INDEPENDENT ORBITER ASSESSMENT

ANALYSIS OF THE ELECTRICAL POWER DISTRIBUTION AND CONTROL/ REMOTE MANIPULATOR SYSTEM SUBSYSTEM

12 FEBRUARY 1987

MCDONNELL DOUGLAS ASTRONAUTICS COMPANY
HOUSTON DIVISION

SPACE TRANSPORTATION SYSTEM ENGINEERING AND OPERATIONS SUPPORT

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1.0 EXECUTIVE SUMMARY

The McDonnell Douglas Astronautics Company (MDAC) was selected in June 1986 to perform an Independent Orbiter Assessment (IOA) of the Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL). Direction was given by the Space Transportation System (STS) Orbiter and Government Furnished Equipment (GFE) Projects Office to perform the hardware analysis using the instructions and ground rules defined in National Space Transportation System (NSTS) 22206, Instructions for Preparation of FMEA and CIL, 10 October 1986.

The IOA approach features a top-down analysis of the Electrical Power Distribution and Control (EPD&C)/Remote Manipulator System (RMS) hardware to determine failure modes, criticality, and potential critical items. To preserve independence, this analysis was accomplished without reliance upon the results contained in the NASA FMEA/CIL documentation. This report documents (Appendix C) the results of the independent analysis of the EPD&C/RMS (both port and starboard) hardware.

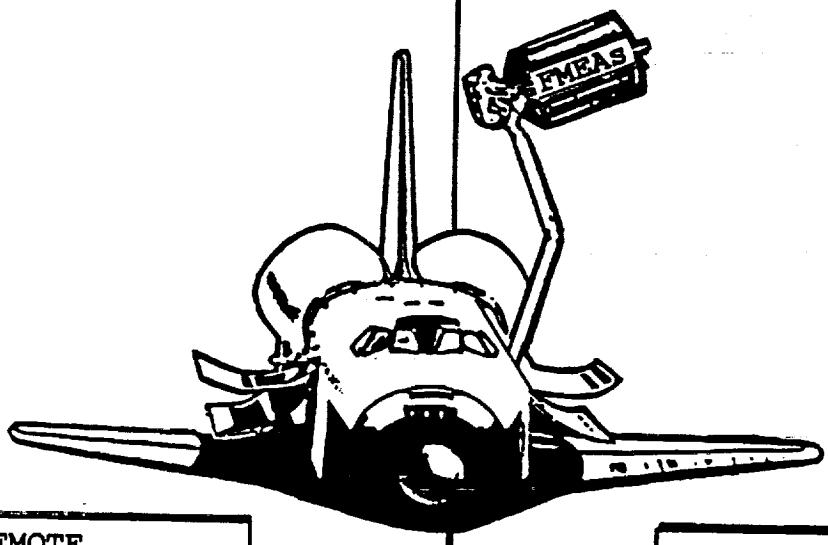
The EPD&C/RMS subsystem hardware provides the electrical power and power control circuitry required to safely deploy, operate, control, and stow or guillotine and jettison two (one port and one starboard) RMSs. The EPD&C/RMS subsystem is subdivided into the four following functional divisions:

- Remote Manipulator Arm
- Manipulator Deploy Control
- Manipulator Latch Control
- Manipulator Arm Shoulder Jettison and Retention Arm Jettison

The IOA analysis process utilized available EPD&C/RMS hardware drawings and schematics for defining hardware assemblies, components, and hardware items. Each level of hardware was evaluated and analyzed for possible failure modes and effects. Criticality was assigned based on the severity of the effect for each failure mode.

Figure 1 presents a summary of the failure criticalities for each of the four subdivisions of the EPD&C/RMS subsystem. A summary of the number of failure modes, by criticality combination, is also presented below with Hardware (HW) criticality on the left of the slash and Functional (F) criticality on the right of the slash or (HW/F).

EPD&C/RMS ANALYSIS SUMMARY		
CRIT	# FMEAs	# PCIs
1/1	23	23
2/1R	79	79
2/2	15	15
3/1R	0	0
3/2R	109	0
3/3	119	0
TOTAL	345	117



REMOTE MANIPULATOR ARM		
CRIT	# FMEAs	# PCIs
1/1	3	3
2/1R	15	15
2/2	13	13
3/1R	0	0
3/2R	8	0
3/3	9	0
TOTAL	48	31

MANIPULATOR ARM SHLDR/RETN ARM & JETT		
CRIT	# FMEAs	# PCIs
1/1	10	10
2/1R	62	62
2/2	0	0
3/1R	0	0
3/2R	1	0
3/3	6	0
TOTAL	79	72

