

# RT Crash-Survivable Memory Unit



communications  
Electrodynamics, Inc.



## FEATURES

- 0.5 MB to 2 MB EEPROM storage capacity
- 100,000 memory write cycles (minimum)
- Power fail protection, memory management and error detection for high integrity
- RT-to-RT transfer available
- Ready-to-record in 5 seconds from turn-on
- Can be driven from any processor
- MIL-STD-1553B Notice 2 protocol
- Extraction per B-1, B-2, T-45 methods and equipment
- Less than one bit error per million
- BIT: power-on, commanded, periodic
- RS-232 test bus
- Operational software is uploadable
- Exceeds FAA-TSO-C51a crash survivability
- Mounts with four captive bolts
- Ground strap for composite vehicles
- Convention cooled
- 100% ESS on all units

The L-3 Communications, Electrodynamic (L-3/EDI) RT Crash-Survivable Memory Unit (RT-CSMU) receives vehicle, subsystem and environmental parameters from a MIL-STD-1553B data bus, and stores these parameters in uncompressed form in electrically erasable PROM (EEPROM) solid state memory. It protects the data records from incidents and mishaps, including crash protection exceeding FAA-TSO-C51a levels. The RT-CSMU was developed for the F-22 aircraft but can be easily adapted to other vehicles. L-3/EDI also supplies a Flight Data Recorder suitable for recording with the RT-CSMU.

The RT-CSMU mounts in a survivable and accessible area of the vehicle, up to 100 feet from the recorder. It contains a microcontroller, 1553 and RS-232 interfaces, power conditioner and 0.5 to 2 megabytes of EEPROM memory. This highly reliable unit contains no moving parts or adjustments. It is suitable for circular loop rewrites as often as every 20 minutes or as long as 12 hours, for up to 17,000 operating hours. The memory format handles periodic and aperiodic parameters and events, with read-after-write and CRC error-detecting codes. All records are independent and self-documenting as stored.

Unit built-in test is performed on power-up or on external command. BIT status is available on the 1553 and RS-232 buses. Downloading can be performed after an incident or at any time. Card-level and chip-level data extraction equipment are available at L-3/EDI. Markings are inverted for ease of service on the vehicle. The unit is not field-repairable due to its unique construction. Cooling is by convection.

L-3 Communications, Electrodynamic, a leader in solid-state recorder technology, has also produced recorders for the B-1, B-2, F-4, and T-45 aircraft.

# RT Crash-Survivable Memory Unit

## DESIGN

- MIL-E-5400—general
- MIL-STD-883—integrated circuits
- MIL-STD-2000—soldering
- MIL-S-19500—semiconductors
- MIL-C-38999G—connectors
- MIL-STD-461/462—EMI
- MIL-STD-810—environmental test
- MIL-STD-1553B—data bus



## SPECIFICATIONS

- Size:** 3.8" H x 5.75" W x 5.4" L
- Weight:** 6.4 lbs. (2 MB)
- Color:** Fluorescent international orange
- Power:** +16 to +40 VDC @ 250 mA
- Shock:** 3400 g /5-8 ms. six axis
- Penetration:** 10 foot drop of 500 lb. weight, six axis, 0.05 in<sup>2</sup>
- Crush:** 5,000 lbs. for 5 minutes, six axis
- Fire:** 1100°C for 30 minutes
- Seawater immersion:** 1500 ft., 14 days
- Fluids:** Fuel, glycol, hydraulic, fire extinguishing, for 24 hours
- MTBF:** 30,000 hours (MIL-HDBK-217E)
- Life:** 17,000 hours operating, 30 years useful

