malaysia; Manila in the Philippines; and Singapore.

Flights to the Bangladeshi capital Dhaka will begin in August, potentially being followed by Shanghai, China in the winter and Seoul, South Korea next year. Bali, Indonesia is also being evaluated as a potential extension of the Singapore route. At this stage, however, Gregorowitsch is unwilling to confirm any launch dates beyond Dhaka.

“We cannot do everything at

Continued  
on Page 26

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CONTINUED FROM PAGE 24

the same time," he stressed. "The moment we get more frequencies to France or to India, I have to fine-tune the aircraft supply again."

With Asian points being selectively introduced and European frequencies hopefully nudging up, there is little room to pursue long-haul growth elsewhere. Oman Air's sub-Saharan presence – comprising Dar es Salaam and Zanzibar in Tanzania – is not currently earmarked for expansion. The Americas and Australia will remain absent from the network, given the high fixed costs of serving those lengthy sectors.

But one market closer to home is crying out for growth. Oman and Iran have long enjoyed close ties, thanks to their geographical proximity and the sultanate's neutral religious demographics. Most Omanis adhere to the Ibadi school of Islam – distinct from both Sunni and Shia Islam – which has allowed Muscat to stay on the sidelines whenever sectarian conflict engulfs the wider region.

Yet, despite warm diplomatic and economic relations between the neighbours, Oman Air operates just one daily service to the Iranian capital Tehran. That is a conspicuously low presence for a country and trading partner of 77 million people.

Gregorowitsch said the modest size of the Iranian network reflects yet another balancing act the flag-carrier must tread. "Oman is, in its political position, an ally of more or less all neighbouring countries, but also the United States of America," he noted.

#### Huge benefits

The recent agreements with Iran could see huge benefits for Oman.

Muscat played a pivotal role in the process by facilitating - and even hosting - nuclear talks aimed at ending the sanctions on Iran.

"Everything is taken in a considerate way step-by-step. We should not pre-empt a larger process, where his majesty [Sultan Qaboos bin Said] has been very instrumental in bringing the US and Iran together," the chief executive affirmed.

"We do not want to disturb that [process] as long as sanctions are still there... The moment that that [sanctions regime] is lifted, it will be an open market."

While Oman Air plays second fiddle to the sultanate's broader geopolitical agenda, there are ample expansion opportunities on the flag-carrier's doorstep.

Along with Tehran and three domestic points (Khasab, Salalah and Sohar), Oman Air flies to 12 destinations in the Middle East and north Africa. They are Amman in Jordan; Bahrain; Beirut in Lebanon; Cairo in Egypt; Doha in Qatar; Dubai and Abu Dhabi in the UAE; Jeddah, Riyadh, Dammam and Medina in Saudi Arabia; and Kuwait. Rising east-to-west traffic over the Muscat hub should foster a gradual uptick in regional connectivity, initially in the form of higher frequencies.

The flag-carrier may also begin basing aircraft

**"I am striving to go from 61% Omanisation of the workforce to 70%, to employ promising, highly educated Omanis, to give them a chance in the airline. If I tried to save costs by cutting jobs and by preventing young Omanis from starting a career, the government would never support that."**

**PAUL GREGOROWITSCH**

at Salalah's new airport – opened in June with an initial capacity of 1 million passengers annually – though only to strengthen the domestic trunk route to Muscat, which will be served eight times daily in the winter season.

Asked whether he would consider launching international routes from Salalah, Gregorowitsch said the cost of a dual-hub network and the complexity of re-negotiating international traffic rights are major hurdles. "It would be interesting to fly from Salalah to India," he admitted, referring to the monopoly currently enjoyed by Air India Express. "But then you need the bilaterals to be changed."

Either way, the abundance of network opportunities and the clear mandate from the government to continue growing has fuelled rapid fleet expansion.

The airline's 39-strong fleet presently comprises 10 A330s, 23 737NGs (including four 900ERs), four Embraer E175s, and two ATR 42s.

#### Withdrawn from service

Both of the regional types are being withdrawn from service but Gregorowitsch said new commitments have been signed for up to 20 next-generation 737 MAXs and up to 10 787 Dreamliners. Together with planned current-generation narrow-body leases, that should put Oman Air on-track to reach 70 aircraft by 2020.

Its Dreamliner order dates back to November 2011, when the flag-carrier signed for six 787-8s. Gregorowitsch modified the commitment in March 2015, initially saying he would take nine units of mostly 787-9s. The first two Dreamliners are due to arrive this year.

However, it is worth noting that the updated tally has not been confirmed by Boeing. According to the US manufacturer's order book, Oman Air still has commitments for just six 787-8s and one 737-900ER – suggesting that negotiations are on-going.

While talks about the pace of growth continue,

Gregorowitsch is pressing on with the flag-carrier's 'shape and size' restructuring programme.

Launched in January, the plan aims to make Oman Air profitable by 2017. That is a herculean task for an airline that has lost \$1.1 billion over the past four years, but Gregorowitsch said the combination of cost-cutting and improved scale will steadily feed through to the bottom line. He pointed to early savings from network optimisation, contract re-negotiations, fuel-burn reductions and on-demand catering.

Emphasising Oman Air's broader socio-economic role, the chief executive quickly added that "short-sighted" savings would remain off-limits.

"I am striving [to go] from 61% Omanisation [of the workforce] to 70%, to employ promising, highly educated Omanis, to give them a chance in the airline," he explained. "If I tried to save costs by cutting jobs and by preventing young Omanis from starting a career, the government would never support that."

#### Built for the longer term

"Everything in Oman is built for the longer term. So, if that means [that the break-even target of] 2017 has to become 2018, there will be full understanding by the government. Nevertheless, I keep the target, and we are all working hard to get it done by 2017."

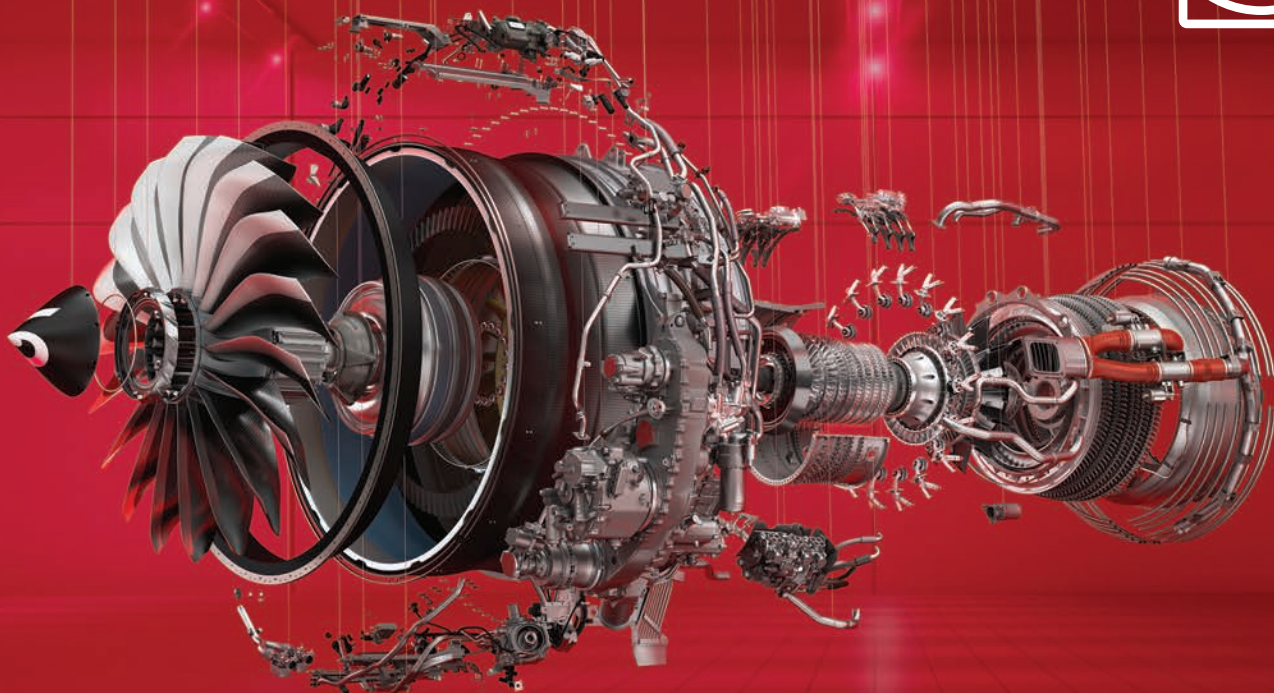
Muscat's focus on the long game was, indeed, re-affirmed in February, when it invited bids from low-cost carriers to establish a base of operations in the sultanate.

Full-service Oman Air will probably not take part in the tender and Gregorowitsch is downbeat on its prospects. "I do not think a low-cost initiative can be successful in Oman," he warned. "The market is small. There are no open skies, except to the Gulf Cooperation Council countries. The country is not web-literate enough to easily book through websites. And the cost of fuel, aircraft and labour will be the same. So, all in all, where are the lower costs?"

The chief executive also drew a distinction between low-cost business models and low-price fares, arguing that the latter should be attainable through productivity gains alone. Oman Air's domestic prices will inch down this winter, for example, as it transitions from regional aircraft to higher capacity 737s.

But, whatever happens with the low-cost tender, it is telling that Muscat has invited no-frills operators to enter the fray, even as it seeks to strengthen Oman Air.

Whereas other countries erect protectionist barriers around their flag-carriers, this sleepy sultanate is throwing its weight firmly behind the virtues of open competition. Though risky at first, the long-term benefits to efficiency and scale should reverberate across the local market – nowhere more so, Muscat hopes, than on the balance sheet of its national carrier.



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A DIFFERENT SCALE ALTOGETHER.

*In 1985, Emirates Airline appeared on the ramp of Dubai International Airport for the first time. Three decades on it has broken innumerable records and seems set to keep on growing for the foreseeable future. Alan Dron looks back over three decades of success.*



The Airbus A300 was a key part of the Emirates growth.

# EMIRATES AT 30: GROWTH IS STILL THE DRIVER

Every year scores, if not hundreds, of fledgling airlines take to the air for the first time. Most will go under in the first two years: The old joke, 'How do you become a millionaire airline owner? Start as a billionaire.' has a kernel of truth to it.

The air transport business is notoriously unforgiving. To sustain an airline through economic recessions, changing passenger tastes and perhaps, even, wars takes skill, vision and, occasionally just some luck, such as being in the right place at the right time. Oh, and let's not forget cash. Lots of cash.

On October 25 1985, Emirates Airline was just another start-up. As its first flight – EK600 to Karachi – took off into the Arabian sky and turned away eastwards, there was little to distinguish it from any one of all those other young, hungry carriers that appear each year.

Indeed, its background seemed less promising than many.

Just five months before its first flight, today's ruler of Dubai, and then prime minister, Sheikh Mohammed bin Rashid Al Maktoum, gave \$10 million – even 30 years ago, not a huge sum – to a start-up team of just 10 people.

Continued  
on Page 32



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Rolls-Royce

CONTINUED FROM PAGE 29

The airline's initial 'fleet' consisted of just two aircraft wet-leased from Pakistan International Airlines, an Airbus A300B4 that would operate that first flight, plus a Boeing 737-300.

And Dubai itself, while a growing commercial centre, was still something of an aviation backwater. The main transit point for flights between Europe and the Far East (which in those days usually had to stop somewhere in the Middle East to refuel) was Muharraq in Bahrain, home to Gulf Air, the region's dominant airline.

Leading the start-up team was Maurice Flanagan, who had arrived in Dubai five years earlier to run Dnata, the airport services group. Flanagan, a former British Airways manager, recalled later that on receiving the \$10 million seed money for the airline, he was told firmly by Sheikh Mohammed, 'And don't come back for more.' He never did.

Flanagan, who did so much to build and transform Emirates into its present position and worked well past what most people would regard as a reasonable retirement age, died earlier this year, aged 86.

Another of those early founders was Tim Clark – now Sir Tim – who left the regional market-leading airline, Gulf Air, to join the start-up as head of planning. Today he is the airline's president and CEO.

### An inspiration

Also involved at the very beginning – and often described as an 'inspiration' by those who have worked alongside him over the past 30 years – is Sheikh Ahmed bin Saeed Al Maktoum.

Sheikh Ahmed was given the task of developing the emirate's civil aviation authority in 1985. The concept of the start-up airline with its two borrowed aircraft was rolled into the job along with the corporate responsibility for the country's tiny airport.

Sheikh Ahmed is the son of the former ruler of Dubai, Sheikh Saeed bin Maktoum Al Maktoum, and the younger brother of Sheikh Rashid bin Saeed Al Maktoum, who is described as the father of Dubai. Ahmed is also the uncle of the current ruler, Sheikh Mohammed, who had found the seed money for the airline.

Sheikh Ahmed did go back and persuaded his nephew to give the fledgling Emirates two Boeing 727-200s to help increase services. This gave the new fresh airline the momentum it needed and it took just two years before Emirates took delivery of the first aircraft it purchased, an Airbus A310-300.

Some of the earliest indications of the company's ambitions came in 1991. It began services to London Heathrow, then the world's busiest international airport hub. It also placed its first order for the Boeing 777, one of the aircraft with which it would become synonymous. It now operates the world's largest fleet of the type.



Sheikh Mohammed (top left), now ruler of Dubai, was a supporter of his uncle, Sheikh Ahmed's plans for Emirates.



Left, he witnesses the signing for more aircraft.

Below: A Boeing 727 in the early days.



## Rolling on with the Trent family

An order from Emirates this year created history for Rolls-Royce and continued a long-standing relationship.

Emirates' selection of Trent 900 engines and TotalCare service support, worth \$9.2 billion, was the largest order in Rolls-Royce's history. The engines will power 50 Airbus A380 aircraft due to enter service from 2016.

It was also extremely significant for the Trent 900 programme, resulting in the engine now securing more than 50% market share on the twin-deck European airliner, in addition to confirming its position as the customer engine of choice for the type.

Rolls-Royce's history with Emirates began when the Trent 800-powered Boeing 777 entered service with the airline in 1996. The engines on the aircraft were ordered in 1992, just seven years after Emirates began operations from Dubai, and before they had even run for the first time.

Emirates eventually received 21 Trent-powered 777s, including -200, -200ER and -300 variants. These aircraft have had a long and successful career in the airline, with 19 still in service today. They have flown for more than 2.7 million hours so far, and completed 340,000 flights for the airline.

After the success of the Trent 800, Emirates followed up with orders for Trent 700-powered Airbus A330-200 aircraft in 1996 – a considerable vote of confidence in the Derby-based powerplant manufacturer, as the airlines' previous Airbus aircraft had all been powered by another engine provider.

These aircraft started to be delivered from 1999, with the fleet eventually totalling 28 aircraft, most of which are still in service. This fleet has since completed more than 460,000 flights in Emirates service.

In 2003, Emirates further showed its faith in the Trent, by ordering Trent 500-powered A340-500s for ultra-long-haul routes. This fleet eventually totalled 10 aircraft.

The Trent family has proven especially suited to the arduous operating conditions in the Middle East, contending reliably with high temperatures and a sandy environment.

With this background, Emirates has been able to select the Trent 900 for its future Airbus A380 fleet with confidence that this variant will replicate the performance of its Trent 800 and Trent 700 predecessors.

## Vast contracts just keep on coming

There were early signs of how Emirates planned to use a high-quality passenger experience as a means of attracting traffic. In much the same way that Gulf Air had raised the bar in the late 1970s with its standards of in-flight service, Emirates aimed to replicate that 20 years later with quality in-flight catering and attention to detail. It enhanced that experience with technology, becoming, in 1992, the first airline to install seatback video systems in all cabin classes throughout its Airbus fleet.

These factors meant that it started to outshine the in-flight standards of many legacy airlines, attracting more passengers to its services.

A series of 'firsts' followed in the 1990s; it was the first airline to offer satellite phones in all cabins and to have an in-flight fax facility.

Satellite phones never really became as popular as their backers had hoped, mainly due to the cost of making calls, while fax machines had a brief burst of popularity, then faded as internet usage blossomed – but the introduction of the services kept Emirates in the public eye and helped establish a reputation as a carrier in the vanguard of passenger-facing advances.

### Keep its fleet young

The airline has been at pains to keep its fleet young, with an average age of around 6.3 years. Nor has it shied away from taking difficult decisions when external circumstances rendered some aircraft inefficient.

The carrier started services with the ultra long-range Airbus A340-500 in 2003, complete with the first 'suites' in the first-class cabin. Its range gave it the ability to connect city pairs that had not previously been possible to link non-stop.

However, in 2013, the airline began parting out the first of the fleet. Scrapping an aircraft after just 10 years of revenue service is highly unusual, but Emirates' hand was forced by the skyrocketing cost of fuel, which made the four-engine jets hopelessly uneconomic. The remainder of the 10-strong fleet has been retired (the last A340-500 is scheduled to make its final revenue flight on September 30) with Clark warning that all would be scrapped unless a buyer could be found.

In another striking decision, Emirates announced in June 2014 that it was cancelling an order for 70 of the brand-new Airbus A350-900s. The reason, said Clark, was to wait until the A350 and its US rival, the Boeing 787-9, were established in service and then look carefully at their respective performance figures as they emerged.

Meanwhile, the airline has steadily expanded its services worldwide, linking Dubai to its first US destination, New York JFK, in 2004 and to Sao Paulo, its first South American destination, three years later.

Both continents are targets for expansion but, in recent months, the prospect of increased competition on its own doorstep has prompted several major US carriers to resurrect accusations that Emirates (together with Etihad Airways and Qatar Airways) benefit from state subsidies.

Emirates vehemently denies this and has noted

**Emirates is an airline that sends accountants in Seattle and Toulouse home each evening with a spring in their step and a smile on their face.**

**The vast contracts that the carrier has placed with both Boeing and Airbus over the past decade or so involve numbers so staggering that they can be difficult to comprehend.**

**The airline has become the world's largest operator of both the Boeing 777 (150 777-300ERs in service or on order, plus almost another 30 in other variants) and the Airbus A380 (more than 60 in service with a fleet due to reach 140 when all orders are fulfilled). It was also the launch customer for the A380 in 2000.**

**In fact, if not for Emirates' huge orders for the latter aircraft, the A380 order book would be looking decidedly thin. The European twin-deck aircraft allows Emirates to move some 500 people at a time to airports such as Heathrow that are extremely slot-constrained, precluding growth in frequencies.**

**Despite having entered service with Emirates seven years ago, the airline has found that 'the A380 effect' still continues – prospective passengers will go out of their way to choose a service on which the aircraft is flying, in order to experience its spaciousness.**

**The airline has looked at an 11-abreast economy-class cabin rather than the existing 10-abreast arrangement, to maximise passenger capacity.**

**However, Emirates president Sir Tim Clark has admitted in the past that he worries about filling the highly unpopular middle seat in a bank of five.**

**For some time, Clark has been urging Airbus to develop an 'A380neo' with new engines to give a 10-13% improvement in costs, with the new powerplant to be fitted to some of the A380s still to be delivered to Dubai; Airbus has been cautious about committing more funds to a programme that has sold more slowly than it would like.**

**Emirates' latest order for 50 A380s came at the 2013 Dubai Air Show, at which the carrier also signed up for 150 next-generation Boeing 777X airliners (35 -8Xs and 115 -9Xs) in what was the largest order in US commercial aviation history and Boeing's single largest-ever order.**

**Even before the order was placed, Emirates operated more than 10% of the worldwide fleet of 777s, which were described by Clark as "the workhorse of our fleet".**

**The new 777X would give Emirates aircraft with ranges "comparable with the 777-200LRs and -300ERs, but with more passenger capacity at potentially more than 18% higher fuel efficiency".**

**Emirates' huge order for the 777X means it will continue to be a mainstay of the fleet for those heavily-trafficked routes that do not merit the additional passengers that can be carried by the A380.**

**Emirates became Boeing's largest B777 owner and took the milestone 1000th aircraft.**



that US carriers benefit from a variety of methods that are, effectively subsidies, such as Chapter 11 administration, which gives a US airline the power to renegotiate contracts with external suppliers and its employees with the aim of cutting costs. The issue has still to be resolved.

Emirates has in one way been fortunate. Many states regard airlines as a nuisance, because of the noise factors involved, or at best as a source of revenue through charges and taxes. There are very few that place civil aviation at the centre of their economies and create an economic vision that coordinates airlines, airports and the support infrastructure that sustains all of it. Dubai has done precisely that – to the extent that aviation and aviation-related industries will

account for an astonishing 37.5% of the emirate's GDP by 2020. And the emirate had the vision to realise that an accident of geography had placed it in one of the best places on the globe to link distant cities with just one stopover point.

Support from the Dubai Government has taken its most tangible form in the shape of Al Maktoum International, an airport that will have a capacity in decades to come of 220 million passengers a year. This will give Emirates – which plans to move its operation there in 2023 – virtually unlimited space in which to grow.

For several years now, Emirates has held the title of 'world's most valuable airline brand'. It has come a very long way since that A300 took off from Dubai.

As Emirates has grown into a global brand, legacy carriers that wrote off the Gulf airline are now demanding that growth be halted. In the USA, three major carriers accused Emirates – along with Qatar and Etihad – of illegal practices. But, as **Martin Rivers** reports, Emirates is hitting back.

## Emirates bites back at US allegations

**E**mirates has gone public with its point-by-point, fact-based response to allegations of subsidy and unfair competition levelled by the ‘big three’ US legacy carriers – Delta, United and American Airlines.

The full document was released to the media and public, following meetings where an Emirates delegation briefed officials from the US Departments of State, Transportation, and Commerce on the airline’s response.

The US legacy carriers launched an aggressive lobbying campaign in January in a protectionist bid to restrict consumer choice and restrict the growth of international flights to the USA operated by Emirates and other Gulf airlines.

Only on March 5 did the US legacy carriers publicly release their 55-page ‘white paper’, which presented so-called “evidence” of Emirates receiving subsidy and competing unfairly. Full appendices to the 55-pager were not made public until April 21.

Sir Tim Clark, president of Emirates said: “The methods employed by the US legacy carriers to discredit Emirates have been surprising and frankly, repugnant. We do not underestimate their lobbying prowess but facts are facts. Unlike the ‘big three’ white paper, which is riddled with inaccuracies, conjecture, and legal misinterpretations, Emirates’ response is comprehensive and based on hard facts.

“We clearly show why the ‘big three’ have no grounds to ask the US Government to unilaterally freeze Emirates’

operations to the USA or pursue other action under the open skies agreement. It is because we are absolutely not subsidised and our operations do not harm these legacy carriers, but instead benefit consumers, communities and America’s national economy.”

Analyst Saj Ahmad said the rebuttal to the charges laid against it by United Airlines, Delta Airlines and American Airlines “lays bare the desperation to which the US carriers have stooped to in order to somehow convince people that state support props up Emirates.

“As it is, nothing could be further from the truth,” he said.

“Unlike the nonsense peddled by the US airlines, which at one point flat out refused to share their so-called ‘subsidy document’, Emirates has been patient, diligent and utterly annihilated every point made by the US airlines. The whole purpose of the UAE-US open skies pact was to foster and develop economic and transport links.”

### Systematically disproves

Emirates’ response systematically disproves each of the ‘big three’ allegations that it has received more than \$6 billion in subsidies, including fuel hedging subsidies; purchased goods and services from related third parties at below-market terms; disproportionately benefitted from airport infrastructure and user fee at Dubai International airport; and had an artificial cost advantage through the structure of the UAE’s labour law.

Clark said: “The subsidy allegations are patently false. We have been profitable for 27 years straight and, unlike our accusers, we have never depended on government bail-outs or protection from competition. In fact, we were told right from the start by the Government of Dubai that Emirates had to deliver profits and stand on its own feet. We had to then, and we still have to now. Dubai has no oil reserves to speak of and, therefore, it embarked on a well-documented strategy to diversify its economy with air transport as a key enabler.

“That directive is what led us to pioneer a successful business model as an efficient long-haul connector that offers customers a best-in-class experience.

“Our global expansion is funded from our own cash flow and debt raised in the open market through banks and financial institutions. Our success is due to superior commercial performance. To date we have paid our shareholder, the Dubai Government, more than \$3 billion in dividends. All of this is laid out in our financials, audited by Pricewaterhouse Coopers. We are financially transparent and have published fully audited accounts for more than 20 years.”

■ The full Emirates rebuttal is available at: [www.emirates.com/USsubsidyRebuttal](http://www.emirates.com/USsubsidyRebuttal)

**“The methods employed by the US legacy carriers to discredit Emirates have been surprising and frankly, repugnant.”**

SIR TIM CLARK



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*Air Arabia has finally broken into the Jordanian market by teaming up with Petra Airlines. Group chief executive Adel Ali tells **Martin Rivers** about his plans for the franchise.*

## Jordan deal holds few fears for Air Arabia

**A**ir Arabia moved a step closer to regional domination in May when Queen Alia International Airport in Amman became the low-cost group's fifth base of operations.

Group chief executive Adel Ali admits that 2015 is a risky time to launch a subsidiary in Jordan, which borders Syria to the north and Iraq to the east. Tourism flows to the country have been depressed ever since the Arab Spring uprisings and there is little prospect of a sustained recovery while the so-called Islamic State (IS) lays siege to much of the Levant.

Yet, with geopolitical unrest never far from the headlines in the MENA region, Ali is less concerned about Air Arabia Jordan's near-term challenges than its future prospects.

"The MENA region has been going through volatility probably since 2011," he said. "Our investment is a long-term one. Jordan is the most stable country in the Levant region, so we just need to see how things progress in the surrounding areas. Sometimes challenges can create opportunities."

Air Arabia was founded in 2003 by the ruler of Sharjah but its no-frills business model bears little resemblance to

Continued  
on Page 38



**Adel Ali: bullish about expansion plans. (Inset) Welcome ceremony at QAIA as the first flight was set to go.**

CONTINUED FROM PAGE 37

the other flag-carriers in the UAE.

Envisioned as the Middle East's first truly point-to-point operator, the company was floated on Dubai's stock exchange in 2007 before spreading its wings with franchises in Casablanca, Morocco and Alexandria, Egypt. Foreign ownership restrictions block the carrier from basing aircraft overseas, so Ali must, instead, sign joint-venture (JV) agreements at each new hub.

The group also now operates from the northern emirate of Ras al Khaimah, having stepped in to replace defunct flag-carrier RAK Airways.

Though the franchise model can be longwinded, Air Arabia's vision of pan-regional connectivity is gradually falling into place. It currently deploys 43 Airbus A320s to more than 100 destinations worldwide, focusing primarily on the MENA region but also extending its reach deep into Europe, Asia and Africa.

Asked whether setting up shop in Jordan is perhaps a step too far in the current climate, Ali cited the group's rocky start in Egypt as evidence of its doggedness. Air Arabia Egypt, a JV with Travco Group, took to the skies from Alexandria just six months before the Arab Spring engulfed the region.

"We had a similar scenario [as in Jordan today]," he recalled. "But we sustained the business during the revolution and then we grew it. Now we are

penetration, as well as giving us good access into Europe."

Jordan, ironically, signed an open-skies treaty with Europe in the same month that the Arab Spring started in Tunisia. But, whereas a similar accord between Morocco and the EU unleashed a wave of low-cost competition – heaping pressure on Air Arabia Maroc, the Casablanca-based subsidiary – Amman has barely registered a ripple.

Even following the launch of Air Arabia Jordan, low-cost penetration in the country is still well below 10%. That compares with about 40% in the flourishing Moroccan market.

Ali's group now provides about one-third of the low-cost capacity in Amman, when measured by available seat kilometres. On top of its five outbound routes, inbound services are also operated from the bases in Sharjah and Alexandria. Flydubai remains the largest low-cost player, with a local market share of 40%, while Kuwait's Jazeera Airways and Saudi Arabia's Flynas also have a presence.

London-based EasyJet had launched services to Amman in 2011 but it pulled out in 2014 in favour of Tel Aviv expansion. Israel recently signed its own open-skies treaty with Europe.

The limited impact of open skies is unsurprising given that visitor numbers to Jordan have plummeted from 8.2 million in 2010 – before the

are only about four flights per day. We are used to being given a hard time! Hopefully, eventually, they will see that we bring benefits."

Protectionism in the domestic market is less of a concern. Even though Air Arabia Jordan is going head-to-head with Royal Jordanian on four of its five routes, Ali praised the flag-carrier for its progressive attitude towards new market entrants.

"I believe, and they believe, that we will add jointly to the market," he affirmed. "We will create employment and an economic cycle that both airlines then benefit from."

Turning to the other subsidiaries, Ali said he expects "imminent" expansion of Air Arabia Maroc's four-strong fleet. The franchise – the group's first, launched in 2009 in conjunction with Regional Air Lines – operates flights to Europe from five Moroccan cities (Casablanca, Fes, Marrakech, Nador and Tangier). The Moroccan authorities have not yet approved planned expansion to west Africa.

Air Arabia Egypt, meanwhile, continues to face difficulties in its home market, although its relatively small Gulf network has limited exposure. "Egypt's challenge has always been traffic rights," Ali said. "Once things are a little bit more settled, we could do much better in Egypt."

Interestingly, Oman's Government has announced that it is seeking bidders for a low-cost airline in the sultanate. "We are looking at that," Ali confirmed, while stressing that Air Arabia had not formally engaged in the tender process.

### Focus on core business

"North Africa and the Levant both have their challenges so we will focus on our core business and just see how the region develops. At the moment we need to grow Morocco, improve Egypt, and develop Jordan. But if an opportunity comes up that we think is lucrative, then of course we will consider it."

With cautious growth the name of the game, Air Arabia is unlikely to place one of the aircraft mega-orders that its home country has become so famous for.

The airline's 2007 commitment for 44 A320s is likely to be fulfilled next year, pushing it above the 50-aircraft mark when including leased units. Although Ali has initiated talks with three manufacturers for the next wave of growth, he is "not in a particular rush" to place an order. Lease agreements may be favoured over direct purchases.

As for the on-going dispute between the 'big three' Gulf carriers and their US rivals, the chief executive left no doubt as to where his sympathies lie.

Ali has, in the past, criticised Emirates, Etihad and Qatar Airways for their government support – subsidiaries that Delta, United and American Airlines cite as justification for nullifying America's open-skies treaties – but his business model also depends heavily on cross-border liberalisation. All things considered, the latter priority prevails.



seeing much more stability."

Jordan had, indeed, been in the business plan long before IS set the region on fire. An earlier attempt at partnering with Tantash Group was announced in June 2010 – the same month that Air Arabia Egypt took the skies – but quickly unravelled as civil unrest spread.

This time around, Air Arabia collaborated with RUM Group to acquire 49% of its charter operator, Petra Airlines. "An opportunity arose where Petra needed some support so we joined forces to create Air Arabia Jordan," Ali confirmed. The newly re-branded airline deploys three A320s on scheduled flights to five regional destinations – Erbil in Iraq; Jeddah and Medina in Saudi Arabia; Kuwait; and Sharm el Sheikh in Egypt.

His enthusiasm for the country stems largely from its geographical location – in the heart of the Arab world and within narrow-body range of Europe.

"In terms of tourism into Jordan, when things are good, Queen Alia Airport is quite attractive," Ali argued. "It makes sense in terms of Middle East

Arab Spring – to just 5.3 million in 2014. Flag-carrier Royal Jordanian Airlines is also feeling the pinch, last year deepening its losses to 40 million dinar (\$56 million) despite a concerted turnaround strategy.

Against this backdrop, Ali admits that European expansion is a "work in progress" for the local franchise. No launch dates have been set and forthcoming routes will need to be synchronised with Sharjah to "feed traffic into Europe".

While those evaluations continue, Air Arabia Jordan will, instead, focus on expanding its regional footprint.

"We'd like to launch to Istanbul and Beirut as soon as possible," Ali said, noting that Sabiha Gokcen Airport offers the best opportunity for securing traffic rights to Turkey. Air Arabia already serves the secondary hub from Sharjah and two of its Moroccan bases.

