XMM Optical Monitor

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FLIGHT MODEL (Prime and Redundant) HANDLING, STORAGE AND TRANSPORTATION

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1 DESCRIPTION

The two identical flight OM2 units, denoted Prime and Redundant, consist of fully functional electronic and mechanical assemblies consistent with the physical criteria defined in the OM2 Interface Control Drawing (R39988, Issue E).. The FM structure and housing components are machined aluminum with a chromate (Alodine) coating to prevent corrosion. Two external surfaces (top and front cover) on each assembly are painted black with Chemglaze Z306 for thermal control. Within the FM units are housed 17 electronics modules, including five MSSL ICU cards. All are mounted in individual frames (either machined aluminum or Ryton R-4 thermoplastic) and interconnect directly with a shared backplane or mother-board. The module / mother-board interconnects are Sandia designed connectors and have either 74 or 95 connections each; (the SNL modules are primarily 95 pins, the ICU modules are 74 pins). There are four modules with I/O D-Type connectors protruding through the front cover (J0! 1-J0 4) and four modules with small test connectors (J06-J09) only accessible with removal of the small secondary cover at the center of the front cover. Each module is also mechanically tied to the front cover of the assembly with two 2-56 stainless screws. Each OM2-FM unit has been fully tested to all Acceptance levels for Vibration and Thermal/Vacuum and has been cleaned per the XMM/OM2 - FM Cleaning Procedure in preparation for flight Each OM2-FM will be transported in an individual, small, glass fiber reinforced, thermoplastic shock platform case. Green in color, the transport case is designed to be carried on a passenger aircraft and will fit in an overhead compartment or under the seat. The platform case has an automatic release pressure valve, humidity indicator, internal desiccant cage and soft storage pouch for miscellaneous tools, gloves, ground strap and extra ESD storage bag.

2 NOTE

The OM2-FM units are STATIC SENSITIVE electronic assemblies.. They require full use of ESD (Electro-Static Discharge) precautionary measures, including but not limited to: grounding wrist strap and ESD gloves. It is strongly recommended that an ESD lab coat be worn when any proximity to the FM units is required. The units should only be handled or operated by personnel trained in ESD procedures. ESD gloves, a single wriststrap and a small ESD blanket will be provided with the unit. The blanket should be placed over the unit when not enclosed in the transport case or in use. Velcro has been attached to the underside of the transit case platform and is to be used for attachment of the provided ESD blanket during shipment and when the unit is not in use.

3 UNPACKING / STORAGE

1.) The OM2-FM units will be delivered to MSSL in the small shock platform case described previously. WARNING: Before opening the transport case, press the manual release button on the pressure valve located next to the handle of the transport case. Though automatic in nature, the trip on the valve is set at 1.5 psi differential , meaning the valve opens when the pressure difference is 1.5 psi and closes at .5 psi. An internal pressure difference is most probable during air transport and may cause some concavity or bulging in the transport case. This is expected due to the extreme changes in altitude during transport.

2.) Once all pressure has been released, the case may be unlatched, fully exposing the EQM unit. An ESD storage bag will be placed over the unit as a secondary protective cover for transport. Over this, a blue ESD protective blanket will be placed that attaches to the underside of the shock mount platform with Velcro. This blanket should be kept over the unit at all times when it is not being used for cleanliness and electrostatic protection.

3.) The transport cases for the FM units contain an external humidity indicator as well as an internal desiccant cage. Humidity level inside the transport case should be checked each time the units are transported or stored for any length of time. If the humidity indicator shows an internal RH of 40container located inside the transport case is to be recharged.

4 HANDLING / OPERATION

1.) The OM2-FM units should only be handled by personnel wearing clean, ESD gloves, a grounding wrist strap and preferably an ESD lab coat. The unit is bolted to the shock mount platform within its transport case using 6 ea, 8-32 x .500 inch stainless bolts. It is recommended that the unit remain bolted to the platform for all allowable testing, as the transport case lid is fully removable. Use of the transport case bottom as a handling fixture lessens the risk to the EQM while allowing full access to all I/O connectors.

2.) The black paint on some of the exterior surfaces of the EQM is highly susceptible to grease and in-particular, fingerprints. In the event that cleaning is required, use only alchohol on a lint free cloth, with minimal scrubbing. Particulate matter (dust, etc) may be removed using ionized filtered air or dry nitrogen. This cleaning procedure may also be used on non-painted exterior surfaces.

3.) The four I/O connectors exposed on the front of the EQM will be covered with black, ESD plastic caps when not in use. J01 and J02 have connector savers installed. They are to remain in place at all times, until final test integration unless the front cover requires removal. It is highly recommended that J03 and J04 (interfaces to ICU modules) have connector savers installed before further testing proceeds. (Connector savers for J03, J04 were not provided by MSSL). All connectors / connector savers/ mating cables should be inspected before each use for external damage (bent pins, etc). It is recommended that all connections be blown out with ionized filtered air or dry nitrogen prior to mating.

4.) Additional handling precautions may be required if any thermal foil is applied to the unit.

5.) Electronic operation is not covered in this document, however it is assumed that standard operating safety precautions will be observed.

5 TRANSPORTATION

The green transport case, within which each FM unit is housed, is designed to be hand-carried aboard a passenger aircraft. IT IS NOT MEANT TO BE SHIPPED VIA COMMERCIAL CARRIER OR PLACED AS BAGGAGE. If commercial transportation is required, the transport case with the FM unit mounted inside, should be placed in an appropriate size wood crate lined in high density foam. Care should be taken to leave the air pressure relief valve unblocked (externally) by any packing material so the case can breathe”. This relief valve should be released following any change in altitude before opening the case.