

**FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL HARDWARE  
NUMBER:05-1-0N28A -X**

**SUBSYSTEM NAME:** GUIDANCE, NAV. & CONTROL

**REVISION:** 0      12/02/98

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**PART DATA**

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

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**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 EQUIPMENT REQUIRED TO MONITOR THE PERFORMANCE OF THE CIRCUITS IN THE AADT.

**FAILURE MODES EFFECTS ANALYSIS FMEA – NON-GIL FAILURE MODE**

**NUMBER: 05-1-GN28A-02**

**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:**

**ERRONEOUS OUTPUT**

**MISSION PHASE: DO DE-ORBIT**

<b>VEHICLE/PAYLOAD/KIT EFFECTIVITY:</b>	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, CORRUPTION OF INPUT SIGNAL**

**CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO**

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

<b>REDUNDANCY SCREEN</b>	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-GN2BA-02**

**MASTER MEAS. LIST NUMBERS:** V71S7300X  
V71S8300X  
V71S7800X  
V71S8800X

**CORRECTING ACTION:** AUTOMATED

**CORRECTING ACTION DESCRIPTION:**  
ERRONEOUS 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:**

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**- FAILURE EFFECTS -**

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**(A) SUBSYSTEM:**  
LOSS OF AFFECTED ADVANCED AIR DATA TRANSDUCER (AADT). 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.

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**- TIME FRAME -**

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**TIME FROM FAILURE TO CRITICAL EFFECT: MINUTES**

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL FAILURE MODE  
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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).

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- APPROVALS -

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SS&PA ENGINEER  
BNA SSM

: T. AI  
: W. ANCHER

: *[Signature]* 12/17/98  
: *Wayne A. Ancher 12/17/98*