Thursday, June 17, 2010

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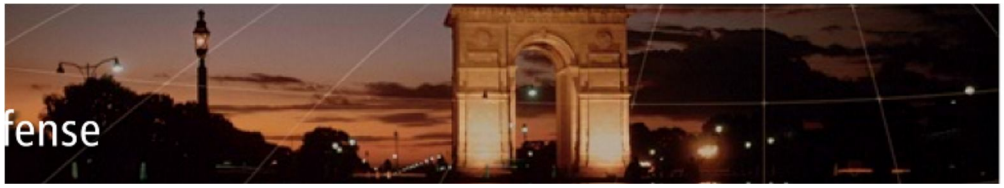

June 2010 Issue

FEATURE/REPORT

Digital Domain

State of the art mission computer developed by HAL Joint Venture for the Jaguar DARIN 3 upgrade

By Atul Chandra

The successful design and development of the mission computer for the IAF Jaguar DARIN 3 upgrade by HAL-Edgewood Technologies Pvt Ltd (HETL) was the reason for a visit to their facility in Bangalore by FORCE. The mission computer called as the Open System Architecture Mission Computer (OSAMC) is a flexible and rugged modular mission computer. The OSAMC can handle discrete and analog Input and Output (I/0), video, voice, map, head up display (HUD) and graphics processing needs for modern military systems.

Senior company officials who spoke to FORCE unequivocally stated that “This mission computer which has been indigenously designed and developed is far ahead of any mission computer in its class anywhere in the world”. HETL took 24 months to design and develop the OSAMC, an appreciably short time period when compared to similar mission computers available abroad. The OSAMC is also significantly cheaper than its competitors and costs up to two and a half times less than comparable products in the world market.

HETL currently has orders for 165 units of the OSAMC for the IAF Jaguar DARIN 3 strike fighter upgrade programme underway at Hindustan Aeronautics Limited (HAL), Bangalore. Officials at HETL expressed the possibility of total orders exceeding 300 for the airborne variant alone while also stressing the fact that the OSAMC is compatible with all variants of the Jaguar currently in IAF service. Safety of Flight (SOF) trials for the OSAMC is being carried out as per CEMILAC and CRI guidance and expected to be complete by July 2010. A variant of the ‘OSAMC’ will be used for the display mission computer in the Light Combat

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Helicopter (LCH). The Automatic Flight Control Computer (AFCC) for Light Combat Helicopter (LCH) is also being proposed by HETL

Open System Architecture Mission Computer (OSAMC) for Jaguar DARIN 3 upgrade

The OSAMC uses commercial-off-the-shelf technology (COTS) and proven protocols to provide high performance computing resources for avionics, ground based systems and shipboard environments.

The computer with multiple Power PC processors has various interfaces used in aviation such as the MIL-STD-1553B, ARINC-429, Gigabit Ethernet, USB 2.0, RS-422, Synchro, Discrete, Analog and video with various formats. The OSAMC offers superior processing power and modular flexibility making it suitable for a wide range of applications ranging from embedded module functions to full scale computer configurations. This mission computer has been designed and developed to comply with D0-178B for platform software, D0-254 for hardware, MIL-STD-810F for environmental and MIL-STD-217F for reliability standards.
A unique feature is the I/O and industry standard VITA-46 backplane. While the backplane supports the standard VME-bus communication system for legacy systems, the I/O transition panel is linked to the backplane in such a way that the complete unit attains a cable-less configuration. This configuration offers reduction in EMI/EMC characteristics, lighter weight and increased reliability. The hardware of the OSAMC is driven by software based on the VxWorks 653 Real Time Operating System (RTOS). This RTOS is being used for the first time in POWER PC architecture with PCI-e communication protocol between the intelligent, IO Transition and Analog/Synchro cards within the chassis.

The ever changing and increasingly complex mission requirements for today's jet fighters have made the role of aircraft mission avionics the crucial differentiator between success and failure of a mission. To keep pace avionics and aircraft mission computers must be highly flexible and versatile with open source computing architectures and increased processing power to meet the demands of the user. Modular software, the ability to utilise legacy software and increasingly dense packaging are a must to enable optimum efficiency of existing hardware. HETL has combined various technologies in the OSAMC to provide a mission computer which offers higher reliability, affordable costs both in purchase and product support with a quantum jump in capability.

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