

**FLIGHT
SIMULATION
GROUP**



**ROYAL
AERONAUTICAL
SOCIETY**



Simulation and Training - Recent World News

July 2017

Editor: Ian Strachan FRAeS



Pictures: ITEC 2016 Orlando exhibition hall, Boeing/QinetiQ Portal Farnborough, Warton F-35 sim, BAES sim integration facility

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Word Count table

Previous editions of World Simulation and Training news were published by the European Simulation and Training Association (ETSA) but there has been a change of policy to concentrate on European, rather than world, matters. Since the Flight Simulation Group (FSG) of the Royal Aeronautical Society (RAeS) has been involved at a world level for many years, it is appropriate that publication continues under the new title shown above. As an organisation independent of national and commercial interests, the RAeS FSG has chaired international groups since the 1990s that included simulation world players, aircraft manufacturers and national bodies which were willing to co-operate under FSG chairmanship. After an initial request from the US FAA that the FSG should undertake this task, this activity led to worldwide standardization of the characteristics of Full Flight Simulators in civil aviation. More recently, after a series of high-profile airliner fatalities due to upset and loss-of-control events, it chaired the International Committee for Aviation Training in Extended Envelopes (ICATEE). The final ICATEE report was the basis of new ICAO procedures on upset prevention, reflected in more detailed rules from Regulatory bodies such as EASA in Europe, the FAA in the USA, and others. It is therefore appropriate that this document reviewing the latest projects and events in world Simulation and Training is published under the FSG name.

Looking at the various parts of this 7000 word document, the aviation area has an enormous lead with nearly 4000 words, followed by land systems with over 700, corporate changes and simulation systems with over 300 each, multi-role and maritime systems with about 100 each. The reason that these other areas are included is that there is much commonality between them in technology and training application. It is useful to compare S&T across the board rather than only in one area, because in the application of S&T, each area of activity can learn from others. In the aviation area, civil aviation is well in the lead with over 2000 words compared to military with about 1100, then Air Control and UAVs with over 300 each. Helicopter activity has over 500 words split about equally between military and civil.

Other than these raw figures of word counts, what are the trends? In the military, more training is now on simulators and less in the aircraft itself. One of many examples is the entry for CAE Australia on page 7 that notes that use of a Full Flight Simulator (FFS) has more than halved the aircraft training flights needed to qualify new pilots on the KC-30A Multi Role Tanker Transport (MRTT) aircraft, based on the Airbus A330. After training on a Full Flight Simulator, new MRTT pilots need only two sorties on the aircraft itself before taking their qualification test. This closely parallels the US Air Force conversion programme for pilots of the C-17 Globemaster III strategic transport, which has been in place for over 10 years and has much simulation before two training sorties in the aircraft followed by the qualification test. The savings in air-time and cost by using FFS training, are enormous. At a Flight Simulation Group conference that addressed finance, cost ratios between aircraft and simulator training were calculated, and for large transport aircraft were estimated at between 30 and 40 to one. That is, it is 30-40 times less costly to train on a modern state-of-the art Full Flight Simulator compared to using the aircraft itself. Furthermore, less flying hours means less fatigue and a longer airframe and engine life.

On the civil side, conversions to new airliners are now almost exclusively on FFS, for the above reasons. A particular point of interest in the civil aviation section is the first FFS from the new ACCEL company in Tiensin, China, see the entry on page 3, perhaps setting a trend for further FFS manufacture in China. In addition to routine types of training, simulator-based Upset Prevention and Recovery Training (UPRT) is now required worldwide and this needs enhanced flight envelopes in the simulator and motion cueing to match. Finally, according to estimates from both Airbus and Boeing, the world civil airliner fleet is due to double over the next 20 years and this will mean a proportionate expansion in training by simulation.

ROYAL AERONAUTICAL SOCIETY - SIMULATION AND TRAINING EVENTS

September 27-28, 2017 - International Flight Crew Training Conference 2017 (IFTC 2017)

Venue: Royal Aeronautical Society, 4 Hamilton Place, London W1J 7BQ, UK

Organiser: Royal Aeronautical Society, London www.aerosociety.com

November 1-2, 2017 - Simulation for Future Air Traffic Management

Venue: Royal Aeronautical Society, 4 Hamilton Place, London W1J 7BQ, UK

Organiser: RAeS Flight Simulation Group www.raes-fsg.org.uk

WORLD TRAINING-RELATED EVENTS

August 28-31, 2017 - Australasian Simulation Congress

incorporating SimHealth, SimTecT and Serious Games.

Venue: International Convention Centre, Sydney

Organiser: Simulation Australasia www.simulationcongress.com

August 29-30, 2017 - 14th Annual Asia Pacific Airline Training Symposium (APATS)

Venue: Marina Bay Sands, Singapore. Organiser: Halldale Media www.halldale.com

September 11-15, 2017 - Simulation Interoperability Workshop (SIW)

Venue: Conference Center, Sand Lake Road, Orlando, Florida, USA.

Organiser: International Simulation Interoperability Standards Organization (SISO)

www.sisostds.org/2017SIW.aspx

Supported by NTSA www.trainingsystems.org & www.ndia.org/events/2017/9/10/71w0

September 18-21, 2017 - Flight Simulator Engineering and Maintenance Conference (FSEMC 2017)

Venue: Sheraton, Memphis, Tennessee, USA. Organiser: ARINC www.aviation-ia.com/fsemc

September 26, 2017 - National Modeling and Simulation Coalition meeting

Venue: Detroit, Michigan, USA Organiser: NMSC www.thenmsc.org

September 27-28, 2017 - International Flight Crew Training Conference 2017 (IFTC 2017)

Venue: Royal Aeronautical Society, London, UK. Organiser: RAeS www.aerosociety.com

September 27-28, 2017 - Training & Simulation Display Summit

Venue: Sterling, Virginia, USA. Organiser: Rockwell Collins Simulation and Training Solutions