"For Lebanon, technically, there is an open-sky agreement with Jordan. But the Lebanese side is holding us up. They're saying there are enough operators [on Amman-Beirut], even though there



“We will study the different aspects of a low-cost carrier to find the right solution. But I can’t say if it’s going to be a new airline or a subsidiary.”

MOHAMED BOUDERBALA



## MAN IN THE HOT SEAT...

*Air Algérie is hoping to draw a line in the sand with the appointment of new chief executive Mohamed Bouderbala.*

**Martin Rivers and Vincent Chappard** look at the challenges facing Algeria’s flag-carrier.

**M**ohamed Bouderbala takes to the helm of Air Algérie following a tumultuous period at the state-owned flag-carrier, which suffered its worst ever disaster in 2014 and is coming under increasing pressure at home to improve its service levels and reliability.

Friends and relatives of the 116 mostly French citizens who perished on Flight 5017 can hope for some closure later this year, when air crash investigators publish their final report into the disaster.

The McDonnell Douglas MD-83, operated by Spain’s Swiftair for Air Algérie, had been on a routine flight from Ouagadougou, Burkina Faso, to capital city Algiers when it crashed in Mali on July 24 2014. Preliminary findings suggest the aircraft stalled shortly after reaching cruising altitude, probably due to an auto-thrust

malfunction caused by the flight crew’s failure to activate engine anti-ice systems. Bad weather was also likely a contributing factor.

The tragedy overshadowed the achievements of Bouderbala’s predecessor, Mohamed Boultif. The outgoing boss had presided over several initiatives during his four-year tenure at the flag-carrier.

Chief among these was the long-awaited fleet renewal programme. Bouderbala’s ascension to the top job in May came just as Air Algérie prepared to receive the last of three newly ordered Airbus A330-200s. Two of three ATR 72-600s have also recently arrived in Algiers, while the airline has unfulfilled orders for eight Boeing 737-800s and two 737-700C convertible freighters.

Speaking during the International

Continued  
on Page 40

## CONTINUED FROM PAGE 39

Air Transport Association (IATA) annual meeting in Miami in June, Bouderbala said the first 737 was due to arrive imminently and that the full 16-aircraft renewal should be completed “before the end of 2016”. All the new units will be used to expand operations, he stressed, insisting that Air Algérie has “no old aircraft to replace”.

The flag-carrier’s pre-existing fleet comprised another five A330-200s, three 767-300s, 22 737NGs, 12 ATR 72-500s, and one Lockheed L-100 Hercules freighter. Only the Boeing wide-bodies and the freighter pre-date the turn of the century.

In addition to its permanent fleet, Air Algérie also frequently contracts extra aircraft during the summer peak season. At the time of writing, the airline was wet-leasing one A330-200 from Portugal’s Hi Fly, one A330-300 from Malaysia’s AirAsia X, and one A320 from Tunisia’s Nouvelair.

**Under-performing**

Although passenger numbers have surged by more than 60% over the past decade – reaching five million in 2014 – Bouderbala freely admits that the airline is under-performing when it comes to customer care and punctuality. Its on-time-performance rate stands at just 55%, according to Flight Stats, while its on-board product is widely considered to lag behind rival offerings in the marketplace.

“We want to improve our relations with customers and get back passengers who have decided, for one reason or another, to switch to another airline,” the chief executive said, promising an overhaul of management structures at the flag-carrier. “Our aim is to develop the airline so that it reaches international standards.”

Previous ideas floated in government have included restructuring Air Algérie by establishing four new subsidiaries – catering, cargo, ground-handling and maintenance – and venturing into the low-cost sphere with a no-frills division or affiliate.

The latter discussions accompanied reports that Algeria might follow Morocco’s lead by signing an open-skies agreement with Europe, thereby

opening the floodgates to low-cost competition. Today only three carriers – Spain’s Vueling, Belgium’s Jetairfly, and Transavia France – operate no-frills flights to Algeria. But Transport Minister Amar Ghoul poured cold water on the plans in November 2014, repeating previous governments’ concerns that Air Algérie could not withstand the competitive onslaught.

His anxiety was, perhaps, justified: the flag-carrier’s international network today focuses heavily on 22 destinations in western Europe, including 10 in France.

Air Algérie presently accounts for more than half of the 100 daily flights operated between the north African nation and its former colonial power. Aigle Azur, a French carrier part-owned by China’s HNA Group, is in second place with a 37% share, while Air France operates just 8% of flights in the market. Open skies would decimate this cosy oligarchy.

Nonetheless, even though liberalisation is not an imminent prospect, Bouderbala remains interested in the possible benefits to efficiency and scale that a low-cost offshoot could bring.

“I have talked with several people within the company and the concept of a low-cost [operation] has not been rejected,” he insisted. “We will study the different aspects of a low-cost carrier to find the right solution. But I can’t say if it’s going to be a new airline or a subsidiary. I don’t know which form it will take.”

**Expand in its home continent**

While taking steps to fortify the European network, the chief executive must also now re-evaluate Air Algérie’s long-standing commitment to expand in its home continent.

At present, just four destinations are served in west Africa (Dakar, Senegal; Niamey, Niger; Nouakchott, Mauritania; and Ouagadougou) plus three in north Africa (Casablanca, Morocco; Tunis, Tunisia; and Cairo, Egypt). That excludes the very extensive domestic network of about 30 Algerian points.

Previous statements by the flag-carrier have

suggested that Chad, Djibouti, Ethiopia, Nigeria and South Africa could join the network in the years ahead. Speaking less than a fortnight after taking on the top job, however, Bouderbala was understandably reluctant to pin down any strategic decisions.

“All these matters need to be discussed,” he insisted. “Maybe [we will grow] within Africa to make a hub; we are analysing our network development [options]. But first, we want to reinforce the existing routes.”

More ambitious long-haul growth will need to be carefully considered.

The airline presently serves just one destination in North America (Montreal, Canada) and one in Asia (Beijing, China). New York, Shanghai and Sao Paulo, Brazil are the most likely candidates for expansion.

But the arrival of new wide-bodies does not make long-haul growth a foregone conclusion; the A330s could also be used to boost frequencies to Dubai, for example, or to up-gauge narrow-body services to Istanbul.

**Efficiency gains**

Closer cooperation with Tassili Airlines, meanwhile, may deliver some efficiency gains. The carrier was founded in 1997 as a joint venture between Air Algérie and Sonatrach, the state-owned oil company, initially to ferry oil workers across the vast, energy-rich country.

Although Air Algérie subsequently sold its stake to Sonatrach in 2005, the two carriers maintain close links. Tassili’s expansion into the scheduled international market was followed, in June, by the announcement of a shared ticketing agreement with its former shareholder. The cooperation will enhance travel options for customers, while making it easier for the airlines to synchronise flights.

There is no denying that Bouderbala has his work cut out trying to push through reforms at the 68-year-old flag-carrier. Inefficiency and bureaucracy are endemic to Algeria’s national industries – long dominated by the state due to the country’s socialist path post-independence.

But, having formerly served as director general of the customs authority, the chief executive has both personal and professional experience of the challenges facing Air Algérie.

“[My time as] the managing director of customs at the ministry gave me the opportunity to travel a lot with Air Algérie and, thus, to get acquainted with the airline,” he explained. “It enabled me to better understand how the airline operates.”

That first-hand knowledge will now be put to the test as the flag-carrier works to rehabilitate its image while maintaining steady growth. Its home market faces significant headwinds due to the double-whammy of falling oil prices and rising regional instability. Protectionism may shield the parastatal from losses in the short-term. But, longer term, Bouderbala’s vision of commercial excellence will require tough decisions to be taken over dependence on the state.





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New entrants: Al Maha Airways and SaudiGulf Airlines.

# Home truths in a

*As Saudi Arabia inches towards opening its domestic airline market to more competition, Alan Dron asks who will survive the battle for passengers?*

**A**t the last Bahrain International Air Show in January 2014, I asked a senior Middle East airline executive why Saudi Arabia's plans to open up its domestic air market to new carriers seemed to be taking so long to mature. He looked surprised: "By Saudi standards," he remarked, "this is going like a train".

That train seems to have hit the buffers some time ago. At the time of writing, 18 months later, there is still no clear indication of when the two new entrants – Al Maha Airways and SaudiGulf Airlines – will carry their first passengers, although SaudiGulf has publicly targeted November as a starting date.

However, both new carriers, who will line up against each other as well as national flag-carrier Saudia and relative newcomer Flynas, had hoped to be flying by now.

There is little doubt that the two new carriers will get off the ground. But just who will remain in business among the competitors a year or two down the road remains to be seen.

Saudi Arabia is an ideal market for domestic services. As the largest nation on the Arabian

peninsula, distances between many cities are sufficiently large to make air travel an attractive option. The country also has the largest population of any in the region (around 27 million) and there is a large, wealthy middle class accustomed to flying.

For years, Saudia has handled the great majority of domestic passengers and, in 2013, 15 million of its 25 million customers flew within the kingdom's boundaries.

Some routes are densely trafficked; for example, Saudia has 12 flights daily between Riyadh and Jeddah and frequently uses Boeing 777s for the 90-minute hop. These are often full.

The other current domestic airline is Flynas, which began life in 2007 as low-cost carrier Nas Air but which has moved to a hybrid model, with business-class cabins. It operates 24 Airbus A320s.

Saudi Arabia's aviation regulator, the General Authority of Civil Aviation (GACA), announced in December 2011 that the domestic market would be opened to new entrants and that these could include foreign companies.

A year later it said that licences would be granted to two bidders – Al Maha Airways, a subsidiary of Qatar Airways, and SaudiGulf Airlines, a new airline set up by the Al Qahtani Group, a Saudi industrial consortium with no previous airline experience.

Al Maha will operate Airbus A320s and unspecified twin-aisle aircraft diverted from its parent company's vast order book, with the aim of building a fleet of 50 aircraft within a few years of starting operations.

## High-amenity cabin

SaudiGulf announced at the January 2014 Bahrain air show an order for 16 Bombardier CSeries CS300 regional jets (plus 10 options). Bombardier Commercial Aircraft regional VP-sales, Middle East and Africa, John Kassis, commented that the new airline "picked everything on the option list" to provide a high-amenity cabin.

Four A320neos have been ordered as interim equipment until the Canadian airliners are delivered next year.

Al Maha was due to start operations in the third quarter of 2014, with SaudiGulf following shortly afterwards. Neither has got airborne yet.

The delays have been caused by being unable to obtain air operator certificates (AOCs) from GACA. Speaking at the delivery of Qatar Airways' first Airbus A350 at Toulouse last



# domestic battle

December, CEO Akbar Al Baker said that only the lack of an AOC was preventing Al Maha from starting operations, but that acquiring it was proving “complex”. The following month, he was reported by Saudi newspaper, Al Watan, as saying that this process could take “anywhere between six to 18 months”.

However, the following month, GACA’s president, Sulaiman Al Hamdan, was quoted by Saudi newspapers as laying the problem at the doors of the new airlines: “There are regulations that [the airlines] have to follow to get the licence. We are transparent and we provide the same facilities to all airlines.”

GACA said some months ago that “once the two mentioned companies meet all the security, economic and technical requirements, the AOC will be granted”, but has said no more since. SaudiGulf declined to make any comment about its activities for this article, while Qatar Airways has been almost as tight-lipped about Al Maha.

In April, however, Al Baker was at Airbus’s Hamburg facility to take delivery of four A320s for Al Maha; while the AOC affair remains unresolved, these will be used on Qatar Airways’ mainline schedules.

Meanwhile, at least two A320s in SaudiGulf’s green and gold colour scheme are understood to be parked at Tarbes-Lourdes-Pyrénées Airport in southwest France. Unlike Al Maha, SaudiGulf has no other services on which they can be



**Paul Byrne: “We have become accustomed to competition and it is something we do not fear. Bring it on.”**

deployed.

For its part, Flynas is preparing for the forthcoming competition for passengers by strengthening its domestic timetable. Its current schedule shows no fewer than 14 daily round-trips between Jeddah and Riyadh compared to 11 a few months ago and CEO Paul Byrne said that it was changing departure times to differentiate them from those of Saudia.

A ‘nasmiles’ loyalty programme was launched at the Arabian Travel Market travel trade show window in May and more Saudi destinations are due to be launched this year.

Speaking at May’s inaugural Routes Middle East & Africa forum in Bahrain, Byrne said that about 70% of Flynas’ operations were focused within, to or from Saudi Arabia. Due to local market regulations and pricing systems, the airline could not be defined as a true low-cost carrier. However, it was definitely low-cost compared to its competitor Saudia.

He said that growth for Flynas would come primarily in the domestic market but acknowledged a need to increase its activities internationally, particularly within the Gulf Cooperation Council countries.

It will, however, be careful not to over-extend itself, as it did in 2014 when it launched short-lived long-haul Airbus A330 services to the UK, Malaysia and elsewhere. The UK

Continued  
on Page 44

CONTINUED FROM PAGE 43

routes, in particular, lasted less than three months.

Low-cost long-haul may work “if you’re completely focused on it. We dabbled. It didn’t work for us as we weren’t good at it.”

However, lessons have been learned from the experience: “If we want to go the long-haul route, we will do that through codeshare,” said Byrne.

He added that he was not afraid of increased competition: “Competition is not something new for us.

“In fact, we currently only serve one route in the country that has no direct competition, less than 1% of our network. We have become accustomed to competition and it is something we do not fear. Bring it on.”

#### Ready for battle

Saudia, meanwhile, says it is also ready for battle. A spokesman commented that the national carrier currently had “more than 90%” of the domestic market and that, even after the arrival of the new competitors, it expected its market share not to drop below 80%.

He added that, unlike the other carriers, it would serve all 26 Saudi airports and additional aircraft were being acquired to provide frequent point-to-point services, as well as providing connections at the two main hubs of Jeddah and Riyadh for international traffic. It expects to accept eight Boeing 787-9s and four 777-300ERs in 2015-16.

Saj Ahmad, lead analyst at UK-based Strategic

## Historic regional first for Saudia

**Saudia is to become the first airline in the world to operate the new Airbus A330-300 Regional.**

Passenger demand in Saudi Arabia is experiencing high growth, both on domestic and regional routes. The new A330-300 Regional variant, specially designed for regional and domestic operations, is Airbus’ solution for markets with large populations and fast-growing, concentrated air traffic flows.

The aircraft is set to boost capacity on several of Saudi Arabian Airlines’ most in-demand routes.

Saleh bin Nasser Al-Jasser, Saudia’s director general said: “The A330-300 Regional’s unique flexibility, high capacity and operational capabilities will enable us to expand our domestic and regional network and better absorb growing passenger traffic.”

The shopping spree will not end there. Al-Jasser said the airline is “keen to modernise” its fleet and indicated that, within five years, it would acquire “more than 100” aircraft of various types.

The purchase of the new A330s led to a record finance deal by the Saudi airline.

Lessors, International Airfinance Corporation (IAFC) appointed Quantum Investment Bank



(Quantum) and Palma Capital (Palma)—both based at the Dubai International Financial Centre (DIFC) and regulated by the Dubai Financial Services Authority (DFSA)—as exclusive arrangers for the largest aircraft leasing deal in Saudi Arabian Airlines’ history.

The deal consists of arranging debt and equity financing to acquire 20 A330-300s and 30 A320-200s.

The A330-300 Regional is optimised to seat up to 400 passengers, utilising the Airbus 18-inch wide economy seat comfort on missions up to 3,000nm. It offers significant cost savings through a reduced operational weight of around 200 tonnes.

The reduction in fuel burn per seat and maintenance costs will result in an overall cost reduction by up to 26% compared with the today’s long-range A330-300. Airbus said the A330 Regional benefits from the latest A350 XWB and A380 technologies.

Aero Research, believes that the two winners in the forthcoming struggle for passengers will be those with the strongest financial resources, namely Saudia and Al Maha.

Ahmad believes that the Saudi Government will not allow Saudia to be damaged by increased

competition, while Al Maha will benefit from having access to Qatar Airways’ resources.

He believes the two companies most at risk from a prolonged battle for market share are Flynas and SaudiGulf.

He believes that Flynas is hampered by its relatively small route network: “They’re not expanding anything like as fast as [low-cost carriers] Flydubai or Air Arabia. Flydubai has been flying six years and has more than 100 destinations. Flynas has been around for 10 years and has 24 destinations.” This gives the Jeddah-based airline a lack of connectivity compared to rivals, he said.

His greatest concerns, however, are for SaudiGulf. “SaudiGulf worries me for a number of reasons. If Al Maha wasn’t there, they might have some chance of making inroads [but] I don’t think they have the power to make any meaningful difference to the market.”

#### Lack of financial muscle

The combination of the Al Qahtani Group’s lack of aviation experience, its planned reliance on the untried C Series and what Ahmad perceives as a relative lack of financial muscle may be fatal, he says.

He thinks that the Saudi authorities may be having second thoughts on the wisdom of opening up the domestic market to competition but that they have passed the point of no return.

“The biggest flaw in their strategy is that opening up the domestic Saudi market harms Saudia and Flynas... I think they are realising their folly.

“I think [providing] AOCs is nothing more than Saudi procrastination at this stage. It will happen, but we can’t say when.”

Saudi passengers will shortly have more choice in domestic air services than ever before; but will the airlines serving them have a similarly happy experience?

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Ahmed Aly: "We'll also be expanding outside of the Middle East region by launching services to Sudan in Africa."

# More tributaries for

*Nile Air chief executive Ahmed Aly tells Martin Rivers that 2015 will be a pivotal year in the airline's history.*

**E**gypt's Nile Air will add Iraq and Sudan to its growing network this summer, as it makes good on a pledge to double its fleet size to four Airbus A320s.

The Al Tayyar Travel Group affiliate took delivery of a leased A320 from Aviation Capital Group in April and, at the time of writing, was poised to receive a fourth unit from AerCap.

It has also resolved an outstanding purchase agreement with Airbus, opting to replace a stalled order for nine A321s with two A320s. That owned pair will be delivered in the first half of 2018.

Nile Air's pre-existing route network connected three points in Egypt (Cairo, Alexandria and Luxor) with five in Saudi Arabia (Jeddah, Tabuk, Qassim, Ta'if and Yanbu) plus Kuwait.

Its new aircraft are initially being used to lift frequencies across the network, making routes such as Cairo-Tabuk daily and Cairo-Qassim double daily. Egypt's capital has also benefited from the addition of two new services – to Kuwait and Hofuf in eastern Saudi Arabia – while Luxor-Kuwait will likely be upgraded to a year-round service.

But it is the addition of Iraq and Sudan that will

make 2015 a transformational period for the seven-year-old airline, expanding its overseas reach beyond the Arabian Peninsula for the first time.

"Baghdad is a high-potential market from Egypt but is very restricted in terms of bilaterals," chief executive Ahmed Aly noted. "Nile was able to secure bilaterals when it was first launched.

#### Expanding outside the Middle East

"We'll also be expanding outside of the Middle East region by launching services to Sudan in Africa. So, our first service will go to Port Sudan in the north of the country, and then soon after we'll be launching flights to the capital Khartoum – we're just waiting to finalise the bilateral there."

Nile Air became the first Egyptian carrier to operate Cairo-Port Sudan when its service began in June. Sudan Airways already serves the route once weekly.

Cairo-Baghdad was scheduled to get under way as *Arabian Aerospace* was going to press, with Nile Air and EgyptAir sharing the 10 weekly frequencies permitted on the Egyptian side of the bilateral air services agreement. Iraqi Airways is

also a designated carrier on the route.

Aly predicted strong demand on the Sudanese connection, noting the country's large expatriate community in Egypt. An agreement with several European tour operators to funnel scuba divers over Cairo to Port Sudan, located on the Red Sea coast, should also strengthen flows.

Although the Egyptian market has faced difficulties since the Arab Spring, Nile Air's diverse traffic make-up has sidestepped the downturn. Its passenger count rose by 26% to about 400,000 last year.

The airline presently caters for five main types of customers: religious traffic to Saudi Arabia; visiting friends and relatives (VFR) drawn from the six-million-strong Egyptian diaspora living in the region; corporate and government contracts; independent business traffic; and inbound tourism from the Gulf.

The latter two categories saw a "significant resurgence" in 2014, Aly said, while recent agreements with Sabre and Travelport have also enhanced the carrier's distribution capabilities. Nile Air is now listed on all three major global distribution systems (GDSs).

Saudi-owned Al Tayyar Travel Group has further played an important role in developing the airline's reputation.

"Al Tayyar Group is the largest travel and





## MAXIMUS HUNTS A GIANT (OR TWO)

*Having slimmed down its fleet and weathered financial squalls, Abu Dhabi-based cargo specialist Maximus Air is now looking for new aircraft. Alan Dron reports.*

If anyone knows where they can lay their hands on a spare Antonov An-124 or two, Mohamed Ebrahim Al Qassimi would like to hear from them.

The CEO of outsize cargo specialist Maximus Air would dearly like to add to his existing single example of the giant Ukrainian-built freighter, as the Abu Dhabi-based company continues to focus on the outsize cargo market.

Maximus is about to sell the older of its two Ilyushin Il-76TD freighters “and we plan to acquire another one or two An-124s, if available”, said Al Qassimi.

The critical phrase is ‘if available’. Just 55 were built and only around half those examples are in the commercial sector. “We’re finding it difficult to locate a

but the lack of aircraft is preventing this.

Despite these hurdles, the company is now back in profit – modestly – and at present “We’re well into the green,” said Al Qassimi.

Humanitarian relief flights remain an important part of Maximus’ services. It regularly operates for the Red Crescent and recent tasks have included flying shelters, food and medicine to Lebanon and Jordan for refugees from Syria’s civil war, who were hit by unusually severe late winter storms.

One recent development has been the signing by Maximus of a memorandum of understanding (MoU) with Antonov to operate its new An-178 airlifter, which flew for the first time in May.



Maximus is considering the new Antonov An-178 transport as a means of bolstering its fleet.

## Nile...

tourism company in the Middle East and its managing director, Dr Nasser Al Tayyar, is the chairman of Nile Air,” Aly explained. “He’s been a fantastic supporter... in terms of feeding us with passengers and joint negotiations for travel-related services. Al Tayyar Group has always been a strong leverage for Nile Air.”

Egypt’s Government also wins praise from the airline boss. With the addition of Cairo-Kuwait in June, Nile Air has been granted access to two of the three largest markets from Egypt.

### Gradual improvement

“We are seeing a gradual improvement in the situation with the Egyptian Civil Aviation Authority,” Aly affirmed. “Last year we were given approval to launch Cairo-Jeddah. This year we got approval for Cairo-Kuwait. These are significant steps towards the liberalisation of the market.

“We have shown the Egyptian authorities the value of Nile Air – the fact that it’s not in competition with EgyptAir, but it’s actually growing and stimulating traffic to Egypt, bringing in tourism and investment.”

Looking beyond the current wave of expansion, Aly said Riyadh and other cities in the Gulf, Europe and Africa will be targeted in the years ahead.

decent one; I wish they were like 737s or A320s. Life would be much easier!”

Assuming examples become available, Al Qassimi would prefer to take them on lease. For the moment, aircraft can be sub-leased from Antonov, but this is not ideal.

The need for new aircraft comes as Maximus says it is experiencing strong growth. The situation is considerably brighter than a couple of years ago, when the airline found that its fleet of five newly-acquired Airbus A300-600R2F freighters were effectively being undercut by the explosion of belly hold space available in the fast-growing fleets of the major Gulf carriers – particularly those that operated Boeing 777s with their under-floor capacity.

The A300s were grounded and all have now been sold off to various buyers, including Turkish Airlines.

Instead, Maximus has focused exclusively on out-sized or specialist loads, ranging from horses or helicopters to heavy earth-moving machinery.

The Middle East, Africa and Europe have proved fruitful markets, with the Antonov’s 120-tonne capacity and its capability – together with the Ilyushins – of operating into difficult airfields off the normal scheduled carriers’ route maps. The ability to use their on-board cranes to load and unload cargo is also invaluable when flying into airfields with minimal infrastructure.

One frustration for Al Qassimi is that Maximus has the necessary licences and approvals to operate to the US

Al Qassimi is careful to note that the MoU is non-binding and subject to further negotiations, but says that several factors have interested it in the new offering.

A development of the Antonov family that began with the An-148 twin-jet regional airliner, the An-178 differs from its civil cousin largely through having a rear cargo ramp.

While handling considerably smaller loads than the An-124 or Il-76 – a maximum payload of 18 tonnes, or 10 tonnes at a range of 4000km – the An-178 has been designed with a cargo compartment that can take two standard shipping containers and is aimed at replacing aircraft such as the 1950s-vintage Antonov An-12 turboprop.

Its size and capabilities potentially make it a versatile airlifter, especially where the cargo being carried does not merit the use of one of Maximus Air’s larger aircraft.

Maximus was attracted to it “Firstly and most importantly by its economy and new technology, plus the fact that it’s made by the same people who made the An-124. It’s as simple as that. It has a new and economical powerplant. Sometimes we go into airports where they don’t even have forklift trucks, so the fact that the aircraft can load and unload itself is very useful.”

Deliveries of the An-178 are due to start in around two years, which gives Maximus time to decide whether to firm up its MoU.

In the meantime, if anyone has a spare An-124, you know who to call.

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The Rafale contract signing in Doha was witnessed by Sheikh Tamim bin Hamad Al Thani, Emir of Qatar, and by France's President François Hollande and French minister of Defence Jean-Yves Le Drian and Foreign minister Laurent Fabius.



# ANOTHER SCALP FOR RAFALE

*Dassault Aviation has signed a contract to supply 24 Rafale fighters (six of them combat-capable two-seaters) to the Qatar Emiri Air Force.*

**Jon Lake** looks at the deal in detail.

**T**he Rafale deal, signed in May, includes the supply of Meteor, SCALP/Storm Shadow and Exocet weapons by MBDA and includes an option for 12-24 further aircraft, as well as training for 36 Qatari pilots, 100 Qatari ground crew and a number of intelligence officers.

The contract signing in Doha was witnessed by Sheikh Tamim bin Hamad Al Thani, Emir of Qatar, and by France's president François Hollande and French minister of Defence Jean-Yves Le Drian and Foreign minister Laurent Fabius.

Dassault CEO Eric Trappier, MBDA CEO Antoine Bouvier and Safran CEO Philippe Petitcolin were all also present – the high-level delegation reflecting the importance of the deal to France, which is enjoying closer links with the strategically important and wealthy emirate.

Qatar Airways is strongly growing in the French market and there have been suggestions

that the Rafale order was placed, in part, to try to influence the French Government to give extra 'slots' to Qatar Airways.

France's *Le Monde* newspaper claimed the French Government had been forced to grant Qatar Airways additional traffic rights to serve Nice and Lyon St Exupery airports in order to secure the €6.3 billion (\$7.1 billion) deal, although links between the Rafale deal and the granting of landing rights were officially denied.

Qatar currently has a single fighter squadron with just 12 Mirage 2000s, and the replacement Rafales will allow the formation of two squadrons – representing a doubling of the Qatari frontline fighter strength.

However, it has been reported that Qatar intends to procure up to 72 new fighters, in two batches, and probably encompassing two aircraft types.

The political advantages and influence that

would flow from selecting two aircraft types from two different suppliers would seem to outweigh the operational advantages conferred by a common fleet for Qatar, so that the aircraft not selected this time may not be out of the running just yet.

In April, Qatari Foreign minister, Dr Khaled Al-Atiyah, was reported to have said that he believed that no Gulf Cooperation Council (GCC) country would be able to obtain Lockheed F-35 joint strike fighters during the term of US President Barack Obama, and perhaps not for some time after that.

Accordingly, on the last day of that month, the Emir of Qatar and the French president agreed on the phone that they would sign a deal for the Rafale.

The Qatari order for Rafales comes hard on the heels of February's €5.2 billion (\$5.75

Continued  
on Page 50

## CONTINUED FROM PAGE 49

billion) Franco-Egyptian arms deal, which also included 24 Rafales – the first three of which will be delivered this year in time for Egyptian pilots to fly the aircraft over the opening of a new waterway on the Suez Canal.

This will be accomplished by diverting three F3 standard aircraft (B352, 353 and 354) that had been under construction for the Armée de l'Air, with their NATO standard communications equipment and Air-Sol Moyenne Portée (ASMP) nuclear missile capability removed.

Most Egyptian aircraft will be to the later F3R standard (due for delivery from 2018), with Meteor missile capability.

Dassault also has an order for 36 Rafales from India – having clinched the deal in early May with the offer of a 25% discount – albeit for only 36 French-built aircraft rather than the 126 aircraft originally anticipated (nor will there be the significant local industrial participation, including assembly of some aircraft that was initially hoped for by the Indian side).

Rafale discussions are being held with the UAE (which rejected the aircraft in November 2011), but these are not contract negotiations, according to Trappier.

Sheikh Mohammad Bin Zayed Al Nahyan, crown prince of Abu Dhabi and deputy supreme commander of the UAE Armed Forces, received a visit from Le Drian in Abu Dhabi in May 2015, and has been reported to be “showing optimism” about the possibility of acquiring the Rafale for the UAE Air Force and Air Defence (UAE AF&AD). In June, major-general Ibrahim Nasser Al-Alawi, the commander of the UAE AF&AD, made a short visit to Paris for further discussions on a Rafale deal.

**Offer capabilities**

Rafale continues to offer capabilities that are in service today and that the rival Eurofighter Typhoon has not yet introduced into frontline service, though particular weapons integrations are now funded on the Typhoon that will give the aircraft the same categories of air-to-ground stand-off precision-guided weapons.

The capability gap between the two aircraft types in these areas has already narrowed, and many judge the Typhoon to be superior in certain areas, but the Rafale does still offer an edge, with battle-proven reconnaissance, and short- and long-range stand-off missile capabilities.

Though the Typhoon has earned a ‘combat proven’ label with the RAF in Libya, and more recently with the RSAF in operations over both Syria and Yemen, the publicity-shy Saudis have been reticent in highlighting and broadcasting the success that they have achieved with the Typhoon/Damocles/Paveway II and Typhoon/Damocles/Paveway IV combinations. It is quite probable that many decision-makers in other GCC nations remain unaware of how far the Saudis have come with their Typhoon aircraft.

The Rafale is also significantly further ahead in the deployment of an operational active



The Rafale flew at this year's Paris International Airshow.

electronically scanned array (AESA) radar capability. Perhaps more significantly, there is a widely held perception that the French side is willing and able to offer access to full Armée de l'Air mission data, which is of crucial importance in determining the performance and operational effectiveness of a number of systems, including electronic warfare (EW), defensive aids and even radar.

There are also no issues with US international traffic in arms regulations (ITAR)-controlled technologies on the aircraft and France is widely seen as being a reliable weapons supplier that is unlikely to impose sanctions or disrupt the supply of spares in the future.

**Credibility advantage**

The French fighter also enjoys a credibility advantage with a generation of former fast jet aircrew, who flew the Mirage 2000, many of whom are now senior officers in particular potential customer air arms.

Furthermore, with annual Rafale production currently running at 11 aircraft per year, while the preferred minimum economic rate is 18 per year, and the maximum rate is twice that, Dassault is hungry for orders, and has proven itself able to offer compelling pricing and terms. The French Government has also proved adept in offering support to Dassault's export endeavours, not least through a highly developed and effective defence diplomacy and ‘soft power’ projection effort.

French defence diplomacy has been particularly effective in the UAE, where a permanent French Armée de l'Air Rafale detachment has been in-country for a number of years.

Dassault has now delivered 137 Rafales to the French armed forces, with 43 remaining to be delivered in the present fourth tranche. Exports will keep the production line open longer, and could also help to fund further improvements and enhancements.

The Rafale is still in the running in a number of other on-going fighter competitions. In Kuwait, events seem to have moved away from the French offering. Sheikh Sabah Al-Ahmad, the Emir of Kuwait, is believed to have a strong preference for procuring the country's major weapons from the United States, and in May 2015 it was reported that the Pentagon had reactivated contacts with Kuwait aimed at concluding a deal to supply the Boeing F/A-18E/F Super Hornet to the Kuwaiti Air Force (KAF).

