

Legacy Fighter Gets New Life From Technology Aligned with SOSA™ Standard

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A leading aerospace and defense prime contractor, known for its advanced land, air and space defense technologies, stays at the tip of the spear by anticipating the demands of the defense aerospace market.

Engineers at the contractor know that galvanizing a vision into a tangible solution oftentimes means bringing in a trusted technology partner. Recently, for example, the contractor wanted to offer the Department of Defense (DOD) a multi-function processor (MFP), aligned with the Sensor Open Systems Architecture™ (SOSA) standard, that would extend the lives of F/A-18 and other aging fighters.

The MFP would fill the F/A-18's need for leading edge signal intelligence (SIGINT), electronic warfare (EW) and intelligence, surveillance and reconnaissance (ISR) next GEN applications. It would also meet DOD's stringent cybersecurity requirements while providing faster processing, expanded random-access memory (RAM) and superior data storage.

This would be a tall order for most aerospace defense suppliers, to be sure. However, when the contractor's long-time technology partner Abaco Systems got the call to compete for the upgrade, Chief Growth Officer John Muller, was not surprised. In the past, the Huntsville-based company had been down similar vision-to-fruit paths with the contractor, including supporting a vast amount of technical work for the high mobility artillery rocket system (HIMARS) platform.

"The contractor is always pushing what it needs for its next system," says Muller, "looking for the most technologically advanced components to reach its tech vision."

Cutting Edge, Designed to Align with SOSA Standard

After the contractor reviewed key system concept objectives with Abaco sales personnel, followed up by several discussions, Abaco quickly identified the technological gap it could fill for the customer.



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"We knew we could enable a system concept with high levels of modularity and customization options," says Muller.

Not long after initial discussions, Abaco presented its recommendation to make the contractor's advanced embedded system vision a reality – two rugged SBC3511 3U VPX single board computers, designed to align with the SOSA standard, acting as hosts to Abaco's RAR15X high density MIL-STD-1553 and ARINC 429 XMC front I/O module.

"After we gave the contractor real hardware and firmware to evaluate, its system engineering team accepted our recommendation over other options because it is a tailorable, all-in-one solution," says Muller. "It provides the processing capacity, memory, anti-intrusion cybersecurity and chip technology the contractor needed. We also provided a software development kit."

Performance with Security

The SBC3511 single board computer is the backend processor and subsystem mission computer for the contractor's integrated 12-slot 3U VPX system. Serving as the system data processing nerve center, the SBC3511 3U OpenVPX rugged single board computer provides a unique combination of high performance, advanced security and leading-edge thermal management.

This high performance comes from the new, highly integrated Intel® Xeon® E-2176M 6-core/12-thread processor (formerly known as Coffee Lake Refresh) operating at 2.8 GHz with TurboBoost up to 4.5 GHz, up to 64 GB of DDR4 RAM and the inclusion of up to 256 GB of NVMe SSD.

The card also includes a 40 Gb Ethernet data plane, delivering a high-speed interconnect, as well as aligned with the SOSA standard, for maximum multi-vendor interoperability.

The SBC3511 also includes a range of security features designed to assist with advanced security strategies. "Because we have a Xilinx UltraScale+ Field-Programmable Gate Array (FPGA) coupled with



SBC3511

the CPU on the card, along with a Trusted Platform Module and various sensors, we can offer a path to enhanced security and root-of-trust well beyond that of many platforms" adds Abaco's Vice President of Product Management Pete Thompson.

The RAR15X delivers the highest density of MIL-STD-1553 and ARINC 429 channels available on a single card to help reduce SWaP. It delivers up to four channels of dual-redundant, multi-function MIL-STD-1553 and up to 18 channels of ARINC 429 plus general-purpose Avionics discretes on a single XMC card with optional front or rear I/O connections.

The I/O's on-board firmware, large data buffers and a high-level API are integrated to provide total flexibility in monitoring and generating ARINC bus traffic. Simultaneous scheduled and burst mode (FIFO) messaging is supported on all ARINC 429 transmit channels. Each ARINC 429 receive channel provides simultaneous dedicated and buffered mode storage, along with label/SDI filtering. Additionally, Abaco offers intuitive Windows® GUI tools to simplify and accelerate configuration and development.

Decades of Options Ahead

Today, the contractor is preparing for a proof of concept MFP system development and QUAL. The new MFP will enable the ability of fixed and rotary wing platforms to communicate and execute mission-critical functions on the networked battlefield of the future more effectively.

Looking ahead, Muller expects the openness of the MFP system will increase the F/A18 and other fighters' capabilities to easily accommodate common architectural standards, mission kits, mission upgrades and technology insert kits that can be ported onto the platform.

"The DOD is gaining a better ability to upgrade emerging technology for decades to come with minimized platform-level impact," says Muller. "This ability mitigates the EOL or diminishing manufacturing sources of times past, where they were just locked into one particular OEM-based solution."

RAR15X





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