

Best of the Biggest & the Fastest



billion (Rs 3,93,100 crore) later, the sceptics were eating their words. Dubai may be the world's third largest in terms of exhibitors and space but it is now the world's richest, and there will be few that will wager against it taking the top spot when the show moves to the

new purpose-built site at Dubai World Central, soon to be Maktoum International, the world's largest airport.

This was the tenth edition of the Dubai extravaganza. What started as a small regional event with fewer than 200 exhibitors has grown beyond belief. This final event at the current Airport Expo featured more than 850 exhibitors seen by 45,421 industry-linked visitors from 131 countries. The turnout included 32 civil delegations from 30 countries and 82 military delegations from 48 countries looking at more than 150 aircraft on display.

But these are just statistics. The real value of the Dubai show was in dollars and cents—certainly as far as the civil aviation market was concerned—with both commercial airline and business aviation sectors capturing the headlines.

The action took off within minutes of

The real value of the Dubai show was in dollars and cents—certainly as far as the civil aviation market was concerned—with both commercial airline and business aviation sectors capturing the headlines.

His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, officially opening the show. And it just didn't stop. "The wide spectrum of business achieved was simply breathtaking," said Weller. "It covered all aspects of civil aviation but also considerably impacted the military sector."

Civil Aviation

Emirates, the international airline of the United Arab Emirates, placed orders and options worth over \$34.9 billion (Rs 1,37,192 crore) on the first day for a range of Airbus and Boeing aircraft as well as GE and Rolls Royce Trent engines. Cessna quickly followed with \$190 million (Rs 747 crore) worth of sales to a Saudi private jet operator and Egyptian carrier Nile Air, Brazilian plane-maker Embraer clinched a \$45 million (Rs 177 crore) deal with an order from Abu Dhabi's Falcon Aviation Services and Qatar Airways weighed in with an order for 30 firm and 30 options for Boeing 787-8 Dreamliners and confirmed orders for 27 Boeing 777s.

On the business aircraft front, an historic moment occurred when Aeron took an order for its Mach 1.6 supersonic business jet from a member of the Ajman Royal family which will ensure that its owner, Sheikh Rashid Bin Humaid Al Noaimi, becomes one of the first world lead-

ALAN PEAFORD
DUBAI

There was a moment of disbelief when Alison Weller, the vivacious blonde director of aerospace for F&E, organisers of the Dubai Air Show, suggested that Dubai could become the number one air show in the world. Despite the nods of approval and agreement from Weller's bosses, F&E Chairman Virginia Kern and the show's host, Sheikh Ahmed bin Saeed al Maktoum, President of Dubai's Civil Aviation Department and Chairman of Emirates Airline, the audience who packed the media centre could barely mask its cynicism. Admittedly, Dubai has laid claim to being the biggest and the best of just about everything else it set its mind to—but the air show? One week and orders worth more than \$100



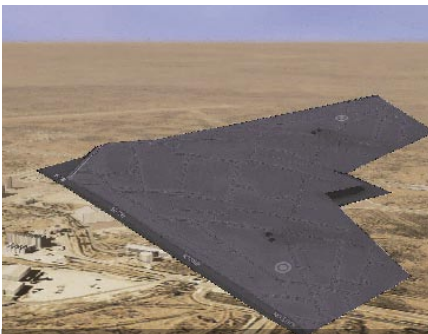
Abu Dhabi Aircraft Technologies will provide MRO services to Etihad Airways

PR Agency / Dubai



The unusual Pitagora UAV

PR Agency / Dubai



BAE Systems won approval for unique UAVs

PR Agency / Dubai

ers to routinely fly above the speed of sound. The supersonic jet is still on paper but the firm order for the \$80-million (Rs 315-crore) aircraft gives the project credibility and others are expected to follow. If you can't be first with the fastest, then you can be first with the biggest. That headline-grabbing deal was between Saudi Arabia's Prince Alwaleed bin Talal bin Abdulaziz Al Saud, Chairman of the Kingdom Holding Company and Airbus for an A380 Flying Palace—becoming the first customer for the VIP version of the new double-deck airliner.