MANIPULATOR LATCH CONTROL		
CRIT	# FMEAs	# PCIs
1/1	0	0
2/1R	0	0
2/2	0	0
3/1R	0	0
3/2R	70	0
3/3	74	0
TOTAL	144	0

MANIPULATOR DEPLOY CONTROL		
CRIT	# FMEAs	# PCIs
1/1	10	10
2/1R	2	2
2/2	2	2
3/1R	0	0
3/2R	30	0
3/3	30	0
TOTAL	74	14

Figure 1 - EPD&C/RMS ANALYSIS SUMMARY OVERVIEW

Summary of IOA Failure Modes by Criticality (HW/F)							
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
Number :	23	79	15	0	109	119	345

For each failure mode identified, the criticality and redundancy screens were examined to identify critical items. A summary of Potential Critical Items (PCIs) is presented as follows:

Summary of IOA Potential Critical Items (HW/F)						
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
Number :	23	79	15	0	0	117

2.0 INTRODUCTION

2.1 Purpose

The STS-51L Challenger accident prompted the NASA to readdress safety policies, concepts, and rationale being used in the National Space Transportation System (NSTS). The NSTS Office has undertaken the task of reevaluating the FMEA/CIL for the Space Shuttle design. The MDAC is providing an independent assessment of the Orbiter FMEA/CIL reevaluation results for completeness and technical accuracy.

2.2 Scope

The scope of the independent FMEA/CIL assessment activity encompasses those Shuttle Orbiter subsystems and Government Furnished Equipment (GFE) hardware identified in the Space Shuttle Independent FMEA/CIL Assessment Contractor Statement of Work. Each subsystem analysis addresses hardware, functions, internal and external interfaces, and operational requirements for all mission phases.

2.2 Analysis Approach

The independent analysis approach is a top-down analysis utilizing as-built drawings to breakdown the respective subsystem into components and low-level hardware items. Each hardware item is evaluated for failure mode, effects, and criticality. These data are documented in the respective subsystem analysis report, and used to assess the NASA and Prime Contractor FMEA/CIL reevaluation results. The IOA analysis approach is summarized in the following steps 1.0 through 3.0. Step 4.0 summarizes the assessment of the NASA and Prime Contractor FMEAs/CILs that is performed and documented at a later date.

Step 1.0 Subsystem Familiarization

- 1.1 Define subsystem functions
- 1.2 Define subsystem components
- 1.3 Define subsystem specific ground rules and assumptions

Step 2.0 Define Subsystem Analysis Diagram

- 2.1 Define subsystem
- 2.2 Define major assemblies
- 2.3 Define detailed subsystems representations

Step 3.0 Define Failure Events

- 3.1 Construct matrix of failure modes
- 3.2 Document IOA analysis results

Step 4.0 Compare IOA Analysis Data to NASA FMEA/CIL

- 4.1 Resolve differences
- 4.2 Review in-house
- 4.3 Document assessment issues
- 4.4 Forward findings to Project Manager

2.4 Ground Rules and Assumptions

The EPD&C/RMS specific ground rules and assumptions used in the IOA are defined in Appendix B.

2.5 Analysis Subsystem Interfacing Identification Coding

In order to provide for ease of cross-referencing and comparisons of subsystems, the analysis of the EPD&C/RMS subsystem is further subdivided into the four separate subdivisions that comply with the EPD&C/Interfacing Subsystem Identifiers defined in Tables 4.0 and 5.0, Rockwell International Space Division Reliability Desk Instruction No. 100-2G, Flight Hardware Failure Mode Effects Analysis (FMEA) & Critical Items List (CIL), dated January 31, 1984.

The EPD&C/RMS subsystem interfacing identifiers and subdivision names are as follows:

05-6	Electrical Power Distribution and Control (EPD&C)
05-6IA	Remote Manipulator Arm
05-6IB	Manipulator Deploy Control
05-6IC	Manipulator Latch Control
05-6ID	Manipulator Arm Shoulder Jettison and Retention Arm Jettison

3.0 SUBSYSTEM DESCRIPTION

3.1 Design and Function

The EPD&C/RMS subsystem provides the electrical power and power control circuitry required to safely deploy, operate, control, and stow one port and one starboard RMS. The EPD&C/RMS is a subset of the Orbiter EPD&C subsystem and uses the same three main busses and the same type of distribution and control hardware that is used to supply electrical power to the rest of the space shuttle subsystems. In addition, electrical power and control circuitry is provided to guillotine the appropriate cabling and jettison either or both the remote manipulator arms in the event it becomes necessary for crew/vehicle safety.