More recently, a delegation from the Italian Defence Ministry and Alenia Aermacchi visited Kuwait for talks about the Eurofighter Typhoon, which reportedly proved most impressive of all the candidate aircraft during in-country evaluations.

Outside the Gulf, talks are continuing with Malaysia about the Rafale, and in June 2015, Hollande met his Algerian counterpart, Abdelaziz Bouteflika, in Algiers, with a potential deal for the Rafale aircraft high on the agenda.



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**TEXTRON AVIATION**

*Ukrainian manufacturer Antonov has formally announced the launch of its new Antonov An-132 military freighter. The aircraft, which is a derivative of the existing An-32 Cline, will be produced jointly by Ukraine and Saudi Arabia for both military and civilian use. Jon Lake looks at the programme.*

# ANTONOV ALLIANCE

**T**his Antonov announcement, at the Paris International Airshow, followed the signature of contracts on May 6 2015 for co-development and co-production by Antonov, the King Abdulaziz City for Science and Technology (KACST) and the Taqnia Aeronautics Company.

The Taqnia Aeronautics Company is a subsidiary of the Saudi development and investment company Taqnia, which is sponsored by the council of economic affairs and development, chaired by HRH prince Mohammed bin Salman bin Abdulaziz Al Saud, deputy crown prince and Defence minister and special adviser to the custodian of the Two Holy Mosques.

The contract followed some seven months of serious negotiations after initial talks between Antonov and the Saudi side had begun in 2013.

*Defense News* quoted a source as having reported an "initial payment of \$150 million", with an initial plan for the production of eight aircraft.

Under the terms of the agreement, which was signed by Antonov's chief designer, Dmitry Kiva, and Turki Bin Saud Bin Mohammed Al-Saud, chairman of Taqnia Aeronautics and president of the King Abdulaziz City for Science and Technology, there will be extensive technology transfer and Saudi participation.

Al Saud said that the Saudis will "own" the intellectual property and engineering designs for the aircraft.

The new joint venture will employ only Ukrainian and Saudi nationals and Saudi personnel will work on the project in-kingdom and in the Ukraine.

The An-132 programme is expected to play an important part in strengthening the kingdom's drive to develop a domestic military and aerospace industry, which is a key element in Saudi Arabia's on-going attempts to diversify its economy beyond oil production and to reduce reliance on imports.

Saudi Arabia already manufactures aerospace components and undertakes in-depth civil and military aircraft maintenance but has not, as yet, undertaken large-scale aircraft assembly.

The basic An-32 is extremely well suited to use in the Middle East, with excellent hot and high performance and austere airfield capability. This led to an Iraqi Air Force order for six An-32Bs, which were delivered by 2012. An improved variant would be even more useful in the region.

#### Improved derivatives

There have been a number of attempts to produce improved derivatives of the Antonov An-32, including a proposed AN-32B-300 variant that would have featured the same Rolls-Royce AE2100D engines and GE Aviation Dowty R391 eight-bladed propellers as the Alenia C-27J, together with Rockwell Collins avionics and other improvements. The An-32B-300 promised more than 20% improvement in fuel efficiency and range with a maximum payload of 7,500kg.

The new-generation An-132 offers even greater improvements and will be capable of carrying payloads of up to 9.2tonnes out to a maximum range that is double that of the original An-32, and with a maximum cruising speed of 550km/h (80km/h faster than the An-32). This is made possible by using modern full authority

digital engine control (FADEC)-equipped 5,071shp Pratt & Whitney Canada PW-150A engines – originally designed for the Bombardier Q400 – apparently driving highly efficient Hamilton Sundstrand six-bladed auto-feathering, synchrophasing composite propellers, like those used on the Airbus Military C295.

The Taqnia/KACST An-132 will also feature a two-man glass cockpit and a Honeywell navigation system, with other equipment from various US and UK suppliers, including General Electric and Liebherr.

Externally, the new aircraft bears a close similarity to the original An-32, with an almost identical empennage, wing and cabin, and with the same characteristic ventral fins flanking the rear-loading ramp.

Forward of the wing, the fuselage is completely redesigned, with a longer, lower, flatter nose, with bigger, deeper cockpit windows. This makes the new aircraft about 66cm longer than the original, at 24.44 metres.

The aircraft has cabin doors fore and aft on both sides of the fuselage, instead of one door on the starboard side of the forward fuselage only. With modern navigation equipment and a two-man crew on the flight deck, the aircraft no longer has a dedicated navigator's station and lacks the characteristic 'observation bubble' usually fitted on the port side of the fuselage of Antonov's twin-engined transports (An-24 Coke, An-26 Curl, An-30 Clank and An-32 Cline).

The new An-132 was originally aimed at meeting a possible Indian Air Force requirement for 56 light transport aircraft to replace its ageing Avros, as India's HS-748s are still known. The



The An-132 programme is expected to play an important part in strengthening the kingdom's drive to develop a domestic military and aerospace industry.

conflict between Russia and Ukraine has meant that the new Antonov is no longer in contention for this requirement, however.

Instead, initial production will be to meet a specific Saudi requirement, though Antonov says that it has identified a global market for 900 aircraft, primarily as a replacement for the original An-32 and the older An-26, both of which are high-wing, twin-turboprop tactical transports with rear loading ramps.

The 900 aircraft sales forecast would suggest that Antonov has abandoned any hope of the An-132 replacing the large number of An-26s and An-32s currently in service in Russia, apparently accepting that that market will now fall to the Russian-made Ilyushin Il-112.

The first of up to three prototype An-132s will be rolled out at the end of 2016 and will then be followed by series production aircraft from 2017 or 2018, with an initial annual build rate of 8-12 aircraft.

The An-132 is being marketed to potential customers in the Middle East, Africa, Asia, and South America, in both the military and civilian sectors. Though primarily intended as a military tactical transport and commercial cargo aircraft, the basic An-132 aircraft will be capable of carrying out a wide spectrum of roles, from air-

dropping and troop transport to casualty evacuation and intelligence, surveillance, and reconnaissance (ISR).

Dedicated sub variants are already being studied for fire-fighting and for maritime patrol. A sea patrol maritime patrol aircraft (MPA) variant with an under-nose electro-optical/infrared (EO/IR) turret and a belly-mounted radome was promoted at Paris, while the proposed water bomber featured external tanks like those fitted to the existing An-32P.

#### Wider diameter propellers

The original An-32 was distinguished by the unusual over-wing mounting of its engines, which allowed the installation of wider diameter propellers driven by 5,100hp AI-20 turboprops. These gave almost double the output of the An-26's engines, allowing the An-32 to carry almost 50% more payload (6,900kg or 14,750lb) with a 1,050km/650 mile range at full load.

The An-32 was also able to take off with much higher payloads in hot and/or high-altitude conditions, so it came as no surprise when the Indian Air Force became the launch customer.

The new An-132 reverts to a more conventional engine mounting but will inherit the best characteristics of its predecessor, including

excellent performance in hot climates and in mountainous terrain, and good basing flexibility, thanks to a real ability to operate autonomously from unpaved runways and unprepared airfields.

The aircraft has comprehensive built-in loading/unloading equipment and an auxiliary power unit. It should offer western standards of reliability and maintainability, and is designed for a 40,000-hour, 25,000-cycle, 40-year life.

For markets requiring a lighter weight aircraft than the An-132, Antonov offers the An-140T, which more closely replaces the legacy An-26 twin-engine turboprop in terms of payload performance.

Sitting above the An-132 in the range is the new twin turbofan Antonov An-178 (broadly comparable with the Embraer KC-390, which has gained some traction in the Middle East).

There is also a new An-188 (a slightly stretched, turbofan-powered, derivative of the four prop An-70 military transport), and a proposed update of the massive An-124 Condor. This, the An-214-121, would be fitted with new avionics and a modern glass cockpit, as well as improved or new engines.

There may be some scope for some Saudi industrial participation in some of these programmes, according to some sources.

**Alan Warnes** takes a look at an aircraft well known in the general or business aviation market and finds out just why it is becoming popular with air forces in the Middle East.

# Caravan club is growing in the ME

**S**pecial mission-equipped Cessna 208 Caravans are a relatively new aircraft in the Middle East, even if the platform has been around for more than 30 years.

The single-engine aircraft has the capability to cover a plethora of missions, in addition to the transport role it was designed for, and only now is beginning to match its potential.

Companies like Virginia-based Orbital ATK have shown the way – having been contracted by the US Government to supply specially adapted Caravans to Iraq and Lebanon – while Sierra Nevada Corporation, which specialises in operating and upgrading mission aircraft, has recently upgraded Cessna 208 Caravans in the UAE.

Having realised there is big market for its aircraft, Textron Aviation has also come up with some modifications for the Grand Caravan EX. At the recent Paris International Airshow, it displayed such an aircraft with new wiring hard point provisions. This was “so customers don’t have to tear the wings apart when upgrading it to the armed role”, according to Textron’s Dan Keady, senior vice president, special mission aircraft.

## Special roles

“We are also developing an electro-optical/infrared (EO/IR) lift into the pod underneath the aircraft and putting hardware in the wings to make it more adaptable to special mission roles,” he added.

Nearly 2,500 Caravans have been produced since the type was launched in 1984, powered by the Pratt & Whitney PT6 engine – one of the safest engines in the world. The speed and range capability of the Cessna 208 Caravan is unusually high for a cargo hauler. Also, its versatility in all weather conditions and terrains make it a durable workhorse. It can take to the sky from rough, unprepared, and short airstrips in remote areas, at high altitudes, and in hot climates, making it an attractive proposition to Middle East operators.

When the US started to modernise the Iraqi Air Force, one of its first jobs was to monitor the



## Emirate Grands made grander

**A batch of eight Cessna Grand Caravans was acquired, in standard configuration, for operation by the UAE Air Force and Air Defence (UAEAF&AD) Special Aviation Command, with deliveries taking place between mid 2005 and early 2006.**

**In November 2013, it was confirmed that several of the aircraft had undergone modifications and had been weaponised to meet AC-208B Combat Caravan configuration. This allows the deployment of AGM-114M/K Hellfire air-to-surface missiles and a sensor suite that includes a FLIR Systems Star Safire 380HD turret.**

**The work was contracted to GAL, which subcontracted it to Sierra Nevada Corporation and took two years to complete.**

many militias on the ground in Iraq. In stepped ATK (now Orbital ATK), which was contracted on December 1, 2006 to deliver three intelligence, surveillance, and reconnaissance (ISR)-equipped Cessna RC 208 Caravans.

Within a week, ATK Integrated Systems’ Airborne Development Center at Fort Worth, Texas had taken delivery of the three ‘green’ aircraft. An impressive four months later, on March 8, 2007, the first Federal Aviation Administration (FAA)-certified RC-208 had been fitted out and delivered to its new base at Kirkuk to begin the training of pilots, sensor operators, maintenance and operations personnel with the Iraqi Air force’s 3rd Squadron.

Six weeks later, on May 9, 2007 it was joined by the second, while the third arrived on June 1, 2007.

Inside the aircraft was the Orbital ATK mission management and fire control system integrated with the MX-15 Penta sensor, and its laser illuminator, laser designator/rangefinder and IR sensor. The defensive suite included an AAR-47 missile warning system and ALE-47





**An Iraqi Air Force AC 208B Caravan unleashes a Hellfire missile.**

**Left: An Iraqi Air Force pilot walks to his ISR-configured RC 208 – used as an ‘eye in the sky’.**

**Below: The Iraqi Air Force has fired more than 1,600 Hellfire missiles since last June, when IS invaded Iraq.**

PICTURES: ALAN WARNES

countermeasures dispenser (CMDS).

The AAR-47V2 provides passive warning against infrared and laser-guided missiles fired at the platform, and prompts the pilot to make appropriate manoeuvres in a bid to avoid the incoming threat. The ALE-47 CMDS provides an integrated computer-controlled system to dispense expendables/decoys, which should see the aircraft survive. Underneath the fuselage is a video datalink, which transmits streaming imagery to ground commanders and troops within 40-70nm range. The company also integrated a secure UHF/VHF communications suite to allow for air-to-ground tactical communications.

Five Caravans ordered for multi-engine training in late 2007 were also modified by ATK with defensive suite, communications sub-systems and antennae, ballistic protection and a de-icing system modification. All five were delivered to the 1st Flight Training Squadron at Kirkuk by December 2008.

In early 2008, ATK was contracted to arm three new

Continued  
on Page 56



CONTINUED FROM PAGE 55

Cessna 208 Grand Caravans for the Iraqi Air Force, known by the company as the Iraqi Armed Caravan (IAC) or AC-208. It would provide the new Iraqi Air Force with its first air-to-ground strike platform.

The IAC start up/integrating technology programme covered the transfer of technologies from the armed MQ-1 Predator to the Grand Caravan and began in January 2008.

There were many challenges to arming the Caravan. Developing and producing an FAA-certified and US Department of Defense airworthy wing attachment solution was one. Then came the integration of the AGM-114 weapon system and developing a robust but releasable fire control solution, as well as ensuring the armed solution did not significantly increase the payload!

The AC 208s have a Hellfire (missile) rail mount under each wing and an MX-15D integrated laser designator under the port side of the fuselage behind the cabin. "Being fitted off to the side of the landing gear, it doesn't obstruct the sensor's vision and is also clear of the exhaust. Linked to the Hellfire, the targeting data can then be transferred all the

way to impact via the MX-15Ds laser-targeting indicator," explained Bill Kasting of Orbital ATK's defense systems group.

In the rear, the missions systems operator/weapons systems officer (WSO) sits behind a Orbital ATK mission system workstation. With a handgrip, the officer can move the forward-looking infrared (FLIR) and study the imagery on an 18-inch LCD monitor, as well as control the laser illuminator, data link and operate a Harris remote radio.

#### Kill box

"Using a track/ball the WSO slews the FLIR to track the target," added Kasting. "The pilot also has a viewer in the front of the cockpit so he can see the target inside the kill box and what the operator is focusing on.

"This ensures he is aware of the location, so as to keep the aircraft in line with the WSO's target. The operator will fire the Hellfire missile once the target is verified and the pilot gives the go ahead."

The first test firing occurred in October 2008 and the first AC-208 was delivered to Kirkuk in December 2008. On October 27, 2009, five

months after pilots had completed their training on the type, the Iraqi Air Force fired its first weapon since the end of 'operation Iraqi freedom' in 2003.

A week later, an air force crew managed to strike a ground target during a live firing exercise.

During the early days of operations, technicians from the United States Air Force's 521st Air Expeditionary Advisory Squadron worked with the Iraqi Air Force.

Orbital ATK was awarded a maximum \$15 million firm-fixed-price flight management system (FMS) contract modification on May 5, 2014 to continue contractor logistic support services for the Iraqi Air Force's Cessna RC-208 Caravan ISR aircraft and the Cessna 208 Armed Caravan.

The work, initially carried out at Joint Base Balad, also included aircraft maintenance and student training on both aircraft types without a break in service. According to one industry insider, not connected to Orbital ATK, the Iraqi Air Force Caravans have fired more than 1,600 Hellfire missiles since the Islamic State (IS) troubles started in Iraq a year ago.



PICTURE: DANIEL GUERRA

#### Second customer

The Lebanese Air Force became the second customer for the special mission Cessna 208 and, according to Lebanese sources, it is being put to good use against IS, Al Nusra and Al Qaeda-affiliated militants.

The first was delivered on April 15, 2009, modified to carry AGM-114 Hellfire missiles on under-wing hard points and subsequently designated the AC 208B. The aircraft, was modified, together with integration and testing of the Hellfire weapon system, by Orbital ATK in Fort Worth, Texas.

A further example was ordered in August 2013, which according to Kasting, "is going through the modification programme now".

Orbital ATK was awarded a \$26 million contract to arm a third aircraft, which by June had just been purchased by the company in a 'green' configuration. It will be powered by a Pratt & Whitney PT6A-140 turboprop engine and fitted with a Garmin 1000 baseline glass cockpit and avionics package.

The aircraft will be modified with mission equipment that will include a Wescam MX-15D imaging system, hard points on each wing for carrying and launching AGM-114 Hellfire air-to-surface missiles, an AN/ALE-47 countermeasures dispenser system and a Terma aircraft survivability equipment suite missile warning system.

Also installed will be a video datalink system and updated secure communications package. Orbital ATK will also implement its latest revision of the proven, since November 2001, micro measurement and flight control system (MMFCS). Work on the contract is to be completed by May 30, 2016.

## Crash sets back Turkish A400M deliveries

An Airbus Military A400M crashed at Seville on its first flight on May 9 2015, after a software problem caused three of the four engines to become unresponsive, leaving them in 'flight idle' after take-off.

There were reports that the problems were not with the software itself but, instead, with the way in which it had been installed in the aircraft.

Two test pilots and two flight-test engineers were killed in the crash. Two other engineers were seriously injured. All were Spanish nationals employed by Airbus Military.

The aircraft involved was c/n 023, intended to be the third for the Turkish Air Force and scheduled for delivery during June 2015.

It will be replaced, but not immediately, and so the stand up of the Turkish A400M squadron (which will eventually operate 10 A400Ms) will take longer than had once been planned.

The first Turkish aircraft (c/n 09) made its maiden flight on August 27 2013 and it was formally handed over on April 4 2014, delayed from September by unspecified contractual difficulties.

The aircraft was delivered to the 12nci Hava Ulastirma Ana Us Komutanligi (the 12th Air

Transport Base Command) at Kayseri-Erkiilet on April 16, joining the 221 Filo 'Esen', which primarily operated the C160D Transall. The Turkish Air Force thereby became the second operator of the A400M, after the French Armée de l'Air.

A second A400M (c/n 013) was delivered to the unit in December 2014.

Airbus Military is expecting global sales of its A400M to reach 400 aircraft over the next 30 years – with 50-100 going to customer air forces in the Middle East and north Africa (MENA).

Airbus Military already enjoys a good presence in the MENA market, with 82 aircraft in service in (or on order for) nine countries in the region, comprising nine A330MRTTs (with two more selected but not yet formally ordered by Qatar), 40 C295s, 25 CN235s and eight C212s.

Airbus Military's definition of the MENA region includes Morocco, Algeria, Libya, Egypt, Jordan, Saudi Arabia, the UAE, Yemen and Oman, but does not include Turkey, where the air force, navy and coastguard are all operators of the CN235, many of the 61-strong fleet having been assembled locally by Turkish Aerospace Industries.

The C-17s capacity is demonstrated here by US forces.



# THE OLD MASTER

*Qatar is to buy four Boeing C-17A Globemaster III transport aircraft, thereby doubling the air force's existing Globemaster fleet. Jon Lake looks back over the aircraft's history.*

**F**inancial details and a delivery timetable were not disclosed when the contract with Boeing for four C-17A Globemaster III transport aircraft was announced in a press release timed to coincide with the Paris International Airshow.

Qatar had become the first Middle Eastern customer for the C-17 when it purchased two aircraft in 2009, and the Emirate then bought another two in 2012.

Boeing has built a total of 279 C-17s since 1991. In September 2013, when the company announced that it would terminate production with the 279th aircraft, it had built 257 C-17As, and had orders for 10 more.

Boeing decided to produce more aircraft than it then had orders for, expressing itself confident that it would quickly find customers for the last 12 unsold, 'white tail' transports.

There was a great deal of pent-up demand for the C-17A but orders did not come through quickly enough to allow Boeing to maintain an economically viable production rate.

Dennis Muilenburg, the president of Boeing Defense, Space & Security, explained: "While the desire for the C-17's capabilities is high, our customers around the world face very tough budget environments. Budgets cannot support additional purchases in the timing required to keep the production line open."

Some had hoped that the US Department of Defense would continue buying sufficient aircraft to keep the production line open, perhaps recapitalising the fleet by replacing the US Air Force's (USAF) oldest and earliest C-17As, which might then be sold on to air forces that could not afford brand new C-17s. US orders were not forthcoming however, although Congress added some 17 extra aircraft (that had not been requested by the USAF) to the planned 205 aircraft total

Continued  
on Page 58

## CONTINUED FROM PAGE 57

on June 12 2009, and the USAF placed its final order for a single attrition replacement C-17A on June 19 2012.

Boeing did become more successful in selling C-17s to export customers, with the UK announcing a seven-year lease of four aircraft in May 2000. The UK bought the aircraft at the end of the lease and then acquired four further aircraft in 2008, 2010 and 2012.

The Royal Australian Air Force signed a contract for four C-17As in 2006 and received a fifth and a sixth in 2011 and 2012, before finally ordering a further pair. The Canadian Forces Air Command (renamed as the Royal Canadian Air Force in August 2011) took delivery of four aircraft (known as the CC-177 Globemaster III in Canada) from 2007, and a fifth arrived in March 2015.

In 2009 the Indian Air Force and NATO (strategic airlift capability programme) ordered

requirement, only a single aircraft remained available.

In the event, the 11 'white tails' sold so far have been ordered by Kuwait (two aircraft, both delivered), Canada (a single aircraft, delivered), the UAE (two extra aircraft), Australia (two aircraft) and the four aircraft recently ordered by Qatar.

With 279 aircraft built, 223 for the USAF and 51 known export aircraft, and with one aircraft as yet unsold, there is an apparent disparity of four aircraft. These may have included the single YC-17 prototype, the two static test airframes and another of the earliest C-17As, or there may have been a further as yet unacknowledged export sale – possibly to Singapore and/or Saudi Arabia.

Alternatively, there may be five unsold C-17As remaining, rather than the single aircraft referred to in recent Boeing briefings.

However many are left, the company remains

Though this will be a valuable activity for the company, it will not employ so many people as the development and production phases of the programme, and the jobs involved will be more thinly spread over a larger number of locations.

With no replacement programme in sight, the end of C-17A production spelled the end for Boeing's 72-year-old, 1.1 million sqft, Long Beach aircraft assembly plant. This had built more than 15,000 aircraft since World War II, including a succession of Douglas and McDonnell Douglas airlifters and civil airliners, and represented a strategically important asset for the USA and a source of thousands of jobs for the State of California.

Boeing appointed San Diego's Heritage Global Partners to auction off the plant's equipment and the auctioneer has already started to accept sealed bids from interested parties.

When Qatar's order for four extra C-17s was announced, general

Ahmed Al-Malki, deputy commander of the Qatar Emiri Air Force and chairman of Qatar's airlift committee blandly said that: "We are very pleased with the C-17s from Boeing and look forward to doubling our fleet to enhance worldwide operations."

Qatar's first two C-17As were initially heavily committed to humanitarian missions, to the extent that the first aircraft was delivered in a pseudo Qatar Airways colour

Qatar's first C-17 takes to the skies.



the C-17, while Qatar received its first C-17 in 2009, the UAE in 2011, and Kuwait in 2014.

There had been hopes of selling significant numbers of C-17As to both existing operators and a number of new customers, and some expected that the unsold Globemasters would be pounced on immediately as customers fought for a slice of what was a very limited 'pie'.

But, even with a pool of just 12 remaining aircraft, the unsold C-17As were not immediately 'snapped up'.

This may have been, in part, a function of the relatively small number of aircraft available, with some potential customers probably requiring fleets that were larger. The Royal Saudi Air Force, for example, is believed to have had a requirement for the C-17, and was expected to acquire more than a dozen aircraft. It may or may not have been interested in a significantly smaller number of aircraft. Similarly, by the time New Zealand was nearing a time when it could have placed an order to meet its 2-4 aircraft

optimistic that it/they will be sold quickly. In June 2015, during the Paris air show, Boeing executives Christopher Raymond and Jeff Kohler said that every aircraft should have a buyer by the fourth quarter of 2015, following what they called "deep discussions with a number of countries".

Given a little extra time, Boeing could probably have sold the 12 'white tails' twice over, with India expressing a requirement for six additional C-17As, and with the UK, New Zealand and the NATO/ Partnership for Peace consortium all expressing interest in the type, as well as Saudi Arabia and Singapore.

The US Air Force has now taken delivery of final C-17 aircrew training simulator, bringing the number of simulators delivered by Boeing to 32 in total.

With production of aircraft and simulators at an end, and deliveries almost completed, Boeing will soon shift its focus to the upgrade and sustainment of the in-service C-17A fleet.

scheme. This reflected Qatar's intention to use the new aircraft as a highly visible means of exerting 'soft power', and of ensuring that the recipients of disaster relief knew where it had come from.

The growing Qatari C-17 fleet has progressively taken on a more active and more military role in supporting Qatar's sometimes controversial foreign policy, flying weapons and ammunition to various Islamic and Islamist rebel groups. The aircraft have been used to supply arms to Islamist opposition groups in Libya and, more recently, in Syria, and the new aircraft will enhance Qatar's ability to operate on the world stage, to the evident concern of some of its neighbours.

The *New York Times* reported that between April 26 and May 4 2012, a Qatari Air Force C-17 made six trips from Al Udeid Air Base to Esenboga Airport in Turkey, laden with arms destined for moderate rebels. The Qataris made 14 more cargo flights by August 8. There have been suggestions that much of the equipment ended up with al-Qaeda and IS.

# P Twenty-Ten



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*Iomax delivered the first of 24 new Archangel aircraft to the UAE Air Force and Air Defence in June 2015. Jon Lake looks at the programme and the aircraft.*

# GUARDIANS OF THE ANGEL

**D**elivery of the first Archangel aircraft to the UAE Air Force and Air Defence (UAE AF&AD) was achieved on time – a mere seven months after signature of the contract.

One aircraft will be delivered every month through to January 2016, after which the remaining 18 will arrive at a rate of two per month until the end of the contract.

The new Archangels will replace the entire block 1 and block 2 border patrol aircraft (BPA) fleet.

Six of the first 10 block 1 aircraft have already been donated to the Royal Jordanian Air Force and more are understood to have been given to Libya.

The first of the new aircraft delivered was actually the second production-standard Archangel. It was flown from the company's facility at Mooresville, North Carolina to the UAE soon after the first Archangel – used as the programme engineering, manufacturing and development (EMD) aircraft – was shipped to Le Bourget to be statically displayed at the Paris International Airshow.

## Changes to the aircraft

The Archangel was also known as the block 3 BPA, though changes to the aircraft have been so major that Iomax has reportedly had to drop the block 3 designation.

The UAE received an initial batch of 10 block 1 Air Tractor AT-802Us between November 2010 and May 2011 and a batch of 14 similar aircraft to block 2 standards, modified to carry heavier payloads and with other detail enhancements, followed from January 2012.

The 24 Air Tractor AT-802 aircraft were delivered to the UAE's Special Operations Command and were based at Falaj Hazza Camp near Al Ain, and, later, with the rest of the Presidential Guard Aviation fleet, also known as Group 18, at Sas Al Nakhl. The Presidential Guard aviation force subsequently became Joint Aviation Command, though the Air Tractors are believed to have been transferred to the UAE

AF&AD, and they are now thought to be based at the new airfield at Abu Dhabi Northeast.

It is understood that the type was used operationally in Libya, in Egypt and over the Yemen, proving itself to be an extremely useful and versatile intelligence, surveillance, and reconnaissance (ISR) and light attack platform in the process.

This led to the issue of a requirement by the UAE for a further improved block 3 aircraft. However, it became clear that the modifications required would be extensive – and that some would need to be incorporated on the production line, requiring minor design changes.

Iomax CEO Ron Howard explained that this prompted the company to move away from using the Air Tractor AT802 as the basis for the BPA and to shift to the Thrush Aircraft S-2R Turbo

armament, and Air Tractor building a prototype AT-802U. It was the latter aircraft that prompted Iomax to base its UAE BPA on the Air Tractor AT802 airframe.

“In discussions with our then current aircraft provider, Air Tractor, we concluded that it would not be possible to influence the basic design of the 802 aircraft,” Howard said. “Iomax, therefore, entered into discussions with Thrush Aircraft as a possible provider of aircraft and, in November 2012, we entered into a verbal agreement to jointly produce the block 3.”

In 2013, this verbal agreement was succeeded by a formal partnership and Iomax revealed a demonstrator (N7555A) at the 2013 Paris air show. This aircraft had a two-seat cockpit with an Esterline CMC Electronics Cockpit 4000 avionics suite, with three 5 x7in multifunction



660 Thrush.

Both types were derived from the original Leland Snow-designed Snow S-2. This was subsequently built as the Aero Commander Ag Commander and Rockwell Thrush Commander, the Ayres Thrush and Turbo Thrush, and finally by Thrush Aircraft in a variety of forms. Meanwhile, Leland Snow founded the Air Tractor company to build a similar aircraft.

Both lines of development resulted in armed and militarised variants; Ayres producing the two-seat Vigilante with mission equipment and

displays in the front cockpit and one in the rear cockpit, a new head-up display (HUD) for the pilot, six under-wing weapons hardpoints and an L-3 Wescam MX-15Di imaging and targeting turret under the belly.

Iomax claimed that the Archangel would cost about one-third as much as aircraft like the Embraer A-29 Super Tucano and the Beechcraft AT-6, while offering three or four times the payload (5,000lb) and endurance (nine hours).

Joel Hampton, a former US Air Force A-10 pilot and now an instructor pilot with Iomax,

The new Archangels will replace the entire block 1 and block 2 border patrol aircraft (BPA) fleet.



described the Archangel as having taken the best things from its agricultural heritage, making it tough and able to operate from semi-prepared and rocky strips. He called it “the Kalashnikov of aircraft” adding: “You can chuck it in the mud and beat it up and it will still function just fine.”

The aircraft displayed at Paris 2013 was not fully representative of the planned production configuration and an EMD Archangel Block 3 BPA prototype (N925KH) was, therefore, built to showcase and test the planned production configuration.

The fuselage was redesigned with a purpose-built fuel tank and the tandem twin-cockpit was stretched and moved forward 43 inches to increase the space available for the rear crew-member, while also improving the view forward and down for the pilot. The rear cockpit was elevated to improve visibility for the back-seater.

The old agricultural ‘hopper’ was removed and replaced by the new conventional self-sealing fuel tanks, which offer level two protection against ballistic threats. The revised design also freed up space in the rear fuselage for avionics equipment.

The new aircraft (dubbed as the engineering development platform by Iomax) had a ‘cleaned-up’, lower-drag fuselage with a sleeker nose profile and a blended rear cockpit, as well as remodelled wing roots and wingtips.

The engine exhausts were angled rearwards providing about 200lb of additional thrust and the five-bladed Hartzell propeller was replaced by an MT-Propeller MTV-27, with composite scimitar-style blades.

#### Twin launch rails

The under-wing pylons are now more widely spaced, allowing the use of twin launch rails and dual stores on each hardpoint.

The tailfin and rudder was also redesigned, with greater height and area, giving better directional stability – especially when firing weapons.

Inside the cockpit, new throttle quadrants are provided in both front and rear cockpits and the aircraft has a new digital autopilot. It is fitted with night vision goggle (NVG)-compatible and NVG-covert external lighting.

The aircraft made its maiden flight in July 2014 and was later displayed statically at the

2015 Le Bourget show with a wide range of weapons displayed under its pylons.

A number of weapons have been cleared on the Archangel, which has already dropped or fired 150 bombs and laser-guided rockets. These include the podded GAU-19B 0.50 calibre (12.7mm) gun, GBU-12/58 precision-guided bombs, AGM-114 Hellfire missiles, and Roketsan Cirit guided rockets.

Iomax hopes to integrate the Roketsan UMTAS anti-tank guided missile and Roketsan’s new Teber 250lb and 500lb laser-guided bombs (newly unveiled during the Paris show) this year. Further into the future, Iomax hopes to integrate the Thales FreeFall lightweight multi-role missile (FLLMM).

Iomax expects there to be about 70 Archangels and BPAs flying with Middle Eastern air arms in the next two years and forecasts another sales announcement, “Maybe before the end of the year.”

The US Government is reportedly close to fulfilling a Congressional 1206 request (security assistance) to provide the aircraft to the Philippines, and Iomax has admitted receiving expressions of interest from Angola, the Ivory Coast, Niger, and Turkey.

*Deliveries of the first Boeing F-15SA Eagles to the Royal Saudi Air Force (RSAF) are now imminent following the solution of an unspecified problem with the aircraft's all-new digital fly-by-wire (FBW) flight control system. Jon Lake reports.*

# All eyes on the eagle

The F-15SA flight-test programme was originally planned to last for 18 months, ending in July 2014, using three instrumented aircraft as 'prototypes'.

