

REPORT ON SMRM
C/P MAIN ELECTRONICS BOX
COMPONENT AND MATERIALS DEGRADATION EVALUATIONS

MAY 9, 1985

ROBERT E. DAVIS
SATELLITE SERVICING PROJECT/CODE 408
NASA/GODDARD SPACE FLIGHT CENTER
GREENBELT, MD 20771

PRECEDING PAGE BLANK NOT FILMED

C/P MAIN ELECTRONICS BOX HISTORY

- o HAO C/P OPERATED SUCCESSFULLY TAKING PICTURES OF SUN'S CORONA UNTIL FAILURE SEPTEMBER 29, 1980 (7 MONTHS)
- o AROUND EARLY 1982, DECISION MADE THAT C/P COULD BE REPAIRED BY BUILDING NEW MEB FOR EVA REPLACEMENT
- o SMRM MEB REPLACEMENT PERFORMED APRIL 10, 1984
- o FAILED MEB RETURNED FOR DEGRADATION STUDIES

SOLAR MAXIMUM MISSION OBSERVATORY IN CLEAN ROOM
(SHOWS MEB AND ITS BLANKET LOCATION BEFORE LAUNCH)

MEB INSTALLED IN SMM P/L COMPARTMENT BEFORE LAUNCH

(SHOWS CABLE INTERCONNECTIONS WITH MEB TEMPORARILY HINGED FOR ACCESSIBILITY

- THIS AS FLOWN PHOTO USED TO DETERMINE FEASIBILITY OF REPAIR MISSION)

MEB IS A COMPLICATED ASSEMBLY CONTAINING

- o 15 PLUG-IN STITCH-WELDED CIRCUIT BOARD (APPROX. 4 1/2" x 10" EA.)
- o POWER SUPPLY
- o 11 EXTERNAL SUBMINIATURE CONNECTORS (WITH 362 ACTIVE LEADS)
 - MOUNTED WITH 22 #4/40 SCREWS
 - (PLUS 1 TEST CONNECTOR) CLIPS INSTALLED ON NEW MEB FACILITATING EVA REPLACEMENT
- o ESTIMATED 1,000 COMPONENTS (ABOUT 20% MICROCIRCUITS)

MEB HANDLING CONDITIONS FOLLOWING SMRM REPAIRS

- o MEB WITH THERMAL BLANKET FOLDED WAS INSTALLED IN FSS LOCKER BY ASTRONAUTS
- o UNHEATED MEB RETURNED TO KSC IN FSSL
- o MEB CAREFULLY REMOVED, PHOTOGRAPHED, BAGGED AND PURGED, AND INSTALLED IN SHIPPING BOX FOR RETURN TO GSFC
- o BOX STORED IN CLEAN ROOM AT GSFC FOR OVER SIX MONTHS
- o THERMAL BLANKET REMOVED DURING STORAGE AND GIVEN TO MATERIALS PERSONNEL FOR ANALYSIS
- o ALUMINUM HONEYCOMB PANEL REMOVED FROM MEB AND GIVEN TO FSC FOR ANALYSIS - NO NOTICEABLE INCREASE IN SCREW REMOVAL TORQUE
- o MEB GIVEN TO HAO FOR CONFIRMATION OF ON-ORBIT MALFUNCTIONS AND COMPONENT REPLACEMENT (NOT PERFORMED IN A CLEAN ROOM)

PRESENTATORS ON RESULTS OF MEB COMPONENT AND MATERIALS DEGRADATION STUDIES

MAY 9, AM PRESENTATIONS

HAO - BOB LEE, C/P PROJECT ENGINEER

- o MEB MALFUNCTION CONFIRMATION
- o REPAIRS AND RETEST OF REWORKED BOARDS AND MEB

GSFC CODE 311.2/SPERRY - TONY MARQUEZ, FAILURE ANALYSIS ENGINEER

- o MEB PARTS FAILURE ANALYSES
- o REMOVED AND RESIDUAL PARTS RESCREENING

JHU/APL - DICK MAUER, RELIABILITY ENGINEER

- o MEB GENERIC PARTS RADIATION SUSCEPTIBILITY MEASUREMENTS

LATER PRESENTATIONS

FSC - MATERIALS SPECIALIST

- o MEB ALUMINUM HONEYCOMB DEGRADATION MEASUREMENTS

GSFC/JSC/OTHERS - MATERIALS ANALYSTS

- o MEB THERMAL BLANKET DEGRADATION AND SPACE DEBRIS PENETRATIONS

(This page intentionally left blank)