The show's record sales tally soared further when Dubai Aerospace Enterprise (DAE) signed a \$13.5-billion (Rs 53,070-crore) letter of intent with Airbus for up to 100 aircraft, which included an associated deal with Rolls-Royce for Trent XWB engines to power the A350 XWBs. The aircraft will be owned by the group's aircraft leasing and financing business, DAE Capital. Within hours DAE Capital went on to sign a letter of intent for 100 aircraft with Boeing, for 70 Boeing 737 next generation aircraft and 30 widebody planes. Boeing smiled wider when Dubai-based aircraft leasing company LCAL placed an order for six additional 787-8 Dreamliners. Saudi Arabia's National Air Services, the fastest-growing independent provider of aviation services in the Middle East, told a packed media conference that it intends to add 120 new aircraft to its fleet over the next five years while Abu Dhabi's Royal Jet, announced a refurbishment and upgrade programme for its five BBJ aircraft which form the world's largest solely-owned BBJ fleet.

Airbus, in particular, was euphoric. The company recorded its best ever sales result thanks to the multi-billion dollar deals at the show. In total it received 163 firm orders valued at more than \$28 billion (Rs 1,10,068 crore) from 10 customers. At the same time, the order for 70 A350 XWBs and 11 A380s from Emirates Airline was the manufacturer's largest ever in terms of value. In addition, it received 132 commitments from three customers. "Demand for the A350 XWB was very strong with a total of 80 firm orders from two customers. Besides Emirates and DAE, we received a firm contract from Yemenia for 10 A350s. C Jet Limited of Hong Kong also became the first customer for the VIP version of the plane, the A350XWB Prestige," said Airbus' John Leahy.

The show, however, wasn't just about the big jets. The world's smallest jet—the Eclipse 500—attracted a successful order, again by DAE, this time to be used at the company's new training centre. The

growth of airline and business aviation in the Middle East has prompted a demand for up to 3,000 new pilots, let alone the cabin crew requirements. Many at the show were offering training services and the sector was boosted with the \$8.8-million (Rs 35-crore) order by the Emirates for one of the world's largest ever Cabin Service Trainer (CST) installations. The contract went to Dubai's Spatial Composite Solutions which will design 13 CSTs with Emirates' specifications for various Airbus and Boeing configurations and install them at the airline's new Aviation Crew Training College.

Defence

Combat Aircraft: The show had not one, but three national aerobatic display teams with the Spanish Patrilla Aguila making their Dubai debut. Backed by the world-renowned British Red Arrows and the French Patrouille de France, the flying display never ceased to be anything but spectacular, especially with the Spanish landing in full formation. Although the F-15's planned appearance at Dubai was disrupted, Boeing remained confident that the aircraft still had a rosy future. "The F-15 is a terrific platform, and we have only satisfied customers, all of whom come back for more airplanes," said Steve Winkler, director F-15 International Programs at the show. "The Eagle will remain a vibrant part of the USAF for decades to come, with a robust road map for upgrades and capability expansion."

While the cat's away, the mice will play. And MiG took the skies with its ultra-impressive MiG-29M OVT. A one-off test aircraft, converted from one of the original six MiG-29M (9-15) prototypes, it represents part of the test programme for what the MiG calls its new 'Unificated' family of advanced MiG-29 variants. It is not intended to form the basis of a service variant in its own right, though its thrust vectoring engines could be offered as part of possible MiG-29SMT and MiG-35 production configurations. The

MiG-29K (9-41) and the KUB (9-47) are destined for the Indian Navy and based on the original 9-15 (29M) variant with increased fuel capacity, fly-by-wire control system and Klimov RD-33K engines rated at 19,400 lb thrust.

The other new-build version is the MiG-35 (originally known as the MiG-29M2), which combines the new 'operational' two-seat forward fuselage with a Phazotron NIIR Zhuk-AE AESA (Active Electronically Scanning Array) radar, together with a new electro-optical sensor suite and a new, more capable defensive aids suit. With dedicated air-to-ground optronic sensor package mounted on the bottom of the starboard engine nacelle ground attack options are improved. The MiG-35 is being heavily promoted for the upcoming Indian MMRCA requirement, and will be offered in single-seat and two-seat (MiG-35D) forms.