The delivery of the first few full-series production aircraft to a US base was expected to begin in September 2014. These aircraft were to have been used for training an initial cadre of US Air Force and RSAF instructors in the USA.

Aircraft deliveries to King Khalid Air Base (KKAB) in Khamis Mushayt were then expected to follow in January 2015.

None of these deliveries have taken place and, at the time of writing, the flight-test programme was still under way, although about six 'full standard' production F-15SAs are believed to have been completed, painted and test flown, before being stored, in addition to the three instrumented aircraft currently being used to support the flight-test programme.

The first three instrumented production F-15SAs are being used as 'prototypes' in the flight-test and development programme. The first of these made its maiden flight at St Louis on February 20 2013, beginning the planned 18-month flight-test effort.

This was an unusually lengthy test programme for a variant of an existing aircraft type, though it was explained that this was necessary because the F-15SA's new FBW system had to be cleared and recertified across the entire F-15 flight envelope.

The three 'prototype' aircraft were each allocated individual responsibilities within the programme. SA-1 (12-1001) was to be used for weapons testing, SA-2 (12-1002) for flutter and aerodynamics, and SA-3 (12-1003) for electronic attack and awareness testing.

The first two F-15SAs were subsequently given conspicuous DayGlo orange markings on their

intakes, wingtips, tailerons and tailfins, using a very similar design to that of the very first F-15As in the early 1970s.

The third aircraft retained its standard Saudi air force camouflage, though all three carried USAF serials and US 'star and bar' national markings, the latter applied in black 'outline' form.

The stored production aircraft are now awaiting the conclusion of flight-testing, when they will receive the definitive FCS Software Solutions load. This will allow deliveries (and aircrew training) to begin.

In April 2015, photos emerged on social media of unidentified guests being shown around the first full production aircraft (12-1020) at St Louis, though this aircraft is understood to have been completed and flown some time before that. In January 2015 images had emerged showing later Saudi F-15SAs (including 12-1023 and 12-1025) being test-flown from St Louis, fully painted, and wearing toned-down US national markings in light grey.

## Resolutely refused

Beyond brief announcements of the roll-out and first flight, Boeing has never commented on the F-15SA programme and has resolutely refused to help journalists requesting further information. But it is understood that flight-testing was put on hold due to engineering issues with the digital FBW system in the first week of April 2013, resuming in October.

A 'stand-down' from flight testing had always been planned to allow further control law development, system ground tests, and simulations, but it apparently occurred earlier, and went on for rather longer than expected, and envelope expansion with the new FCS was also slower than anticipated.

Many of the features of the new Saudi F-15SAs have already been seen on the Republic of Korea Air Force's F-15K Slam Eagle, or on the Republic of Singapore Air Force's F-15SGs, including the AN/APG-63(V)3 AESA radar (the most advanced radar available for export F-15s), the BAE Systems digital electronic warfare suite (DEWS), and the AN/AAQ-33 Sniper targeting pods and LANTIRN Tiger Eyes navigation pods, with the integrated Lockheed Martin AN/AAS-42 infrared search and track system in the Sniper pylon.

The F-15SA is also believed to incorporate a new 'wide field of view' head-up display (HUD) for the pilot, and may feature a new 'wide area display' in both front and rear cockpits.

Several of these systems have, therefore, already been integrated and fully tested on the F-15. But the new FBW control system, wide area display and wide field of view HUD, have not.

Compared to all other production F-15 variants, the F-15SA has two extra outboard under-wing weapons stations to allow increased weapons carriage. These new pylons (known as stations 1 and 9) are technically not new at all, however.

Every F-15 built has had provision for pylons in the same positions. These outboard hardpoints were originally designed to accommodate tactical electronic warfare suite (TEWS) pods on the original F-15A, before this equipment was abandoned. This was just as well, as wind tunnel testing had shown that the use of these stations would have destabilised the aircraft longitudinally to the extent that the original control system would not have coped.

In order to allow the use of these outboard under-wing stations, Boeing designed a new digital FBW flight control system for the F-15SA.



The F-15SA now set for a new dawn with the Royal Saudi Air Force.



It was also hoped that this would provide improved handling qualities and a significant reduction in maintenance compared to the original electro-mechanical control system. The new system was developed using experience from the F/A-18 and F-15 S/MTD control systems, and from Boeing's unsuccessful X-32 JSF contender.

It had always been planned to transfer flight-test activities to Air Force Plant 42 at Palmdale (part of the Palmdale/Edwards complex in California), reflecting the F-15SA's status as a US Air Force foreign military sales (FMS) programme, where Boeing was a sub-contractor and the US Air Force Life Cycle Management Center at Wright-Patterson Air Force Base was the US Air Force's decision authority. The move was undertaken on November 1 2015.

The move to Palmdale also reflected the need to conduct higher risk activities in the less restricted airspace of the vast Edwards and Nevada ranges. These included flutter testing, stores separations, and flight at high angles of attack and with different stores configurations.

There were clues that progress was being made in early 2015, when the second F-15SA prototype was photographed carrying twin AMRAAM launchers on stations 1 and 9, while small, low-

resolution photos on social media indicate that Boeing has been 'fit-checking' a variety of weapons load outs on F-15SAs and on a number of Boeing test assets, including an F-15E that seems to be in use as a test-bed for 'advanced F-15' derivatives.

The Saudi F-15SAs may use some of these weapons and load configurations.

One loading seen included an AGM-88E advanced anti-radiation guided missile (AARGM) outboard, a KEPD-350 Taurus cruise missile inboard, and a JDAM on the conformal fuel tanks (CFTs) 'shoulder', with small diameter bombs on the pylons under-slung below the CFTs.

**Air-to-air fit**

An alternative air-to-air fit included no fewer than eight AIM-120 AMRAAM BVR missiles and eight close-range AIM-9X Sidewinders.

There remains the possibility that the Saudi F-15SA could be supplied with the conformal weapons bays (CWBs) that can be fitted in place of the standard CFT, and which still appear to be under development. The CWBs were originally developed for the F-15SE Silent Eagle, which also featured a number of F-15SA features.

The F-15SA has been used for testing of the

new, digital JHMCS II version of the joint helmet-mounted cueing system (JHMCS), which began flight trials in SA-2 during June 2015.

The new version of the helmet features a newly developed high-definition, colour, smart-visor system that operates in both day and night modes, and which is more reliable and more affordable than the original JHMCS, as well as being less fatiguing for pilots to wear.

Vision Systems International, a joint venture partnership between Elbit Systems of America and Kaiser Electronics, produces JHMCS. It is not known whether an F-15SA was used for the helmet trial simply for convenience, or whether the new version of the helmet is being supplied to the Royal Saudi Air Force.

Spotters have yet to photograph the F-15SA prototypes flying with heavy air-to-ground load-outs, or in asymmetric configurations. This might suggest that a significant amount of testing remains to be completed.

A Boeing spokesman, however, gave a rather different picture. "The F-15SA flight-test programme is now proceeding at break-neck speed and deliveries are awaiting the imminent conclusion of the programme," he said.



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# SIX OF THE BEST...

**Barbara Saunders** talks to AJA's Mark Pierotti about how six years' experience in Abu Dhabi has prepared the business for its next growth stage.



**S**ix years after beginning operations from Abu Dhabi's Al Bateen Executive Airport as a jet owner and commercial charter operator, Al Jaber Aviation (AJA) is planning to expand its portfolio to include an approved maintenance organisation (AMO) operation and build its pioneering, niche Sky Limo service.

Chief operating officer Dr Mark Pierotti, whose pragmatism has been honed over 23 years in Gulf aviation, says AJA is now an established aircraft management company, which was all part of the plan from day one.

"From the beginning, we knew we had to have multiple revenue streams. You have to get your air operator's certificate (AOC), you need to get your capabilities right, your reputation established and then diversify," he said. "You can't make money on charter alone."

A swish brand, promising customers 'your private airspace' headlines a company which now also offers ground-handling, crewing of other people's aircraft, cleaning services and aircraft management. "We are now a full aviation service company," said Pierotti.

AJA's fleet includes a 19-seater Airbus Elite 318+, two 19-seater Embraer Lineage 1000s and a nine-seat Hawker 800 XP, with more aircraft to join soon.

"We have a brand new Legacy 650, capable of flying from Abu Dhabi to London, coming under management this winter and are negotiating for five other managed aircraft, which would bring more Airbus Corporate Jets into the fleet," said Pierotti.

Two Legacy 600s, which were 2009 models, have left the fleet. AJA sold them on behalf of the owner and managed them for a year before the owner decided to put them under management in Africa.

Continued  
on Page 66



Mark Pierotti: "Joint Ventures are the way to go. They get you way ahead of the game and you climb the learning curve quicker and remove a lot of the pain."

Al Bateen could be the base for a new registry to end grey market woes.



CONTINUED FROM PAGE 65

High on AJA's current agenda is its hunt for an established international partner for a planned maintenance, repair and overhaul (MRO) facility at Al Bateen to establish a 'jet centre of excellence' in the UAE capital.

AJA currently leases MRO facilities but sees huge potential for a full-service operation. "We have the land, we have a 10-year business plan, which includes building a 5,000sqm facility, and we already have the design," explained Pierotti.

"We are now looking for a partner for the jet centre MRO business who would start with servicing our charter and managed fleet. We have some interest and are looking to identify the partner and get a joint venture in place by the end of the year. It will be for VIP and executive jets and also airliners of the same type. Ideally the partner will be someone with an established operation who is looking for a foothold in the Gulf Cooperation Council (GCC) region."

According to Pierotti, there are 300 executive jets in the GCC, which are being sent overseas for maintenance. "So why wouldn't someone want to be based here and penetrate that market?"

A joint venture is the preferred approach because of its fast-track, start-up abilities and because AJA is now basking in the rewards of its Avis Gulf consultancy operation, established five years ago.

The aviation advisory and safety consultancy is a joint venture between AJA, which holds 51%, and Avis UK, which retains the other 49%.

Again based at Al Bateen, Avis Gulf is the Middle East's only approved aviation consultancy, offering airworthiness, technical, operations and commercial advisory services. Its sheer uniqueness is paying off.

"It's going very well, we're working on aircraft surveys, inspections and evaluations," said Pierotti. "Training is a big part of the business and also operations and maintenance start-ups, where we do the business planning, help arrange finance and produce all the required manuals for operations. We have also moved into aircraft acquisitions and disposals as well."

Pierotti added: "We're working on a start-up airline, which will operate in the South Indian Ocean, and a start-up MRO for the northern MENA region. We're handling aircraft sales in Saudi Arabia, facilities audits in the Gulf and regular training from our base in Al Bateen.

## "We are now looking for a partner for the jet centre MRO business who would start with servicing our charter and managed fleet."

MARK PIEROTTI

"Joint Ventures are the way to go. They get you way ahead of the game and you climb the learning curve quicker and remove a lot of the pain, providing, of course, you choose the right partner in the first place."

Earlier this year, AJA broke new ground with its Sky Limo service, which centres on its Hawker jet. "It's aimed at executives who want to go up and down the Gulf in a day. It's a cheaper alternative than a big jet and more convenient than the airlines," explained Pierotti.

Although an established concept in the US and Europe, Pierotti said the service is going to take time to build in the Gulf, but he is confident of its long-term potential. "It's more difficult in the GCC region because there are not as many runways as in Europe or the US, so it will take its time. But it's definitely an area of growth.

"The concept is becoming better known and it is taking off slowly. We are in a break-even phase; we have to stick with it and I think you will see it become fruitful next year. We are looking for other small jets to operate under our AOC and under the 'Sky Limo' brand. It could develop into something else later on."

The small jet sector, according to Pierotti, currently accounts for 23% of the UAE's charter market and he believes it has great growth prospects. Compare first class scheduled travel with Sky Limo and Pierotti says the small private offering wins hands down every time for convenience and speed.

"Take, for instance, first class Dubai-Paris-Dubai, which can cost up to \$10,000 per person. You can have our Legacy for \$90,000 and it will take 13 passengers who use a VIP terminal and can go where they want – Nice, Stansted, Bangalore, Macau or wherever – and are not restricted to the destinations and timings of the scheduled carriers. And executives can have

meetings and get work done on the jet – it's much more productive."

The diversification moves help counter a growing, yet increasingly competitive charter market, which, according to Pierotti, is beset in the UAE with black and grey market operators.

He's keen to push the idea of a UAE private jet registry, which he believes will have significant dividends and will generate a new aviation market in the UAE that is currently being served by territories abroad. "I would love to see a private jet registry here and I think the UAE is the perfect territory," he said.

"With Al Bateen Executive Airport as a dedicated private and executive jet airport, why not complement it with a private jet registry? Why don't we have a private registry? It would be a revenue generator for the government, it would support operators like AJA and it would lead to better management and administration of the sector.

"At the moment foreign-registered jets are here in the UAE and some of them are being offered for charter when they are registered as private. This is black market, there's nothing grey about it.

"A registry would be good for the aviation industry here and create jobs and opportunities for aviation professionals and companies established here already. It would generate a whole new aviation industry sector in an area in which the UAE is already strong."

Pierotti also took a swipe at those people operating illegally. "There are foreign aircraft that are trading in the UAE and they have no trade licence or AOC – this is the grey market. We don't know why Abu Dhabi has been successful in rooting out the grey and black market but Dubai hasn't."

Despite the competition – fair, black or grey – AJA's charter business grew 12% last year. "Prices also have increased a bit. Growth is coming about because of the on-going development of Abu Dhabi and Dubai and the influx of high-net-worth people living here. Falling fuel costs have also helped make us more competitive," said Pierotti.

AJA's immediate ambitions centre on Abu Dhabi and it will be an anchor client for the state-of-the-art FBO, which Abu Dhabi Airports hopes to open at the end of this year, turning Al Bateen into the Middle East's only dedicated executive airport and joining the likes of New York, London and Paris.

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# BELL BUILDS ON ITS MIDDLE EAST BASE

Two Bell 429 helicopters configured for emergency medical services (EMS) and a Bell 525 Relentless in VIP trim are just three of the latest headline sales for Bell Helicopter in the Middle East. **Dave Calderwood** looks at the success story.



The Middle East accounts for a substantial chunk of Bell's business, according to Steve Suttles, vice-president and director Middle East and African sales.

"We have more than 720 aircraft in the region," said Suttles during June's Paris International Airshow. "The premier market for us is oil and gas but we also have search and rescue (SAR).

"We're expanding into some utility products and also paramilitary support.

"The 407 and 412 [helicopters] are stable products that we can always count on to sell but the best aircraft we have now is the 429 wheeled landing aircraft, which is doing exceptionally well worldwide.

"Across all types of market, it can become anything. It has an amazing interior for corporate, for EMS – we have just delivered two of the first EMS aircraft into Kuwait and they're already working.

"We have more than 340 letters of intent (LOIs) for our 505 and over 40 LOIs for the 525. Almost 26% of

those are from the Middle East and Africa. They really understand and appreciate what the 525 is going to bring to the region."

But it's not just helicopter sales that Bell is expanding in the Middle East. It has recently launched a new base in Abu Dhabi and is looking to open both a customer service facility (CSF) and start pilot training in the region.

"We have a beautiful office in Abu Dhabi, opened last year," said Suttles. "It is the centre point for all of our activities and we bring customers there from all over the region.

"Abu Dhabi is the best opportunity for a CSF to service the rest of the Middle East. We're looking to work with a company within the UAE to operate as a certified Bell partner on training so customers won't have to send their personnel to the United States. They'll have someone there in the community where

they can get trained, from ab-initio all the way through transition training. In South Africa we also have a CSF, where we're also working to become a training academy.

"Our goal is to help the community that we're in to train their people, to help them grow and become technologically capable so they can manage their own products and services. I think that's what they want from us."



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## AERION FAST MAKING ITS MACH

*Aerion is quickly forging ahead with plans to create the world's first certified supersonic business jet.*

**Liz Moscrop**  
*tries to keep up.*

**S**upersonic is always sexy, no matter what else is on the floor at an aviation show. This year's European Business Aviation Convention & Exhibition (EBACE) saw a buzz of excitement around the Aerion booth, as the supersonic jet maker opened its order book on the new Mach 1.5 AS2 Supersonic Business Jet at a price of \$120 million in 2015 dollars.

The first 50 customers will receive preferential pricing and other benefits available only for the first tranche of orders.

Chairman Robert M Bass explained: "We are offering a select group of forward-thinking business aviation users the opportunity to fly faster and to make history with us as we reintroduce commercial supersonic flight."

The firm is ramping up its sales efforts, too, with the appointment of a dream team, including Ernie Edwards, formerly president of Embraer Executive Jets. He said: "We will be having some very interesting discussions with travellers who place a high value on their time. They can save three hours between Paris and Washington, DC, and six-and-a-half-hours between San Francisco and Singapore. That speed advantage will be quite meaningful to them."

Last year Aerion paired with Airbus to work on a joint definition phase to refine the AS2. The companies are exchanging knowledge and capabilities in design, manufacturing and certification. For Aerion, this means collaboration to advance the development and commercialisation of its trijet.

The joint effort will help Aerion to design, specify and source engines, structures, avionics and equipment. First flight is slated for 2019.

### Smooth technology...

**Supersonic natural laminar flow (SNLF) is the enabling technology behind the AS2. It conserves fuel and reduces emissions versus other potential or proposed supersonic designs.**

**The unswept wing has SNLF on most of its surface. Under laminar flow conditions, air flows smoothly across the wing surfaces without creating turbulent layers. Achieving the precise wing contours necessary to achieve supersonic laminar flow required new materials, such as carbon fibre, as well as new analytical tools.**

**Aerion reckons the SNLF wing reduces total airframe drag by as much as 20% versus a delta wing configuration, like that used by Concorde. Less power and fuel are, therefore, required to sustain supersonic flight.**

**It also has excellent low drag characteristics at subsonic speeds.**

Airbus, through its defence and space division, will provide technical and certification support, which will include the assignment of senior engineering staff to Aerion's expanding development team. "This is a major step forward," said Bass. "It puts us solidly on track toward our objective of certifying the world's first supersonic business jet in 2021."

Over the longer term, Aerion will provide technology and assistance to Airbus in its high-performance aircraft development. These technologies include research, tools and aerodynamic designs. Bass added: "The agreement kicks the programme into high gear. Aerion moves quickly toward building a supersonic jet, and Airbus Group gains exclusive access to more than a decade of successful research and high-performance aircraft technology."

The collaborators are working out of Aerion's new HQ in Reno, Nevada. One of the first big projects is a low-speed wind tunnel test, to be held at the University of Washington wind tunnel complex in September.

So what's the AS2 like? At 160 feet long it has a maximum take-off weight of 115,000lbs and can fly for 4,750nm (with the intention to achieve 5,000nm).

Inside it has a 30ft cabin in a two-lounge layout plus galley and both forward and aft lavatories, plus a baggage compartment that is accessible in flight. The cabin is 6ft 2ins high and 7ft 3ins wide.

Aerion is in discussion with all leading engine suppliers to choose a powerplant that can be adapted to supersonic requirements. The selected engine will be in the 15,000lb thrust range.

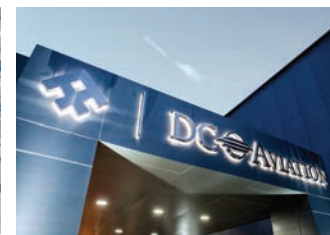
Supersonic flight will come about primarily through advanced wing technology, which Aerion is developing in conjunction with NASA and other leading aeronautical institutions. This research includes breakthrough work in the area of supersonic natural laminar flow, the key enabling technology behind the Aerion's vision for supersonic and high-subsonic flight.

The firm projects sales of around 600 over 20 years and its last market research prompted it to reconfigure its earlier design to today's variant. "The bottom line," said an Aerion spokesman, "is that the desire for supersonic transportation is steady and strong. The buyers are there. Their biggest question is: 'When can we have one?'"



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**Patrick Gordon:** "Our typical pilot is a guy who's done work for an airline and, at 4,000 hours he thinks, 'I'm bored stupid. I'm doing the same thing day after day. It's like driving a bus'. That's the kind of guy we like as he's got thousands of hours of really good experience."

**P**resented with a plethora of tales to tell, where does one start with Royal Jet?

Most recently the operator took home the prize for the Middle East's leading private jet charter at the 2015 World Travel Awards. This follows hot on the heels of new aircraft orders, a new MRO provider for its engines, and forays into new markets, including medevac and international fixed-based operations (FBOs).

That's right – the firm is, as acting CEO Patrick Gordon put it: "Putting our toe into the FBO industry."

It already has an FBO at its home base in Abu Dhabi and, late last year, opened another in conjunction with Air Seychelles in the Seychelles. Gordon continued: "It took about a year to do – it's the first time we've done that but the process was smooth between our companies. We will use that as a template for future FBOs – we have our eyes on three others and are confident we can open one more this year."

The Seychelles is a popular destination for Royal Jet customers, so it seemed like a natural fit for the two companies to pair up. Although there are concierge and fuel services on site, there is no maintenance offering, and possibly never will be. He added: "A surprising number of executive jets go down there."

*Royal Jet is looking to kit out its new aircraft, while branching into new products and services.*

*Liz Moscrop pays court.*

# Royal flushed with success

Closer to home, Switzerland's SR Technics is to take the reins as Royal Jet's engine overhauler, with a five-year contract to maintain, repair and overhaul its CFM56-7B engine fleet, in service on six Boeing Business Jet (B737-700 IGW) aircraft.

It's a good win for the Zurich MRO provider. In 2013, Royal Jet announced a \$700 million investment to boost its fleet to 20 aircraft by 2020, adding to its current 11-strong fleet of six BBJs, two Gulfstream G300s, two Bombardier

Learjet 60s and one Bombardier Global 5000.

Royal Jet has consistently remained quiet as to which airliner types it will select, although Gordon said he would not rule out the possibility of adding Boeing's 787 Dreamliner to the fleet. "We are going to use aircraft we can operate on a profitable basis. It all boils down to the bottom line. It's a good aircraft with good engines, so we're glad to take a look."

In addition to the new orders,

Continued  
on Page 72



“The type of flying we do demands a completely different mind-set than being an airline pilot.”  
Patrick Gordon

**CONTINUED FROM PAGE 71**

there are two 34-seat BBJs set to enter service next year, both with interiors from New York designer Edese Doret. They were in completion centres as *Arabian Aerospace* was going to press.

Doret will also design the interiors for the new fleet but, as yet, Royal Jet has not selected who will kit them out. Gordon added: “We have tenders out with 10 different completions centres.”

Although he confirmed that Royal Jet is not going local (Middle East) with the choice of outfitter, he explained that time is the critical issue. “The problem is with getting slots. Some shops do really good work and are really busy because they do really good work. We have to match slots with downtime. Once we take delivery of the aircraft our costs start. We want the quickest centre that can do the best job. We have a significant need for our aeroplanes to generate revenue.”

Although his firm is taking on more aircraft, Gordon said the carrier may not sell the older jets. “It is a waste to get rid of assets that could be generating revenue. The older ones may not have the most illustrious interiors in world, but a 10-year-old aircraft is not like Mercedes that’s 10 years old. Some people say they wouldn’t get on a 10-year-old aeroplane, but they would get on an airliner with 40,000 hours on it with a worn and torn interior, which is not as nice as an executive jet inside.”

Royal Jet’s bespoke service motto permeates the organisation’s philosophy, including crew training. Gordon explained that volume of flights is one of the key differences between flying privately or for a commercial carrier. “Airlines can take a brand new instrument and multi-engine rated pilot and say ‘you are a co-pilot now’ and put him on piece of equipment

between London and Abu Dhabi. These low-time pilots are considered safe and it is an efficient way to train pilots. They go to two cities for a month.”

Compare this with Royal Jet’s itinerary last year, which involved flying to 250 airports in more than 150 countries. The company can get a phone call at 5pm, and the pilots have to be ready to fly to a destination they may never even know existed. Although the operator has a highly skilled operations department that coordinates flights, as well as the usual support systems, such as computerised flight plans, landing assistance etc, the pilots are not able to fly the route in advance, which airline pilots naturally do as part of their training. Consequently Royal Jet only hires pilots with a minimum level of 4,000 hours.

“Our typical pilot is a guy who’s done work for an airline and, at 4,000 hours he thinks, ‘I’m bored stupid. I’m doing the same thing day after day. It’s like driving a bus’. That’s the kind of guy we like as he’s got thousands of hours of really good experience.”

**Think on their feet**

So long as the person has the ability to think for him or herself, then Royal Jet would consider hiring. Gordon added: “They land somewhere in the middle of a major city in China, or a small strip, and they know what to do, even when there’s nobody there to meet them. They have to think on their feet and quickly made decisions and make the trip a success.”

Flight attendants are equally carefully chosen. “Pilots operating these flights need to know there’s someone on board who can always fix a snag. The type of flying we do demands a completely different mind-set than being an airline pilot.”

The switch to SR Technics came about after a recent engine repair tender process and is part of a

corporate inventory-taking. Gordon continued. “We looked for who could do this for us in the most reliable cost-effective manner. It’s interesting, you can slip into a pattern of spending and you’re really not getting true value for what you’re spending. We have roughly two engines a year to service on six BBJs. SR Technics came up with the best price and have a good engine shop so we are very comfortable with them.”

Royal Jet is a canny housekeeper. Fuel savings are 40% of operating costs, so the firm has preferential deals with fuel and trip support providers – although fixing fuel prices does not come into the equation. Gordon added: “We’ve never hedged. We burn a lot but it’s not worth the gamble. Our overall consumption does not make sense for us to hedge. We’re not that smart. It’s better just to ride the wave and adjust our prices.”

Although there has been a recent decrease in fuel prices, Gordon cautioned that this has not reflected the current low price of oil. “It is a temporary dip, we can’t count on it staying this low. Customers understand if they book a flight for between city pairs one week that the price may be different the next. Our sales department explains the whole process to them.”

He is also a firm believer in the value of empty legs, citing another key local aviation luminary. “James Hogan of Etihad used to say ‘you’ve got to keep aircraft working on the backside of the hog’. Airlines go to more destinations, so it’s not quite that easy with ad hoc charter – you sell as efficiently as you can, for example, if you have an empty leg going from London to Abu Dhabi or Riyadh, they’re close enough to take the extra cycle, so it’s worth it.”

It does seem to be paying. Royal Jet launched operations a decade ago and is still going strong. He pointed out: “We have been profitable every year for the last eight years.”



Dignitaries from the UAE government, police, military and the oil and gas industry were at Al Bateen to witness the debut of the region's first AW189 with Falcon Aviation.

## FALCON SHOWS NEW BACKBONE

**Barbara Saunders** sees the debut of a new helicopter for the Middle East oil and gas market.

**F**alcon Aviation, the Abu Dhabi-based aerospace company with origins in oil and gas sector transportation, has taken delivery of two, twin-engine, 19-seater, medium-lift Agusta Westland 189 helicopters, which will be the backbone of its 21st century fleet upgrade.

Falcon is the fourth worldwide customer for the AW189.

The new acquisitions will be the first 189s in operation in the United Arab Emirates and will be used in the oil and gas sector.

"The 189's floatation system is strong, so that the aircraft can remain upright in the case of a mishap at sea. If, by any chance, the aircraft does submerge, escape is enhanced by no more than two passengers having to escape through any single window," explained Falcon director of flight operations and head of training, captain Raman Oberoi.

"We have invested in new technology. The five-blade rotor produces a smoother ride and it has a stronger undercarriage. The GE, front-facing engines also mean better fuel consumption and the next generation avionics make maintenance easier."

### Vote of confidence

Oberoi said the investment was also a vote of confidence in Abu Dhabi's hydrocarbon industry, where new generation helicopters are required.

"There's always a bit of a challenge when you introduce new models but our aim over the next five years is to replace the entire fleet," he said. Older aircraft will be phased out over five years with the company having placed orders for three, 10-seater Agusta Westland 169s, two of which will be used for platform-to-platform hopping, the third for VIP operations.

Falcon's first 169 is due for delivery in January next year with the other two following in the subsequent four-six months.

"Oil companies are talking to us about these aircraft," said Oberoi.

Falcon, which will maintain the helicopters at its Al Bateen Airport base and which has trained 12 pilots and 14 engines for the 189 project, has also signed up to Agusta's power-by-the-hour system, which gives it priority call on spares.



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*With a hefty order from Qatar Executive and strong interest in its new aircraft, Savannah-based Gulfstream is enjoying blue skies all the way in the Middle East. Liz Moscrop reports*

# Full Stream ahead

Could there be much better news for a business jet manufacturer in the Middle East? Qatar Executive, one of the largest operators in the region, has agreed to buy up to 30 Gulfstream aircraft, including its new babies.

The order is a combination of Gulfstream's new clean-sheet, wide-cabin aircraft, the G500 and G600, and its flagship G650ER.

Scott Neal, SVP worldwide sales and marketing explained: "Qatar was a significant opportunity for Gulfstream and one that we had worked on for quite a number of years. Our dialogue with the airline and with [CEO] Akbar Al Baker had been going on for three years, and fortunately we came to an agreement last October when we announced the orders. So it's a great opportunity for us in the Middle East. We are glad to have our aircraft in operation with Qatar Airways."

## Ultra-long range aircraft

The charter operator will take delivery of its first G650ER in the fourth quarter this year. The ultra-long-range aircraft can travel 7,500nm/13,890km at Mach 0.85 and 6,400nm/11,853km at Mach 0.90. It will join the 13 other G650s based in the Middle East, with more to come into the region, promised Neal.

He continued: "We are really excited about the relationship with Qatar. They want the extended range of the G650, not necessarily to compete with their airline model, rather to fulfil the role that Qatar Executive is playing."

The new Gulfstream types are making good progress in their roads to certification and will prove popular, according to Neal. He said: "We've seen a trend in optimised speed and range and cabin size and technology. Customers really want a combination that delivers



Gulfstream adds the interiors to all its own aircraft.

everything. That's where we think we've hit the sweet spot with the 500 and 600, which are really designed for those things. They are going to have the same speed capability as the G650."

Up front sees ground-breaking innovations in the new types, too, with active sidestick controls in the new Symmetry cockpit, which is a first for business aviation.

Neal continued: "The sidesticks offer a tremendous advantage over traditional controls, in that each pilot will know what the other is doing in terms of inputs at all times."

He explained that, like the PlaneView flight deck on current in-production models, it's not a

static system. "They are built for growth and change." This means they can easily be upgraded to allow for new regulations, such as new air traffic control mandates coming into play over the next few years.

Both new aircraft have reasonably long legs – the G500 can fly 5,000nm/9,260km at Mach 0.85 or 3,800nm/7,038km at Mach 0.90. The G600 is capable of traveling 6,200nm/11,482km at Mach 0.85 or 4,800nm/8,890km at Mach 0.90. They're fast, too. The maximum operating speed for both aircraft is Mach 0.925, the same speed as Gulfstream's G650 and G650ER.



They are on target to enter service when predicted, Neal said. The first flight of the G500 took place on May 18 this year and Gulfstream projects it will receive type certification from the US Federal Aviation Administration (FAA) and European Aviation Safety Agency (EASA) in 2017. The G600 flight-test programme is expected to begin approximately 12 to 18 months after the G500's, and entry-into-service is projected to be in 2019.

Although the newest members of the fleet garner the most headlines, the smaller end of the airframer's output is also well received and working hard for its money.

The super mid-sized G280, for example, recently set a city-pair speed record between Paris and Abu Dhabi, covering 2,908nm/5,386km in six hours and 16 minutes at an average speed of Mach 0.82. It, too, has been well received since its inception in 2012. There are now more than 60 G280s in service across 11 countries.

Passengers will also approve of the recent FAA supplemental type certificate (STC) granted to install the next-generation Satcom Direct router (SDR) on Gulfstream G550 and G450 aircraft.

The addition of the smart router allows for more communication options in the cabin, including Satcom Direct's GlobalVT, which enables passengers to use their personal smartphones to call and text in flight, just as they would if they were on the ground. Outgoing calls show the passengers' personal phone numbers and incoming calls display the number of the person calling them. This voice and text functionality is secure and available at any altitude, virtually anywhere in the world.

