

## FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE

NUMBER: 05-6PG-21216 -X

SUBSYSTEM NAME: EPD&amp;C - COMM. &amp; TRACK.

REVISION: 0 01/05/88

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PART DATA

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	PART NAME	PART NUMBER
	VENDOR NAME	VENDOR NUMBER
LRU	: PNL A1A2	
SRU	: DIODE	JANTXV1N4246

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## EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

DIODE PREAMP POWER DIODE, S-BAND PREAMPLIFIER POWER CONTROL CIRCUIT.

REFERENCE DESIGNATORS: 36V73A1A2A18CR11  
36V73A1A2A18CR12

QUANTITY OF LIKE ITEMS: 2  
TWO

## FUNCTION:

IN CASE OF SWITCH (S10) FAILURE, PREVENTS UNWANTED INPUTS TO THE GCIL  
COMMAND MODE DRIVERS DUE TO REVERSE LEAKAGE CURRENT FLOW THROUGH THE  
CONTROL BUS AND INTO THE COMMAND DRIVERS.

## FAILURE MODES EFFECTS ANALYSIS FMEA - CIL FAILURE MODE

NUMBER: 05-6PG-21216- 02

REVISION#: 1 08/15/97

SUBSYSTEM NAME: EPD&amp;C - C&amp;T; S-BAND COMMUNICATIONS (05-2G)

LRU: PANEL A1A2

CRITICALITY OF THIS

ITEM NAME: DIODE

FAILURE MODE: 2R3

## FAILURE MODE:

FAILS SHORT CIRCUIT (END TO END).

MISSION PHASE:       LO   LIFT-OFF  
                           OO   ON-ORBIT  
                           DO   DE-ORBIT

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

## CAUSE:

STRUCTURAL FAILURE, MECHANICAL STRESS, VIBRATION, CONTAMINATION,  
 ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY.

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN       A) FAIL  
                               B) N/A  
                               C) PASS

## PASS/FAIL RATIONALE:

A)  
 FAILS SCREEN "A" BECAUSE SHORTED DIODES CANNOT BE DETECTED DURING  
 GROUND TURNAROUND TESTING.

B)  
 N/A FOR SCREEN "B" BECAUSE THE SWITCH FAILURE CAN BE DETECTED BY LOSS OF  
 SWITCH FUNCTION EVEN THOUGH THE SHORTED DIODES CANNOT BE DETECTED  
 DURING FLIGHT.

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

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NO EFFECT ON EPDC. LOSS OF PROTECTION FOR GCIL DRIVERS IN CASE OF SWITCH FAILURE. AFTER A SECOND DIODE FAILURE LOSS FOR BOTH GCIL PREAMP POWER DRIVERS.

**(B) INTERFACING SUBSYSTEM(S):**

NO EFFECT

**(C) MISSION:**

NO EFFECT

**(D) CREW, VEHICLE, AND ELEMENT(S):**

NO EFFECT

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

AFTER THREE FAILURES (TWO DIODES AND ONE SWITCH SHORT TO GROUND) LOSS OF USE OF BOTH PREAMPS. POSSIBLE LOSS OF PRIME MISSION OBJECTIVE DUE TO LOSS OF TDRS COMMUNICATIONS.

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**-DISPOSITION RATIONALE-**

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**(A) DESIGN:**

REFER TO APPENDIX F, ITEM #3, DIODE.

**(B) TEST:**

REFER TO APPENDIX F, ITEM #3, DIODE.

GROUND TURNAROUND TEST - NO TESTS ARE AVAILABLE TO DETECT SHORTED DIODES DURING GROUND TURNAROUND.

**(C) INSPECTION:**

REFER TO APPENDIX F, ITEM #3, DIODE.

**(D) FAILURE HISTORY:**

CURRENT DATA ON TEST FAILURES, FLIGHT FAILURES, UNEXPLAINED ANOMALIES, AND OTHER FAILURES EXPERIENCED DURING GROUND PROCESSING ACTIVITY CAN BE FOUND IN THE PRACA DATA BASE.

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(E) OPERATIONAL USE:  
CREW CAN USE REMAINING PRE-AMP TO MAINTAIN TDRS COMMUNICATION

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- APPROVALS -

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EDITORIALLY APPROVED	: BNA	: <u>J. Kamura 8/18/97</u>
EDITORIALLY APPROVED	: JSC	: <u>A. Deary 9/23/97</u>
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 05-CIL-015_05-6PG/