October 4-5, 2017 - Annual Display Summit Conference

Venue: Rockwell Collins, Sterling, Virginia, USA

Organiser: Insight Media www.insightmedia.info & www.displaysummit.com

October 18-19, 2017 - First Asia-Pacific Simulation and Augmented/Virtual Reality Conference

in conjunction with the Seoul International Aerospace & Defense Exhibition

Venue: Seoul Airport, South Korea

Organiser: Asia Pacific Simulation Alliance (APSA) www.asiapacificsimulationalliance.com
& Korea Training and Simulation Association (KTSA)

October 19-20, 2017 NATO NMSG Symposium

Venue: Lisbon, Portugal

Organiser: NATO Modelling & Simulation Coordination Office (MSCO) illeana.ganz@cs0.nato.int

November 1-2, 2017 - Flight Simulation Conference

Venue: Royal Aeronautical Society (RAeS), London, UK

Organiser: RAeS Flight Simulation Group www.raes-fsg.org.uk

November 27, 2017 - December 1 - IITSEC 2017

Interservice/Industry Training, Simulation & Education Conference and exhibition

Venue: Orlando, Florida, USA. Organiser: NTSA www.trainingsystems.org

2018 - January 30-31 - MilSim Asia

Venue: Marina Bay Sands, Singapore. Organiser: Clarion Events, London, UK www.clarionevents.com

2018 - May 15-17 - European International Training Equipment Conference and exhibition (ITEC) incorporating Civil Security Simulation conference

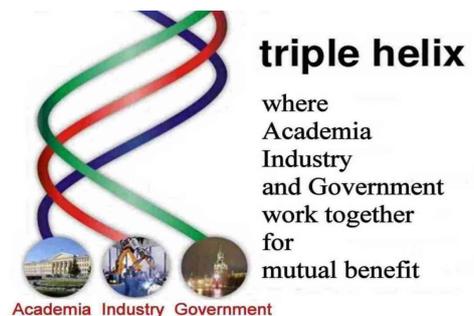
Venue: Stuttgart, Germany

Organiser: Clarion Events, London, UK www.clarionevents.com & www.itec.co.uk

ITEC Exhibition and Conference - Rotterdam May 2017 - Brief Report

The European International Training Equipment Conference and exhibition (ITEC) was held in May 2017 at the Ahoy Conference Centre on the south side of Rotterdam.

Conference Chairman Wim Huiskamp mentioned the NATO Modelling and Simulation (M&S) Group which encourages interoperability of M&S systems, improvement of training and cost savings. He suggested that in view of the increased importance of modern M&S, delivery times to end-users should be improved. Finally, he referred to the "Triple Helix" of Academia, Government and Industry through which new systems are developed. In other presentations the "Triple Helix" was mentioned several times, so this appears to be a fashionable buzzword.



Dr Tom Killion is NATO Chief Scientist and in previous appointments worked in the Land, Sea and Air areas. Since the days of earlier generations of simulators including the Link Trainer, he said, things have changed, particularly more realistic synthetic environments. M&S is now "a core part of almost all the NATO does, from design onwards". It is embedded in many NATO activities, not only for basic training but also Mission Rehearsal in a Synthetic Theatre

of War (STOW) environment. Today, "synthetic reality is reality", he said. A critical area is how to model enemy action, for which realistic behaviour must be used including looking at different enemy tactics, the cyber area, and optimal responses to these situations. This is not easy for real vehicles such as "red aircraft" in live exercises, but straightforward when simulation is used through which a number of different enemy actions and our responses can be generated. Finally, he said, training is for personnel from the individual soldier right up to Army General.

Later in the Conference there was a symposium on training for the F-35 Lightning 3 Joint Strike Fighter. Air Commodore Robert Adang of the Royal Netherlands Air Force said that today, Air Superiority required Information Superiority, and the F-35 can be regarded as an "Information Dominance Fighter". This leads to a problem in matching F-35 operations with other fighters. Looking at the future inventory of fighters in NATO Europe, there will be about 18% "Fifth Generation" F-35 and 82% others, mainly Fourth Generation aircraft. It is essential that these can operate together, not only between aircraft in the air but also between their simulators for realistic collective training. Interoperability is essential, he said, and concluded that if simulators are connected in a network, "the majority of training can be done in the simulator".

Countries and Regions mentioned in this document

(Use the search function to find individual items)

Australia, Austria, Brazil, Canada, China, Columbia, Croatia, Ethiopia, France, Fiji, Germany, India, Israel, Kenya, Kuwait, Malaysia, Malta, N America, Netherlands, Norway, Peru, Philippines, Portugal, SE Asia, S Korea, Singapore, Slovenia, Spain, Switzerland, Taiwan, Tonga, Turkey, UAE, UK, USA. (Total 35 countries & regions)

AVIATION SYSTEMS - training systems for the aircraft and aviation environment

CIVIL FIXED-WING AIRCRAFT SYSTEMS

For rotary wing systems (helicopters and propeller-driven tilt engine / tilt wings), see later

ACCEL Flight Simulation - www.accelflightsimulation.com

China. ACCEL Flight Simulation Co Ltd of Tientsin, SE of Beijing, has received Level-D qualification from the Civil Aviation Administration of China (CAAC) for a Full Flight Simulator (FFS) for the Boeing 737NG. It is installed at the Haite A-Safety training centre, also in Tianjin. ACCEL is a joint venture (JV) between Haite High-Tech of Chengdu, China and Rockwell Collins, headquartered in Cedar Rapids, Iowa, USA.



Alsim - www.alsim.com

France. Alsim of Le Loroux Bottereau, East of Nantes, France, is to supply an AL250 FNTP II flight simulator to Aeroformation, a pilot training school based at Lyon Bron airport, east of Lyon. This is re-configurable between single- and multi-engine configurations. Aeroformation operates the Beech C90, Cessna 152 and 172, Diamond DA42 and DA40, and Socata TB20.