The SDR also offers worldwide 3G

connectivity on the ground with any service provider and supports mobile applications on board, including moving map and Flight Tracker, command and control of satellite links, and real-time connection status reporting.

Additionally, it interfaces with ViaSat's Ku-band and Honeywell's SwiftBroadband systems on-board connectivity systems, and is designed to work with future systems, including Ka-band (which offers much faster broadband speeds).

Installation of the SDR and accompanying software is standard on new G550 and G450 aircraft, while available as a retrofit for in-service G550s and G450s.

The new equipment weighs less than 10 pounds and can be installed inside the cabin or avionics bay. The airframer is pursuing similar STCs to add it to G650/G650ER, GV and GIV aircraft. Gulfstream's company-owned service centres have exclusive rights to perform the work.

**Apple and Android inputs**

This brings up an interesting point about maintenance, repair and overhaul (MRO) services as part of a manufacturer's business strategy. Gulfstream has created its own cabin in-house, which uses both Apple and Android inputs to control the lights, window shades, entertainment and temperature, "and we continue to evolve that", said Neal.

He explained: "Since it is designed in-house, we can make improvements on a continual basis. We built it, so we can support it. If there ever is an issue we are responsible and can respond very quickly to fix it."

Typically, this means if there are regulatory mandates, for example for avionics updates,

Gulfstream offers that as a service through its product support network, (which also includes third-party authorised suppliers).

Neal continued: "One of the main focuses of our business is product support. It's one of the ways we can make sure all customers have a good experience with an aeroplane that is reliable and not down for maintenance all the time. We have brought more of the design in house so on the 500 and 600 we are building the wing."

This means Gulfstream does not rely so much on third-party support to address its fleet issues. "We have taken more of a vertical approach to allow us to have more control over the reliability and support of our entire fleet." This goes down to completions – Gulfstream adds the interiors to all its own aircraft.

The airframer is in the middle of a big leadership change, with long-term chiefs Joe Lombardo and Larry Flynn both stepping down. However, that is no cause for concern, assures Neal. "It's a smooth leadership transition. If you look at the individuals involved they've all been with the company for a very long time. Mark Burns (who took over as president on July 1) has been with the company 33 years. I'm on the leadership team and I've been with the company 21 years. Most of us have been there a long time, so it's been a stable management team for many years and will continue to be so."

So how does he see prospects for the regional market in the Gulf?

"We continue to be very focused on the Middle East. The Qatar relationship will be a big benefit to Gulfstream and our owners and operators in the region. We are seeing strong activity in most countries," he concluded.

Middle East business aviation professionals always have an eye on Europe's largest business aviation event, EBACE. Alan Peaford was there to see what was catching their attention.

## GDC moves into Africa with Morocco MRO

GDC Technics is stepping into Africa to develop maintenance, repair and overhaul (MRO) and modification services across the continent and challenge existing providers in southern Europe.

Mohammad Alzeer, general partner of the Texas-headquartered company, which was formally known as Gore Design Completions until a take-over by the Saudi-based owners two years ago, is to establish the new facility at Manera Airport in Marrakech, Morocco.

"This will be a centre of excellence across the region," Alzeer said. "We will be bringing the experience we have from Fort Worth and our German and Middle Eastern satellites. There are great opportunities here and we look forward to offering the same world-class service for modifications and MRO."

Heading up the business as CEO, GDC Technics Africa, will be Shabbir Pirmohamed, who spearheaded the aggressive turnaround at GDC USA.

"The difference from two years ago, when we became involved, is the difference from night to day, and that is down to Shabbir's leadership," said Alzeer.

GDC has embarked on a global expansion programme, having recently opened a facility in India and agreed a joint venture in Hong Kong to develop its presence in Asia.

"Africa is very important to us," Alzeer said. "We have worked closely with the Moroccan Government and we have identified the right site in Marrakech. It is great place to go to and there is a skilled workforce in Morocco. There are already 10,000 people working in the aerospace industry there. Morocco has an excellent education system, is a multi-lingual country and has a great work ethic."

GDC will be offering aircraft modification and demonstrating its extensive capabilities in design, engineering, manufacturing, installation, testing and certification to commercial, business and military markets.



Mohammad Alzeer: "Africa is very important to us."



## Tipped for further success

All new Boeing Business Jets (BBJ) from summer 2016 onwards will be fitted with a revolutionary split scimitar winglet (SSW), the company's president said.

BBJ president David Longridge said the Aviation Partners' innovation would deliver up to 2% of improvements, showing as either an additional 222km (120nm) of range or an extra 453.5kg (1,000lbs) of payload.

"As an engineer, I always look for function before form, but I tell you these split scimitar winglets look pretty cool too," Longridge said.

Aviation Partners will also be offering retrofits for owners who want to take advantage of the new winglets.

Company president, Joe Clark, said that the SSW "completely redefines the aerodynamics of the existing blended winglet".

The retrofit consists of adding a new scimitar-tipped large ventral strake, beefed up internal winglet structure, and replacement of the aluminium winglet tip caps with new aerodynamically shaped scimitar tip caps.



## The Nextant big thing

Nextant Aerospace, which makes the award-winning 400XTi – the world's only remanufactured business jet – and is currently flight-testing its new G90XT turboprop, has announced a major expansion of its Middle East sales operation. The company's regional agent, JethQ, has just celebrated delivery of its first 400XTi to a Saudi customer and is now setting its sights on additional markets in India and sub-Saharan Africa.



## Falcon to fly first

Pilatus Aircraft has revealed that Abu Dhabi's Falcon Aviation Services (FAS) is one of the five launch customers for its PC 24 light jet.

FAS has ordered four of the \$9 million aircraft.

The Williams FJ44-4A-powered PC-24 was launched at EBACE last year – marking Stans Switzerland-based Pilatus' first foray into the business jet space.

The twinjet has a projected take-off distance of 820 metres (2,690ft) and a landing distance of 2,530ft, enabling it to operate from unpaved runways and grass strips.

## New Legacy on schedule

Embraer Executive Jets' newest mid-light jet, the Legacy 450, made its European debut at the show.

The development of the Legacy 450 is advancing on schedule, with its entry into service expected in the fourth quarter of 2015.

The aircraft is performing very similarly to the midsize Legacy 500, which was certified last year, with all its design goals having been achieved or surpassed.

An aerial, high-angle photograph of a white Dassault Falcon 900LX private jet flying over a wide river. The river reflects the sunlight, creating a shimmering effect. The surrounding landscape is lush green with dense trees. The aircraft is viewed from a high angle, showing its three engines and T-tail configuration. The text "PROVEN PERFORMER" is overlaid in white, bold, sans-serif font across the middle of the image.

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The wreckage of an aircraft on the overgrown airport apron gives an idea of the uphill struggle facing Tripoli's dream of revival.

*Libya's post-revolution civil war has crippled the country's aviation sector, with airports and aircraft damaged by fighting and all international carriers forced to withdraw from the Libyan market. A year after intense clashes destroyed Tripoli International Airport, the Airports Authority is planning to build a semi-permanent terminal and get international flights back up and running.*

**Tom Westcott** reports from Tripoli.

# Libya takes up the fight to rebuild

It is one year after Tripoli International Airport was caught up in a battle between rival militias, which saw Libya's embryonic civil war spread across the country. Planes still lie in charred pieces on the runway, the air traffic control tower is riddled with holes from heavy artillery fire and the burnt-out terminal building has become a haven for birds.

After the 2011 revolution, which overthrew long-term dictator Muammar Qaddafi, armed groups that had fought in the uprising were tasked with providing security across the country.

Militias from the town of Zintan controlled the airport and some parts of the capital, while groups from the city of Misrata were in charge of securing other areas of Tripoli. However, during three years of post-revolutionary instability, tensions mounted between these former allies.

In July 2014, Misrata militias led an attack on the airport to expel the Zintan forces, and five days of intense fighting at the airport and three weeks of clashes in the surrounding area resulted in devastating losses for the aviation sector. The Zintan forces withdrew allowing the Misrata militias to advance on the capital 30 kilometres away, resurrecting the former parliament and creating a new government in opposition to the internationally recognised institutions.

While flames engulfed the terminal building, hangars were bombarded with heavy weaponry and aircraft worth millions of dollars were assaulted – sprayed with bullets, set ablaze or





**Wreckage lies everywhere, but the new terminal building is rising from the ground and in the hangars there is hope as a Libyan Airlines engineer patches over bullet holes in an Airbus A320. Each repair is done to Airbus specifications to ready the plane for a single flight to an official Airbus workshop in Europe.**

climbed over by fighters who posed for photos on the fuselage. Ten aircraft were completely destroyed and a further 10 damaged severely, with others sustaining minor damage.

A year later, on the fringes of the ravaged airport, engineers are now hard at work patching up the aircraft bullet holes. The Airports Authority has been working on plans to rebuild the ruins of the former terminal to create a semi-permanent replacement that could enable international operations to resume.

#### **Rebuilding the terminal**

“We have signed a memorandum of understanding (MoU) for rebuilding the terminal and work is expected to start at the end of this year,” said Libya Airports Authority director of air transport affairs Ibrahim Wali. The MoU is between the ministry of transport and Libya’s state-run Organisation for the Development of Administrative Centres (ODAC).

“They are still negotiating, so the final contract has not yet been signed but its value will be a minimum of LYD 100 million (\$72 million),” he explained, adding that this could extend to as much as LYD 300 million (\$216 million).

“As well as the terminal buildings, there is a lot of maintenance work to be completed and we will have to meet the minimum international requirements and regulations.” The airport’s air traffic control system and tower – riddled with holes from artillery fire – also requires a complete overhaul, as does the fire-fighting area and

equipment. The airport’s two runways, however, were not damaged by the fighting and remain intact, needing only modest maintenance.

After discussing three different options, ODAC has decided on a two-floored semi-permanent terminal, with the capacity to handle around three million passengers. “The concrete sections of the terminal were not damaged so the new design will fit around these, incorporating some of the old structure,” Wali said. “The departure lounge will be new but the arrivals hall will be the same because this was not badly damaged.”

The work will be subcontracted to foreign partners, he explained. With European companies still reluctant to work in Libya, not least because no European embassies have missions in the country at present, Wali predicted that the partner companies were likely to be either Turkish or Egyptian.

“This will be a temporary terminal that could last between five and eight years, basically until the French company working on the new airport can return,” Wali explained.

In 2007, a contract with an estimated value of LYD2.54 billion (\$1.8 billion) for the expansion of Tripoli International Airport was awarded to French company Aeroport de Paris International (ADPI), with works undertaken by Brazilian firm Odebrecht in a joint venture with Turkish and Greek companies. “The new airport should have been finished by the end of 2015. The contract still exists and these companies will come back,

they have to, but they can’t come back yet,” he said.

In the wake of four years of post-revolution instability, successive faltering governments and an on-going civil war, the country is on the brink of economic collapse but, Wali insists, there is money to fund the rebuilding of the airport. “The money is already there as ODAC had another project with the Libyan Civil Aviation Authority (LYCAA) which is stable, so the money for that project will be transferred to this one,” he explained. “The money is there and work on the new terminal is expected to start by the end of this year.”

In preparation for this, clearance operations by a Libyan scrap metal company are already under way.

#### **Daily reminder**

For those working at the airport, being surrounded by the destruction is a daily reminder of the high cost of those first few weeks of civil war. “It’s such a pity,” said Ramadan Malti, chief engineer for Libyan Airlines – one of the country’s two state-owned operators. “In total 12 of our planes – four A320s, an A330, two ATRs and five CRJs – were damaged and some are beyond economic repair.”

Malti heads a team of nearly 40 engineers who, working in shifts, have spent the last six months patching up an Airbus A320, riddled with bullet holes and shrapnel damage. “We have almost

Continued  
on Page 80

## AIRPORTS

CONTINUED FROM PAGE 79

finished this one. It has taken about six months to make these temporary repairs and it should be ready in another month," he said. These repairs will ready the aircraft for a single flight to an Airbus workshop in Europe, where the damaged fuselage will be replaced.

At the other end of the airport, engineers for Libya's other state-owned carrier, Afriqiyah Airways, are also repairing three planes. "We started working on this Airbus A319 in October last year," engineer Abdullah Al-Tershani explained. "This one needed almost 50 individual repairs."

The process is time-consuming, he said, with dimensions and photographs of each damaged area being sent to Airbus for confirmation that the proposed repair is acceptable.

Other aircraft bombarded by missiles and bullets at the airport were already redundant. Abandoned planes, some dating back to the Kingdom of Libya, had been a feature for decades and more were left to deteriorate during Qaddafi's 42-year rule, when sanctions made the acquisition of spare parts difficult. One western plane enthusiast visiting the airport in 2013 suggested an aviation museum would attract many international visitors but now even many of these historic aircraft have been ruined.

The on-going civil conflict continues to have an impact on the country's aviation sector. Tripoli's former military airbase of Mitiga now serves the capital but, Wali said, it is no substitute for the sprawling former international airport. "Mitiga is being used only by Libyan carriers because it has

little infrastructure and is not security-cleared for international flights," he pointed out.

Despite a capacity for around 3,000 passengers it struggles to manage these, with services characterised by delays and cancellations. However, as Wali said: "It is better than nothing."

Mitiga has just one option for Europe – an often fully-booked service to Malta on an 18-seater Beechcraft 1900D aircraft, owned by Libyan-Maltese joint-venture Medavia.

Based in Malta, Medavia is the only international operator now serving Libya. "There were 24 foreign operators before the revolution and after the revolution there were 13. But now only Medavia and Libyan carriers fly here," he said, adding that most travellers preferred to drive overland to neighbouring Tunisia from where they could fly to Europe.

Mitiga is one of 18 Libyan airports, only six of which are still operational, most suspended by the LYCAA because of nearby fighting or security issues.

### Reduced domestic services

The closed airports, lack of international flights and reduced domestic services have caused problems for many Libyan citizens.

With no trains or a proper system of buses, aviation had previously acted as public transport, with cheap government-subsidised flights connecting remote towns and cities in the vast country.

Wali hopes that, if the area surrounding Tripoli remains peaceful, the rebuilding of Tripoli International Airport could start as early as this autumn. "It should take about eight months to finish, maximum one year, and could be operational by the middle of 2016," he said.

"We are losing money but so are many people whose jobs relied on the airport, from cafe owners to taxi drivers. The problems last year affected a lot of things and we hope that rebuilding and reopening the airport will give international companies the confidence to come back to work in Libya."

The completion of a major construction project such as Tripoli Airport and the prospect of returning international companies could offer hope to people across Libya, a country which, after decades of neglect and four years of instability, is in urgent need of extensive rebuilding.



The arrivals hall, which was only lightly damaged, will be incorporated into the new semi-permanent terminal.



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# Trains on track to transform transit

*Airport railway and monorail systems can be very complex but, as Keith Mwanalushi finds, advanced mobility solutions for major facilities in the Middle East are increasingly important.*

Rail transportation is gaining momentum across the Middle East North Africa (MENA) region.

Investment is at an all-time high and rail projects are being prioritised at the regional, national and local levels.

The very best in rail technology was showcased at the recent Middle East Rail 2015 exhibition in Dubai. On display were the various solutions for airports, as well as cities.

“The Middle East continues to be one of the world’s most dynamic markets for rail systems, with upcoming projects ranging from airport people movers to urban mass transit and high-speed lines,” said Philippe Casgrain, Bombardier Transportation’s VP for Europe, Middle East and Africa, systems division.

In fact, Bombardier has established hubs in Dubai and Riyadh to support its customers in the region.

Airport projects include two applications of the latest Bombardier Innovia automated people mover

300 (APM) system and at Dubai International, a 1.3km turnkey system with 18 vehicles that will transport passengers between the existing terminal 1 and the new concourse 4.

Casgrain also said a 1.5km Innovia APM 300 system, with 10 vehicles, would run through the King Abdulaziz International Airport building in Jeddah, linking the main terminal to the international hub.

## Complex undertaking

“Transit system development and integration is a complex undertaking,” he acknowledged. “System integration is the process of transforming operational requirements into a system configuration that best satisfies the operational needs.”

He continued to say that this incorporates all related technical parameters and interfaces in a manner that optimises the entire system. “It also combines the

Continued  
on Page 82

CONTINUED FROM PAGE 81

efforts of all engineering disciplines and specialities into one single engineering effort.”

To develop and implement rail transportation at airports, Casgrain stressed the importance of decision-makers having the right partnerships with a multi-disciplined team of transit experts. “They must plan a realistic project schedule and forge working relationships that generate rapid decision-making, and interact effectively with contractors and project stakeholders,” he said. “Bombardier has an experienced team of project managers with the mandate to successfully deliver rail system projects to the satisfaction of customers, project stakeholders and the community.”

Industry sources suggest that the MENA region is one of the world’s fastest-growing markets for rail and metro projects, with more than \$35 billion-worth of contracts awarded in 2013. Projects planned or under way in the region are valued at just under \$170 billion, including more than \$50 billion-worth in Saudi Arabia and \$35 billion in Qatar.

#### Key considerations

As Casgrain noted, there are some key considerations when planning railway or monorail system for airports. He said, when developing an urban or airport rail system, the first step was deciding on the approximate route for the system in terms of alignment, station locations and positioning of a maintenance and storage depot.

“Typically, the system operator, together with the municipal and or regional governments involved, will be responsible for these decisions based on the master plan for the airport,” he said. “Passenger forecasts will include ridership estimates between stations in each direction and station boardings and alightings at different times of the day and week.”

With this data, planners would then determine how many vehicles/trains were needed, how often trains should serve each station at different times of the day and week, and how much electrical power would be required.

“They also must consider the size and shape of the maintenance and storage facilities, as well as the land available, power supply and distribution, and entry and exit points between depot and the mainline,” explained Casgrain.

“Planners should carefully consider the likely future ridership growth as they create the initial design of the system and possibility of future expansion. With advanced planning, a system can be expanded easily without disrupting daily service,” he advised.

The cost of developing and connecting rail systems can be a deterrent for some airports but there are also other economic benefits that can act as an enticement. For instance, airports that had implemented transit systems to provide passengers with a link to new terminals or satellites, generally improved connections to amenities such as car parking, regional transit,



**“As passenger numbers continue to rise, improving services is the key driver for investment. This means providing train-to-plane solutions that help airports to manage passenger flows and reduce congestion.”**

PHILIPPE CASGRAIN

conference centres and hotels; and connected directly with the city centre.

“As passenger numbers continue to rise, improving services is the key driver for investment,” said Casgrain. “This means providing train-to-plane solutions that help airports to manage passenger flows and reduce congestion.”

In the cost-sensitive world of public transportation, Casgrain believes a turnkey transit system is the most efficient and comprehensive approach for mobility at airports.

Design-build-operate-maintain, (BDOM) concession contracting, and planning the whole life of the product and systems, are seen as attractive options. Casgrain said this allowed

airports to optimise the system design and add value during the project execution stage; for example, by reducing energy consumption, decreasing fleet mileage and using less space for maintenance facilities and depot buildings. In an ideal set up, all the savings would then translate into lower capital and operational costs for the operator.

“Smooth and reliable connections for passengers provide stress-free and enjoyable travelling,” he emphasised. He also said better passenger flow enhanced an airport’s global reputation and resulted in increased air traffic and investment from airlines.

He continued: “A well-planned transit system that conveniently connects the airport with the surrounding city will have a positive impact on local amenities and retail vendors. Many airports become popular shopping and dining destinations with the local residents. An APM system, especially one with 24-hour operation, provides quick and comfortable mobility for members of the public, allowing them to easily access the hottest shopping spot in the city.”

#### Driverless systems

Bombardier’s Innovia family of driverless systems also includes automated metro and automated monorail technologies. The company says these fit seamlessly in new and existing infrastructure, and meet the most stringent environmental and safety standards.

“With four Innovia systems currently in delivery in the MENA region, it’s clear that this market has really embraced driverless technology.”

Casgrain added: “The APM system can be supplied in many different configurations due to its customisable features and flexible operating modes, enabling it to meet the specific airport requirements. Sleek, aerodynamic vehicles can operate in coupled trains of up to six cars providing generous passenger capacities. The APM’s advanced suspension and guidance system, coupled with rubber-tires, reduces noise and vibration to achieve exceptional ride quality. The propulsion system allows the trains to operate at speeds up to 80km per hour.”

Bombardier is convinced that automated systems have reached a new level of maturity and are now seen as the most practical choice for airport and urban mobility. Casgrain said these systems had brought a number of benefits for operators and passengers, including improved safety, high reliability, head-ways as short as 60 seconds, and optimised energy usage.

“Automated scheduling means that day-to-day operations are easily adjusted to accommodate the changing traffic demands at peak times, weekends or for special events, resulting in shorter waiting times for passengers and maximum use of assets for owners. All functions are monitored from the control centre, affording split-second analysis and fast resolution should service disruptions arise,” Casgrain concluded.

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*Remote towers are now operating elsewhere in the world, so how could the concept be applied to the*

*Middle East? Alan Corner, who heads up the Dubai office for aviation consultancy Helios, gives his views.*

The Middle East is not generally afraid of innovation. We are no longer surprised at the incredible growth and achievements of the aviation sector – the record orders for the world's fastest growing airlines, building 'super-sized' airports and developing new concepts to further increase air traffic management efficiency and capacity.

Given the challenges and a natural tendency to innovate, it is, therefore, surprising that we have only recently seen an interest in remote towers and their technology in this region.

Of course, the introduction of remote towers is not straightforward but, with the recent transition into operation of Örnköldsvik airport in Sweden, air navigation services provider LfV has proved that it is possible to meet all the operational, safety and regulatory challenges, albeit for a specific fairly low-intensity operation.

Other air navigation service providers (ANSPs) are not far behind. Avinor is procuring technology for use at 15 airports; HungaroControl is well down the road to system definition for Budapest Airport; and, in the Asia Pacific region, Air Services Australia and Airways New Zealand are completing or planning trials.

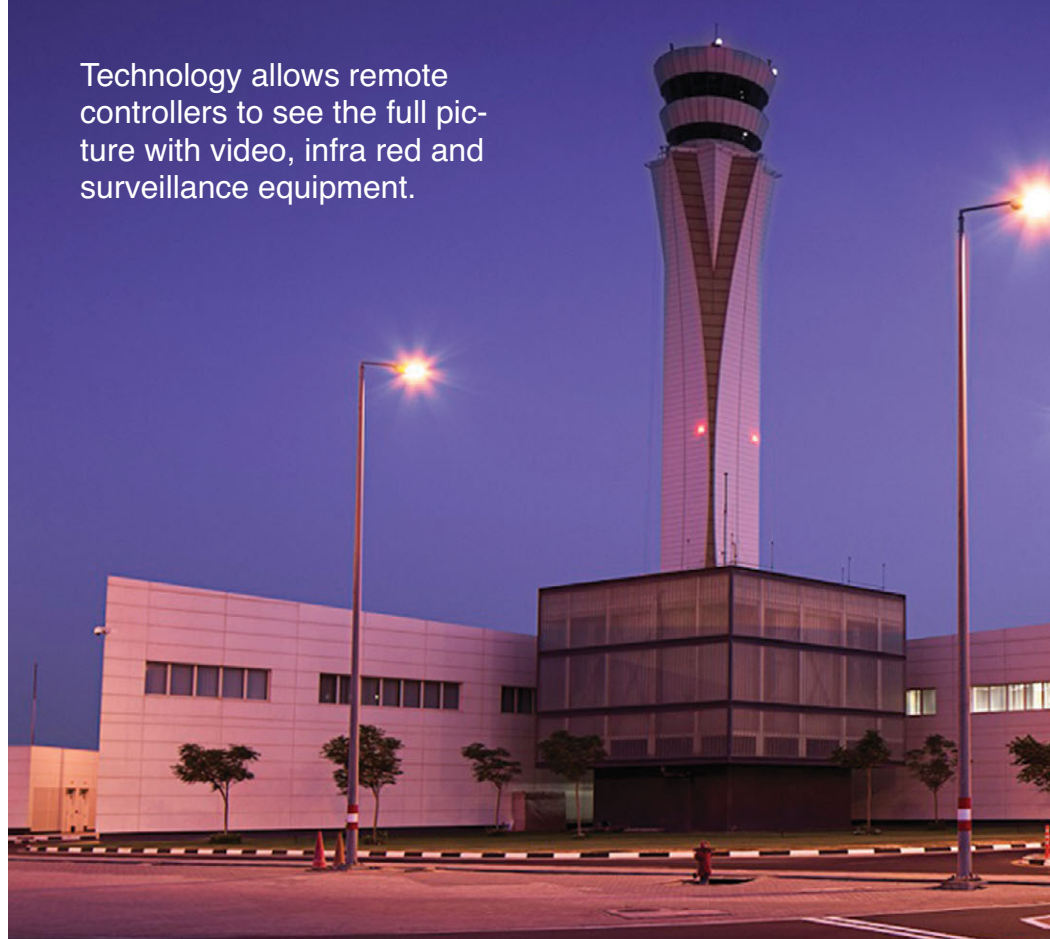
Back in Europe, the Irish Aviation Authority (IAA) and DFS recently announced contracts to procure remote tower technology.

DFS is planning to use remote technology for medium-sized Saarbrücken Airport, which will be controlled from a facility some 350 miles away in Leipzig beginning in 2017, with Erfurt and Dresden airports to follow.

The IAA is implementing a remote tower centre at Dublin Airport, plus remote tower installations at Cork and Shannon, as part of a high-level demonstration under the single European sky ATM research (SESAR) programme in 2015-16.

Also in cooperation with SESAR, ENAV is participating in the remote airport concept of operation (RACOON) project to demonstrate the viability of providing remote air traffic control tower services to multiple airports from

Technology allows remote controllers to see the full picture with video, infra red and surveillance equipment.



## Much more than a

Milan Malpensa Airport.

Until recently, the case for remote towers has generally been driven by cost and based on providing services to one or more low-intensity airports from a single location. There are, of course, scenarios where this would potentially apply in the Middle East, including at some of the smaller domestic airports in the Kingdom of Saudi Arabia, or even to support aviation operations in the oil and gas industry.

However, the use of remote technology has an even greater potential in the region.

The Middle East is home to some of the world's largest and fastest growing airports. This provides significant challenges for ANSPs to maintain or even improve safety and efficiency in an increasingly busy and complex environment, including apron operations. The digitisation of data developed for remote towers can provide controllers with additional 'tools', such as target tracking, laser range finders and surveillance label overlays, to name but a few. It can also provide greater levels of resilience, for example, using infra-red (IR) vision in low visibility and through improved foreign object detection, and airport security, all of which help both the ANS provider and airport to maximise operations in

different weather conditions.

This would have a significant impact on airports across the region that routinely suffer from unexpected and extended periods of fog at certain times of the year.

One of the largest planned facilities is Dubai's Al Maktoum International Airport. Here, Dubai Air Navigation Services (DANS) is studying how remote technology could be employed in what will be a particularly complex operation.

While the initial aim is to provide contingency, it is easy to see how a single remote control centre, staffed by several controllers using an integrated picture comprising video, IR and other surveillance sources, could provide a safer and more efficient operation than a traditional tower (or towers). Indeed, when the airport reaches full capacity, it might be the only way of safely providing air traffic services.

The same concepts could also be used to enhance more routine operations at other fast-growing airports. A remote centre can be located away from the operation, avoiding the need for new towers as new runways are built or terminals expanded.

If we think further out of the box, there is also the potential to provide cross-border services to



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# remote possibility

airports in countries that are recovering from conflict.

So, if there is so much potential, why hasn't the region embraced remote towers already?

There is no single answer. There is no end of potential suppliers and the technology, in the main, is already proven. Clearly, the focus, until recently, has been on providing services to multiple smaller airports, such as those in remoter areas of Norway, Sweden or Australia.

The geography in the Middle East is very different. The service providers, predominately state-owned, also have other priorities and, until recently, there has been less pressure on cost, particularly in the Gulf Cooperation Council states. The reluctance might also reflect the different social context, as governments seek to create new high-value employment opportunities for the younger generation.

The regulatory environment is also different. Regulators tend to be more cautious and, arguably, less well resourced.

The Swedish regulator has been heavily involved in the development of SAAB's remote tower in Sweden. This proved essential but was a significant commitment over many years. While it is easier not being the first, the General Civil Aviation Authority

(GCAA) will undoubtedly have to commit a similar amount of effort to DANS' proposals for Al Maktoum. In Europe, it took 10 or so years to develop, mostly for the design phase, with the last two to three years being used for verification, testing and regulatory approval. The key is getting the implementation concept and design right from the outset. Once all the different options have been explored, an implementation plan can then be prepared and the detailed task of assessing issues and risks (safety, cyber security, human factors etc) can begin.

As the focus for remote towers shifts, we are already starting to see more interest from the Middle East and, given the ability of the region to innovate quickly when required, we shouldn't be surprised if a major airport in the region is the first in the world to provide routine high intensity operations from a remote centre... The operational rationale already exists.

■ Alan Corner is director Middle East for aviation consultancy Helios, with offices in UK, Dubai and Slovakia. He has extensive experience living and working in the Middle East, where he oversees a wide range of projects for airports and ANSPs throughout the region. Helios has been providing independent advice to airports and ANSPs on remote towers since 2008. Its work includes the development of feasibility studies and business cases, and supporting the procurement of remote tower solutions, including operational concepts, business cases, technical requirements and safety assessments. Helios is part of Egis, a \$1 billion global infrastructure engineering group with an extensive aviation offering.

## Dubai looks to remote control

Dubai Air Navigation Services (DANS), the air navigation service provider for Dubai's two international airports and the airspace of the Northern Emirates, is to issue a request for proposal (RFP) for the first version of a remote aerodrome control service (RACS), writes *Barbara Saunders*.

The company's vice president strategy, Nils Svan, said the move followed a detailed study of requirements and the first RACS version would focus on providing business continuity.

The remote tower concept enables air traffic control services (ATS) and aerodrome flight information services (AFIS) to be provided at airfields where such services are either currently not available, or where it is difficult or too expensive to implement and staff a conventional manned facility.

Speaking on the sidelines of the Global Airport Leaders Forum in Dubai, Svan said four international companies – three European and one Canadian – would be asked to pitch. An appointment would be made "by the end of the year." Implementation, said Svan, "will take a while" but would be "short and swift".

"The regulator has been with us on this and has been very supportive," he added.

The RACS is expected to be the first civil application of its kind in the Middle East and, according to Svan, "the first application in a very busy environment".

Addressing the forum he said: "We believe in RACS. If we want to service five runways at Al Maktoum International Airport we need this. Our business driver is to use it as a business continuity option and foremost for the future is utilising the digital images differently than we do today."

Svan told delegates that DANS' current focus is on throughput "so that capacity is not constrained" but said the focus would shift as more runways are built.



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*Dubai's Airport Show once again introduced technology that will soon be on show for real at the regions airports. Steve Nichols and Tom Billingham were there to look at the new ideas in detail.*

## Emaratech iris gate security at a glance

**E**maratech's new smart gate uses the latest high-tech iris recognition technology, which the company claims is in excess of a 1,000 times more accurate than fingerprinting, to assess a passenger's credentials in just two seconds.

Unlike other biometric readers that require users to stop or to position their eyes close to a camera, the latest iris-recognition technology allows people to simply glance and go.

Called 'Eyen', which is Arabic for 'sight' and 'noble', the module allows a passenger's eye to be scanned from distances of up to one metre away, even if they are not looking directly at the camera or are wearing spectacles.

The technology has been developed by Stanford Research Institute (SRI) International – a spin-off subsidiary of the US university. SRI is also the company that was originally behind the Siri voice-recognition and automation technology used in Apple iPhones.

### Next generation

George Kim, SRI's director, products and solutions, said the same iris-recognition technology is going to be built into the next generation of Samsung smartphones and tablets.

He demonstrated it on the recently announced Samsung Galaxy Iris, which was able to identify him correctly in less than a second at a comfortable distance when he was holding the tablet.

The new Samsung tablet was official unveiled at the International Security Conference and Exposition (also known as the ISC West conference) in Las Vegas, USA, in April.

