XMM Optical Monitor

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DEM Mechanical Design

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The Digital Electronics consists of two identical units, OM 2(Prime) and OM 2(Redundant), mounted separately from the Telescope Unit on the Spacecraft Bulkhead. Both units consist of a single piece aluminum box structure into which a series of electronics modules are inserted. The two open ends of the box have covers over them. Electrical Interface with the Telescope Unit as well as the Spacecraft occurs through the front cover of each DEM where five "D-Style" connectors protrude. A cable harness (OM 3) will interconnect the two OM units with the Telescope Unit as well as the Spacecraft.

Each unit is to be bolted to the Spacecraft Bulkhead through six mounting lugs, machined as part of the primary box structure. The units are independantly removeable. A preferred orientation for the two units, relative to each other, is to place them so that their rear covers are facing each other, in order to minimize radiation shielding requirements on these surfaces. Additional radiation shielding is selectively provided on the top and front surfaces of the units as well as internally.

Within each unit, 19 individual electronics "modules" are housed. Each module consists of a multilayer printed circuit board, 180mm $\times$ 92mm $\times$ 1.5mm thick, mounted in a frame, made either of aluminum or Ryton R-4 thermoplastic. Components are primarily mounted on a single side of the PC board. Assembled modules are 187mm $\times$ 94mm with thickness varying according to component height requirements. Modules are individually inserted into the box where they interface with a single backplane or motherboard. This type of packaging scheme, using the same module size and configuration, has been successfully used on Satellite packages at SNL for over fifteen years. Examples of systems that have successfully utilized this packaging concept are: ULYSSES, ALEXIS and GPS. Upcoming systems will include Spectrum-X-Gamma (SRG) and JUNO.

Supporting Figures: XMM-OM Interface Control Drawing Module Placement Diagram Sample Printed Circuit Board Sample Module Assembly