NEWS RELEASE

Curtiss-Wright, Green Hills, and L3Harris Technologies Demo FACE™ Conformant Software Running on 7th Generation Intel Xeon Platform

Demo features L3Harris Technologies' FliteScene® Digital Moving Map Software, Green Hills Software INTEGRITY-178® tuMP™ RTOS, and Curtiss-Wright Single Board Computers and Graphics Modules

U.S. Air Force-hosted FACE™ & SOSA™ Expo & Technical Interchange Meeting (TIM), DAYTON, Ohio (Booth #14) – Sept 17, 2019 Curtiss-Wright's Defense Solutions division, in collaboration with L3Harris Technologies and Green Hills Software (GHS), has publicly demonstrated the first working example of a FACE-conformant operating system (OS) and FACE-conformant software application running on a 7th Generation Intel® (Kaby Lake) Xeon™ processor. The demo featured L3Harris Technologies' popular FACE-conformant FliteScene Digital Moving Map software running on top of GHS's industry-leading and FACE-conformant INTEGRITY-178 tuMP™ real-time multicore OS.

The commercial off-the-shelf (COTS) module hardware solution showcased in the demonstration included Curtiss-Wright's 7th Gen Intel Xeon™ (Kaby Lake) processor-based XMC-121 mounted on a VPX3-716 3U OpenVPX graphics module. The demonstration includes the ability to run on all eight of the Intel Xeon processor's virtual cores while running on a DO-178B/C DAL A RTOS capable of locking application threads to virtual cores, (also known as bound multi-processing [BMP]).

"We are very proud, in collaboration with Green Hills and L3Harris Technologies, to extend our support of FACE-compliant solutions to the Intel Xeon processor," said Lynn Bamford, Senior Vice President and General Manager, Curtiss-Wright Defense and Power. "The promise of FACE is to deliver the latest technology to military system designers while simplifying their logistics, boosting

interoperability, and eliminating costly proprietary solutions. This successful demonstration helps advance that promise from theory to practical reality."

About FACE

FACE is a government-industry software standard and business strategy for acquisition of affordable software systems that promotes innovation and rapid integration of portable capabilities across global defense programs. Certon, an affirmed FACE Verification Authority, completed all verification activities on the FliteScene software in accordance with the FACE Technical Standard and FACE Conformance Policy, resulting in L3Harris Technologies receiving FACE Conformant Certificate #2. Certon was also the FACE verification authority for Green Hills' RTOS.

About Green Hills Software INTEGRITY-178 tuMP RTOS

The INTEGRITY-178 tuMP multicore RTOS is the only RTOS certified conformant to the FACE 3.0 Technical Standard. It conforms to both the FACE Safety Base and Security Profiles for the C, C++ and Ada programming languages. INTEGRITY-178 tuMP is the only RTOS that includes a full set of features and libraries to mitigate multicore interference as required by CAST-32A. The RTOS has successfully met the DO-178 DAL A certification objectives multiple times across several different multicore SOC architectures, each of which featured a different core design. It is available for all of Curtiss-Wright's DO-254 safety-certifiable products including its Power Architecture, Intel, and Arm-based single board computers (SBC) (www.ghs.com).

> ***GHS FACE 3.0 Conformance Certificate numbers:***
> - INTEGRITY-178 tuMP for Intel – Certificate number 15544850 issued Apr 5, 2019
> - INTEGRITY-178 tuMP for PowerPC – Certificate number 1549398072 issued Feb 5, 2019
> - INTEGRITY-178 tuMP for Arm – Certificate number 15556074 issued April 28, 2019

About the XMC-121 Single Board Computer

Curtiss-Wright's XMC-121 SBC is a VITA 42 XMC single-width mezzanine SBC. It features Intel's latest low-power E3-1505L v6 Xeon processor to provide more quad-core x86 performance than previous processor generations while operating at lower power levels. The SBC delivers quad-core, hyper-threading performance operating at 2.2 GHz with turbo operation to 3.0 GHz. With an integrated 8 MB L2 Intel Smart Cache and featuring Intel Virtualization and vPro Technologies, the E3-1505L processor provides 64-bit high-performance processing while consuming under 25 watts of power. The processor is coupled to a dual-channel 64-bit DDR4 memory system with ECC,

supporting up to 32 GB of high-speed system memory and provides up to 38.4 GBps memory performance. Up to 32 GB of SATA NAND flash memory is offered, providing a vast amount of non-volatile data storage for operating systems, applications code, and data storage. The XMC-121 is designed for use in size, weight, power and cost (SWaP-C) constrained aerospace and defense systems. This fully rugged, open architecture processor modules is ideal for use in general purpose mission computing applications that require the highest possible processing performance while consuming low power.

About the VPX3-716 Graphics Module

The Curtiss-Wright VPX3-716 3U OpenVPX high performance graphics processor is based on the AMD Radeon E8860 Graphics Processing Unit (GPU). The E8860 meets the long lifecycle availability required for military programs through the use of a suite of CoreAVI software drivers and 20-year component supply program. Designed for high reliability, the VPX3-716 is especially well-suited to support embedded training, moving maps, Geographic Information Systems (GIS), 360 degree situational awareness, Degraded Visual Environment (DVE) and other graphics, video and compute-intensive applications.

About L3Harris Technologies FliteScene Digital Map

The L3Harris Technologies FliteScene Digital Map open-architecture system provides situational awareness for both civilian and military operations. It supports advanced terrain awareness and obstacle avoidance features and offers three-dimensional synthetic vision modes. It has been integrated with modern tactical networks such as Link 16 and ANW2 providing a full real-time common operating picture. FliteScene supports a standard OpenGL interface that can be integrated with COTS processors and graphic accelerators. This combat-proven, feature-rich digital mapping software solution enables system integrators to seamlessly integrate critical situational awareness capabilities into demanding commercial and military airborne platforms. It provides scalable and configurable 2D and 3D terrain images, street maps, map overlays, and mission planning capabilities required for demanding aerospace, defense, law enforcement, fire, and search and rescue applications. For more information about FliteScene, please visit https://www.harris.com/solution/flitescene-digital-map.

FliteScene Performance Features:
- Capable of displaying raster maps in all relevant formats and scales

- 2D and 3D views for both cockpit and wingman, with extended scene and enhanced performance
- Map overlays for elevation, depth, vectors, targets, and other line-of-sight objects
- Multiple map underlay layers including terrain and bathymetry
- Multi-vehicle tracking and sensor footprint display
- Configuration via XML configuration files
- Multi-channel output with pan/zoom, and orientation capabilities

Sales inquiries: Please forward all Sales and reader service inquiries to ds@curtisswright.com.

For more information about the Curtiss-Wrights Defense Solutions division, please visit www.curtisswrightds.com.

About Curtiss-Wright Corporation

Curtiss-Wright Corporation is a global innovative company that delivers highly engineered, critical function products and services to the commercial, industrial, defense and energy markets. Building on the heritage of Glenn Curtiss and the Wright brothers, Curtiss-Wright has a long tradition of providing reliable solutions through trusted customer relationships. The company employs approximately 9,000 people worldwide. For more information, visit www.curtisswright.com.

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