Although the EPD&C/RMS subsystem is designed to supply the required electrical power to both a port and a starboard RMS on a given mission, only one RMS can be powered-on at a given time. The port and starboard RMSs are essentially mirror images of one another. Some of the EPD&C/RMS electrical power control switches are common to both the port and starboard systems and some switches are dedicated to one or the other RMS. The port and starboard EPD&C/RMS subsystems are essentially identical in design. The port and starboard systems do differ in that power and control bus assignments are not the same for both systems.

The EPD&C/RMS subsystem consists of the following subdivisions:

1. The EPD&C/RMS Remote Manipulator Arm (05-6IA) subdivision consists of the hardware to provide Main Bus 28 volts Direct Current (DC) and 115 volts, three-phase (3-PH) and single-phase (1-PH), 400 Hertz (Hz) Alternating Current (AC) primary and backup (standby redundant) power to both the port and starboard (only one at a time) Remote Manipulator Arms for operation of its control electronics, heaters, lights and drive motors.

2. The EPD&C/RMS Manipulator Deploy Control (05-6IB) subdivision consists of the hardware to provide Main Bus 28 volts DC and 115 volts, 3-phase (3-PH), 400 Hz AC power to the Motor Control Assemblies (MCAs) to control power to the two electrical motors that drive the actuator to physically drive the appropriate Manipulator Positioning Mechanism (MPM) to stow or deploy the port and starboard Remote Manipulator Arms.

3. The EPD&C/RMS Manipulator Latch Control (05-6IC) subdivision consists of the hardware to provide Main Bus 28 volts DC and 115 volts, 3-phase (3-PH), 400 Hz AC power to the MCAs to control power to the three sets of electrical motor pairs that drive the retention latch actuators to release or latch position. There are three retention latch mechanisms with one located at each of the forward, mid, and aft positions for the port arm and another set for the starboard arm.

4. The EPD&C/RMS Manipulator Arm Shoulder Jettison and Retention Arm Jettison (05-6ID) subdivision consists of the hardware to provide the 28 volts DC and control switching to safely arm and fire the Pyro Initiator Controllers (PICs) that enable detonation of the explosives to guillotine the necessary RMS cables and jettison either or both the port and/or starboard arms if it becomes necessary for crew/vehicle safety.

3.2 Interfaces and Locations

The remote manipulator arm is attached to the Orbiter longeron (port, starboard, or both) through a roll-out deployment mechanism. The RMS is operated by a crewmember using direct viewing and Closed Circuit Television (CCTV) from the Display and Control (D&C) station on the aft flight deck. Most of the EPD&C/RMS switches are located on panels A8A2 and A14. The Payload Bay Mechanical (PLBM) power switches that control the power to the Motor Control Assemblies are located on panel R13A1 in the cockpit and the circuit breakers are located on the standard circuit breaker panels.

3.3 Hierarchy

Figure 2 illustrates the hierarchy of the EPD&C/RMS and the corresponding subdivisions. The subdivisions are represented in Figures 3 through 6.

