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SEAKR HAS BEEN AWARDED $2.3 MILLION DOLLAR CONTRACT BY AIR FORCE RESEARCH LABORATORY TO DEVELOP THE TACSAT-III ARTEMIS PAYLOAD PROCESSOR

OVERVIEW

Centennial, CO. – March 1, 2006 – SEAKR Engineering, Inc. (SEAKR) has been awarded a $2.3 million dollar contract by the Air Force Research Laboratory (AFRL) for the TacSat-3 program. The purpose of this contract will be to provide a space qualified On-Board Processor (OBP) for the Advanced Responsive Tactically Effective Military Imaging Spectrometer (ARTEMIS) payload. The Air Force is funding this with a combination of Small Business Innovative Research (SBIR) and program funds. Work under this effort will be completed in March, 2007.

"SEAKR is excited to be part of the AFRL team developing responsive space avionics for next generation OBPs. SEAKR has invested over $1.5M to develop an Application Independent Processor (AIP) for space, and the ARTEMIS Hyperspectral Imaging Processor (HSIP) is the first space application for the AIP," said Mr. Anderson, Vice President, SEAKR Engineering, Inc. The AIP scalable array of processors is designed to be very flexible in order to support multiple applications with minimal NRE, shortened development time, and reduced risks. Some of the other applications that the AIP is designed to support are: Software Defined Radios, GPS Digital Receivers, Space Radar Processing, EO Imaging Systems (IR & Visible), Data Compression such as JPEG2000 for imagery and H.264 for video.

ARTEMIS On-Board Processor

The ARTEMIS OBP provides real time hyperspectral image processing, image storage, payload control and power switching, and flexible plug-in-play interfaces such as SPA-S (Spacewire). Each OBP contains both a ReConfigurable Computer (RA-RCC) and a G4 PowerPC™ Single Board Computer (G4-SBC). Its modular design provides a flexible processing platform for many applications.

The RA-RCC is SEAKR's fourth generation of ReConfigurable Computers (RCC). It's Processing Elements (PE) are based on Xilinx's latest and highest performance Field Programmable Gate Arrays (FPGAs) – Virtex IV. Each of the three PEs on the RA-RCC can be configured to perform highly computational intensive algorithms that typically are performed in Application Specific Integrated Circuits (ASICs), but unlike ASICS, algorithms can be reprogrammed almost instantaneously eliminating the long lead time associated with developing custom semiconductor devices. Each PE has a bank of high speed DDR-II SDRAM memory. For increased flexibility, there are three high speed mezzanine connectors directly interfacing to each of the three PEs. This allows for the user to change I/O, memory, and additional functions like analog conversion with minimal NRE and development leadtime. The system supports both PCI and high speed multi-gigabit serial busses allowing for multiple RA-RCCs to be linked together providing an extremely scalable, fault tolerant processor.

The G4-SBC processing module is a space qualified single board computer based on the G4 PowerPC™. It serves as the controller and the image processor. At 600 MHz, it's measured Dhrystone 2.1 benchmark performance numbers is 600 MIPs. Utilizing the AltaVec floating point co-processor, 2.0 GFLOPs can be achieved. Standard Operating Systems such as VxWorks™ are supported. It also has a PCI Mezzanine Card (PMC) slot which is used for the gigabit ethernet interface. Two ports of spacewire are also available.

The ARTEMIS HSIP has one RA-RCC mezzanine with 16 GByte of EDAC protected flash memory with power switching, two high speed camera link ports, a single 14 bit Analog to Digital Converter, and the focusing mechanism. Mezzanines are typically application specific.

Space Computer Corporation is working with SEAKR to provide the FPGA firmware and G4 software for performing the ARTEMIS sensor processing. Leveraging its ten years of experience in real time hyperspectral data processing, SCC's software will apply advanced spectral algorithms for target detection, material discrimination and generation of precision-georegistered data products for tactical and scientific users. SCC is working closely with SEAKR Engineering to take advantage of the high performance computing capabilities of RA-RCC and G4-SBC to demonstrate real-time, on-orbit computation.

The ARTEMIS flight OBP will be commercially available in Q2'07.

FUTURE DEVELOPMENTS

SEAKR is continuing Internal Research & Development (IRAD) on new capabilities that will provide our customers with the most advanced integrated avionics available. On-Board Processing for IP routers is a strategic focus at SEAKR. IP Routing is a key building block for the next generation of networked based communication systems in space. We are also developing our next generation Solid State Recorders that will have reduced power consumption, reduced mass, reduced size, increased memory capacity, faster datarates, with on-board processing for image compression. We are also expanding our capabilities in C&DH by developing new memory and payload processing cards. "Our investment in advanced technology is critical for us to make our customers more competitive," said Dave Jungkind, Business Development for SEAKR.

ABOUT SEAKR

Since 1982, SEAKR Engineering Incorporated has been developing Solid State Storage Solutions offering higher performance and greater reliability for the user community. Corporate experience spans over twenty years delivering more than 700 Mass Memory Systems to U.S. Government and Foreign Service Customers. The company is acknowledged throughout the aerospace industry as the World's leading supplier of solid state recorders for spacecraft. Since its inception, the company has designed and built over one-hundred (100) spacecraft memory/processing systems. Over 50 of our units have been launched and properly performed, or are still performing, their mission.

ABOUT SCC

SCC was founded in 1986 and specializes in solving information-processing problems associated with advanced sensor systems. Our work in these areas extends from algorithm development and data analysis through design and fabrication of specialized signal-processing hardware field operations and support for data-collection experiments. SCC is currently involved in hyperspectral systems for the Predator, Global Hawk, and other advanced real-time imaging systems.