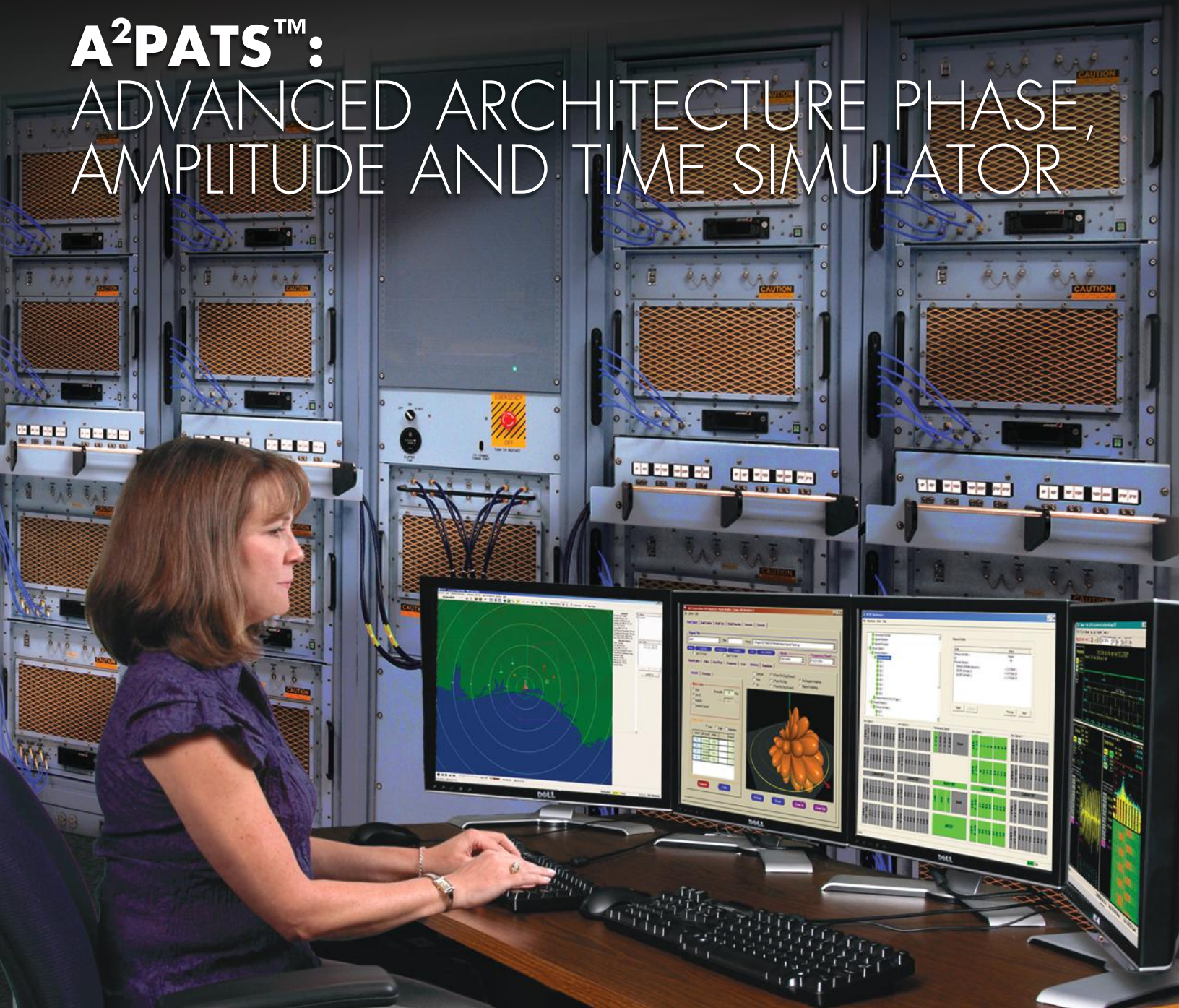# A²PATS™:
ADVANCED ARCHITECTURE PHASE, AMPLITUDE AND TIME SIMULATOR

INDUSTRY'S FIRST DIRECT PORT ELECTRONIC WARFARE (EW) SIMULATOR

With over 800 fielded systems, Electronic Systems delivers cutting edge technology to the Electronic Warfare industry. The A²PATS is designed to verify that U.S. and allied aircraft EW systems have the ability to precisely locate, identify and defend against virtually all ground-based threats, surface-to-air threats and air-to-air threats.

Textron Systems' A²PATS EW simulator technology is not available from any other supplier. It is a plug-and-play, continuously aligned system that uses identical phase-coherent, direct digital Synthetic Stimulus Instruments (SSIs) as the radio frequency (RF) source for all signals.

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TEXTRON Systems

DIRECT PORT ARCHITECTURE WITH CONTINUOUS, REAL-TIME ALIGNMENT PROVIDES INCREASED AVAILABILITY

The A²PATS™ direct port architecture minimizes the path from the RF source to the system under test, providing the highest possible signal fidelity with maximum throughput.