Malaysia. Alsim has supplied a third AL42 flight training device to the flight training school of HM Aerospace at Langkawi. This is configured for the Diamond DA42, and includes Performance-based Navigation (PBN) and a High Definition Visual System (HDVS). HM Aerospace is a member of the Halim Mazmin Group and can train up to 200 cadet pilots per year at Langkawi.

AvSoft - www.avsoft.com

ATR-72 Course. AvSoft International of Denver, Colorado, USA, has released an aircraft systems course for the ATR 72-600. This has 22 modules with 33 hours of instruction with interactive guides, system diagrams, and end-of-module exams. Courses can be delivered through Avsoft's Learning Management System (LMS), or an LMS from a third party. The course can also be viewed on an iPad or Android tablet using Avsoft's Portable Classroom application.

Kenya. AvSoft is to provide eLearning and Learning Management Systems (LMS) for Dash 8 Q300 and CRJ-200 aircraft to Fly540 Aviation's training centre in Nairobi. The Kenyan CAA has approved these courses which can be presented on PCs, iPad and Android tablets.

Axis FTS - www.axis-simulation.com

India. Axis Flight Training Systems GmbH of Tobelbad, SW of Graz, Austria, has approval from the India Directorate General of Civil Aviation (DGCA) for an full flight simulator (FFS) for the ATR aircraft series. This is at the Flight Simulation Technique Centre Private Limited (FSTC), Gurgaon, SW of New Delhi, and has Moog 14t motion and RSI Raster XT4 imagery.

SE Asia. Axis is to deliver a full flight simulator (FFS) to an undisclosed customer in Southeast Asia. The value of the order is €10M and includes re-hosted avionic systems. The simulator will have a Moog motion system and RSI Raster XT4 imagery.

Boeing Flight Services - www.boeing.com/commercial

UK. Boeing Flight Services, headquartered in Seattle, USA, is to build an extension to its Flight Training Centre in Crawley near London Gatwick Airport. When the new annex is built, it will be Boeing's largest site of this type outside the USA. Boeing Flight Services is part of the Boeing Global Services business unit, established earlier in 2017. The Boeing Gatwick Centre originally opened in 2004 and now has classrooms, fixed-base training devices and eight full-flight simulators (FFS). The FFS are for the B737 Max 8, B737NG, B777, three for the 787-8 and one for the 787-9). There are also fixed-base training devices for the 737 Max 8 and NM, 757, 767, and 787-8.

CAE - www.cae.com

Fiji. CAE, headquartered in Montreal, Canada, is to supply a full flight simulator (FFS) for the B737 Max to Fiji Airways at its new Aviation Academy at Nadi Airport on the west side of the island of Fiji, north of New Zealand. The 737 Max and another simulator for an A330-200 are scheduled to be installed by late 2018.

India and USA. CAE announced a Commercial Pilot License (CPL) training programme with Jet Airways, headquartered in Mumbai, India (www.jetairways.com). This will be for up to 380 pilots over the next five years. 60 cadets will begin training in the second half of 2017, with ground school and flight training at CAE facilities in Phoenix, Arizona, USA, and Gondia, India, followed by Boeing 737 type-rating at CAE's training centre in Bengaluru, India.

Slovenia. CAE is to deliver a four-year pilot training program to Elit Avia of Ljubljana (www.elitavia.com). This will include classroom software, distance learning, a tablet application for course materials, pre-study tools, and a module for Upset Prevention and Recovery Training (UPRT).

Cockpitsonic - www.cockpitsonic.com

USA. Cockpitsonic gmbh, headquartered on the NE side of Frankfurt-am-Main, Germany, has delivered a B737 flight training device to 2Fly Group at Merritt Island, Florida, USA (www.2flygroup.com).

EDM - www.edm.ltd.uk

UK. Engineering Design & Models (EDM) of Manchester, UK, is to deliver a B737 door trainer to the airline Jet2.com, based at Leeds/Bradford airport (www.jet2.com). The trainer has a clutch system to simulate slide deployment and slide inflation sound is also produced. EDM has previously manufactured a B757 door trainer and B737 overwing exit trainer for Jet2.com.

UK. EDM is to supply a UK airline with an cabin door trainer and a flight deck door trainer for the A320. The cabin trainer will include handle and door jam, power assist and slide deployment failure, and have a touch-screen instructor station. The flight deck trainer will train for entering the flight deck during normal and emergency situations, and will have a flight deck access panel and keypad.



FlightSafety - www.flightsafety.com

India. FlightSafety International (FSI), headquartered at La Guardia Airport, New York, USA, is to supply a full flight simulator (FFS) for the Bombardier Q400 to Flight Simulation Technique Centre Pvt Ltd (FSTC). It is scheduled to be installed at the FSTC training center in Gurgaon in July 2018. It will have a 60-inch electric motion, VITAL 1100 visual and a multi-function Instructor Operating Station.

USA. FSI has announced a number of special training courses for the Dassault Falcon 2000EX EASy and 900EX EASy. These include (1) Upset Prevention and Recovery, (2) Rejected Takeoff Go/No-Go, (3) Crew Resource Management and Human Factors in Line-Oriented Flight Training (LOFT), (4) Energy Management. The courses are part of FSI's Master Aviator™ programme.

Flyco Training - www.flycoglobal.com

Croatia. Flyco Training Solutions, headquartered in London, UK, is to supply A320 Type Rating courseware for pilots and cabin crew to Trade Air based at Zagreb Airport. Trade Air's training department will have access to Flyco courses for pilots, cabin crew and technicians.

Slovenia. Flyco is to supply their Advanced Learning Management System (A-LMS) to Elit Avia of Ljubljana that operates private jets. The system will include a courseware library for pilots, cabin crew, loadmasters, dispatchers, and technicians. The Assessment Creation Center (ACC), Advanced Report Server (ARS) and Licence Auto-Track (LAT) allow clients to create their own content and to record data, and a FlyPad mobile application allows training offline.

