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ATTACHMENT -
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FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE

NUMBER: MO-AA1-710-X

SUBSYSTEM NAME: STABILIZED PAYLOAD DEPLOYMENT SYSTEM

REVISION : 2 06/08/90

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
ASSEM :	MID JTSN CONT ASSY NO.1	VOB2-764360
SRU :	PYRO INITIATOR CONTROLLER	VOB2-764374

PART DATA

■ EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

REFERENCE DESIGNATORS: 40V76A137-PIC 13
: 40V76A137-PIC 18
: 40V76A137-PIC 20
: 40V76A137-PIC 22
: 40V76A137-PIC 2
: 40V76A137-PIC 7
: 40V76A137-PIC 9
: 40V76A137-PIC 11

QUANTITY OF LIKE ITEMS: 8

■ FUNCTION:

PROVIDES THE CAPABILITY TO GENERATE THE POWER REQUIRED TO FIRE THE NSI ASSOCIATED WITH PAYLOAD RELEASE. PIC'S 13, 18, 20, AND 22 ARE PART OF SYSTEM A WHILE PIC'S 2, 7, 9, AND 11 ARE PART OF SYSTEM B.

NOTE: FOR INADVERTENT OPERATION DUE TO A STRAY ELECTRICAL IMPULSE TO OCCUR, A SERIES OF EARLIER FAILURES WOULD BE NECESSARY. TYPICAL OF THESE IS THE NON-CREDIBLE EVENT OF A CIRCUIT BREAKER SHORTING CLOSED FROM AN INTENTIONALLY OPEN CONDITION

FAILURE MODES EFFECTS ANALYSIS (FMEA) — CRITICAL FAILURE MODE
NUMBER: MO-AA1-710-01

REVISION# 2 06/08/90 R
SUBSYSTEM: STABILIZED PAYLOAD DEPLOYMENT SYSTEM
ITEM NAME: PYRO INITIATOR CONTROLLER
CRITICALITY OF THIS FAILURE MODE:1R3

■ FAILURE MODE:
LOSS OF OUTPUT OR WEAK OUTPUT

MISSION PHASE:
00 ON-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 102 COLUMBIA
: 103 DISCOVERY
: 104 ATLANTIS
: 105 ENDEAVOUR

■ CAUSE:
PIECE PART STRUCTURAL FAILURE, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK, PROCESSING ANOMALY

■ CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN A) PASS
B) FAIL
C) PASS

PASS/FAIL RATIONALE:

■ A)
PRELAUNCH CHECKOUT

■ B)
FAILURE MODE IS NOT DETECTABLE BY CREW.

■ C)
PHYSICAL AND ELECTRICAL ISOLATION OF REDUNDANT ELEMENTS.

- FAILURE EFFECTS -

■ (A) SUBSYSTEM:
LOSS OF PIC REDUNDANCY FOR PAYLOAD RELEASE OPERATION.

■ (B) INTERFACING SUBSYSTEM(S):
FIRST FAILURE - NO EFFECT. MULTIPLE LEVELS PIC REDUNDANCY EXIST TO COMPLETE THE OPERATION.

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NUMBER: MO-AA1-710-01

(C) MISSION:
NO EFFECT.

(D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT.

- (E) FUNCTIONAL CRITICALITY EFFECTS:
LOSS OF ALL REDUNDANT PICS IN THIS FAILURE MODE COULD RESULT IN THE INABILITY TO RELEASE PAYLOAD AND A SUBSEQUENT FAILURE DURING RE-BERTH FUNCTION COULD RESULT IN LOSS OF CREW/VEHICLE DUE TO THE INABILITY TO CLOSE PAYLOAD BAY DOORS.

- DISPOSITION RATIONALE -

- (A) DESIGN:
FIRING CIRCUITRY CONSISTS OF TWISTED SHIELDED PAIRS OF WIRE FOR PROTECTION AGAINST ELECTROMAGNETIC INTERFERENCE (EMI) AND RADIO FREQUENCY INTERFERENCE (RFI). PYRO INITIATOR CONTROLLER (PIC) IS TWO FAILURE TOLERANT FOR PROTECTION AGAINST AN ERRONEOUS OUTPUT. REFER TO APPENDIX H, ITEM 1.

- (B) TEST:
REFER TO APPENDIX H, ITEM 1.

OMRSD: GROUND TURNAROUND
FREQUENCY OF CHECKOUT IS MISSION DEPENDENT.
PIC BITE CIRCUITRY, VERIFIES ENERGY OUTPUT OF THE PIC'S.
S070A.230-A
S070A.230-B
S070A.230-C
S070A.230-D
S070A.230-E
S070A.230-F
S070A.230-G
S070A.230-H

- (C) INSPECTION:
REFER TO APPENDIX H, ITEM 1.
- (D) FAILURE HISTORY:
REFER TO APPENDIX H, ITEM 1.
- (E) OPERATIONAL USE:
NONE.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: MD-AA1-710-01

- APPROVALS -

RELIABILITY ENGINEERING:	W. R. MARLOWE	<i>[Signature]</i>	6/4/90
DESIGN ENGINEERING :	T. TAUFER	<i>[Signature]</i>	6/14/90
QUALITY ENGINEERING :	M. F. MERGEN	<i>[Signature]</i>	6/14/90
NASA RELIABILITY :		<i>[Signature]</i>	9/1/90
NASA SUBSYSTEM MANAGER :		<i>[Signature]</i>	9/25/90
NASA EPD&C RELIABILITY :		M. S. Duncan for J. Woodard	9/18/90
NASA QUALITY ASSURANCE :		<i>[Signature]</i>	9/21/90
NASA EPD&C SUBSYS MGR :		<i>[Signature]</i> for F. Harris	9/20/90