

AUG 27 1996

Critical Item: Field Monitor Pole Assembly
 Total Quantity: 6 (1 per system)
 Find Number: Unit 810 (Azimuth/DME)
 Criticality Category: 1

SAA No:	09LA03-002	System/Area:	MSBLS-GS at SLF, SLS-1 & GLS
NASA Part No:	None	PMN/ Name:	C70-1116 MSBLS-GS
Mfg/ Part No:	Cutter-Hammer 502154-1 (Azimuth/DME)	Drawing/ Sheet No:	502654 1

Function: Receives and decodes the transmitted beams looking for changes in pulse coding. The transmitted signals are detected, amplified and compared with a preset signal.

Critical Failure Mode/Failure Mode No: Continuous wave/09LA03-002.049 (Az/DE)

Failure Cause: Swamping of the DME receiver and AZ/DME Monitor due to the CW Oscillator operating continuously at the Field Monitor Pole.

Failure Effect: Will generate 3 continuous AZ/DME monitor alarms. The system will switch to the backup system. The backup system will see the same malfunctions and will also shutdown. There is no method of immediate recovery. Possible loss of life/vehicle due to loss of Azimuth, distance and elevation data to the Orbiter.

Detection Method: Monitored by remote control unit operator.

Time to Effect: 2 to 3 minutes. (Begins with orbiter signal interrogation at 22,000 ft and 10 miles out and ends with touchdown)

ACCEPTANCE RATIONALE

Design:

- The MSBLS design was structured from existing/proven ground-based landing systems and upgraded to meet MIL-E-4158, MIL-STD-454 and all subsidiary specifications in effect at the time of manufacture. Military and standard NASA approved parts, materials and processes were used.
- The design evolved from a timely and in-depth internal design review process culminating in an optimum reliability/maintainability/performance end-item product. The design review process included studies such as FMEA, electrical and thermal analysis, sneak circuit analysis, worst case studies, tolerance analysis, etc. which resulted in direct impact of the design.

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- The design was approved via the formal NASA-Eaton PDR, OADR, PCA, FCA and certification process.

Test:

- The MSBLS program consists of an equipment confidence build-up approach starting from 100% screening of components (burn-in and environmental test). Environmental testing of SRU's and 100% temperature/vibration tests at the LRU and equipment rack-level.
- In plant ATP from functional performance verification and workmanship were performed and witnessed by Eaton, NASA and AFPRO on all LRUs and again at system level.
- OMI's Z3111 thru Z3115 require system operational testing and validation prior to each Shuttle operational mission.
- OMRSD File VI requires verification of proper operation prior to use of each landing site in support of a Shuttle launch or landing.

Inspection:

- OMI's Z6100, Z6111, Z6112, Z6113, Z6114 and Z6115 requires adjustment of the electronic system and verification of proper operation utilizing the built-in test equipment (BITE) in periods of three months or less.

Failure History:

- Current data on test failures, unexplained anomalies, and other failures experienced during ground processing activities can be found in the PRACA database. The PRACA database was researched and the following failure data was found on this component in the critical failure mode.
- Problem Report No. PV-6-Z31337 was written against the Azimuth Field Monitor Pole Mounted Unit on Runway 15 at the SLF on October 21, 1992. Problem description was, "All three monitor alarms are on when Field Monitor 2 Power Switch is turned ON. FM No. 2 jumped to a CW mode during the performance of another PR. FM Pole Unit S/N 002 was replaced and the system operated satisfactorily".
- The GIDEP failure data interchange was researched and no failure data was found on this component in the critical failure mode.

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Operational Use:**• Correcting Action:**

Technician must isolate and switch off the defective Field Monitor at the Electrical Equipment Rack in the AZ/DME shelter. However, this action cannot be taken after 20 minutes prior to a landing when the runway cannot be crossed and there is no access to the equipment.

• Timeframe:

Correcting action must be accomplished by 25 minutes prior to the landing.