Tonga. Flyco is to provide Learning Management Systems and e-courses to Real Tonga Airlines (www.realtonga.to), for on- and off-line use. The company's FlyPad system allows remote access to manuals and other training documents.

Frasca - www.frasca.com

Canada, S Korea, USA. Frasca International Inc of Urbana, S of Chicago, USA, has supplied Cessna 172 Flight Training Devices (FTDs) to a number of flight training providers. In the USA these include the Central Oregon Community College, Florida Memorial University, Louisiana Tech University College, Spartan College of Aeronautics, and the US Air Force Academy. Outside the USA these have been supplied to the Confederation College in Ontario, Canada; and the Korean Aerospace University in Goyang, South Korea, on the N side of Seoul.

Ethiopia. Frasca is to supply a Type 172 Flight Navigation Procedures Trainer (FNPT II) to Ethiopian Airlines Flight Training Academy, the training division of Ethiopian Airlines Aviation Group. The 172 FNPT II will have Frasca's TruVision™ Global visual and a 210 x 57 degree cylindrical visual display. The device will be installed by Africair, based in Miami. The Academy is expanding with new aircraft, computer based training, simulators, and other facilities.

USA. Frasca has delivered flight training devices to the University of North Dakota (UND) at Grand Forks, North Dakota. These include FAA Level 5 FTDs for the Piper Archer and Seminole with Garmin G1000 NXI avionics and Frasca's TruVision™ Global visual system and Simplicity™ instructor operator station.

L3 Commercial Training - www.l-3com.com

Netherlands. L3 Commercial Training Solutions (L3 CTS), headquartered at Crawley, S of London Gatwick airport, UK, is to supply a Level D Boeing B787-9 FFS to the Flight Simulation Company (FSC) at its base at Amsterdam Schiphol. This will be a RealitySeven model to be ready for training in July 2018, configured for the GE NX-1B and RR Trent 1000 engines. There is an option for a second B787 FFS.

Merlin Flight Simulation UK - www.merlinsim.com

USA. Merlin Flight Simulation Group, headquartered in Edenbridge, east of London Gatwick airport, UK, has installed an MP500-1 Engineering Flight Simulator at Mississippi State University (MSU) at Starkville, SE of Memphis. This will enable aircraft designs to be developed and tested in-house.

MPS - www.flymps.com

Netherlands. Multi Pilot Simulations B.V. (MPS) of Groenekan, Utrecht, The Netherlands, has supplied Flight Training Devices (FTD) for the A320 and B737-800 to the Flight Simulation Company's training facility in Amsterdam. The A320 device has been certified by the Netherlands CAA as FTD-1 and FNPT-II / MCC, and the B737 to FTD-1.

UK. MPS is to supply a B737-800 fixed based training device to the flight training centre of Virtual Aviation (VA) at Cambridge Airport, UK, to be operational in November 2017. There is also an option for MPS to supply an Airbus A320 FTD1 to VA in the first half of 2018.

Rockwell Collins Simulation - www.rockwellcollins.com/service/simulation

France and Netherlands. Rockwell Collins Simulation & Training Solutions (STS) of Sterling, Virginia, N of Washington Dulles airport, USA, is to supply their EP®-8100 image generator, laser projectors and a Panorama™ collimated display for a Boeing 787 Dreamliner simulator for the Air France-KLM Group. They will also supply projectors for an existing Air France Airbus A320 simulator and four Boeing 777 simulators. In addition, EP-8100 and laser projectors are to be supplied to upgrade a KLM Boeing 777 simulator.

RP Aero - www.rp-aerosystems.com

Australia. RP Aero Systems of Littlehampton on the south coast of the UK, has installed a B787 door trainer for Qantas at their Training Centre in Sydney. The airline now has ten devices supplied by RP Aero.

Taiwan. RP Aero is to supply a Boeing 787 door trainer to the EVA Airways Training Centre west of Taipei for installation in Q4 2017. It will have a 1L main door with attendant's seat. The door will include RP's electronic door hinges and handle control system, deployable girt bar, virtual slide and out-of-window visual system.

Spatial Composites - www.spatial-composite.com

Philippines. Spatial Composite Solutions FZE, Jebel Ali Free Zone, Dubai, UAE, are to supply an Airbus A330 Door Trainer to Cebu Pacific Air's training facility in Manila. This has a Type A door with a variety of malfunctions for the door and slide, a cabin crew operating panel, and information panels.

TRU Simulation - www.trusimulation.com

Colombia. TRU Simulation + Training Inc, headquartered at Charleston, South Carolina, USA, has delivered an Level D A320 full flight simulator (FFS) to Avianca Airlines of Colombia. The package also included an A320 flat panel trainer (FPT). An update to the A320ceo and A320neo models will be delivered in the near future with new engine options and enhanced performance due to the sharklet wingtip.

USA. TRU has achieved Level D certification from the US FAA for Cessna Citation Latitude and Sovereign simulators. These are at the TRU ProFlight Pilot Training Center™, Tampa, Florida.

CIVIL ROTARY-WING SYSTEMS - Helicopters and tilt wing / tilt engine designs capable of hovering

Entrol - www.entrol.es

Spain. Entrenadores Olarte, S.L (Entrol) of Madrid, Spain, has supplied a H11 / H135 FNPT II MCC training device to Coptering, based at Sabadell Airport, north of Barcelona. It will have dual GTN 750, for training in LPV & LNAV approaches. It will also have an entrol vibration system.

Redbird - <http://simulators.redbirdflight.com>

USA. Redbird Flight Simulations Inc of Austin, Texas, has FAA approval as an Advanced Aviation Training Device (AATD) for a Redbird VTO trainer for the Robinson R22 helicopter. The base price is reported as about \$150k. Under FAA rules, private pilots will be able to use the device for up to 7.5 flying hours credit and up to 20 hours credit towards instrument ratings. It has a multiple channel visual with downward view for hovering, and the cab is mounted on a curved lateral rail for motion in roll and sway.