Unmanned Aerial Vehicles: As UAVs take on an ever increasing role in today's armed forces, BAE Systems was promoting its HERTI (High Endurance Rapid Technology Insertion) UAV system at Dubai for the first time, with a flyable production-standard air vehicle and full ground station and support equipment. Unlike other UAVs, HERTI is claimed to be the world's fully autonomous UAV and was originally developed as a concept demonstrator. And unlike most UAVs in-service, HERTI does not need to be controlled by an operator on the ground using a joystick and throttle. Instead, once programmed, the operator clicks 'the mouse' and the aircraft takes care of everything else.

During one test flight, for example, a HERTI making a routine flight over the Irish Sea spotted an unexpected object in the water, and automatically photographed it. Although the 'object' turned out to be a lobster pot, it demonstrates the system's ability to find a head-sized object in a heavy swell—a perfect illustration of the kind of dull, repetitive tasks that humans find difficult to sustain, but which computers are optimised to undertake.



Aircraft on static display at the air show

PR Agency / Dubai

Italian company International Aviation Supply (IAS) turned up to Dubai showing a previously unannounced UAV, the Pitagora UAV. Which, to say the least, has an unorthodox design: a roughly triangular-shaped lifting body with canards and a wingspan of 2 m whose centre sections contains a ducted propulsor with two contra-rotating propellers. Pitagora isn't a one off prototype; however IAS remained tight-lipped about its customer. The initial Pitagora-1A flew for the first time in October last year with initial tests taking place in Italy, but with restrictions on flying UAVs above 1,500 ft (500 m) means future testing will take place in Malta. Powered by a Fuji Imvac BT-86 developing 7 hp with a maximum speed of 90 km/h following a vertical take-off, and an operational range of 150 km, the Pitagora is a fresh take on UAV design and requirements. It is mainly intended for civil applications, but obviously has potential military uses. Weighing in at 20 kg, it can carry a 4 kg payload that can be completely tailored to customer wishes. This is mounted on a stabilised gimbal platform and can include a Sony daylight camera or a Forward Looking InfraRed (FLIR) camera.

Trainer Aircraft: Although out of the UAE advanced trainer competition, the first two Hawk Mk 132 advanced jet trainers for the Indian Air Force left Warton on

November 9, en route to their new home at the IAF's Air Force Academy at Bidar. These two aircraft are the first of a 66 aircraft order, of which another 22 will be built in the UK by BAE Systems and the remaining 42 under licence by Hindustan Aeronautics Limited.

Alenia Aermacchi and Pilatus were informed that their aircraft had been short listed for the basic jet trainer competition—the M311 and PC-21, respectively. The Brazilians had been eliminated from the contest and Embraer, manufacturer of the Super Tucano, which sent no defence executives to the show, said: "We have received no news on this, and officially the competition is still open."

Airborne Early Warning (& Control) Aircraft: Modern air combat tactics make strong use of Airborne Early Warning (AEW) and at the show, Boeing said it was closing in on the final specification of the four 737 AEW&C (Control) aircraft it is building for South Korea's E-X contract. The first aircraft is due to be delivered to South Korea in 2011 and will be modified by Boeing; the rest will be modified by Korea Aerospace Industries in 2012. "The aircraft is just about fully defined. It's almost nailed down," said Mark Ellis, programme manager for the Peace Eagle project, which covers the sale of four similar aircraft to Turkey, too. When asked

about the ongoing UAE requirement for an AEW&C aircraft, Ellis added: "We've had a lot of discussions here since the last show. From our understanding, this 737 is a brilliant match for what we believe to be their requirements."

With that contest well under way, Northrop Grumman eagerly displayed its E-2C Hawkeye at the static park and is continuing testing of its E-2D Advanced Hawkeye. The first E-2D has now amassed 17 sorties since its initial flight in August, with the first live radar tests scheduled for November. The second aircraft is undergoing ground tests before joining the flight programme by the end of the year. The UAE requirement was expected to have a winning decision by mid-2007, although this has slipped.

Manufacturers used the Dubai show to talk about how they were progressing in other export markets. Northrop Grumman "is very far along on the design of a wet wing", intended for potential customers that want to operate the aircraft from shore bases, said Jerry Spruill, director, IPT Leader AEW International Programs, at the show. A wet wing would give the aircraft an eight-hour endurance compared to almost six hours for the E-2C and around five hours for the heavier E-2D. As an indication of how serious Northrop Grumman is when it comes to approaching India's requirement for an AEW platform, it has just opened an office in Delhi, headed by retired Commodore Gyanendra Sharma, whose central role will be to promote the Hawkeye to India.