"The technology allows a passenger to pass through immigration in seconds," said Kim. "This advanced technology is so versatile that we are looking at other potential applications too."

"Fingerprints are really old hat, while iris scanning is the future and very difficult to forge," he added.

SRI says that your iris pattern is impossible to change and almost as difficult to duplicate. Human irises are stable from age three, and each iris has more than 250 points of identification, resulting in one of the lowest false accept rates of any biometric.



**George Kim demonstrates the latest iris-scanning smart gate personal identification systems which will be deployed at Dubai's International and World Central airports.**

If both irises are correctly identified, the odds of a false recognition is said to be one in more than one trillion.

The Eyen module is the latest development of Emaratech and SRI International and is already in operation at Dubai International Airport (DXB).

Eyen can also be used in different applications for access and control, such as establishments like labour camps, security zones and other secure locations.

The smart gates have been operational at DXB terminal three arrivals since January 2013, allowing passengers to speed through immigration in as little as 15 seconds.

UAE citizens and residents, GCC citizens and visitors from 46 visa-on-arrival countries, can use

the smart gate utilising their electronic passport, national ID, eGate cards or smart phones (where barcodes can be generated for registered travellers through immigration's smart mobile application).

There are currently 150 e-gates in action across the UAE, Oman and Jordan and more than 50 million visas have been processed through the e-Visa system.

The Eyen-based smart gate will eventually be installed at DXB's terminals one and two, as well as at Dubai World Central, although no firm implementation date has been set.

SRI International entered into an exclusive reseller agreement with Emaratech for its iris-scanning biometric product line for the UAE and Jordan in 2014.

# Business opening up for InfoGate

InfoGate is a standalone multimedia information, communication and navigation system that allows passengers to find out more about their flights, shops, restaurants and other amenities and be shown the ideal way to their selected points of interest by the system's 'smart indoor navigation' functionality.

A 100%-owned subsidiary of Munich Airport, InfoGate's products have been in operation at the German airport since 2011 and allow users to answer their own questions, without resorting to third-party help.

Thomas Borck, of the InfoGate company's key account management team, said that up to 10 of the double-sided units would be installed at the Jeddah airport in 2016.

As well as informing passengers about their flight or gate changes, the system can also display information about the airport's restaurants and shopping facilities.

## Huge airport

"When InfoGate was installed at Munich Airport in 2011, retail sales went up 15% and restaurant revenues increased by 8%, despite there being only a 2% increase in passengers," said Borck. "Jeddah is a huge airport and the InfoGate system will be connected to the airport's flight database to make sure the information is up-to-date and relevant."

Jeddah is also said to be interested in the company's InfoGate Counter product – an enhanced version of the kiosk that allows users to engage in a two-way HD live video conference with airline support staff.

Not only does it allow them to see and talk with an assistant in real time, but the system can operate in a multitude of languages, scan documents, read barcodes or fingerprints and even print out information sheets or directions.

With all this functionality, the solution is



**Saudia Arabian-based ICAD has won a contract to install an InfoGate interactive wayfinder system at Jeddah's King Abdulaziz International Airport.**

comparable to a complete service desk, but without a human needing to be on site.

The system was being demonstrated at the Airport Show in Dubai, where visitors were able to place a boarding pass under a camera, giving the remote assistant the ability to read and scan it.

Using the two-way videoconferencing system, she was then able to find out what help was needed, display a personalised map showing how to get to a gate and even draw and write on it.

She could also call up hotel and visitor attraction information based on your requirements and interests before printing it out at the terminal and issuing a personalised e-card that could pull up the same information at any other InfoGate terminal.

## Huge airport

"InfoGate Counter means that your support staff can be anywhere in the world," said Borck.

"Video calls can even be placed according to the language the user has selected. So, having a call centre with 10 staff, who might each speak three different languages, means you can cover up to 30 different languages at every single location where the InfoGate solution is installed.

"If a passenger wanted to know about hotels or tourist attractions in the area, InfoGate interactive lets them to talk to an assistant and then print out the information they need – even if the assistant is 1,000 miles away," Borck concluded.

InfoGate also offers great advertising and sponsorship opportunities, with the digital display of signs, advertisements for shops, promotions or notices in any language.

Borck added that you could use InfoGate to create a one-stop shop for customer information by linking to the InfoGate call centres of other system partners, such as airlines, hotels or car rental companies.

The company is keen to extend its product lines further into airports in the Middle East.

## CONNECTIVITY IS THE 'KEY TO HAPPINESS'

New airport technologies will significantly reduce the stress of travelling, according to 97% of UAE travellers surveyed by Honeywell and YouGov.

The 22-question survey polled 500 UAE-based respondents in January this year. The results were announced at a Honeywell press conference at the Airport Show in Dubai.

Respondents claimed technologies that reduce the extent of human interaction during airport processes, such as check-in, baggage drop and, by extension, in-flight services, are necessary to a positive travelling experience.

The results offer a clear demonstration that e-flying is the future of successful, user-friendly airport operations, said Norm Gilsdorf, president of Honeywell's high-growth regions for the Middle East, Russia and Central Asia.

"The results show that travellers want to stay connected at all times. They want their experience to

be a seamless one, from home to airport to plane to destination: connectivity is the key to their happiness.

"With advances like the e-gates in Dubai, which a lot of other airports don't have, and facial recognition technology, that whole direction of scanning will get faster and more efficient. The UAE will be where most of those technological advances are seen first," he said.



Around 75% of those surveyed said they would be willing to substitute one in-flight extra, such as a meal, in-flight entertainment (IFE) and extra legroom, in place of fast and reliable on-board Wi-Fi connection.

An agreement with Honeywell will deliver Inmarsat's GX Aviation – high-speed in-flight broadband connectivity of 50MB per second to the aircraft – at "some stage this year," Gilsdorf said, although there is no official timeline for delivery.

Emirates' fleet of A380s currently has the broadband service available, though it is limited and incurs costs for better internet access for economy travellers. Honeywell wouldn't speculate on when other fleets and aircraft would have the technology available for the common traveller.

Just under half of survey respondents (47%) said the top investment priority for airlines and airports in the coming years should be improving the speed and efficacy of flights.

On the back of such opinion, over a quarter (27%) of UAE-based travellers said they would seek an alternative airline if they experienced delays, diversions or cancellations.

Such a response shows the privilege afforded by the Middle East's modern airports and airline fleets, Gilsdorf said: "For other regions, like the US or Europe, where delays are so frequent, it wouldn't be an option."

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## Rockwell Collins upbeat over MEA projects

**R**ockwell Collins passed a major milestone recently with news at the Airport Show in Dubai that it had won a contract from Rwanda's national carrier, RwandAir, to supply common-use passenger processing systems (CUPPS) and related technologies.

Under the five-year contract, RwandAir will install the ARINC vMUSE common-use check-in platform, ARINC AirVue flight information display system (FIDS) and AirDB 7, the latest generation ARINC airport operational database (AODB) system.

Rakan Khaled, Rockwell Collins' regional director for Middle East and Africa (MEA), said this was a significant contract for the company and paved the way for further growth on the African continent.

"We had largely concentrated on Europe and the Middle East until now but there are huge opportunities for us in Africa, especially in the sub-Saharan region," Khaled said.

"The Rwanda win was key as the country acts as a very important hub. We are also confident that the contract win may lead to others, as the airline's systems become automated and integrated. We are helping RwandAir identify what they need to do next."

### Security business lines

Khaled is responsible for all airports and security business lines in the Middle East and Africa. Speaking at the Airport Show, he said: "Many airports in Africa are still using manual passenger processing systems so there is a lot of opportunity for us."

"ARINC is also active in Kenya, where we had a contract win last year for our vMUSE CUPPS at Nairobi's Jomo Kenyatta Airport."

That contract was for the installation of 50 self-service kiosks spread over all three terminals. This represented the first CUPPS installation and first common-use terminal equipment (CUTE) airline "club" in Africa, where at least 12 major airlines use the system.

Rockwell Collins also serves seven airports in Egypt, including Cairo, Sharm El Sheikh, Luxor, Aswan, Borg el Arab and Abu Simbel. At Cairo terminal three it has delivered 14 processing systems, including vMUSE, since 2009.

"We consider Cairo as one of our most strategic airports," said Khaled. "It is a showcase for everything that Rockwell Collins offers. We are now implementing a similar installation at Cairo's terminal two, which will enter the test phase with a 'soft launch' in August."

**Rakan Khaled: "Many airports in Africa are still using manual passenger processing systems so there is a lot of opportunity for us."**



**Rockwell Collins' ARINC vMUSE provides new passenger processing capabilities.**

The company is also working on extending its ARINC AviNet global network, with around 25-40 new ground stations planned across Africa to fill in gaps in its network. More than 300 airlines and over 15,000 aircraft use ARINC's flight deck data services worldwide.

Across the Middle East, Rockwell Collins' airport business was firmly established before the ARINC acquisition. It now has offices in Abu Dhabi, Doha and Cairo and a new office in Riyadh, Saudi Arabia.

### Contract to install

Its products have a strong presence at the new Doha International Airport, where it partnered with Thales on a \$260 million contract to install the airport's IT, security and telecommunications systems inside the main terminal buildings and more than 100 supporting facilities.

At Dubai International it has a contract with Dnata for vMUSE.

It is also tendering for extending its airport operations systems at Dubai World Central and integration services at Bahrain's new airport buildings.

At the UAE's Ras Al Khaimah International Airport, it completed a multi-million dollar deal in October 2013. The 10-year contract involved vMUSE CUPPS, AirVue FIDS and the AirDB 7 systems.

The company is also active in Kuwait, where it is currently upgrading its airport operations and flight information systems.

# Star tech... the new frontier

*American space giant Lockheed Martin is working alongside Saudi Arabian engineers to open new frontiers for the Middle East.* **Dave Calderwood reports.**

**S**audi Arabia-based Arabsat is positioning itself as one of the world's leaders in communications satellites, especially in the Middle East and North Africa (MENA) region.

It has awarded a contract to Lockheed Martin for the supply of two modernised A2100 satellites for launch in 2018 and signed an agreement to explore future design, manufacture, assembly and integration of satellites in the Kingdom of Saudi Arabia.

The new order will boost the Arabsat fleet to 10 in-orbit operational satellites and will provide advanced telecommunications, including television, internet, telephone and secure communications, to customers in the Middle East, Africa and Europe.

Under the joint venture (JV), Lockheed Martin and TAQNIYA Space Company, a subsidiary of the Saudi Technology Investment and Development Company, will develop talent and infrastructure to support space capabilities and services in Saudi Arabia.

King Abdulaziz City for Science and Technology (KACST) will serve as a technology partner, leading research and development efforts that will support new innovations for future Saudi Arabian space endeavours.

"Lockheed Martin's proven record of developing and delivering state-of-the-art space communications capabilities will ensure the kingdom's critical telecommunications needs are met," said KACST president prince Dr Turki bin Saud bin Mohammad Al Saud.

"Arabsat 6A and Hellas-Sat-4/SaudiGeoSat-1 will join a fleet of satellites that provide millions of people with access to TV, radio and broadband services for mobile and landline communications," said Khalid Balkheyour, CEO of Arabsat. "We selected Lockheed Martin due to its impressive technical capabilities and proven track record of the A2100 satellite."

Arabsat 6A will be located at 30.5 degrees East with Hellas-Sat-4/SaudiGeoSat-1 at 39 degrees East. Both satellites will be designed for a 15-year service life, and will be manufactured at Lockheed Martin's facility in Denver, Colorado, USA.

"The last three or four years we've been taking our existing satellites and modernising them," said Rick Ambrose, Lockheed Martin's executive vice president of space systems.

"Arabsat will be using some new capabilities [in the satellites]. Innovations will be around power, flexible solar panels, some of the on-board processing, and the thrusters, which will be more powerful. It'll go about twice as fast as traditional satellites for positioning.

"The second satellite is a combination of both commercial and government. Many countries talk about getting better synergies out of commercial and government and that's designed to have both capabilities.

## Meet the goals

"Arabsat really wanted to see these innovations and by having this ability with the power and the processing allows them to meet the goals they have for their business.

"The JV is initially going to start building up satellite engineering, development capability and training," Ambrose continued. "The kingdom wants to build a facility where it can integrate satellites. So the facility wouldn't be part of the JV but the know-how would be part of that. Having said that, we don't know exactly what the JV will look like as we're still formulating. We're working closely with prince Turki and his team to define what it is we're going to do long-term and step-by-step.

"We're going to continue to evolve the A2100's capacity, its power, size and flexibility. The next big thrust is going to be on agility and programmability. We are putting some programmability in the payload for Arabsat but we see the day coming when we can totally re-programme payloads on the fly."

The satellite business has grown more competitive as more manufacturers and nations take part. However, Ambrose sees growth in the Middle East.

"There is growth and lots of factors driving demand. Arabsat has visions of being one of the top three or four largest operators. I think the Middle East in general is looking to diversify its economies and look at space. We've done an analysis and we think that in the next decade there'll be almost 50 space-faring nations in some capacity. They'll be doing small satellites and large satellites; they may be processing satellite data. Hopefully we can get a lot of countries to work together and explore the stars."

**The Lockheed A2100 satellites are big – about nine metres tall and 44 metres from one end of the fully-extended solar panel to the other. That's roughly the same height and wingspan of a C-130J. Both satellites will have 16kw of power, 60% more than Lockheed's previous generation of A2100 satellites.**



*The Global Space and Satellite Forum (GSSF), held in Abu Dhabi, underlined the importance of the space industry to the UAE, attracting delegates from around the world including Buzz Aldrin, the Apollo 11 astronaut. Steve Nichols was there.*

# A real Buzz as UAE unveils new agency

**T**he GSSF, which took place at the ADNEC exhibition centre, attracted top ranking officials from research centres and more than 30 regional and national space projects.

It featured parallel conferences, technical seminars, a product showcase area and a number of networking events.

The forum was preceded by the UAE officially launching its new space agency and an announcement that it is to build a new space research centre in Al Ain.

This will act as an incubator for development and innovation for future Emirati space scientists and engineers.

His Highness Sheikh Mohammed Bin Rashid Al Maktoum, vice-president and Prime Minister of the UAE and ruler of Dubai, attended the launch event.

The new space centre will form part of the UAE Vision 2021 plan and aims to establish the country as one of the world's leading space nations.

## Enter orbit

The country's Hope space probe should also enter orbit around Mars in 2021 in time for the UAE's golden jubilee events marking the 50th anniversary of the nation's foundation.

UAE Space Agency director general, Dr Mohammed Nasser Al Ahbabi, said the centre, which will cost nearly AED 100 million (\$27.2m) over five years, will act as an incubator for space research and innovation at a federal level.

It will offer space projects, research and development and will serve university students as well as space operators.

The new development, which will form part of the Mohammed Bin Rashid Space Centre (formerly the Emirates Institution for Advanced Science and Technology – EIAST), will help enable the UAE's ambitious space plans, which



**“I congratulate the UAE on launching its own space agency and hope that it, too, inspires the next generation of space professionals in the country.”**

**BUZZ ALDRIN**

currently include the Hope probe, the launch of the KhalifaSat Earth observation satellite, a cubesat mission called Nayif-1, and its existing DubaiSat-1 and DubaiSat-2 spacecraft.

Sheikh Mohammed also witnessed the signing of a memorandum of understanding (MoU) to launch a new graduate degree programme in advanced space science, a first for the Middle East.

The MoU was signed by the Al Yah Satellite Communications Company (Yahsat), the Masdar Institute of Science and Technology, and space company Orbital ATK.

The new space agency said it would also select 15 gifted students as an academic delegation to travel both within the UAE and overseas.

## Space dignitaries

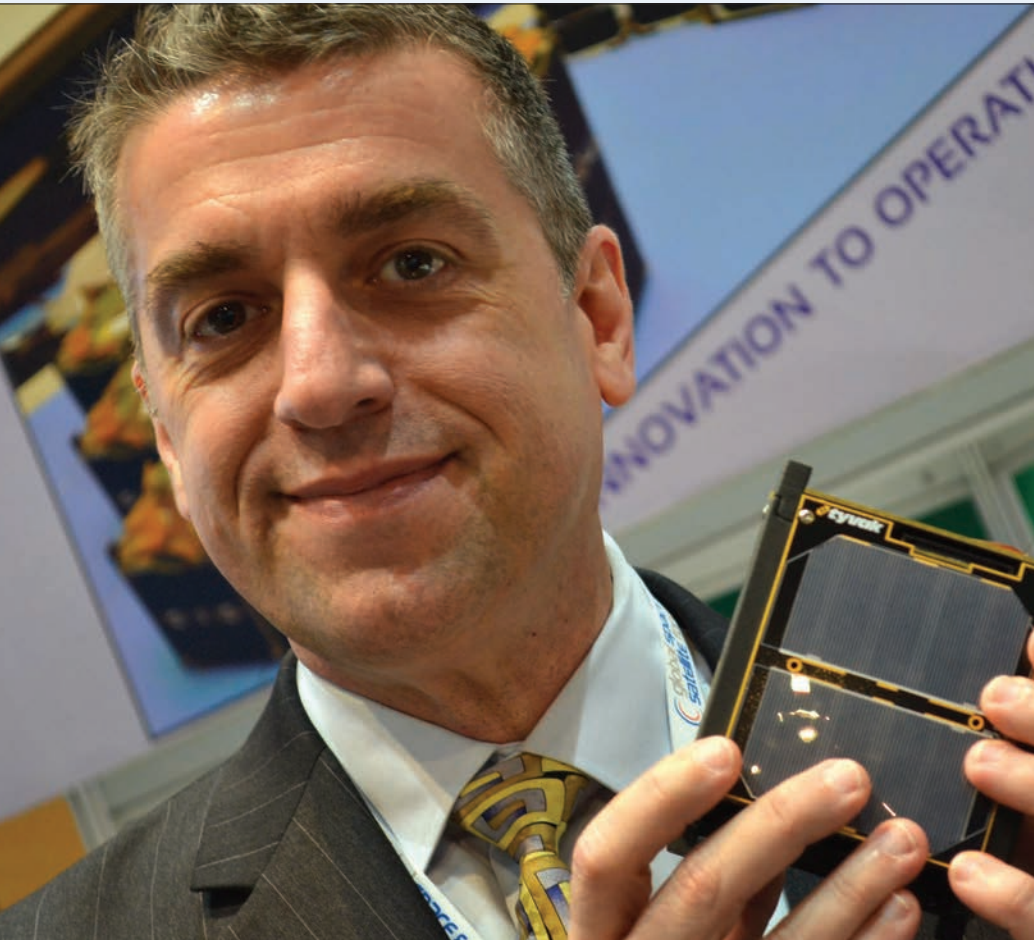
The first day of the GSSF saw a host of prominent space dignitaries gather for a range of panel sessions and presentations. These included Apollo 11 astronaut Buzz Aldrin, Japanese astronaut Soichi Noguchi, and Virgin Galactic CEO George Whitesides.

Aldrin said: “John F Kennedy’s announcement that the US was to go to the moon spawned a massive increase in the number of people wishing to study science, technology and mathematics in the 1960s.

“I congratulate the UAE on launching its own space agency and hope that it, too, inspires the next generation of space professionals in the country.”

Day two focused on the science behind the Hope mission and a panel session also looked at how satellites can help solve critical social and economic issues.

The GSSF organisers also announced that it would now become an annual event, bringing together the world's top space leaders in the UAE. The forum will also receive a new name – the Global Space Congress.



Terran Orbital CEO Anthony Previte with a cubesat.

## Small is beautiful in the tiny world of cubesats

Satellites don't have to be large and expensive to provide big benefits. That was the message from a number of speakers and exhibitors discussing the role cubesats could play in a nation's space programme.

A cubesat is what it says – a tiny cube-like satellite with sides only 10cm long and weighing around one kilogram. Despite their small size, they can pack a powerful punch, carrying sophisticated electronic payloads, scientific experiments or even radio transponders.

Cubesats usually utilise commercial, off-the-shelf components and tend to be mainly operated by educational institutes for scientific research purposes. They can also be built as multiple cubes, so a two-unit cubesat would be 20cm long and 10cm wide. A three-unit model would be 30cm long.



Displaying its wares at the GSSF was US-based Terran Orbital. It specialises in launching cubesats from the International Space Station, where a spring-loaded container is used to push the tiny satellites out into space.

Anthony Previte, Terran Orbital's CEO, said: "We have now launched more than 120 cubesats. The interest has been enormous with the company's turnover doubling to \$18 million over the last year alone. We have got to the point where we can't take any more orders at this time."

The UAE has its own cubesat programme with Nayif-1, which is scheduled to be launched by the end of 2015. The name Nayif means "he who soars high above the ground".

The Mohammed Bin Rashid Space Centre (MBRSC) (formerly EIAST) is developing the tiny satellite in partnership with the American University of Sharjah (AUS).



The project will offer hands-on experience to engineering students in its design, integration, testing, and operation.

Nayif-1 is scheduled to be launched from Florida, USA on board a Falcon 9 rocket, while a ground station is being built at AUS to be operated by Emirati engineering students, who will be responsible for mission planning and operations.

Seven students from various engineering disciplines at AUS, including computer engineering, electrical engineering and mechanical engineering, have been assigned to the project.

It is hoped Nayif-1 will act as a test-bed for future Emirati cubesat missions.

HE Yousuf Hamad Al Shaibani, director general of MBRSC, said: "This programme plays a significant role in developing the science and technology sector in the UAE through investing in local talents and capabilities."

## Space industry sees growing commercialisation

Major panel sessions at the GSSF looked at the commercialisation of space and highlighted the importance of investment in education to support industry growth.

Euroconsult, which is described as "the leading global consulting firm specialising in space markets", forecasts that around 510 small satellites will be launched around the world in the next five years, representing a more than 60% increase on the number of launches over the past 10 years.

A forum highlighted potential commercial uses for small satellites, including better observation of developments here on Earth.

At present, commercially available images from space tend to be poor quality and out of date. But this will change as costs decrease and up-to-date satellite images become more accessible.



Dr Mohammed Al Ahabbi, director general of UAE Space Agency said: "One of the most exciting parts of our industry are the ideas, initially designed for use in space, that have prompted another technology revolution on the ground.

"Inventions such as the global positioning system (GPS), cell phones, and the internet can all use satellites. These and many other essential items would be almost unthinkable today without research provided by satellite technology.

"Many of the technologies that are now part of everyday life were originally developed for space programmes, including bio-medical techniques, imaging technology, digital systems, robotics, information and meteorological applications."

David Parker, CEO of the UK Space Agency, said that the role of the UAE's own agency should include inspiring the next generation of space scientists.

"Space belongs to everyone and no-one at the same time," said Parker. "The cost of getting access to space is being driven down and it is gratifying to see the UAE establishing itself as a major player."



Dr Mohammed Al Ahabbi, director general of the UAE Space Agency.

## Why the UAE wants to see 'Red'

The GSSF delegates heard how the UAE has ambitious plans for an Emirati-led mission to fly an unmanned probe to Mars, Earth's planetary neighbour.

Its Hope probe is planned for launch in July 2020, arriving at Mars seven months later, in time for the celebrations marking the 50th anniversary of the UAE's foundation.

Once in orbit Hope, which was named after a public campaign, will explore the Martian atmosphere using scientific instruments that include visible, infrared and ultraviolet spectrometers.

But it won't be an easy mission. While the UAE has already launched two satellites and has two more on the drawing board – its Nayif-1 cubesat planned for launch by the end of 2015, and KhalifaSat, due to launch in 2017 – sending a probe to Mars is substantially more complex.

Speaking at the GSSF, James Crocker, VP and GM at Lockheed Martin Space Systems, and the force behind many of NASA's Mars missions, said: "Getting to Mars is difficult and the task shouldn't be underestimated.

"It is probably one of the most challenging things humans can do. But get it right and you could change the way we think about the universe."



He wished the UAE well with its project and said that it had a very committed and optimistic approach to its space activities. But he warned that there is no escaping the fact that the UAE cannot afford any launch delays.

"You only have a small launch window when the orbital positions of Mars and the Earth make the trip feasible. Miss that and you will have to wait a long time for the next opportunity."

Sarah Amiri, the UAE's Mars mission team lead, led a panel session on the science behind the Hope probe.

Doctor David Brain, of the University of Colorado, said that understanding the Martian atmosphere better will go a long way to helping us predict conditions on up to 100 billion other planets in the Milky Way.

"We don't know much about the early life of Mars but we do know that its atmosphere is now 95% toxic carbon dioxide at minus 55 degrees Celsius on an average day. The planet's low pressure means liquid water can't exist for more than a few minutes."

Hessa Al Matroushi, the UAE's instrument science lead on the Mars mission, said the Hope probe would help scientists build a holistic model of the planet's daily and seasonal cycles, and help explain why the Red Planet lost a lot of its atmosphere to space.

## The Hope mission to inspire young people

The UAE Space Agency (UAESA) believes its Hope mission to Mars should inspire young people to become scientists and engineers as part of its journey to a knowledge-based economy.

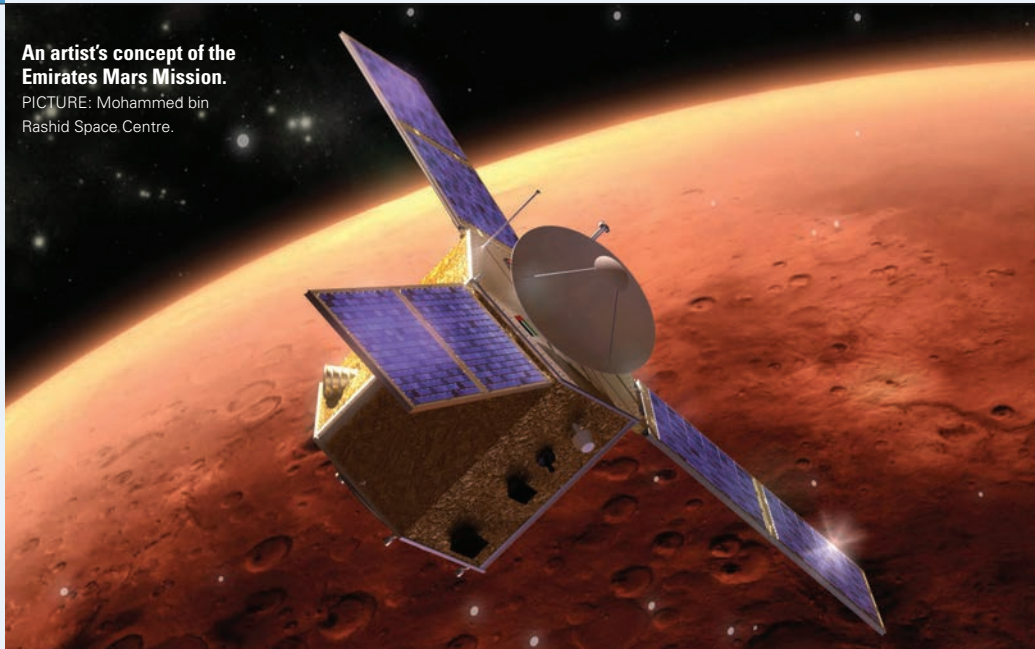
It said it has comprehensive plans to capture youngsters' imaginations and help them follow Hope's journey to the Red Planet.

The UAESA has joined forces with Airbus and rolled-out the first of a series of 'Airbus little engineer space workshops' at the GSSF.

The inaugural workshop challenged around 100 students, aged 15-17, to carry out a simulated mission to space. Over the course of four hours, students assembled and launched a rocket, set up a base and

An artist's concept of the Emirates Mars Mission.

PICTURE: Mohammed bin Rashid Space Centre.



Sarah Amiri, the UAE's Mars mission team lead, led a panel session on the science behind the Hope probe.



established communications. In addition to helping students with science, technology, engineering and mathematics (STEM) subjects, the workshops will also help them practice soft skills including teamwork, communication, critical thinking, public speaking and creativity.



For younger children the UAESA has also joined forces with Sesame Street to target two-to-seven-year-olds with a range of space-related programming and activities.

Sheikha Al Maskari, UAESA's director of innovation

and chief corporate officer, said it was also working with Khalifa University on a range of projects.

"The UAE is a green-field site when it comes to space," she said. "There is a lot of national pride in what we are trying to achieve and we want to inspire the next generation."

Minoos Rathnasabapathy, executive director of the Space Generation Advisory Council, said that catching children when they were young is key.

"We want them to decide they want to be scientists before they reach high school. We also need to show people the benefits of space technology – how it touches them on a daily basis with their phones, their cars, the internet and satellite TV, among others."





## Satellites play key role in disaster relief

The GSSF heard how satellites are helping to save lives after natural disasters and during humanitarian crises.

Thuraya and Yahsat, both based in the UAE, say that their satellites and communications technology have an important role to play that is often overlooked when nations consider the costs and benefits of having a home-grown space industry.

Masood Mahmood, CEO of Yahsat, said that satellite communications continue to work after terrestrial networks fail, which was demonstrated vividly after the recent Nepal earthquake disaster.



“Both mobile phone and internet services provide a vital lifeline,” Mahmood said.

“And the problem with natural disasters is that they often occur in regions where the existing telecommunications infrastructure is not very good to start with.”

Yahsat said its YahClick service can provide high-speed broadband internet anywhere in its coverage area, whether the location is on top of a mountain, on the beach, or in the middle of a forest. It is currently available in 14 countries in the Middle East, Africa and south-west Asia, with more to follow.

Samer Halawi, CEO of Thuraya, said that its

A satellite phone being used during a disaster relief operation in Nepal.

network had recently helped save 500 lives after a boat containing migrants started to sink.

“One of the migrants had a Thuraya satellite phone but no calling credit,” he said. “But they were still able to call our customer services department and we were able to alert the authorities. The result was that many of the passengers were rescued.”



Thuraya has a long-standing relationship with the International Telecommunication Union (ITU) through which it provides free satellite terminals, including both hand-held satphones and broadband terminals, to support communications during disaster recovery.

The company recently collaborated with NetHope, the ITU, and service providers Airbus and Airtel Africa, to deploy Thuraya IP+ terminals in Sierra Leone during the Ebola outbreak.

Philip Davies, MD of Elecnor Deimos, added that Earth observation satellites also have a huge role to play when natural disasters strike.

“After a disaster, such as a tsunami, the whole landscape can change. You need to be able to generate new maps very quickly as the old ones may be useless as bridges collapse and land gets flooded. That’s when satellites come into their own,” Davies said.

## UK signs UAE DubaiSat image applications deal

Deimos Space UK and the Mohammed Bin Rashid Space Centre (MBRSC) in the UAE have signed a one-year contract to develop mapping applications that use DubaiSat-2 and Deimos-2 high-resolution satellite data.

The project has been co-funded by MBRSC (formerly EIAST) and the UK Space Agency’s international partnership space programme (IPSP).

HE Mohammed Al Ahabbi, director general of the UAE Space Agency, signed the contract along with UK Space Agency CEO David Parker, and Elecnor Deimos managing director Philip Davies.

The smart application for feature extraction and 3D modelling using high resolution satellite imagery (SAFIY) project will use Earth observation (EO) data to monitor and detect changes in vegetation, water, road networks and buildings in support of Dubai’s “smart government” initiative.

Safiy is a Muslim name that means best friend.



The 300kg DubaiSat-2 satellite was launched aboard a Russian Dnepr rocket in November 2013 and provides worldwide one-metre resolution images.

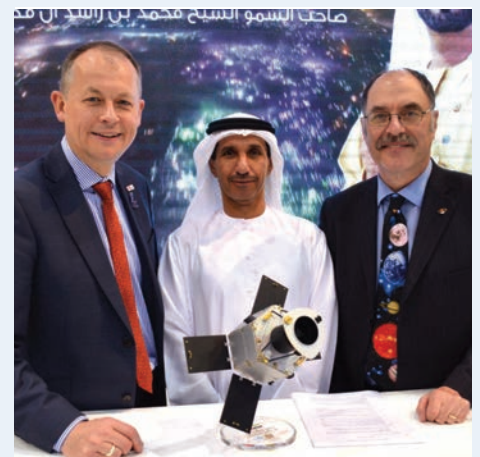
Deimos has a portfolio of Earth observation products, including data from its two satellites, Deimos-1 (22metre resolution) and Deimos-2 (75cm resolution).