Thales Group - www.thalesgroup.com

China. The Thales Group, headquartered in Paris, France, has obtained Level-D qualification from the Civil Aviation Administration of China (CAAC) for a Full Flight Simulator for the EC 135 helicopter at Haite Group's Aviation Safety flight training centre in Tianjin, SE of Beijing. It has 240°x80° field of view, ThalesView imagery, and Thales Hexaline electric motion.

MILITARY FIXED-WING AIRCRAFT SYSTEMS

For rotary wing systems (helicopters and propeller-driven tilt engine / tilt wings), see later

BAE Systems - www.baesystems.com

UK. BAE Systems, headquartered in London, has opened a £2.3M Training and Simulation Integration Facility (TSIF) at their airfield at Warton in the NW of England. This includes simulations of the BAES Hawk, Typhoon and future aircraft. TSIF enables pilots and engineers to test and evaluate the system under test, and is part of a wider investment in which the company is to invest over £10M in training and simulation facilities at Warton. A new Mission Systems Integration Facility co-located with TSIF is to open later this year for test and evaluation of future aircraft designs.

Boeing Military - www.boeing.com/military

Australia. Boeing Military, headquartered in St Louis, Missouri, USA, is to deliver a training system for the P-8A maritime surveillance aircraft to the Royal Australian Air Force, beginning in 2018.

UK. Boeing Defence UK (BDUK) and QinetiQ have opened a "Portal" simulation facility. This has a main theatre, two laboratories for research, debriefing and control rooms. It provides video, voice and data feeds in unclassified or secret modes, enabling industry and the MoD to practise large-scale manoeuvres including urban operations.

USA. Boeing is to provide seven P-8A Deployable Mission Readiness Trainers (DMRTs) to the US Navy, starting in 2019. The DMRT design includes Boeing's Weapons Tactics Trainer (WTT) with modelling for sonobuoys and ocean acoustics. The US Navy trains P-8A Poseidon aircrews at Naval Air Stations Jacksonville, Florida and Whidbey Island, Washington State. It is reported that 70% of P-8A aircrew training takes place in simulators.

CAE - www.cae.com

Canada. CAE, headquartered in Montreal, Canada, has a contract with Airbus Defence for the C295W Fixed-Wing Search and Rescue (FWSAR) training program for the Royal Canadian Air Force. CAE will provide upgrades for training device, also maintenance, courseware updates and other support services.

CAE Australia - www.cae.com/Worldwide-Presence/cae-australia-pty-ltd

Australia. CAE Australia Pty Ltd, of Silverwater, Sydney, NSW, manages the training centre at the RAAF station at Amberley, near Brisbane. Use of the CAE-built Full Flight Simulator (FFS) at Amberley for the KC-30A Multi Role Tanker Transport (MRTT) has more than halved the aircraft training flights needed to qualify new pilots on the aircraft, only three flights now being required. The FFS can be networked with other trainers such as that for the Air Refuelling Officer (ARO) who controls the air refuelling boom. The MRTT is based on the Airbus A330 with a fuel capacity of 111,000 kg (245,000 lb).

CAE USA - www.cae.com

US Air Force. CAE USA of Tampa, Florida, USA, has a contract from Lockheed Martin for an HC/MC-130J enhanced fuselage trainer (eFuT) for USAF Special Operations Command. This is to be delivered to Kirtland AFB in 2020.

US Marine Corps - USA & Japan. CAE USA has a contract from Lockheed Martin for four KC-130J fuselage trainers (FuT) for the US Marine Corps. These include an instructor operator station (IOS), aircraft interface monitor, virtual cargo compartment and various simulations. Delivery will be to Marine Corps Air Stations Cherry Point, North Carolina, Miramar, California, and Iwakuni Japan in 2020 and 2021, also to Naval Air Station Fort Worth, Texas in 2022. They will be networked to existing KC-130J weapon systems trainers (WSTs) for complete crew training.

Elbit Systems - www.elbitsystems.com

Israel. Elbit Systems Ltd, headquartered in Haifa, Israel, has networked two aircraft simulators at different locations using a secure cloud-based Synthetic Natural Environment (SNE). The next phase is to develop a systems with a number of current platforms at the Israeli Air Force SkyBreaker™ Mission Training Centre.

Lockheed Martin Training - <http://www.lockheedmartin.com/training>

USA. Lockheed Martin Training and Simulation, headquartered in Orlando, Florida, USA, has a US\$104M contract for a truck-mounted emitter to train aircrew to deal with SAM threats. The system will emit signals that simulate current and future surface-to-air threats. A Production Ready Assembly (PRA) will be produced and there are options for up to 20 systems. These will include an Advanced Radar Threat System Variant 2 (ARTS-V2) for medium-range SAM. Other countries are reported to be interested in the ARTS-V2, including those in the F-35 JSF project.

QinetiQ - www.qinetiq.com

UK - Network Links. QinetiQ Group plc, headquartered in Farnborough, UK, has a UK£9.5M contract to provide network links from RAF Stations Lossiemouth and Coningsby to the Air Battlespace Training Centre (ABTC) at RAF Waddington, south of Lincoln. This is to provide some 10 weeks of simulator training per year to RAF Eurofighter Typhoon pilots, including a variety of scenarios, mission management, and debriefs.

UK - Portal Facility. QinetiQ and Boeing Defence UK (BDUK) have opened a facility called the Portal at Boeing's site at Fleet, near Farnborough. See the entry above on page 7 under Boeing Military.