A²PATS uses Textron Systems-developed SSI RF synthesizers to generate coherent RF signals that can be pulsed or continuous wave and modulated in phase, amplitude, time of arrival and frequency. The output is phase coherent on a pulse to pulse basis across multiple ports. Each SSI generates RF from 20 MHz – 40 GHz. The user can configure port and SSI source combinations easily to accommodate test signal density requirements. The enhanced graphical 3D user interface provides the tools to define all common radar parameters for simple and complex emitter simulation, and execute them in dynamic scenarios or static test situations.

A²PATS offers a modular, plug-and-play design that provides system flexibility and expansion, eliminating costly custom contracting and downtime. Because all SSIs are identical, the system provides outstanding logistical support advantages including reduced life cycle cost.

EWS Block Diagram — Shows Simplicity of Direct Port EWS
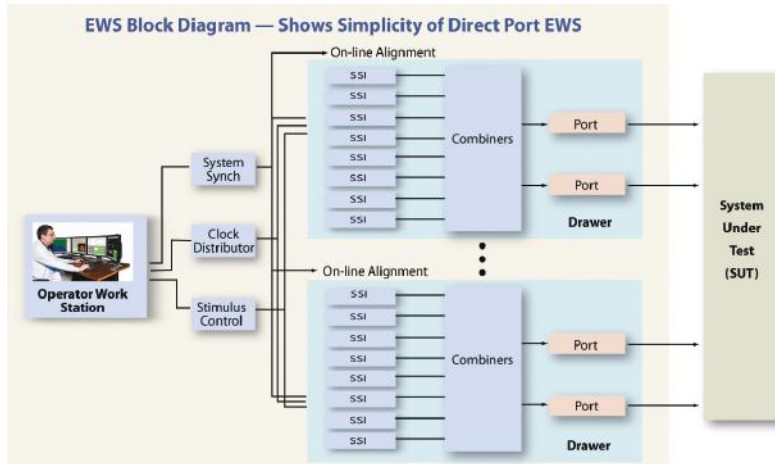
A²PATS' modular design supports expansion and custom configuration without redesign.

KEY FEATURES AND BENEFITS

ADVANCED DIRECT PORT ARCHITECTURE
- Varying numbers of identical SSIs in each port enable even the most stringent testing scenarios
- Simultaneous phase, amplitude and time angle of arrival simulation
- Combining synthesizers enables pulse densities exceeding eight million pulses per second for complex signals

PLUG-AND-PLAY, MODULAR DESIGN
- Easy setup, installation and relocation using organic owner support
- Designed for system growth through addition of identical catalog commercial, off-the-shelf SSI modules
- Interchangeable SSIs to meet test requirements

PLUG-AND-PLAY, MODULAR DESIGN
- Continuous, real-time background alignment for lower support cost and higher operational availability
- Allows for long-periods of simulation time with no external calibration procedures automatically and continuously keeping the system within tolerance

SPECIFICATIONS
- RF sources .... Textron Systems' SSIs
- Operating frequency range .... Standard 20 MHz - 22 GHz continuous, 40 GHz option available
- Pulse density per SSI .... 2 MPPS
- Pulse density per port .... 2/4/8/16 MPPS
- Frequency resolution/accuracy .... 0.1 Hz/±1 Hz*
- PRI range/resolution/accuracy .... 512 ns to 1.0 s/20 ps/±1.0 ns
- Pulse width range/resolution/accuracy................... 24 ns to 1.0 s/20 ps/±1.0 ns
- Spurs and Harmonics .... -60 dBc (typ) / -55 dBc (max)
- Noise floor with No Signal Present......................... -90 dBm/MHz
- Noise floor Signal Present..................................... -80 dBc/MHz
- Port-to-port attenuation/resolution/accuracy............. 10 dB/0.03 dB/0.5 dB RMS
- Phase resolution/accuracy .... 0.022°/1.7° RMS
- Pulse density per RF source/max per port .... 2 MPPS/16 MPPS
- Calibration and alignment .... Run-time dynamic, runs continuously in background
- Wideband Chirp Option Bandwidth/Slew Rate........ 1 GHz/1.1 GHz/us
- Intrapulse modulations .... Linear and non-linear, sawtooth, sinusoidal, linear ramp up and down, triangular, exponential, user defined, discrete FMOP/PMOP/AMOP, intentional FMOP/PMOP/AMOP, unintentional FMOP/PMOP/AMOP, discrete PMOP, frequency modulated continuous wave, FSK
- Operator defined transmit/receive antenna patterns... Active Electronically Scanning Array (AESA), circular, sector (unidirectional or bi-directional), conical, raster, lobe switching, orthogonal, spiral, helical, steady/lock-on, electronic, interleaved raster, step dwell, palmer (sector/circular/raster), multi beam, track-while-scan, LORO,COSRO, omni, user defined

*With coherent reference

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Textron Systems' A²PATS can generate complex simulations for platforms including the Boeing F-18 Super Hornet, the Boeing AH-64D Apache and the Lockheed Martin F-35 Lightning II Joint Strike Fighter.

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