Typical applications include products and services for agriculture, forestry, disaster monitoring, land use, surveillance and intelligence.

Elecnor Deimos’ Philip Davies said: “DubaiSat’s data is very similar to our own from the Deimos satellite, which makes it ideal for processing. We hope for more such cooperation in future.”

The MBRSC was created and established by the Dubai Government in 2006 to drive the vision for a knowledge economy in the UAE and support its sustainable development.

The IPSP was launched by the UK Space Agency in November 2014 as a two-year £32 million (\$50m) programme designed to enable UK satellite and other space sector companies to develop international partnerships.



HE Mohammed Al Ahabbi, director general of the UAE Space Agency, (pictured centre), UK Space Agency CEO David Parker (left) and Elecnor Deimos managing director Philip Davies.



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# Collaboration vital to UAE airspace project

*As a decision nears on the best way to restructure UAE airspace, the man leading the project – Ahmed Al Jallaf – says collaboration will be key to the final solution.*

**Barbara Saunders**  
*finds out more.*

**A**hmed Al Jallaf, assistant director general, air navigation services for the UAE General Civil Aviation Authority (GCAA), heads up the team looking at the airspace restructuring project.

It originated from a key recommendation of an Airbus ProSky study initiated in 2013 by the GCAA.

“Other recommendations relating to policy and technology deployment are being implemented alongside the restructuring,” explained Al Jallaf.

Phase 1 of the project, which focused on the lower terminal airspace, has been completed. Phase II, which is tasked with developing a conceptual design for the upper en-route airspace, began in January and, according to Al Jallaf, should be completed by the first quarter of next year.

Meanwhile, work is progressing on the final phase 3, an implementation roadmap, which is aimed at “merging the airspace design concepts with current and future procedures and technologies”.

#### Stakeholders and decision-makers

The restructure, which Al Jallaf believes is “unique”, in that it takes a collaborative approach involving all stakeholders and decision-makers, has resulted in two implementation concepts being put forward.

However, Al Jallaf admitted that obtaining unanimous consensus continues to be challenging. “Looking at the size of the airspace, its complexity and high density, it’s going to be difficult to satisfy everyone,” he cautioned. “The beauty of it, though, is that everyone is part of it and all interests are represented.

“The GCAA is extremely keen to ensure fair representation and fair acceptance and agreement for all. But, given the complexity of the situation in the UAE, a level of compromise will be required.”

The collaborative process has focused on national stakeholders and has involved a degree of coordination with

the Middle East Business Aviation Association (MEBAA) and the International Air Transport Association (IATA).

The Airbus ProSky study determined that management of UAE airspace – one of the most complex in the world in terms of traffic density – matched anything in the west.

“We need more regional solutions,” said Al Jallaf. “Four major airspace blocks are not available for use at the moment in the Middle East – Yemen, Iraq, Syria and Libya – and it’s a huge portion. It is limiting flow and capacity.

“We need more regional enhancement. We are contributing to the Gulf Cooperation Council airspace project, which should kick off by the end of this year or early next.”

On the wider Middle East – the 15 regional states in the International Civil Aviation Organization (ICAO) – the challenges, said Al Jallaf, are different and are being addressed via the Middle East airspace enhancement programme (MEAP), the board of which he chairs.

“The challenges surround the different levels of understanding. We have to convince everyone of the vital role aviation plays in national economic development and that we need appropriate planning to cater to future traffic demand.

“I am, however, confident that we will continue our journey to convince everyone of the need for a regional solution, which will harmonise airspace projects and procedures.”

#### Packages in place

Al Jallaf said despite four blocks of airspace in the region currently being out-of-bounds, work should continue on getting solutions in place. “We need to work with airspace users to find out what they want and then put packages in place so that, when the right time and demand comes, the necessary procedures, systems and documentation are in place.”

For the UAE, which boasts one of the world’s highest aviation growth rates, technology will be crucial to sustainable solutions and Al Jallaf said the investment appetite was right across the board.

“The solution is investment in technology as we cannot expand the airspace available. We need technology to ensure we are fully utilising on-board systems and that everything is fully integrated and interoperable with the airports to allow operators to manage their fleet in line with the system-wide information management concept for the smooth flow of traffic.

“We have the privilege, here, of having government commitment and support to do our best on what needs to be done to ensure we have secured the safety of our operations and we also have the privilege of timely and effective decision-making.

“In terms of investment, there is willingness. All involved have to work through the due process of cost and benefit analysis. We are quick decision-makers but we are smart decision-makers and it takes time to ensure we have the quality vendors and systems that we require.”



*Advances in satellite-based tracking have improved safety and cut costs in Europe and, as **Martin Rivers** reports, north African countries now stand to benefit from Brussels' investment.*

## A watchful eye in the sky



An Airbus aircraft configured for EGNOS trials.

**T**he official launch of the European Geostationary Navigation Overlay Service (EGNOS) in October 2009 put Europe at the cutting-edge of satellite-augmentation technology, which improves the accuracy of global positioning system (GPS) data used by airlines around the world.

EGNOS is one of four satellite-based augmentation systems (SBASs) that uses supplementary ground stations and transponders to sharpen existing satellite signals, reducing the margin of error from 17 metres on standard GPS receivers to about three metres. The other three SBASs are WAAS in America, MSAS in Japan and GAGAN in India.

For airlines in these regions, augmented GPS signals translate to more accurate flight-paths that reduce fuel burn and associated costs; enhanced access to airports with operational constraints; and – above all – improved safety throughout the flight.

It's little wonder then that more than 110 European airports have already adopted EGNOS technology, with regional operators such as Air Nostrum, CityJet and Aurigny Air Services leading the way in retrofitting their fleets.

Wide-body operators are also reaping the benefits, thanks to fact that the Airbus A350 XWB now rolls off the production line EGNOS-enabled.

### Broadening its gaze

Yet, even as Brussels markets its SBAS service to more airlines and airports on the continent, it is broadening its gaze beyond Europe with the Mediterranean follow-up for EGNOS Adoption (MEDUSA) – an initiative that aims to promote satellite-augmentation technology on the other side of the water.

“MEDUSA is paving the way for the introduction of EGNOS services in the north Africa and Middle-East region,” the group wrote in the global navigation satellite system magazine *Inside GNSS*. “EGNOS can deliver added-value services to the Euro-Med region, just by leveraging the existing European infrastructure with only incremental, marginal and natural extensions.”

Partial EGNOS coverage is already available in north Africa following the installation of ground stations – paid for by the European Union – in Djerba, Tunisia; Alexandria and Abu Simbel, Egypt; Agadir, Morocco; and Nouakchott, Mauritania. Separate initiatives have also been pursued with Algeria, Israel, Jordan, Lebanon, Libya, Palestine and Syria.

Fostering political will for uptake of the new technology is a slow process, but recent tests at Tunisia's Monastir Habib

Bourguiba International Airport – which validated precision approaches using EGNOS-enabled localiser performance with vertical guidance (LPV) – have buoyed support for the initiative.

Working with Tunisia's civil aviation authority, MEDUSA identified Monastir Airport as an ideal candidate for EGNOS, due to prevailing technical constraints at the gateway.

The inability to install instrument landing system (ILS) infrastructure for its second runway results in frequent delays and diversions, typically during meteorological events such as sea fog and desert haze.

Flight validation tests using LPV were an overwhelming success, achieving horizontal accuracy of 1.2 metres and vertical accuracy of 1.4 metres with 99% availability.

### Prime candidate

North Africa is not the only part of the continent that stands to benefit from EGNOS. According to Julien Lapie, technical advisor at the Agency for Aerial Navigation Safety in Africa and Madagascar (ASECNA), the Senegal-based air traffic control agency covering most of west Africa, his region is also a prime candidate for adoption.

“As far as our agency is concerned, we are currently implementing a roadmap for our member states to introduce EGNOS in our area of responsibility,” Lapie confirmed. “We have learned from the past that the lack of vertical guidance was a contributory factor in some accidents [in Africa]. EGNOS-based approaches are one solution.”

Moreover, ASECNA is currently nearing completion of a two-year project – dubbed satellite navigation services for African region (SAFIR) – which will lay the foundation for future EGNOS availability across the whole of sub-Saharan Africa.

“Several studies of the implementation of SBAS services in Africa have been carried out and have indicated robust and undeniable social and economic benefits, especially in aviation,” the agency said in 2013, citing cost-benefit analyses that estimated a 30-year outlay of €360 million (\$396 million) would deliver €1.7 billion of cumulated benefits.

Crucially for Brussels, wider adoption of EGNOS also serves as a stepping-stone towards Galileo, Europe's planned 30-satellite successor to GPS. Taken alongside China's planned 35-satellite BeiDou system – plus the on-going development of new SBASs in China, South Korea and Russia – airlines have a very real prospect of enjoying dual-frequency, multi-constellation signals within years. In a post-MH370 world, that is surely something to celebrate.

**“We have learned from the past that the lack of vertical guidance was a contributory factor in some accidents in Africa. EGNOS-based approaches are one solution.”**

JULIEN LAPIE

A new European reporting regulation is intended to encourage an open aviation safety culture and has implications for Middle East organisations aligned to European standards. **Chuck Grieve reports.**

## Culture shock...or a step forward?

**T**he ancient Greek historian, Plutarch, recognised the folly of killing the messenger who brought bad news.

Despite ample evidence to support that view, some modern cultures continue to punish people for reporting mistakes that, if acted upon, could save lives.

Now the European Union (EU) is taking steps to promote a 'just culture' throughout its jurisdiction and in regions aligned to its standards.

EU Regulation 376/2014, which requires aviation organisations in the EU to adopt and maintain a proactive, evidence-based approach to open reporting of safety occurrences, comes into effect on November 15.

It aims to do that by eliminating what safety experts see as the inappropriate punishment of front-line staff for genuine mistakes, which can lead to concealing errors.

### Important step

For organisations across the Middle East that are aligned to European Aviation Safety Agency (EASA) and EU regulations, the new 'just culture' regulation is an important step in incident reporting and in ensuring safety across the industry.

"As air traffic continues to increase and the technical complexity of modern aircraft grows, it is becoming even more important to understand and recognise potential risks," said Sean Parker, focal for safety reporting for the UK Civil Aviation Authority (UK CAA). "Honest and open reporting of incidents is the first step in developing this understanding."

Experience shows that accidents are often preceded by similar safety-related risks and incidents – many of which go unreported. For example, eight days before the Taipei Chiang Kai-shek airport disaster in 2000, a pilot in poor visibility almost mistook runway 05R for take-off, despite the runway being closed for construction. This incident was not reported so no action was taken – and just days later, SIA



The UK's CAA has a safety reporting system in place to support 'Just Culture'.

Flight 006 made the same mistake. The aircraft crashed into heavy plant on the runway, killing 83 of its 179 occupants.

This is exactly what the new regulation aims to prevent, said Parker. "It's important that employees report incidents for a number of reasons, but primarily so that people understand when something has gone wrong and can learn from that incident and put in place measures to prevent it from happening again, potentially with more severe consequences."

### Air safety occurrences

In the UK, 'just culture' principles have always been central to the investigation of air safety occurrences and are currently applied by UK law. The UK CAA has experience of this culture and contributed to the new EU regulation.

EU Regulation 376/2014 encompasses a broad range of organisations, some of which are not currently directly regulated by the aviation authorities, such as ground-handling organisations.

It also introduces the requirement for aviation organisations to adopt processes that guarantee the implementation of a 'just culture' – a "challenging move" that could bring real change, said Parker.

"We recognise transformation to a 'just culture' cannot happen overnight. Organisations need to overcome the behaviours that prevent occurrences being reported. They must ensure that their front-line staff won't be punished as a result of reporting safety hazards or high-risk occurrences – and that staff believe this to be true."

For organisations in the Middle East that aim to comply with the new EU regulation in November, the UK CAA urges that preparation starts now. Organisations should develop clear reporting processes, organisation-wide communication and effective training for all employees from front-line staff, line managers to senior management.

Even more important is analysing and acting on information provided, taking appropriate corrective and preventative action where required. Without this, said Parker, no benefit will be derived from the reporting process and "staff may even lose confidence in the system and stop reporting incidents all together".

"The sooner the whole industry worldwide can adopt effective open and honest reporting systems, the more sophisticated safety information and risk detection will become."

■ For more information see

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Above and beyond



## Taking the pulse of the 737

*At day eight into its journey along the Renton production line, the latest Flydubai Boeing 737-800 was just two days from being rolled out and prepared for flight, reports Phil Blizzard from Seattle.*

In what could be described as a factory of giant ‘Airfix’ kits, there are enough pieces to supply the demand of the most ardent model maker.

This gigantic structure is a temporary home to numerous Boeing 737s in various stages of assembly – all lined up, as if to taxi to a runway, and almost ready for take-off.

At the Renton factory, just a few miles south of Seattle, the final assembly of 737s began in December 1970 and, since then, they have all been assembled here.

At the time of construction, Renton was the largest building in the world by volume. It has, however, been surpassed by the Boeing’s Everett production facility, north of Seattle – which at just over 13 million cubic metres (472.3 million cubic feet) is now the largest building in the world.

The vast numbers of aircraft parts arrive at Renton by road or rail from numerous manufacturing facilities and suppliers all across the US. Boeing engineers, working in a three-shift pattern, then assemble the multitude of components, including finished engines, into a complete aircraft in just 10 days – turning around 42 aircraft every month.

Down on the shop floor, inside the cavernous production facility, I was dwarfed by the fuselage of aircraft LN 5465, the latest for Flydubai.

### Protective green coating

Still wrapped in protective green coating, the 737-800 NGs are built on a slow, but continuously moving, assembly line. This method of production is referred to as ‘pulse line manufacturing’ according to Marty A Bentrott Snr, vice president, international sales.

“The pulse line is very efficient. We are building 42 737s a month using this production method,” he said. “When I was here in the mid-90s we were building just 24 aeroplanes per month and we were talking about going to 30, which then was just unheard of! People didn’t believe we could do it and now we are assembling 42 a month.

“In 2017 we plan to complete 47 and in 2018, based on market demands, that could rise to 52.

“This Flydubai aircraft is in final assembly on day eight of its production lifecycle and, by day 10, it is actually going to

roll out of that far door and be prepped for its first flight.”

With Bentrott was Ken Gile, chief operating officer, Flydubai, and when asked how felt about being alongside the carrier’s latest ‘baby’ he said: “This is very exciting. In 2008 we had the idea for Flydubai and put in an order for 50 aircraft. In just seven years we have received nearly all of them. We started flying on June 1, 2009 and now look forward to carrying passengers on this aircraft from this summer onwards. But, before that it will go to Amman in Jordan to be fitted with the interiors.”

This newest aircraft will fly via Glasgow, UK, to Amman, where it will be fitted with seats and the in-flight entertainment systems, before continuing to Dubai to enter Flydubai’s fleet.

### Fitting out

The fitting out will be conducted by JorAMCo, a company with more than 50 years of experience, which will also provide the entry into service (EIS) checks.

When completed, this aircraft – registration A6-FEY – will be one of the final deliveries for Flydubai from its original order of 50 made at the Farnborough International Airshow in 2008.

Flydubai has a further 11 737-800s from its 2013 order before commencing deliveries of the fastest-selling 737 of all times – the 737-MAX.

At the time of our visit to Renton, in early June, production of the 737-MAX had begun, on schedule, with employees assembling the wings for the first 737 MAX flight-test aircraft.

Bentrott said: “The 737-MAX takes a lot of the lessons and capabilities of the NG and moves it to the next level, including improved aerodynamics and new engines for better fuel efficiency. Overall operational efficiency of the aircraft is going to be about 14-20% better than the NG.”

The first 737-MAX is expected to enter service in 2017 with launch customer Southwest Airlines. To date, orders for more than 2,700 aircraft have been placed from 57 customers, including 75 for Flydubai, which is expecting delivery of its first 737-MAX in the last quarter of 2017.

*Innovation was the name of the game, incorporating a record-sized in-flight entertainment section, when this year's Aircraft Interiors Expo (AIX) took place at the Hamburg Messe in Germany. Steve Nichols was there.*

# The IFE virtual turns into reality

**M**ore than 500 exhibitors from 30 different countries were spread over seven halls at AIX this year compared with five in 2014. The IFE Zone grew by 31%.

The show came on the back of a recent report from the International Air Transport Association (IATA) showing global passenger traffic has strengthened year-on-year.

Total revenue passenger kilometres rose 6.2% in February, an improvement on the January year-over-year increase of 4.5%.

The 2015 Passenger Experience Conference also took place at the nearby Congress Centre Hamburg (CCH) on the eve of the show.

Industry experts and stakeholders met to discuss contemporary issues, such as cabin innovation, consumer expectations and strategies for profitability within the cabin.

## Wonders of the world

Opening the conference, Professor Richard Seymour, founder of designer Seymourpowell, urged air transport industry delegates to stop their preoccupation with providing airline passengers with packaged entertainment and open up their minds to the wonders of the world, above which they were travelling.

He advocated cameras that could generate extraordinary images of the ground from 38,000 feet, enabling passengers to view in real time wildlife on the Serengeti or the ruins of an ancient city.

The main expo itself saw a number of innovations launched.

Airbus and Recaro Aircraft Seating announced their plan to offer, for the first time, a supplier-furnished-equipment (SFE) economy class seat option for A320 family operators. The proposed new seat, named 3530Swift, is based on Recaro's BL3530, already developed for the A320 family.

Airlines will be able to customise the 3530Swift with various catalogue options, including leather covers, comfort cushions, more stowage space and a six-way adjustable



**Neil James: live sports is the killer application, with passengers often glued to cricket, football, rugby or even US events like the Super Bowl.**

headrest. Customers would also be able to select a tablet PC holder and tablet PC stowage, as well as a power socket for USB and PC.

BAE Systems announced that Vistara is the launch customer for its IntelliCabin IFE system, which provides in-flight wireless streaming of preloaded content to customers' personal electronic devices. The system also includes fully integrated Samsung Galaxy Tab S tablets for business class customers.

The entire Vistara fleet will incorporate the IFE system and is expected to go live in six months. In the interim, BAE Systems is providing Vistara's business class customers with customised Samsung Galaxy tablets with specially selected preloaded content.

Wireless IFE was definitely a popular theme at the expo. Lumexis launched its new iPAX system, which combines a back-seat monitor with Wi-Fi to bring entertainment and information to passengers. And, in a first,

Lumexis, which is best known for its 'fibre-to-the-seat' solution, as used by Flydubai, was bold enough to announce the price publicly.

The in-seat system, which weights only 8.9 ounces (250g) per unit, will be priced at \$1,495 per seat.

The system features a 6.1-inch organic light-emitting diode (OLED) screen with 1080p HD video and offers passengers a wide choice of entertainment, moving-map, food and beverage, and catalogue shopping.

Northern Avionics also introduced its wireless avionics entertainment system (WAVES), its latest line of wired and wireless IFE and cabin management systems.

## Launch customer

Panasonic Avionics announced that China Southern Airlines, Asia's largest airline, is to be the launch customer for its eXO IFEC system, which is designed with single-aisle aircraft in mind. China Southern has chosen it for its new narrow-bodied fleet of Airbus A320s and A321s. It will be delivered from early 2016.

Panasonic also claimed that it now has a 46% market share of the global in-flight connectivity market for Wi-Fi-equipped aircraft. The figure is believed to be based on the number of aircraft equipped/flying and using satellite, excluding ATG (Gogo) in the US.

Neil James, executive director, sales and marketing, said that the company had had a record financial year with a 16% increase in revenue in 2014, compared with 2013. He added that it had registered a 10% increase in its order book with 155 IFE programmes won aboard 1,134 aircraft in 2014. He said Panasonic expects to be flying on 12,000 narrow-body aircraft in the next 10 years.

James said live in-flight TV coverage was "huge" in the Middle East, with Etihad and Emirates competing to provide the best service.

He added that live sports was the killer application, with passengers often glued to





**SITA OnAir's Aurélie Branchereau demonstrates its 3D virtual reality headset.**

cricket, football, rugby or even US events like the Super Bowl.

SITA OnAir said that it had been testing the use of 3D virtual reality headsets for premium passengers who wanted to know more about their destination.

Francois Rodriquez, SITA OnAir's chief strategy and marketing officer, said that the concept had been demonstrated at Qatar Airways' innovation day in March.

"If adopted, an airline might put together some 3D content in conjunction with the local tourist office," he said. "It is just a concept at this stage but everyone who has used it has been impressed."

The system uses a Samsung/Oculus VR headset which, when paired with a Samsung Galaxy Note PDA, gives the illusion of 3D. It is designed to work with the company's OnAir Play service, which can deliver IFE content to a device via Wi-Fi.

SITA OnAir also said that its latest figures show the take-up rate for in-flight Wi-Fi increases by up to 10 times when airlines provide it for free. It said that nearly every passenger now has the potential to be connected, with 97% having a personal electronic device of some form.

It added that different business models have

been adopted to meet demand. For example, Emirates provides free Wi-Fi for all its passengers, in every class, as a standard cabin service.

A new LED cabin lighting solution that gives airlines four billion colour and light intensity levels to maximise passenger comfort during flight was launched by digECOR. The system is fully integrated with digECOR's Glide seat-centric IFE solution and is available as a direct replacement for most aircraft common light fixtures in sidewall and ceiling use.

Thales also announced that its IFEC activities have been rebranded as Thales InFlyt Experience.

#### **Strategic shift**

The company explained that this strategic shift focuses on the passenger experience that Thales enables airlines to offer, as well as the airline experience where customers engage with Thales to design, deliver and support their solutions.

Thales' Android-based Avant IFE system made its debut on Qatar Airways' A350. The company also said that it was working on bringing Inmarsat's ultra-fast Ka-band GX Aviation service as a line-fit option on the Airbus A350 for Qatar when the service is launched later this year. It also said that it would be offered as a retrofit option on the A350 in due course.

Staying with the A350, Airbus announced it is to introduce a new flexible seating arrangement across its wide-body aircraft, starting with the A350. This includes a new slim-line toilet area that could mean six more seats could be accommodated.

Boeing also took the opportunity to showcase its new space bins for the 737 at the show.

Space bins answer the call for more space to stow carry-on bags. Each of the larger bins can hold six standard-sized bags, two more than the large current Boeing Sky Interior pivot bins installed on many next-generation 737s.

That allows for 194 total bags in space bins on a 737-900ER or 737 MAX 9, compared with 132 in the current bin configuration.

And finally, seven companies scooped prestigious Crystal Cabin awards. These were B/E Aerospace, Embraer, SABIC Innovative Plastics, SII Deutschland, ViaSat, Etihad Airways and Hamburg University of Applied Sciences.

Etihad Airways won the Premium Class and VIP award for its Airbus A380 first class upper deck.

■ The next AIX in Hamburg will be held from April 5-7 2016, with the passenger experience conference on Monday April 4.

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Oman Air recently added six Boeing 787 Dreamliners, 16 Boeing 737s, and three Airbus A330s to its stable. All the new aircraft will be equipped with Thales' Avant system.



## Why airlines shouldn't make a meal of connectivity

*Kuwait Airways and Oman Air have chosen the Avant in-flight entertainment system for their new aircraft.*

**Liz Moscrop** talked to the manufacturer, *Thales.*

**F**orget airline meals – a recent survey by Carlson Wagonlit Travel measured triggers of stress on a journey and found that a lack of internet connection was the second biggest concern for business travellers, falling just behind loss of luggage.

It is estimated that, by 2025, 70% of the world's fleet will be equipped with connectivity.

Middle East airlines are taking note of passengers' preferences. Two regional carriers recently opted to add Thales' in-flight entertainment and connectivity (IFEC) services to their fleets.

Oman Air recently added six Boeing 787 Dreamliners, 16 Boeing 737s, and three Airbus A330s to its stable. All the new aircraft will be equipped with Thales' Avant system. The carrier has also added the manufacturer's Touch PMU handset to its order. Passengers will have access to a wide selection of on-demand entertainment delivered through an on-screen interface developed specifically with Oman Air.

The system is offerable on all new generation Boeing and Airbus platforms and proved to be a winner, too, for Kuwait Airways, which has taken it for its five new Airbus A330-200s – its newest wide-bodies for 18 years.

In addition to the on-demand passive entertainment, Thales offers the latest generation of applications on the market, including its own state-of-the-art 3D maps. In premium class, Kuwait selected the 15.4-inch video monitor, and 10.6-inch video monitors in the back.

Dominique Giannoni, CEO, Thales' InFlyt experience said: "Kuwait Airways is undertaking significant investments to modernise and develop its fleet and its choice of Avant signals its commitment to passengers' cabin experience."

So what else is on Thales' menu? The OEM announced

earlier this year that it is committed to "reshaping" its IFEC activities and created a new division – InFlyt Experience – that merges its entertainment, connectivity and services together. The complete portfolio combines state-of-the-art in-seat entertainment systems with wireless content streaming and high performance connectivity services, underpinned by support, maintenance and content management.

A spokesman for the OEM said: "By understanding airlines' expectations from the early design phase through to in-service operations, we can deliver reliable and easy-to-maintain systems, capable of evolving at a competitive price, designed to maximise return on investment."

To add to the feast, connectivity comes via its Flytlive offering, which comprises a host of fast and secure broadband connectivity, connected services, and live content management services. Thales also offers Flytcare, a global maintenance and repair service.

Thales is determined to beef up its connectivity offerings and, earlier this year, teamed with satellite Internet start-up Leosat to conduct a one-year cost study of its planned low Earth orbiting (LEO) constellation of high-throughput broadband satellites. Leosat aims to operate a constellation of small, high-throughput Ka-band spacecraft that will deliver Internet services globally by 2019.

That's quite a plateful. The spokesman continued: "For airlines, this portfolio creates fully integrated solutions, driving differentiation. It offers a connectivity-enabled Android platform, underpinned by strong application development services, drives enhanced business to customer (B to C) marketing, ancillary revenue generation, flight monitoring, data analytics and reporting to manage and use information and live content."

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*The 2015 SITA Air Transport IT Summit, held in Belgium, attracted delegates from around the world and showed how technology continues to help improve the passenger experience, both at airports and in the air. Steve Nichols reports from Brussels.*

# Personalisation...IT's the key to the future

**T**he summit brought together representatives from airlines and airports with case studies and reviews of what is seen as current best practice in the IT field. It was also an opportunity for SITA to demonstrate what it is developing.

The event was also the chance to unveil findings from the latest airline IT trends survey, which has polled responses from airline IT managers for the last 16 years.

This year's survey showed that airlines are shifting from a one-size-fits-all approach towards a more tailored solution.

And, the increasing use of personal devices, and technology such as beacons and proximity sensing, promises to let airports and airlines offer passengers a more personalised experience.

Passengers say they are keen to use their own devices for flight and other information and it is up to the industry to respond. But caution was raised over the vast number of travel apps available – more than 17,000 on the Apple Store alone – along with their quality and accuracy.

Max Kingsley-Jones, editor of *Airline Business* said: "The key is to offer personalisation to passengers in a simple way that amazes rather than frustrates them."

But this is not going to be easy. Around 40% of airlines said they expected their IT budgets to increase this year, with low-cost carriers even more bullish, expecting 85% uplifts.

The summit heard how passengers are increasingly using their personal devices, both for booking and check-in; 9% of all passengers used their smartphone or tablet to check-in this year, double the previous figure.

Information kiosks and beacons are also gaining traction with passengers being able to download information, books, films and other media to their smartphones and tablets. More than one in five airlines say they expect to be offering this service by 2018.

Bacons will also be able to deliver timely information to passengers, such as directions or reminders that they need to go to their gate.

Traditional stress points, such as baggage check-in and security, are also getting an IT makeover with self-service bag drop, facial recognition and other biometric tools helping to speed passengers through otherwise lengthy queues.

SITA had some of this technology on display. Facial recognition is a hit with passengers, who see

it as unobtrusive and akin to taking a 'selfie', said SITA's Vincent D'Haeyere.

"Our trials have shown they prefer it to iris scanning – or at least the iris scans where they have to press their eye close to the scanner," he said.

Some commentators foresee a rise in wearable technology. Tim Grosser, head of digital transformation at the International Air Transport Association (IATA), said it was developing a new app called SkyZen that works with a Jawbone biometric monitor to help passengers better understand when they need to sleep, and take better care of their body when flying.

"For example, we can say that we see you are taking a 7am flight, so why not go to bed earlier the night before," said Grosser. "We will also know that a person might have to walk 3km through an airport, but they normally only walk 2.3kms a day – so do they need any assistance when they land?"

But the final word rests with Rohit Talwar, CEO, Fast Future Research, who said: "The world has been transformed by the smartphone in just nine years. What could happen in the next nine? And how do we ensure the choices we make today are going to be the right ones for tomorrow?"

Continued  
on Page 108



## Keeping a watch on developments

SITA and Québec City Jean Lesage International Airport (YQB) are claiming a world first for the airport workforce's use of the Apple Watch.

The airport are using the watches to connect to its SITA airport management solution to push regular operational alerts to duty managers.

The SITA Lab team built the application for the airport and conducted all the systems integration work to link the Apple Watch.

Marc-André Bédard, vice president, information technology, Aéroport de Québec, said: "We are always looking for new technology to help enhance our operations, and ultimately better serve our passengers."

"For example, we may get an alert to say that two planes are arriving simultaneously and have been assigned to the same gate, or that there is a delay at a certain gate."

"Previously, our duty managers would have checked their tablets regularly for updates. With the watch, a vibration alerts them to an update so they receive vital information just by glancing at their wrist. They can then take immediate action."

The SITA airport management solution, which is in use at 150 airports in 48 countries, streamlines operations by enabling the airport to control all its activities from a single central control centre.

Jim Peters, chief technology officer, SITA, said: "This is another example of how SITA is leading the way in exploring new technology for the air transport community."

"SITA's boarding pass application programming

interface (API) already works with the watch, and the team wanted to trial different ways to harness the benefits of Apple's new technology."

SITA thinks wearable technology could have big uses in the aviation industry. Last year it pioneered the use of Google Glass.

Copenhagen Airport gave Google Glass the "thumbs up" after a successful trial by its passenger services team, who worked with SITA Lab.



The Google Glass device displayed internet information on a tiny screen at the top right of the wearer's vision. It could also understand voice commands and take photographs or record video.

The team used the technology with duty rosters, desk allocation sheets, peak prognosis, passenger numbers and arrivals.

Results from passengers and the airport service team were both positive, thinking the technology enabled them to offer better passenger service.

In another trial with Virgin Atlantic, Google Glass was used by concierge staff in the airline's upper class wing as passengers got out of their chauffeured limousines at Heathrow's T3.

The technology allowed passengers to be greeted by name, and let Virgin staff update them on their latest flight information, weather and local events at their destination, or translate foreign language information.

## Airports must become smaller – Dubai chief

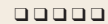
In a surprising statement, Paul Griffiths, Dubai Airports CEO, said future airports should become smaller rather than larger.

At first glance this seems odd, especially as Griffiths is behind the new Dubai World Central (DWC) airport, with its five 4,500 metre runways, 450sqkm and capacity to handle 240 million passengers per year.

But Griffiths is adamant. "DWC will actually be 12 small airports on one site," he said. "The idea is to make it easy for transiting passengers to walk a short distance from one gate to another. The way to do that is by careful computer analysis of who is flying into the airport and where they are flying out to, so that we can park the best two aircraft at the most effective gates for the job."

Griffiths added that each of DWC's "12" airports will be completely scalable, but also absolutely identical and self-contained.

"Using technology, we can dynamically optimise our traffic to ensure that no one will have to walk more than 400 metres from one aircraft to another," he said. "Simple intuitive airport design is what we want."



Griffiths said that, in 15 years, we could see 1.8 billion additional people travelling from Asia alone.

"We are seeing a huge shift in mobility across the world and more people want to be connected than ever before. It makes you wonder how we are going to cope with this demand. But underpinning all this are the massive technological breakthroughs that we are seeing every day."