Quantum3D - www.quantum3d.com

USA. Quantum3D, Inc., of Alameda, E side of San Francisco bay, California, USA, is to supply equipment for a training system for the US Air Force Airborne Warning and Control System (AWACS). The contract is from prime contractor Link Simulation & Training and is part of the US DRAGON programme (Diminishing Manufacturing Sources Replacement of Avionics for Global Operations and Navigation). Quantum Government Systems will deliver their MANTIS® Image Generation Software, GeoScapeSE® Synthetic Environment, CatalystSE® digital content creation system, and other systems. DRAGON is a NATO and US programme, and enhances AWACS worldwide operations by allowing for world air traffic control requirements.

MILITARY ROTARY-WING SYSTEMS - *Helicopters and tilt wing / tilt engine designs capable of hovering*

CAE Germany - www.cae.com

Germany. CAE Elektronik GmbH of Stolberg, near Aachen, has upgraded the German Navy's Sea King MK41 simulator to Full Mission Simulator (FMS) standard at Nordholz Naval Airbase, west of Hamburg. The FMS has CAE's Medallion-6000 image generator, Common Database (CDB) architecture, upgraded avionics, a new vibration system and improved instructor operator and debrief stations.

Leonardo - www.leonardocompany.com/en

Norway. Leonardo Helicopter Division, headquartered in Rome, Italy, has opened its Norway Training Centre at Stavanger Sola Airport. This has a CAE-built AW101 full flight simulator and a Norwegian Air Force AW101 rear crew trainer that can be linked to the FFS. The Sola facility is administered by Leonardo Helicopters' Yeovil (UK) Training Academy.

Quantum3D - www.quantum3d.com

Turkey. Quantum3D, Inc., of Alameda, E side of San Francisco bay, California, USA, is to provide their Independence® IDX 8000 image generator to Turkish simulator manufacturer Havelsan (www.havelsan.com.tr) for a T-625 helicopter simulator for Turkish Aerospace Industries (TAI). The T-625 a light twin-engined helicopter to replace Turkish Bell UH-1H Hueys.



Thales Group - www.thalesgroup.com

Kuwait. The Thales Group, headquartered in Paris, France, has a contract from Airbus Helicopters to provide Kuwait forces with training for Caracal H225M helicopters (developed from the Eurocopter Cougar). Thales will supply a Reality H full flight mission simulator (FFMS) and two other trainers. The devices can be networked for collective training and the contract covers simulator maintenance.

UNMANNED AIR SYSTEMS (UAS)

including Unmanned Air Vehicles (UAVs) & Remotely Piloted Aircraft (RPA)

CAE - www.cae.com

UAE. CAE, headquartered in Montreal, Canada, has a C\$56M 5 year contract for the training of operators of remotely piloted aircraft (RPA) of the UAE Air Force and Air Defence organisation. The contract is from the General Headquarters (GHQ) of the United Arab Emirates armed forces. CAE is to deliver academic, simulator and live flying training for the UAE's RPA fleet. CAE's UAE-based company, CAE Maritime Middle East LLC, will be prime contractor and responsible for program management. The company will deliver classroom instruction, desktop trainers, sensor operator trainers, UAS mission trainers, and training using specially tailored real RPA sorties. CAE will also supply an RPA Pilot Fundamentals training course to the Khalifa Bin Zayed Air College in Abu Dhabi, UAE.

Explotrain - <http://explotrain.com>

USA. Explotrain LLC of Fort Walton Beach, Florida, USA, has developed a simulation and training system for drone-based IEDs. This simulates IEDs delivered by drones and other small Unmanned Aerial Systems (sUAVs). The company's ExploDrone™ system simulates the two main types of attacks carried out by drones.

Inzpire - www.inzpire.com

UK. Inzpire Ltd of Lincoln, UK, is to develop training systems for the RAF Protector Remotely Piloted Air System. A Training Needs Analysis (TNA) will be followed by the training system itself.

Simlat - www.simlat.com

USA. Simlat Ltd of Tel Aviv, Israel, and Grand Forks, USA, has delivered a C-STAR UAS training system to Drexel University, Philadelphia. Drexel is a member of the US FAA UAS Centers of Excellence and the Alliance for System Safety of UAS through Research Excellence (ASSURE). C-STAR includes Simlat's Performance Analysis & Evaluation module (PANEL) that produces reports of trainees' performance.

AIRSPACE AND AIRCRAFT CONTROL - including Air Traffic Control training devices

UFA - www.UFAinc.com

Malta. UFA, Inc., of Burlington, NW side of Boston, Massachusetts, USA, has delivered an approach and en route radar trainer to Malta Air Traffic Services (MATS). This has 10 controller positions and various communications.

Switzerland. UFA is to provide Skyguide (Swiss Air Navigation Services Ltd), with air traffic control training systems. These will include UFA's ATCoach, ATTower, ATVoice, ATSpeak and the ATCloud delivery system for simulation training over the Intranet.

US Army. UFA has supplied ATCoach® Radar and ATTower® Tower Simulators to the US Army Directorate of Simulation at Martindale Army Heli Port (AHP) in San Antonio, Texas. Both Simulators have the UFA ATVoice® voice recognition and response system that automates the running of training exercises. UFA has delivered 33 ATCoach radar simulators and 19 ATTower tower simulators to the US Army and Army National Guard. ATCoach and ATTower simulators are the "Program of Record" for the US Army Schoolhouse at Fort Rucker, Alabama, where new Army Controllers are trained. The Schoolhouse operates eight ATTower simulators and 12 Radar simulators including laptop configurations. Systems accredited by the US Army include ATCoach with the ATNAVICS tactical system, FBPAR surveillance, and ATTower with a 180-degree airport database. A ruggedized radar simulator in a portable transit case is also accredited.



US Navy/Marine Corps. UFA has delivered the 39th

ATTower Tower Simulation System (TSS) to the United States Navy as part of the USN's TSS Project. This has been installed at U.S. Marine Corps Air Station New River, North Carolina. The ATTower system includes ATView airport visuals, ATVoice Voice Recognition and Response, and simulated weather, radar, voice communications and information displays. 43 ATCoach Radar Simulators and 25 ATTower Tower Simulators have been supplied to the US Army and Army National Guard.