Meanwhile, the Egyptian air force has moved to expand its AEW&C capabilities, with the US Defense Security Cooperation Agency having announced the receipt of a \$75-million (Rs 294-crore) request to supply the service with a further two second-hand E-2C Hawkeyes.

Helicopters: On the helicopter front, Sikorsky used the show to announce sales of 10 Black Hawk Helicopters to the Air Forces of the UAE and a further eight to Jordan.

Propulsion: Besides celebrating the con-

tracts for the key civil orders, there was a high level of excitement around the Dubai show for innovations from the engine manufacturers. The key announcement centred on a launch customer for the latest engine development from Pratt & Whitney.

Bombardier Aerospace is now working exclusively with P&W to offer the GTF (geared turbo fan) engine on its CSeries of regional jets. With the CSeries intended to be launched in 2008 for an entry into service in 2013, the GTF is expected to feature a max thrust rating of 23,300 lb to give the CSeries a 2,300 nm range. Bombardier believes the GTF power plant will offer an estimated 20 per cent better fuel burn than the narrowbody aircraft it hopes to replace. The CSeries is being designed as a replacement for aging aircraft like the classic 737, DC-9, MD-80, BAE 146

"We are confident that this demonstrator engine will meet all performance expectations and validate the game-changing characteristics of the Geared Turbofan engine," said Bob Saia, Vice President of P&W's next generation product family.

The GTF engine is designed to give improvements in fuel burn estimated at around 12 per cent along with significant reductions in engine noise, emissions and operating costs. The engine has a fan drive gear system that allows the engine's fan to operate at a different speed to that of the low-pressure compressor and turbine, resulting in greater fuel efficiency. The slower fan speed results in lower noise levels.

Environment

Dubai Air show was also the scene of



A. Peaford

Boeing's 737-based AEW&C in Turkish markings at the static park in Dubai

and Fokker 100. Speaking at the show, Bombardier says its CSeries will achieve an overall 15 per cent better cash operating cost by increasing the amount of new materials in its construction. Composites will now account for 47 per cent of the aircraft, up from 20 per cent specified in the original design.

For Pratt & Whitney, this is nothing short of good news as it gets a head start on going green. The GTF had its maiden test at the company's advanced test facility in West Palm Beach, Florida, USA. Meanwhile, plans are for ground testing to run until May 2008, and flight tests on P&W's 747 test bed would begin in mid-2008.

a major announcement regarding environmental progress. Qatar Airways, Qatar Petroleum, Qatar Fuel Company (WOQOD), Airbus, Rolls-Royce plc, Shell International Petroleum Company Limited and the Qatar Science and Technology Park signed an agreement to research the potential benefits of Synthetic Jet Fuel in aviation engines. The objective of this study is to address the feasibility and potential benefits of using Gas to Liquid (GTL) synthetic jet fuels. GTL is a technology that takes natural gas and converts it into liquid kerosene. The properties of GTL Kerosene are largely similar to conventional jet fuel making it



The booming MRO facilities in Dubai

PR Agency / Dubai

a 'drop in' replacement for today's kerosene, capable of being used in today's aero engines, aircraft and airports without any modifications.

The focus of the research will be on evaluating potential improvements in local air quality, fuel economy and overall reduction in carbon dioxide and other emissions. Specific studies will also look at operational benefits for airlines, such as enhanced payload-range, reduced fuel-burn and increased engine durability.

GTL synthetic jet fuels are currently being developed to meet international standards required for use in aviation under the auspices of the industry-wide Commercial Alternative Aviation Fuels Initiative (CAAFI) of which Airbus, Rolls-Royce and Shell are all members. The synthetic fuels will initially be mixed with standard kerosene to enable the group to model aircraft and engine performance, with a view to exploring the potential of fully synthetic fuels.