"In Dubai we are situated right in the middle of that growth. In the past we have been infrastructure specialists; spending vast sums of money on bigger and bigger facilities to cope with increasing demand. But how on earth can this continue?"

"We need to copy what other industries do – achieve more with less by working smarter, not harder. For example, with 100% smartphone penetration we can communicate with customers individually. And we should leverage that power to make their journey easier and less stressful."



Paul Griffiths: Each of DWC's "12" airports will be completely scalable, but also absolutely identical and self-contained.



Gary Kelly: A drone inspection is safer for ground personnel.

## Drone hull inspections bring cost savings to Emirates

Emirates Airlines has been using SITA-supplied drones to make big cost savings by using them for hull inspections on its Airbus A380 fleet.

The tiny tethered unmanned air vehicles (UAVs) are being trialled by ground crews, who use their high-definition video cameras to check aircraft fuselages for damage, especially from lightning strikes.

This can be a time-consuming job, usually involving ground staff using cherry pickers to painstakingly go around every square inch of the aircraft.

□□□□

They are looking for tell-tale paint damage caused by high-speed hail impacts or lightning's multi-megawatt discharges.

Gary Kelly, from SITA Labs, said: "The trial looked at whether the image quality and resolution would be good enough for the inspections.

"The answer was yes and we are now looking at

developing an algorithm that could automatically detect any damage by analysing the drone images.

"Right now a traditional inspection can take 10-20 hours. These are mandatory if an aircraft has flown through a thunderstorm. An aircraft on the ground costs the airline up to \$10,000 an hour, so the quicker an inspection can be done the better. A drone inspection is also safer for ground personnel too," said Kelly.

All the imagery was stored in the cloud and the trial looked at whether the drone could perform the inspection autonomously.

The drone inspection trials, and airport incident examinations, have been conducted at both Dubai International and Geneva Airports over the last couple of months.

"Ultimately, we would like the technology to produce faster and more accurate inspection reports. The benefits to airlines could be enormous," Kelly concluded.

## Mobile biometrics are the future

Passports, boarding passes and luggage tags could soon be museum items, according to industry experts.

In their place could come personal biometric data stored on your phone, plus lifetime electronic boarding passes and luggage tags.

These could be based around radio-frequency identification (RFID) tags that know who you are and link to the airport and airline computer systems to find out where you travelling.

Renaud Irmingier, director of SITA Labs, said the company is looking closely at the technology to see how it could be used.

"There is no reason why your fingerprints and passport couldn't be stored on your phone," said Irmingier. "The Apple iPhone can handle fingerprints already."

## Oman Air goes for FlightTracker solution

SITA OnAir has signed up Oman Air as a customer for its FlightTracker solution. This enables airlines to track aircraft movement by merging data from SITA's airline dispatcher centre system and airline operations centre system (AIRCOM) server, with future air navigation system (FANS) ground applications.

FlightTracker was introduced following the Malaysia Airlines flight MH370 tragedy and the subsequent International Civil Aviation Organization directive on aircraft tracking.

Oman Air joins Malaysia Airlines, Singapore Airlines, Royal Brunei, Norwegian Air Shuttle and 10 other as yet undisclosed customers for FlightTracker.

The system combines automatic dependent surveillance – broadcast (ADS-B), aircraft communications addressing and reporting system (ACARS) and air navigation service provider (ANSP) data to provide the tracking.

In addition, it enables airlines to proactively obtain automatic dependent surveillance – contract (ADS-C) tracking data immediately when it detects a gap in data from other sources. It can also obtain one-off position reports from the flight management computers on short-haul aircraft that do not have FANS data link avionics.

Ian Dawkins, SITA OnAir CEO, said:

"FlightTracker can be installed and running within a couple of days and doesn't need any additional equipment to be installed on the aircraft."

SITA OnAir is also working on streaming live black box – virtual quick access recorder (vQAR) – data to the ground.

*Thales used the Paris International Airshow to demonstrate its expertise in aviation technology. Steve Nichols took a look at what the company has to offer.*

# Thales of the unexpected

**D**emonstrations of Thales' latest in-flight entertainment and connectivity (IFEC), passenger security, air traffic management and human-machine interface product lines, were all on show at Le Bourget.

Thales also announced that Oman Air has selected its Android-powered Avant IFE system for its fleet expansion. This comprises 16 Boeing 737s, three Airbus 330s and six Boeing 787s.

Thales demonstrated how it is the driving force behind many security systems at airports across the Middle East, including Dubai International and Doha International.

It is currently working on the next generation of airport security systems, looking at ways to improve passenger flow, while maintaining high levels of security.

Thales says any future airport security solutions must both speed up passenger flow and concentrate security efforts where they are needed most.

Two solutions it is developing are selective security profiling plus automated check-in and border control. It aims to create a passenger-profiling tool that can quickly and easily highlight passengers that might pose a threat.

The tool uses passenger name record (PNR) information as supplied to the airline as one of its main databases. It then integrates other information from police and security watch lists and filters the passenger list according to age, gender and nationality.

Other added data includes whether the passenger bought the ticket online or over the phone, how they paid for it, where they have travelled previously, whether they have reported a lost passport or travel documents and even the weight of their baggage.

Sophisticated algorithms then highlight the

probability that a passenger might be a suspected terrorist or potential drug smuggler.

The system can detect what Thales calls "weak signals" that highlight the passenger as being "atypical". This could be as simple as a passenger travelling without luggage or with luggage statistically lighter or heavier than average. The system can also call up a passenger's biometrics if they are stored and can display a detailed diagram showing where the passenger has travelled in the past and how frequently.

The security operator can then decide whether to let the passenger through, refer them for further scrutiny or even warn the authorities.

"The vast majority of passengers are obviously not terrorists," said Vincent Hauseux, Thales' strategy and marketing director, security. "But the system can highlight those that do not present normal, average behaviour. This allows security personnel to concentrate their efforts where they are most needed, allowing passengers who present a low overall risk to pass through faster."

## Iris recognition

The company is also working with the French ministry of the interior on iris recognition biometric systems that are faster and more accurate than other methods, such as fingerprinting.

Its passenger recognition system can also track people through an airport by looking for their face. If security selects a person as being of interest, the system will follow them.

Face recognition is easy in the lab but, in real-life situations, it is more difficult. Nevertheless, Thales reports it can now get a 90% success rate in crowded conditions, which, it says, is "well ahead of the competition". It is currently handling a number of tenders for the technology.

The company is also applying its technology skills to the next generation of air traffic control (ATC) systems.

Thales thinks the future air traffic controller will no longer have a keyboard or mouse in front of them, but will use voice recognition and eye-tracking instead.

Its Shape ATC demonstrator is designed to help the controller concentrate better on the task in hand, showing potential air traffic management (ATM) conflicts up to 20 minutes before they happen using sophisticated look-ahead algorithms.

Shape's eye-tracking capabilities can also be used in training sessions to see where trainees are looking on the screen. This ensures that they are keeping an eye on the whole picture and not missing parts.

The company is also developing Ecosystem, a product that can help ATC centres handle air traffic better. It gives the supervisor a global view of the airspace in his or her region, showing key performance indicators (KPIs), such as air space occupancy and delays.

The system can monitor air traffic up to three or four hours ahead and displays the position of all aircraft in the flight region using automatic dependent surveillance – broadcast (ADS-B) information. It can also help with staff issues, managing controllers' workloads as required.

Thales says Ecosystem could be on the market in 2016. The technology is already being used in the TOPLINK project, which is part of the single European sky ATM research (SESAR).

This project aims to demonstrate the benefits of the deployment of system-wide information management (SWIM)-based services, including meteorological, aeronautical, corporate network and flight information services.





Thales thinks the future air traffic controller will no longer have a keyboard or mouse in front of them, but will use voice recognition and eye-tracking instead.

### ***Latest military radar designs are 'cool'***

Thales has a long history of radar development stretching back 60 years. It is the number one radar manufacturer in Europe, but more than 80% of products are exported.

Its latest ground-based military radar systems are pushing back the boundaries of what is possible. Its Ground Master range is twice as compact as its predecessor, more reliable and offers higher performance.

The secret is its use of cooler Gallium Nitride high-power amplifiers. These are very efficient, providing high power with no need for water-cooling. With no pumps and no water supply, it means that the radar systems can be easily mounted on trucks and deployed rapidly wherever they are needed.

The Ground Master range is software-driven, with digital-beam forming and automatic calibration. It uses multiple stacked beams to scan the coverage area, giving significantly more time on target.

The whole system can also be linked to the internet for remote fault-finding, guiding the operators as to what needs to be repaired or replaced.

The Thales Ground Master 400 has a 470km range and the company has managed to double the mean time between critical (MTBCF) failures to 3,000 hours.

### ***System to detect long-range missile threat***

Thales is building a new long-distance radar to detect intermediate-range and intercontinental ballistic missiles.

The Radar Très Longue Portée (TLP), or very long-range radar, will be installed in the south west of France in the second half of this year.

The TLP should be able to acquire and track ballistic missiles up to 3,000km miles away.

Thales says there has been a rapid proliferation of new highly capable ballistic missiles with a growing number of countries developing them. Early warning capabilities are, therefore, becoming a strategic priority.

The radar will use five radiating panels in a single column and operate on UHF frequencies.



Glenn Latta heads Thales InFlyt Experience.

## Heads up on the latest Topmax

Thales launched its new wearable Topmax head-up display (HUD) at the Paris International Airshow.

The device, which is integrated into a lightweight Bose headset, brings HUD technology to aircraft that have otherwise not been able to take advantage of it.

Topmax displays an image on a tiny monocular display in front of the pilot's eye. It can incorporate synthetic vision system (SVS) or enhanced vision (EV) imagery and knows the position of the pilot's head thanks to discrete sensors fitted to the cockpit ceiling. This means it can give an unlimited field of view as the pilot turns his or her head.

Other information that can be displayed includes the location of other aircraft in the same airspace (using ADS-B information) plus en-route waypoints.

Thales says the first targets will be the business jet and helicopter markets but it expects to roll it out to the air transport market in due course.

## Middle East must wait for Ka-band connectivity

Thales is keen to bring Ka-band in-flight connectivity to the Middle East but it may have to wait until 2016.

With its purchase of Florida-based LiveTV in 2013, Thales acquired a ready-made Ka-band business, which is currently offering high-speed internet access to passengers on JetBlue and United Airlines in the US.

Their passengers enjoy a "12Mbps to every seat" service, which gives them an experience pretty much the same as they get at home.

Now named Thales InFlyt Experience, the business arm is headed by former LiveTV president and co-founder Glenn Latta.

Thales is now bringing the Ka-band business model to Europe with a deal to outfit aircraft belonging to Barcelona-based Vueling.

Mike Moeller, VP business development, Thales InFlyt Experience, said: "What we wanted to do is take the very successful model we have developed in the US and bring it to Europe. We have been very successful with JetBlue and United and passengers

love it. Passengers on JetBlue have free access to 36 channels of direct TV and if they want to use a service like Netflix it is \$9 an hour.

"Live sports has been particularly popular. Sports really have an appeal when they are live – watching a game from a few days ago just doesn't have the same impact."

But that's as far as the service can go. Thales is currently using the ViaSat-1 satellite in the US and Eutelsat's KA-SAT in Europe. But coverage from the latter runs out around the top of North Africa.

So Thales is waiting for the global launch of Inmarsat's GX Ka-band service, which is still awaiting the launch of the third satellite in the set. Honeywell is currently testing its JetWave hardware for the service and a full global launch is expected in 2016.

Thales will then be ideally placed to chase Ka-band business in the region and airlines are hungry for it.

Qatar Airways has said it wants to use GX on its Airbus A-350s when the service is ready and Latta said every Thales Avant IFEC customer wants it as well.



## A new Star is rising

Thales has announced the latest version of its Star primary radar system.

Star NG can now handle wind farm interference better than its predecessor and is also more frequency agile, meaning it can reduce interference to 4G mobile phone systems.

Todd Donovan, Thales VP strategy, air traffic management, said large-scale wind farms exhibit a significant challenge for radars.

"Star NG introduces new features for wind farm mitigation," he said. "This means operators don't need gap filler radar with its associated costs. It also has a better detection range resolution, plus can provide weather data at the same time."

Thales' earlier Star 2000 radar system could give a 45% probability of

detecting an aircraft when looking through wind farm clutter. With Star NG, the probability of detection is improved to 89%.

Star NG is already a commercial success, as it was selected for the Marshall project for the UK Ministry of Defence (MoD). Under its AQUILA guise, the radar will provide air traffic management at all MoD-operated airfields and flying ranges in the UK and overseas for a period of 22 years.

Unmanned air vehicles (UAVs) also present new challenges and Star NG is optimised to detect these as well. It also appeals to military buyers who want to use civilian equipment.

Star NG is scheduled to go through its qualification tests in February 2016. Its first acceptance test is currently slated for Q3 next year.



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Putting the new BIOjet fuel to the test.



**Barbara Saunders** takes a look at a new refining process that will see one Gulf state leading the way in new biofuel technology.

## 20/20 vision for the UAE's fuel of the future

**A** joint industry roadmap for the sustainable production of aviation biofuels in the United Arab Emirates has been rolled out.

It features a 20-point action plan covering four development areas: feedstock supply; bio refinery; distribution and overall supply chain.

The BIOjet Abu Dhabi: Flight Path to Sustainability is a collaborative roadmap by Etihad Airways with Boeing, Total, the Abu Dhabi oil refining company Takreer, and the Masdar Institute of Science and Technology. It is aimed at creating the Middle East's first commercially-viable domestic aviation biofuel industry.

### Knowledge development

Among its 20 recommendations, the action plan calls for knowledge development through the creation of experimental farms; the mapping-out of farm land to facilitate the growing of halophyte crops, which can survive in arid climates and use sea water irrigation; the development of a phased plan to blend aviation fuels into jet supplies; and the exploration of partnerships with local and international stakeholders.

The project's leader, Linden Coppel, head of sustainability, corporate affairs at Etihad Airways, said the upward momentum now



**Dr Alejandro Rios Galván: Aviation industry has "no choice" but to back biofuels development.**

required significant buy-in from government, the commercial sector and civil society. "We have started discussions with various stakeholders and will set up task forces to address the individual aspects of the action plan," she explained.

The initial collaborative partners are bullish about Abu Dhabi's prospects of becoming a bio fuels leader.

According to Dr Alejandro Rios Galván, director, sustainable bioenergy research

consortium, Masdar Institute, the aviation industry "has no alternative" but to back bio fuel development.

"The price of jet fuel has increased from 2000-2012 by 260% and even though there has been some respite recently, increases are likely in the future, meaning the airlines will be held hostage to this volatility. Around 40% of their costs go to this specific item," he said.

"It's clear that we have to respond together to work and push for alternatives that are sustainable."

### Irrigated with seawater

The roadmap suggests Abu Dhabi has the potential to supply domestic alternative fuel feedstock from salt-tolerant halophyte plants that can be irrigated with seawater, inland planted forests and municipal and agricultural wastes.

Research into halophyte products has already begun at a collaborative farm at Sweihan, 70km northwest of Al Ain, where plants are being irrigated by seawater, and also a newly inaugurated experimental farm pilot facility at Masdar City, where eight fields of halophytes are being irrigated by seawater.

The pilot facility – a kind of working laboratory – will double in size within three to five years.

# Claire Athorp talks to Gil Michielin, Thales avionics chief, about the company's prospects

## Seizing opportunities in emerging markets

Thales expects avionics opportunities in emerging markets to account for an increasing portion of its order book as it looks toward the 2017-2018 timeframe.

Gil Michielin, the company's new executive vice president, avionics, said that the company expects that some 35-40% of its business will be conducted in emerging markets by 2017-2018, with opportunities balanced across all areas of avionics in both the commercial and military sectors.

Building on recent successes, such as Qatar's decision to acquire 24 Rafale aircraft – for which Thales avionics equipment accounts for around 25% of the value of each aircraft – Michielin named India, China, and Middle East nations, including Saudi Arabia and the UAE, as countries where the company currently has limited footprints but sees scope to increase operations.

Thales is making moves to meet the demands of the commercial avionics market as this sector sees continued robust growth and aircraft manufacturers ramp up production of next-generation aircraft to meet booming passenger numbers – forecast to rise by 31% between 2012 and 2017.

A key driver is the fact that these passengers increasingly expect broadband connectivity in-flight. "Up to 70% of aircraft flying worldwide by 2025 will



Gil Michielin: "Up to 70% of aircraft flying worldwide by 2025 will be equipped with in-flight connectivity."

be equipped with in-flight connectivity – this is very important to all major airlines, particularly in Asia and the Middle East, where they are not buying aircraft unless they have connectivity," Michielin said.

"As a result, our offerings must grow beyond in-flight entertainment (IFE) to in-flight entertainment and connectivity (IFEC) in order to answer the expectations of the market."

Michielin pointed to the company's acquisition of

LiveTV from JetBlue in June 2014 as evidence of Thales' efforts to "boost its competitive connectivity offerings" and reinforce its leading position in the IFEC market.

"The global commercial aviation market is in a very strong position and we are evolving our offerings so we can benefit from that growth," he said. "We're looking far beyond IFE, toward an in-flight experience that sees each passenger connected to personal and professional networks throughout their entire journey, from door-to-door."

Thales is now taking steps to localise its supply chain in target regions and leverage its global supply chain in order to bring competitive solutions to market.

While work is already under way in China with the Commercial Aircraft Corporation of China under a joint venture to develop IFE for the Chinese market, Michielin indicated that in the Middle East the focus is on innovation, support and services, with Qatar, in particular, driving demand.

"Our work in Qatar [with Qatar Airways to further evolve IFEC systems under a joint innovation and technology project] shows that not only are we keen to innovate but also we are willing to share that innovation with our customers," he said.



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*As aviation in the Gulf continues to boom, Alan Dron investigates the prospects for expatriates seeking employment in the region.*

# Why business is still booming for the expats

**A**rabian Gulf nations face a problem. They want to continue to diversify their economies from traditional hydrocarbon industries. For several, aerospace is a way of doing this. But where do they find the large numbers of personnel necessary to feed that expansion?

Indigenous populations in the Gulf are frequently small, which means that expatriates have to be employed. However, for decades now, Gulf nations have been understandably keen to fill vacant positions with local nationals.

In recent months, there have been suggestions that the boom times for expats heading for the Gulf are about to end. Not only are the increasingly highly educated and trained local citizens becoming better equipped to take on aerospace sector jobs, but factors such as the rising cost of living and nervousness among expats at the political and civil turmoil in parts of the region are said to be turning some people away from the thought of relocating.

## Major role

Aerospace plays a major role in the economies of some Gulf states. In 2013, for example, almost 27% of Dubai's gross domestic product (GDP) came from aviation-related sources and supported 416,500 jobs – 21% of total employment in the emirate.

This is set to continue to grow; in November 2014 a report by UK-based Oxford Economics predicted that, by 2020, an astonishing 37.5% of Dubai's economy would be aerospace and tourism-related.

When one thinks of aviation in Dubai, its two huge airports and Emirates Airline spring to mind. But, for some years, there has been a coordinated drive to build an entire aerospace sector there. That 2013 GDP figure is testimony to what can be done if government and industry are aligned and working towards the same goal.

Qatar Airways, another of the Gulf's 'Big 3', is also using its home base of Doha as an aerospace hub and Etihad is rapidly expanding in Abu Dhabi.

Further up the Gulf in Bahrain, even the much more modestly-sized Gulf Air contributes



## Inspirational award for Twal

**Royal Jordanian pilot Alia Twal has been an inspiration to women pilots since taking up her role as chairman of the Arab section of the Ninety-Nines. Now, the global organisation of more than 5,000 pilots presented her with an "award of inspiration".**

**The Arab section now has 85 members all sharing a passion for flight. On September 29 its fourth annual meeting will take place in Aqaba, in the Kingdom of Jordan under the patronage of HRH Princess Basma Hamza, a pilot herself.**

**For more information contact: twalalia@gmail.com**

around 8% to the island's GDP. Although still loss making, it is financially considerably healthier than a few years ago, when its huge deficits were starting to put a strain on the national exchequer. With the carrier now concentrating on high-value, point-to-point regional services rather than long-haul passengers merely transiting Muharraq, the airline's value to the island kingdom is likely to increase.

Certainly, western recruiters see little sign of demand for their services slowing up any time soon.

"We still see quite a lot of flight crews moving

to the Middle East," said Skaiste Knyzaite, CEO of Lithuania-based AviationCV.com. Salaries remain a major 'pull factor' for pilots and this influx of personnel is unlikely to change.

Indigenisation is proceeding "but there are too few local people", said Knyzaite. "The local nations are quite small and the number of people they need is really huge because of their massive aircraft orders."

Other factors pulling flight crew to the region include the good career progression programmes in place at many carriers compared to other fast-expanding aviation nations such as China, she said.

Andrew Middleton, managing director at Zenon Recruitment, which specialises in providing personnel to airlines, VIP corporate flight and helicopter operators, as well as maintenance, repair and overhaul (MRO) facilities, agrees that the demand for expatriate staff shows no sign of slackening.

## Demand is increasing

"I've been in this business for 26 years and I can't see that changing," he commented. If anything, demand is increasing, despite the number of indigenous people stepping into aerospace roles. There is always the internal demand for indigenisation but they do find that they need to bring in expats. There just aren't enough local staff with the expertise that's required to meet demand."

For historic reasons, expat aviation personnel in the Middle East have tended to come from the English-speaking world. But, in recent years, eastern Europeans have been making an increasing appearance, he said. "They have the expertise and [companies] like taking pilots and engineers [from that region] mainly because their salary expectations are not as high as personnel from western Europe and the US."

Expat staff tended not only to be flight crews but managers, engineers and commercial personnel. Salary and benefit packages in the Middle East were constantly being upgraded to fight off competition from Asia, adding to the attraction of the region.

Certain nationalities tended to settle more



easily in Middle Eastern surroundings, added Middleton: “We find that Australasian personnel are more comfortable being away from home, as are northern Europeans. That’s a giant, sweeping statement but there are certain areas of the world that are more comfortable in relocating to the Middle East than others.”

A reluctance to relocate is really the only reason that prevents some people from working in the region, said William Finden, managing director of Oaklands Global.

His company, which specialises in engineering personnel for both airlines and the military, had seen a “massive surge” in recruitment demand as recently as 2014: “There’s a huge demand for every level and specialism you could imagine in the Middle East. We recruit globally and that’s the beauty of our industry – the skills are transferable; the licences are recognised internationally.”

However, he does detect an increase in turnover in expat personnel: “The cost of living out there is higher; you get accustomed to a certain lifestyle. After three or four years people are looking to come back (home) because they’ve not made the money they thought they

would. We’ve certainly seen that as a bit of a trend.”

Like others, he believes that, no matter how many local personnel are trained up, they will not be able to keep up with demand: “Because of the rate at which the industry is growing, regardless of the number of locals you can get, it’s not going to be enough.”

#### **Hiring strategy**

This latter point was taken up by Emirates’ vice-president of recruitment, Alison Ward: “Although developing opportunities for Emirati nationals is a priority for us, the rate of expansion across the group and with a high staff target in the next few years, means that expatriate recruitment has to remain a part of our hiring strategy.

“In 2015 Emirates Group, which comprises Emirates Airline and Dnata, plans to hire more than 11,000 staff across its business. We will continue to require talent with certain industry expertise for different functional and operational areas, so we inevitably have to look globally at times to fulfil requirements.”

Emirates makes the point that: “As an

international company, we do not set percentages based on nationalities. However, we would be focusing on recruiting nationals for the right roles and exploring new areas to recruit UAE nationals,” said a spokesman. “There is a push for Emiratisation from the government, which is helping us to fulfil the company’s vision on the same.”

At Oman Air, some 60.2% of the company’s workforce is Omani. Expansion over the next five years will mean that the number of expats may rise but the number of Omanis employed will rise faster, reaching 70%.

While stressing its role in employing as many Omanis as possible to any new roles, a spokesman said: “As an international airline, we will always need to employ an international workforce.

“As Oman Air continues its path of rapid growth, there will be an increased number of employment opportunities available across our network and some of those will rightly go to expat staff. However, there are more Omani citizens coming through the educational system and jobs markets with the right qualifications and experience and we look forward to many of them joining the Oman Air team.”

## Boeing appoints Muilenburg as CEO

Boeing has named Dennis Muilenburg as its 10th chief executive, succeeding Jim McNerney, who has held the position for the past decade. Muilenburg, who has served as Boeing president and chief operating officer since 2013, became president and CEO on July 1.

To ensure a smooth transition of his CEO responsibilities to Muilenburg, McNerney will continue working until his planned retirement at the end of February 2016. He will continue advocating on issues important to Boeing's US and global customers, partners and stakeholders, including ongoing Washington DC engagement.

## Regional director job for Donahue

Satcom Direct has appointed Derek Donahue as regional director for Eastern Europe, Middle East and Africa. Based in the Dubai, UAE office, Donahue is responsible for managing the Satcom Direct offices in Moscow, Dubai, and Cape Town, in addition to marketing, sales, support and operational activities in the extended region of Eastern Europe, the Middle East and Africa. Donahue moves to

## SAEED AL DHAHERI IS NEW CHAIRMAN OF SMARTWORLD



Smartworld, an Etisalat and Dubai World Central joint venture company, has appointed Saeed Al Dhaheeri as its new chairman.

Al Dhaheeri, a former IT advisor to the UAE Ministry of Foreign Affairs and previously director general of Emirates Identity Authority (EIDA), said UAE's Smart Cities initiatives have opened a sea of opportunities, especially in the ICT sector.

His prime focus will be on strategic expansion by tapping into these new opportunities across the UAE and Gulf Cooperation Council (GCC) region.

He said: "We are fortunate to have a visionary leader in Sheikh Mohammed bin Rashid Al Maktoum, whose concept of making Dubai the smartest city in the world has opened a wide range of opportunities for growth across all sectors, particularly ICT.

"Along with focusing on strategic expansion across the UAE and GCC region, my goal is to lead Smartworld to contribute toward achieving this great vision."

Dubai following three years working at Satcom Direct's international headquarters at TAG Farnborough Airport, UK, as business development director for Europe.

## Edwards lands Aerion COO role

Aerion has appointed Ernest (Ernie) Edwards as senior vice president and chief commercial officer. He has responsibility for all sales activity related to the company's Mach 1.5 AS2 supersonic business jet.

Edwards reports to Aerion CEO Doug Nichols. "Ernie is known and respected throughout the business jet community around the globe," said

Nichols. "He understands our customer base, which, of course, encompasses the absolute elite users of business aircraft. His contribution to Aerion will be invaluable."

## LORD goes for Rood

LORD Corporation has announced that Joel D Rood has been named president of the company's EMEA region.

Rood succeeds Joe Marotta, who will retire at the end of 2015 after an 18-year career at LORD.

Under Marotta's leadership, the EMEA region achieved major new customer wins on rotary wing platforms through the

company's active vibration control solutions, and several new business awards with automotive and industrial customers for LORD adhesive solutions.

LORD Corporation's presence in the EMEA region has steadily grown with additions of technical, production, and commercial staff, including the opening of a new office in Dubai.

## Boeing names Dunn as ME president

Boeing has named Bernie Dunn president of Boeing Middle East. Dunn will be based in Dubai, and report to Marc Allen, president of Boeing International.

Dunn, who is fluent in Arabic, has lived and worked in the region for most of the last 30 years. Before joining Boeing in July 2012 as president of Boeing Turkey and North Africa, he was vice president, Middle East/Africa, business development, ITT Defense International for 10 years.

Based in Ankara, Dunn has led Boeing activities in Turkey, Morocco, Algeria, Tunisia and Libya for the past three years.

## KIP STEPS UP AS GM



Etiha Airways has appointed Iwan Kip as general manager for Indonesia, based in Jakarta.

Kip, who has more than 10 years of travel industry experience, takes up the role after two years as Etiha Airways' manager direct sales and operations for the Netherlands.

Etiha Airways' senior vice president sales, Jim Mueller, said: "Iwan has a strong record of success in industry sales and marketing and his contribution to our start-up in the Netherlands over the past two years has been considerable. He will play a pivotal role in accelerating the growth of our business in Indonesia."

## EUROPE PUBLIC AFFAIRS ROLE FOR EYDALEINE



Etiha Airways has announced the appointment of Philippe Eydaleine, a seasoned public affairs leader with more than three decades of experience, as head of public affairs in Europe.

Eydaleine will engage with key EU institutions and European states, policymakers and stakeholders, to build an understanding of Etiha Airways and the benefits it brings to Europe in terms of jobs, investment and connectivity.

Based at Etiha Airways' office in Brussels, he will work closely with the airline's regional management in Berlin, reporting to vice president of international and public affairs, Vijay Poonosamy.





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## Ben Griffin

**Marcella Nethersole**

*speaks to the regional director, Middle East and Africa (MEA), Inmarsat.*

5

■ What new things can we expect to see in the coming years from Inmarsat?

The imminent launch of GX (our Ka-band service) is the next big thing that is scheduled for later this year. GX will provide the performance and quality that many customers have been looking for but, so far, have been unable to get close to.

Technology enhancements will also be brought to the market for aircraft equipment – Inmarsat, Honeywell and Kymeta will bring the much-anticipated flat panel antenna technology to aviation. With a profile of around 3cms and no mechanical steering, it will significantly change performance, reliability and economics for broadband equipment on aircraft.

Further, we will introduce a hybrid satellite and air-to-ground service that will augment satellite capacity for Europe. This is the first venture that Inmarsat has embarked upon purely for the requirements of the cabin communications market and promises to deliver huge amounts of capacity to aviation throughout Europe.

Inmarsat will continue the development of our L-band services; specifically, SwiftBroadband safety – due to be launched in 2016. This will bring true prioritised IP broadband connectivity to the cockpit for all manner of safety and operational services.

4

■ What changes have you seen during your time at Inmarsat?

The connectivity aspect of in-flight entertainment and connectivity (IFEC) is compelling and the lure of the large rewards is too good to ignore for some new suppliers. However, economics do not support a myriad of suppliers and this will most likely normalise.

Interestingly, some of the legacy IFE providers make claims that they are not making money from connectivity, which suggests these services are being subsidised from other revenue sources, namely IFE hardware.

Cabin connectivity is on the shopping list for the vast majority of the world's airlines, in some form or another. Many airlines taking new aircraft will simply 'tick the box' to have a certain level of connectivity installed on the line, as opposed to undertaking retro-fit programmes on older fleets. The reality is, the demand is so great there will continue to be a mix of both line-fit and retro-fit in order to provide some level of service commonality across airline fleets.

3

■ What challenges do you face?

Competition is strong but it's also healthy. It is clear that the next generation of frequent travellers will require more and more connectivity capability to reflect the experience they have elsewhere terrestrially. This will be one of the greatest challenges, which is why Inmarsat is looking at augmenting satellite technology with alternatives. One of the biggest challenges is also in helping customers understand the market and when/how they will invest; this is a very complex market with many different messages being portrayed from multiple providers. Perhaps the most important part of my role is helping to decipher facts from various marketing campaigns.

2

■ What does your role involve?

My role is to ensure the aviation community is aware of our services, specifically within the MEA region. It operates predominantly as a wholesale business and reaches our markets through a network of distribution partners and value-added resellers.

I work very closely with these partners to ensure we are covering the opportunities in the region collaboratively. Further, the role requires some dialogue with our airline customers to ensure they are up-to-date with our current and future service offerings. The aviation team at Inmarsat has delivered strong growth over the past few years and, with the advent of GX and other services, our target is to continue that growth for many years by understanding the needs of our customers and delivering services that are second-to-none.

1

■ Can you give me a brief background of Inmarsat, MEA region?

As Inmarsat provides services on a global basis, it's imperative that our customers and partners are supported sufficiently and MEA works alongside Asia Pacific (APAC), Europe and the Americas regions to cover that global customer base. MEA represents an exciting growth area, including not only the large Gulf carriers in the Middle East, but also significant other opportunities throughout the region as we expand our portfolio from legacy L-band services into Ka band, with the introduction of Global Xpress (GX).



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