Training

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Mechtronix: Technology born in the dorm brings power to the people

By **Mike Gerzanics**

Canadian simulator manufacturer **Mechtronix** provesthere is a pay-off from heavy emphasis on research and development.

Mechtronix was created in the early 1980s when the country's **National Research Council (NRC)** launched a research programme at **Concordia University in Montreal** to develop a simulator using microprocessors, says Mechtronix president Xavier Herve. "Then we moved from the R&D world into creating a service company using the technology, which was then state of the art."

The technological edge continues to pay off. "We compete against the likes of CAE and Thales, with their thousands of employees, and we have less than 300," says Herve. Along with developing five new aircraft simulators in the past five years, the same employee base builds the simulators it has created in a facility that can produce as many as 25 full-motion and fixed-base simulators a year.

Hot projects at the moment include a fixed-base jet transition training tool that is being qualified in Europe. Priced at less than $1 million, the simulator is designed for transition pilots who have flown only a few hours in fixed-wing aircraft as part of the multi-crew pilot licence (MPL) programme. "This is a leap in productivity when it comes to training pilots," says Herve.

The low-cost transition trainer follows in the footsteps of other Mechtronix initiatives that tend to create more affordable simulation solutions for the aviation industry. One of those is the company's FFS X series full-motion and FFT X fixed-base simulators, which include models for the **Airbus A320** family.

The FFS X is a full flight simulator whose cab is common to both it and its fixed-base FFT X counterpart. Only two computer racks are needed to house the several Windows-based PCs that drive the simulator. The host PC has a QNX operating system, often called Unix Light. A third cabinet houses the power supply for the entire system.

On the flightdeck, Mechtronix saves costs by fabricating as much as possible in-house. Original equipment manufacturer parts are only used when the expense of certification or manufacture are prohibitive. The motion base for the FFS X is pneumatically driven by a small compressor and accumulator system.

The six Moog-supplied electro-pneumatic actuators operate at 10-11bar (145-159lb/in2)and have 1.52m (60in) of travel. Herve says that not only is his pneumatic system cheaper to produce than a hydraulic one, but it has only one-tenth the maintenance costs.

For my demonstration flight, a level D FFS X with an **A320** cab was provided. The simulator was being prepared for delivery to the **Civil Aviation Flight University China**. The simulator was fully operable, but the motion base was disabled as part of the pre-shipping process. The visual system offered a 180° field of view (FOV), while newer systems will feature a 200° FOV.

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The aircraft was placed at a gate at Hong Kong's Chep Lap Kok airport, in daylight conditions. After a push back from the gate I was able to taxi to Runway 25R. Take-off was in visual meteorological conditions, and I able to fly two visual circuits, the last to a full stop landing.

IMPRESSIVE CAB

During my brief 30min flight, in what was now a fixed-base training device, I was impressed by the level of fit and finish of the cab. Whilenot type rated in the A320, I have flown a number of different Airbus products and the flightdeck looked and felt like the real thing. The visual display was outstanding.

As I moved my head around while seated, there was little if any distortion in the displayed scene. Visual peripheral cues were sufficient for me to accurately judge my height over the runway, aiding in judging the flare manoeuvre. No attempt was made to quantitatively compare the simulator to the aircraft, but on a qualitative level it felt pretty close to the real thing.

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