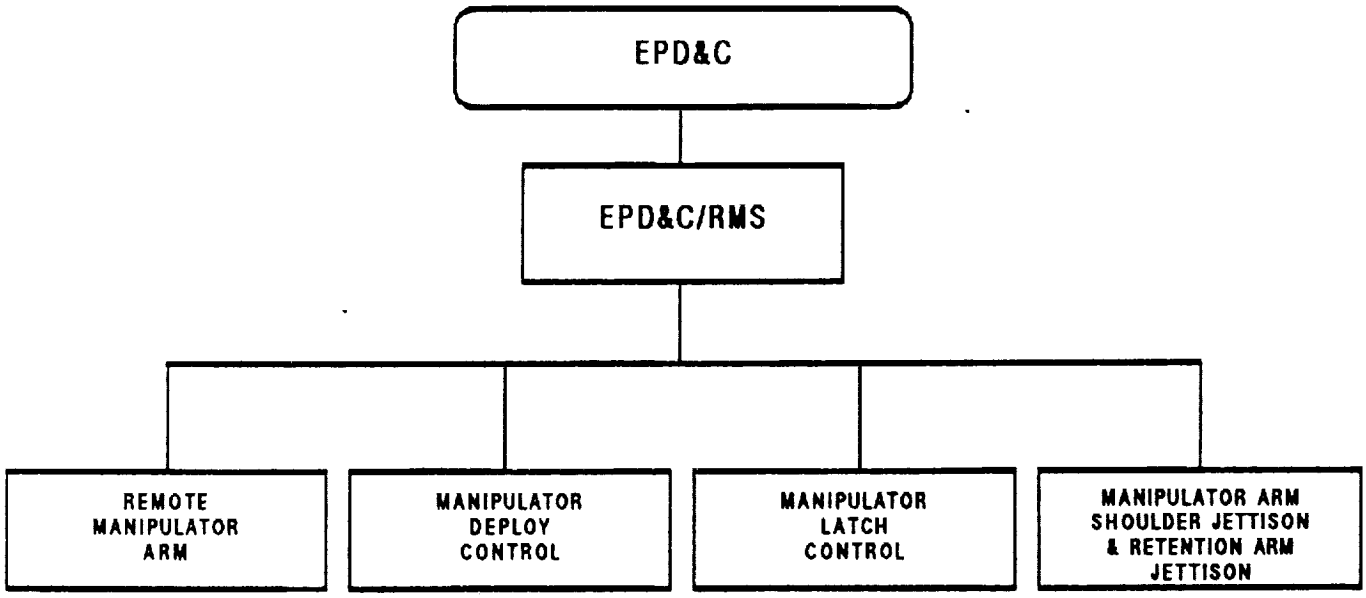


Figure 2 - EPD&C/RMS SUBSYSTEM (05-6I) OVERVIEW

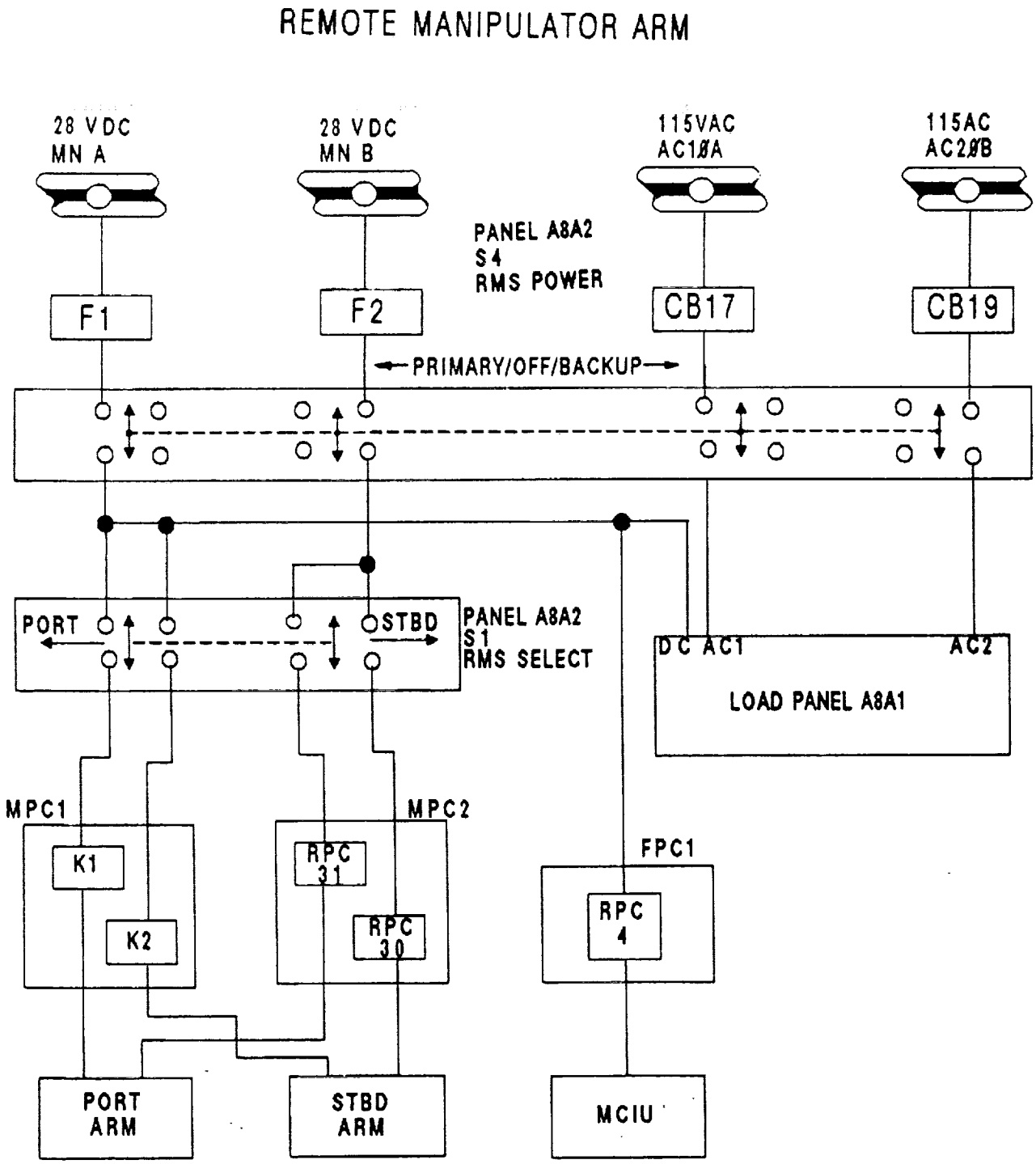


