L3HARRIS™
FAST. FORWARD.

PHOENIX FLIGHT COMPUTER

COMPUTER
Processor
Fault-tolerant LEON3 SparcV8
65 DIMPS @ 50 MHz
IEEE-754 floating point unit
Memory
128 MB SDRAM w/EDAC
4 MB SRAM w/EDAC
32 MB non-volatile boot memory w/EDAC
32 MB non-volatile user memory w/EDAC
Interfaces
2 Ethernet ports (10/100 Base-TX)
3 cross-channel data link ports (Provides triple/quadruple redundancy, full-duplex RS-422)
4 full-duplex RS-422 channels
3 MIL-STD-1553 MT/RT/BC terminals
Switched power outputs with OCP +5.0 V AUX @ 1 A, +5 V @ 2.5 A, + 15 V @ 0.6 A, -15 V @ 0.6 A
Test interface (UART & discrete IO)
Fault Tolerance
Fault-tolerant Leon3FT processor
Register file SEU error-correction up to four errors per 32-bit word
Cache memory error-correction of up to four error per tag or 32-bit word
ECC coding of all on-chip RAM blocks and ECC coding of external memory (SRAM, SDRAM, NV-Memory)
Autonomous and software transparent error handling with no timing impact
Scalability
Cross-channel data link supports frame synchronous operation of up to four computers in a system for scalable redundancy
Applications
Launch vehicle/satellite flight control and navigation (GNC)
Mission data network (via SSCR)
Software-defined radio (SDR)
Command and data handling (C&DH)
Instrumentation and display

L3Harris' Phoenix is a modular and scalable ruggedized flight computer designed for use in a number of launch vehicle and spacecraft applications such as launch vehicle guidance, navigation and control (GNC), launch vehicle engine control, satellite attitude control, mission data network control (solid-state compressive recorder), instrumentation & display controller, software defined radio controller, vehicle health & status monitoring, command & data handling computer and payload control computer.

Phoenix is currently being developed for use as a GNC computer on United Launch Alliance's Vulcan Launch Vehicle.

Phoenix features a fault-tolerant LEON3 SparcV8 processor based on 32-bit architecture. The processor contains fault-tolerant features built-in for surviving in harsh environments. Those features include register file SEU error-correction of up to 4 errors per 32-bit word, cache memory error-correction of up to 4 errors per tag or 32-bit word, and BCH EDAC and Reed-Solomon EDAC protection of NV-memory/SRAM and SDRAM main memory.

COMPUTER	
Software	
Operating systems VxWorks 7.x, RTEMS 5.1, and others	
Compilers & toolchains eclipse IDE, GCC C/C++	
Performance & SWaP	
Radiation	Contact L3Harris
MIPS	65 DMIPS @ 50 MHz
Power	< 20 W internal dissipation; provides up to 35 W external power on switched outputs
Operating Temperature	-30 °C to +65 °C
Physical Footprint	3U cPCI form factor
Size	7.6" L x 6.1" W x 8.9" H
Weight	< 12 lb
Random Vibration	At least 32 g_{rms}
Pyrotechnic Shock	At least 1300 g

MODULARITY

Phoenix incorporates modular features to ensure mission flexibility and a smooth path to meeting customer needs. These features include a three-slot chassis design allowing for mission-specific peripherals, changes to the user's connector interface with minimal impact and plugin modules to accommodate upgrades and changes with no impact to other modules.

EXPERT SUPPORT

The Phoenix Flight Computer is designed, built, assembled and tested all within one facility and is serviced and supported by engineering professionals with decades of spaceflight design experience. Every Phoenix Flight Computer delivered is accompanied by domain expertise in parts, materials, radiation analysis, mechanical engineering, power supply design, digital signal processing, radio frequency design and manufacturing engineering. For most applications, existing data items can be provided for review, reducing the analysis and testing required.

Phoenix Flight Computer

L3Harris Technologies is an agile global aerospace and defense technology innovator, delivering end-to-end solutions that meet customers' mission-critical needs. The company provides advanced defense and commercial technologies across air, land, sea, space and cyber domains.

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