MULTI-ROLE SYSTEMS

Simulators and training systems for more than one of the land, sea and air environments, including Cyber

NLR - www.nlr.nl & **TNO** - www.tno.nl

Netherlands. At ITEC, the NLR aviation research organisation, headquartered in Amsterdam, and TNO, the Netherlands Organisation for Applied Scientific Research (TNO = Toegepast Natuurwetenschappelijk Onderzoek), headquartered in The Hague, are to provide Mission Training through Distributed Simulation (MTDS) to the Netherlands Ministry of Defence. The contract is for 5.7M Euros over four years. Training environments and new scenarios will be provided including models of military equipment, operating areas and cyber threats.

LAND SYSTEMS - *Simulators and training systems for the land environment
(except Medical Training, which follows this section)*

Argon Electronics - www.argonelectronics.com

Austria. Argon Electronics LLP of Luton, UK, has supplied their PlumeSIM training system to the Austrian CBRN Defence Command based in Korneuburg, north of Vienna. This includes Argon's CBRN virtual tabletop CBRN/HazMat training system, RDS200 radiological simulators and LCD3.3 Chemical Warfare simulators.

Bagira - www.bagirasys.com

Peru. Bagira Systems, headquartered in Holon, Israel, had delivered its MAGNET system to the Peruvian Army. This includes facilities for the Galil assault rifle and Panzerfaust 3 anti-tank rocket. MAGNET is a laser-based infantry weapon training system, controlled by an Android based Instructor Field App (IFA).

Cubic Global Defense - www.cubic.com

Canada. Cubic Global Defense (CGD), headquartered in San Diego, California, USA, has a US\$4.5M contract to upgrade Canadian Weapons Effect Simulation (CWES). This is for the Canadian Data Communications Network (DCN) and Exercise Control Centre (EXCON), and will include replacement of the existing network and exercise control hardware and software. CWES is used at the Canadian Manoeuvre Training Centre (CMTC) at Base Wainwright, Alberta, for training Direct-Fire and Area weapons.

Germany - US Army. Cubic has a US\$11M contract for Rotational Exercise Design Support Services (REDSS) at the Joint Multinational Readiness Center (JMRC) in Hohenfels Training Area (HTA), Bavaria, north of Munich. JMRC provides realistic operational environments with instructors and opposing forces.

UK Army. Cubic has a US\$35M three-year contract for the Area Weapons Effects Simulator (AWES) at the Salisbury Plain Training Area (SPTA) in the UK, and the British Army Training Unit Suffield (BATUS) in Alberta, Canada. AWES is used for exercises with weapon and NBC effects, and tracks the actions and positions of more than 1,400 soldiers and 250 vehicles using GPS. It also records hits, kills and misses using the Cubic MILES system.

Environmental Tectonics (ETC) - www.etcusa.com

USA. Environmental Tectonics Corporation (ETC), headquartered in Philadelphia, is to deliver an Advanced Disaster Management Simulator (ADMS) training suite to St. John's University (SJU) at Queens, New York City. The system includes ETC's Scene Builder with custom sounds, images and videos. SJU training scenarios include an active shooter on campus, HAZMAT and CBRN situations, medical emergencies and natural disasters.

Lockheed Martin - www.lockheedmartin.com

USA. Lockheed Martin Corporation, headquartered in Bethesda, N side of Washington DC, has a US\$288M contract as prime contractor for a programme to update US Army live training. LM and partner Saab is to provide a single training product for vehicle crew training. The new Instrumentable Multiple Integrated Laser Engagement System (I-MILES) Vehicle Tactical Engagement Simulation System (VTESS) will integrate with current Multiple Integrated Laser Engagement Systems (MILES). The new system is reported to be smaller, lighter and has simpler components.

Raydon - www.raydon.com

US Army. Raydon Corporation of Daytona Beach, Florida, USA, has a \$20M contract for 10 Virtual Convoy Operations Trainers (VCOT) for the US Army National Guard and to upgrade three existing units. The VCOT is a mobile classroom that was first delivered by Raydon in 2004 and 114 are now in service. The current VCOT is a fourth generation system and trains for gunnery and convoy operations from individual crew to company level.

Saab Defence - www.saabgroup.com

Sweden. At ITEC, Saab Security and Defence Solutions, headquartered in Järfälla, Sweden, launched the BattleTek 5 command and staff training system. This uses simulation to model defence and security scenarios, in which a commander can view the situation and direct forces under his command.

Tapestry - www.tapestryolutions.com

Germany. Tapestry Solutions, a Boeing company headquartered in San Diego, USA, has a US\$58M contract with the US Army's overseas 7th Training Command. This will include LVC training exercises at the Joint Multinational Readiness Center (JMRC) in Hohenfels, Germany, and the Joint Multinational Simulation Center (JMSC) at Grafenwoehr and its satellites in Kaiserslautern, Germany and Vicenza, Italy. Tapestry designs, plans and conducts computer-based simulation exercises from unit-level to joint and multinational exercises in classroom and range environments. The contract will be administered by the Regional Contracting Office, Bavaria (RCO-Bavaria). The team led by Tapestry includes Capstone Corporation (www.capstonecorp.com), Metro Productions (www.metro-productions.com), and Visual Awareness Technology & Consulting, Inc (VATC - www.vatcinc.com).

MEDICAL TRAINING SYSTEMS

CAE - www.cae.com

USA. CAE, headquartered in Montreal, Canada, has announced that the their Aeromedical Evacuation Training System for the C-130 Hercules is now Ready for Training at US Air Force Dobbins Air Reserve Base, NW of Atlanta, Georgia. The trainer models a C-130 fuselage with aeromedical berths and has 6-axis motion to simulate attending patients under aircraft manoeuvre and in turbulence. It includes human patient simulators (real-size working models of injured personnel) from the CAE Healthcare company, and an instructor operator station.