Facilities

It was revealed on first day of the show that as soon as the first runway was ready at Jebel Ali's Dubai World Central Al Maktoum International Airport, as part of the Dubai World Central Aviation City, it would feature the world's largest MRO centre. "Dubai's aviation future is being driven by such projects which reflect the Emirate's strategic vision of transforming

the region into a global hub for trade and commerce," explained HH Sheikh Ahmed bin Saeed Al Maktoum. "The MRO centre will be the world's biggest in land area earmarked for development, and will be able to handle all types of aircraft from light jets to superjumbos such as the Airbus A380. The centre will be able to deliver safe airline operations and assure reliability and availability of customers' fleet. DWC Aviation City will not only feature the MRO centre, but also repair and test as well as aircraft system and components installation facilities." DWC Aviation City, spread over 6.7 sq km, is being designed as a one-stop centre for all aviation-related operations. Khalifa Al Zaffin, DWC's executive chairman said, "This DWC component will host all aviation manufacturing, MRO, aviation support services, design and consultancy, research and development, aviation training, product and parts, light manufacturing units and high-technology industries."

One Indian business has stepped up to become a major investor and operator in the new City. Livewel Aviation Services is to invest \$80 million (Rs 314 crore) in a 23,960 sq m MRO facility within DWC Aviation City's to be operational by 2009. "India's expertise in the \$41-billion (Rs 1,60,800 crore) global MRO market is highly respected worldwide and our agreement with Livewel will bring in the right resources, and personnel to this region," said Abdulla Al Qurashi, CEO, DWC Aviation City. "With the Middle East MRO market growing at 8 per cent annually over the next five years, DWC Aviation City has been launched at an appropriate time as demand is expected to grow at a compound annual growth rate. With newly placed airline orders every year the region's aviation services industry is taking off to a good start." Livewel's facilities will carry out aircraft heavy maintenance for wide and narrow bodied type of aircraft, making it a preferred aircraft maintenance company in the region for airlines. The MRO will em-

DEALS GALORE

Typhoon's first flight: The latest Typhoon test aircraft IPA6 recently made its maiden flight from BAE Systems flight test facility at Warton Aerodrome in Lancashire. The aircraft flown by Typhoon project test pilot Mark Bowman was airborne for 54 minutes. The single seat aircraft, called IPA6, is the sixth Instrumented Production Aircraft (IPA) in the Eurofighter Development fleet.

MRO pact: Abu Dhabi Aircraft Technologies (ADAT), wholly-owned by Mubadala Development Company (Mubadala), has entered into a \$500 million (Rs 1,964 crore) five-year accord with Etihad Airways, the national airline of the United Arab Emirates. Under the contract, ADAT will provide an extensive range of maintenance, repair and overhaul (MRO) services to the award-winning carrier. The pact covers all Etihad's current fleet of three A320s, nine A340s, 14 A330s and five Boeing 777-300ERs.

BAE Systems wins unique approval: BAE Systems has become the first UK-based aerospace business to gain design approval under the UK MOD Design Approved Organisation Scheme (DAOS) for Unmanned Air Vehicle Systems without a weight limit. The approval comes as BAE Systems recently announced the successful 'First Metal Cut' on the £124 million (Rs 956 crore) Taranis Technology Demonstrator programme which will see the BAE Systems Hawk-sized Unmanned Combat Air Vehicle demonstrator begin a series of flight trials in 2010.

Over 350 intents for Skylander SK100: On November 13, 2007, GECI International received a letter of intent from the Group ACT Airlines-Aviation Management Solutions for 15 Skylander SK-100 to be delivered between 2011 and 2021, taking the accumulated number of intents for the aircraft to 356. ACT Airlines Group, based in Istanbul and a specialist in freight transportation, is planning to expand from Turkey into Eastern Europe and Middle-East regions.

DEALS GALORE

ploy approximately 500 aviation professionals during the first year of operations and will cater to customer airlines within Middle East, India and Europe.

Meanwhile, Emirates opened a brand new engine test cell centre covering 24,000 sq m, with the capacity to prepare, maintain and test up to 500 units a year and covering a large range of engines and auxiliary power units (APU). Its capabilities include GE's GE90-115B, the Engine Alliance GP7200 (which will power Emirates' A380 fleet), Rolls-Royce's Trent 500, 700 and 800 series, as well as Honeywell's GTCP331-350, -500 and -600 APUs. "Emirates is delighted to have established one of the most efficient engine test facilities that will not only serve our current and future requirements, but also those of the region. Looking at future industry requirements, the facility has been built to test engines with thrust levels of up to 150,000 lb, far in excess of what manufacturers produce today or are planning for the foreseeable future," said Adel Al Redha, executive vice president, Engineering and Operations.


