PRINT DATE: 12/17/98

FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL HARDWARE
NUMBER:05-1-GN28A -X

SUBSYSTEM NAME: GUIDANCE, NAV. & CONTROL

REVISION: 0 12/02/98

PART DATA

	PART NAME / **VENDOR NAME**	**PART NUMBER** / **VENDOR NUMBER**
	:AVIONIC BAY 1 & 2	
LRU	:ADVANCED AIR DATA TRANSDUCER ASSY	MC409-0224-0002

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
ADVANCED AIR DATA TRANSDUCER (AADT) ASSEMBLY

REFERENCE DESIGNATORS:
81V71A1
81V71A2
81V71A3
81V71A4

QUANTITY OF LIKE ITEMS: 4
2 PER BAYS 1 & 2

FUNCTION:
PROVIDES DIGITAL OUTPUTS PROPORTIONAL TO THE INPUT PITOT AND STATIC PRESSURES, THE RATE OF CHANGE OF THE STATIC PRESSURE, THE ANGLE OF ATTACK INPUT PRESSURES, AND THE RESISTIVE TOTAL TEMPERATURE INPUT, TO THE ORBITER DIGITAL PROCESSING SYSTEM. PROVIDES BUILT-IN TEST EQUPMENT REQUIRED TO MONITOR THE PERFORMANCE OF THE CIRCUITS IN THE AADT.

FAILURE MODES EFFECTS ANALYSIS FMEA -- NON-CIL FAILURE MODE
NUMBER: 05-1-GN28A-01

REVISION#: 0 12/02/98

SUBSYSTEM NAME: GUIDANCE, NAV. & CONTROL
LRU: ADVANCED AIR DATA TRANSDUCER ASSEMBLY **CRITICALITY OF THIS**
ITEM NAME: ADVANCED AIR DATA TRANSDUCER ASSEMBLY **FAILURE MODE:** 1R3

FUNCTIONAL CRITICALITY/
REQUIRED FAULT TOLERANCE/ACHIEVED FAULT TOLERANCE: 1R/2/2

FAILURE MODE:
LOSS OF OUTPUT

MISSION PHASE: DO DE-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY:

102	COLUMBIA
103	DISCOVERY
104	ATLANTIS
105	ENDEAVOUR

CAUSE:
PIECE-PART STRUCTURAL FAILURE, SENSOR/CENTRAL PROCESSING UNIT (CPU) BOARD FAILURE, POWER SUPPLY/IO BOARD FAILURE, LOSS OF INPUT SIGNAL

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

CRITICALITY 1R2 DURING INTACT ABORT ONLY (AVIONICS ONLY)? NO

REDUNDANCY SCREEN
A) PASS
B) PASS
C) PASS

PASS/FAIL RATIONALE:
A)

B)

C)

METHOD OF FAULT DETECTION:
FDI SOFTWARE AND BITE.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL FAILURE MODE NUMBER: 05-1-GN28A-01

MASTER MEAS. LIST NUMBERS: V71S7300X
V71S8300X
V71S7800X
V71S8800X

CORRECTING ACTION: AUTOMATED

CORRECTING ACTION DESCRIPTION:
LOSS OF OUTPUTS WILL BE AUTOMATICALLY DETECTED, CREW NOTIFIED AND OUTPUTS FROM THE REMAINING ADVANCED AIR DATA TRANSDUCERS (AADT'S) WILL BE UTILIZED BY THE DIGITAL AUTOPILOT.

REMARKS/RECOMMENDATIONS:
NOTE: LOSS OF PNEUMATIC INPUTS MAY CAUSE SIMULTANEOUS LOSS OF TWO AADT'S DUE TO COMMONALITY OF PNEUMATIC SUPPLY. THIS SCENARIO IS COVERED BY FMEA 04-2E-054000-1.

- FAILURE EFFECTS -

(A) SUBSYSTEM:
LOSS OF MEASUREMENT CAPABILITY RESULTING IN LOSS OF ADVANCED AIR DATA TRANSDUCER (AADT) FUNCTION. FLIGHT CONTROL WILL USE OUTPUTS FROM REMAINING AADT'S.

(B) INTERFACING SUBSYSTEM(S):
NO EFFECT - FIRST FAILURE

(C) MISSION:
NO EFFECT - FIRST FAILURE

(D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT - FIRST FAILURE

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF CREW/VEHICLE DUE TO FLIGHT CONTROL INSTABILITIES AFTER THREE FAILURES: LOSS OF FIRST AADT, LOSS OF REDUNDANT AADT ON THE SAME SIDE, AND LOSS OF OPPOSING AIR DATA PROBE.

- TIME FRAME -

PRINT DATE: 12/17/98

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL FAILURE MODE
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TIME FROM FAILURE TO CRITICAL EFFECT: MINUTES

TIME FROM FAILURE OCCURRENCE TO DETECTION: SECONDS

TIME FROM DETECTION TO COMPLETED CORRECTING ACTION: SECONDS

IS TIME REQUIRED TO IMPLEMENT CORRECTING ACTION LESS THAN TIME TO EFFECT?
YES

RATIONALE FOR TIME TO CORRECTING ACTION VS TIME TO EFFECT:
THE CREW IS ABLE TO READ ALPHA, MACH, AND ATTITUDE ON THE ONBOARD OVERRIDE SPEC TO COMPARE AADT DATA WITH THE NAV DERIVED DATA TO RESOLVE ANY DILEMMA (FLIGHT RULE A8.1.3-12).

- APPROVALS -

SS&PA ENGINEER	: T. Al	: 12/17/98
BNA SSM	: W. ANCHER	: Whayne A. Ancher 12/17/98