MARITIME SYSTEMS - *Simulators and training systems for the ship, maritime and port environments*

General Dynamics - IT - www.gdit.com

USA. General Dynamics Information Technology (GD-IT) headquartered in Fairfax, Virginia, USA, SE of Washington Dulles airport, is to provide training services for the US Navy Center for Surface Combat Systems (CSCS). GD will provide curriculum development and training up to advanced warfare exercises across CSCS, including its 15 learning sites, detachments and international programmes. CSTS is part of the Dahlgren Division of the U.S. Naval Surface Warfare Center, and the contract has a one-year base period, four option years, and a potential value of US\$244M.

CORPORATE AND INTERNATIONAL NEWS

International Agreements, Corporate Acquisitions, Partnerships and Changes

Bartragh - www.bartragh.com & **C4i** - www.c4ic.com

Canada/USA. Bartragh Services LLC, north side of Tampa, Florida, USA, has acquired C4i Consultants, Inc. of Calgary, Canada, and established a new company, C4i Training and Technology, Inc. The new company will be based in Calgary and will continue to provide simulation products including military simulation and emergency disaster management simulation (EDMSIM).

ETSA - www.etsa.eu & **ADS Group** - www.adsgroup.org.uk

Europe/UK. The European Training and Simulation Association (ETSA) has signed a cooperation agreement with the ADS Group, headquartered in London. The initials ADS are derived from Aerospace, Defence, Security and Space. The ADS Group is a Trade Organisation for UK companies in these areas with a membership of about 1000. Within ADS is a Training & Simulation Interest Group (TASIG) that provides a network for the simulation and training area. TASIG co-ordinator is Frederick Sugden, ADS Group (Farnborough) frederick.sugden@adsgroup.org.uk

German Armed Forces - www.bundeswehr.de

Germany. In April, the Bundeswehr created a Cyber and Information branch under the name *Cyber und Informations Raum* (CIR - see www.cir.bundeswehr.de). CIR will bring together existing military organisations that deal with IT, cyber-security, military reconnaissance, geo-information, and psychological warfare. Lieutenant-General Ludwig Leinhos is the first Chief of Staff with the title of Inspector, and the new service is planned to have about 13,000 personnel in 2021. The University of the Bundeswehr in Munich, is creating a new Cyber Cluster and a Master's course on Cyber-Security. There is also a "Cyber Innovation Hub" in Berlin run by the Bundeswehr. It should be noted that in June 2015, NATO designated cyber as an official domain of warfare, along with air, land and sea.

MASA Group - www.masagroup.net

Brazil. MASA Group, headquartered in Paris, France, has opened a subsidiary in Rio de Janeiro under the name MASA do Brasil. This will support customers in the region, including the Brazilian Army. The intention is to further develop business in the defence and civil markets.

SIMULATION AND TRAINING SYSTEMS

New or updated systems that can be applied generally to simulators and training devices (less systems specific to one of the Land, Sea or Aviation areas).

Diamond Visionics - www.diamondvisionics.com

USA. Diamond Visionics (DVC) of Vestal, west of Binghamton, Upper New York State, USA, has released its GenesisRTX version 10.5.2 rendering engine. Amongst other things, it includes improved sensor imagery, plus automatic rapid response entity tracking.

Lockheed Martin MST - www.lockheedmartin.com/us/mst.html

USA. Lockheed Martin Mission Systems and Training (LM-MST), headquartered in Orlando, Florida, USA, has released Version 4 of its Prepar3D® simulation and training software. This includes enhanced virtual reality, a new lighting system, 3D weather, models of 40 cities and over 20,000 world airports.

MASA Group - www.masagroup.net

France/N America. MASA Group, headquartered in Paris, France, has agreed with Bohemia Interactive Simulations USA of Orlando (<https://bisimulations.com>) that BiSIM will be the official reseller of MASA SWORD in North America. This brings together SWORD and BISim’s Virtual Battlespace 3 (VBS3) system.

Q4 Services - www.q4services.com

USA. Q4 Services LLC of Orlando, Florida, USA, announced their Q4 DirectVue dome display. It is supplied with 200 x 45 degree 3-channel projection and when de-mounted can be transported, and is designed for single door access to the new site.



Terrasim - www.terrasim.com

USA. At ITEC, Terrasim Inc of Pittsburgh, Pennsylvania, USA, announced TerraTools 5.4 terrain generation software. This has new features, enhancements, updates, and bug fixes. Improvements include in areas such as Batch Mode Manager, Distributed Processing Plug-in, Performance Log Analyzer and VBS Export Plug-in.

VT MÄK - www.mak.com

USA. VT MÄK, of Cambridge, Massachusetts, USA, has released their VR-Engage 1.0 multi-role simulator for vehicle drivers, gunners, commanders, and aircraft pilots. It can be used as a training simulator, a role-player station, instructor aid, desktop simulation game, or on a VR headset. It uses open standards and can be used with other simulators.

Sections	Words	%	Aviation Sections	Words	%	Air	Words	%
Editorial & Events	1547	21.6	Civil Fixed Wing	1937	27.0	Civ total	2153	30.1
Aviation Systems	3872	54.1	Civil Rotary Wing	216	3.0	Mil total	1056	14.7
Space Systems	0	0.0	Mil Fixed Wing	794	11.1	RW total	478	6.7
Multi role Systems	100	1.4	Mil Rotary Wing	262	3.7			
Land Systems	715	10.0	UAVs	346	4.8			
Medical Systems	88	1.2	ATC & Air Control	317	4.4			
Maritime Systems	103	1.4	Total Air Sections	3872	54.1			
Corporate changes	323	4.5						
Simulation Systems	317	4.4						
Word count	96	1.3						
Total	7161	100.0						