This was followed on the last day of the show with the opening of the new engineering centre, covering an impressive 55 hectares and represents an investment of \$353 million (Rs 1,385 crore). Emirates says the new site is one of the largest and most advanced engineering facilities in the world. The facility has eight hangars, each measuring 110 m by 105 m, easily capable of accommodating the A380 superjumbo and features a dedicated paint shop, as well as three hangars with fuselage docking systems designed for heavy maintenance and all feature roof-mounted cranes.

Although dwarfed by comparison, Goodrich also took steps in plugging its Middle Eastern MRO gaps with the opening of its 10,700 sq m facility at the Jebel Ali Free Zone, just a few hundred yards from the perimeter of the gargantuan Dubai World Central airport. The facility will give Goodrich the capability to repair and overhaul components including land-

ing gears, aero structures such as nacelles and thrust reversers, plus interior equipment such as the escape slides (which it manufactures for the A380) and lifejackets, as well as being able to handle equipment such as helicopter hoists and de-icing systems. The company claims it is the first major OEM MRO in the region.

Apart from new facilities to meet the rising demand, Gulf Aircraft Maintenance Company made its Dubai debut under its new name and ownership. Mubadala Development Company has renamed it Abu Dhabi Aircraft Technologies (ADAT) and is targeting an \$800-million (Rs 3,138 crore) revenue stream by 2012, with plans to invest more than \$500 million (Rs 1,960 crore). "ADAT has been formed to expand the existing business and to convert the company into a total care provider," said Waleed Al Mokarrab Al Muhairi, COO, Mubadala, at the show. "This will be achieved by increasing capabilities, enhancing the pool of expertise and entering new markets through partnerships, joint ventures and potential acquisitions." ADAT aims to become the foremost independent MRO provider in the Middle East and a major player in India and Europe. A combination of leading-edge technologies and a favourable cost structure, it will provide shorter turnaround times.

Next Big Thing

As the show closed after five record-breaking days, there was no rest for Weller who was keen to begin work signing up the first of the exhibitors. "I was astounded at how many wanted to sign straight away," Weller said. "The event in November 2009 at the new Dubai Air Show site will raise the benchmark for world-class aerospace show facilities. It will cover 4,25,000 square metres—double the size of Airport Expo Dubai—with 42,000 square metres of exhibition space. It will have 130 chalets, car parking for 4,000 cars in 2009 and rising to 7,000 for subsequent events. I can't wait!" 

Mubadala signs MoU with CAE: Mubadala, a strategic investment and development vehicle established and wholly-owned by the Government of the Emirate of Abu Dhabi, has signed a memorandum of understanding (MoU) with leading simulation technologies and integrated training solutions provider CAE to develop a fully integrated flight training system—a key training component that will complement the emirate's ongoing aerospace strategy.

Aviation training joint venture: Mubadala and Germany's Lufthansa Technical Training GmbH (LTT) intend to set up a joint venture establishing an aviation training centre to be headquartered in Abu Dhabi, the capital of the UAE. The companies have signed an MoU paving the way for the joint venture which will develop market opportunities and deliver high-quality training courses for the aviation industry throughout the Middle East and North Africa.

Centre of military aircraft sustainment: Mubadala is holding discussions with top-tier original equipment manufacturers (OEMs) to develop an Abu Dhabi-based regional centre of excellence for military aircraft sustainment. Mubadala has invited Lockheed Martin, Boeing and Thales to consider a joint venture company to deliver world-class technical services and aircraft sustainment solutions to the UAE armed forces, and other air forces in the region seeking to outsource MRO needs to a world-class provider.

Royal Jet crowned the best: Royal Jet, the global luxury executive flight services company headquartered in the UAE, won the prestigious Business Jet Provider of the Year award at the Aviation Business Awards 2007 ceremony held in Dubai on November 12, 2007. Royal Jet's President and CEO Shane O'Hare picked up the award. Royal Jet was picked for its reliability, fine aircraft interiors and very high levels of service.