Figure 3 - EPD&C/RMS REMOTE MANIPULATOR ARM (05-6IA)

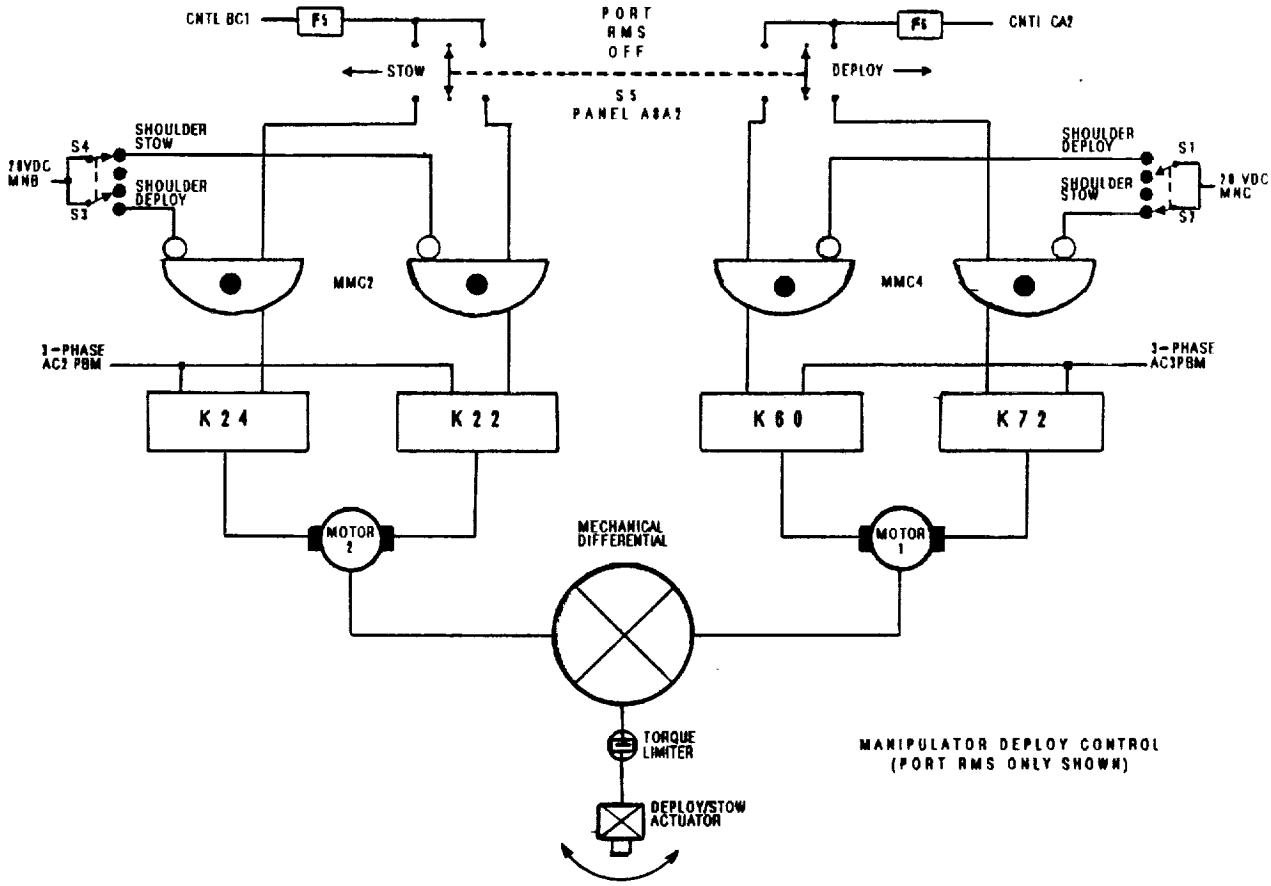


Figure 4 - EPD&C/RMS MANIPULATOR DEPLOY CONTROL (05-6IB)

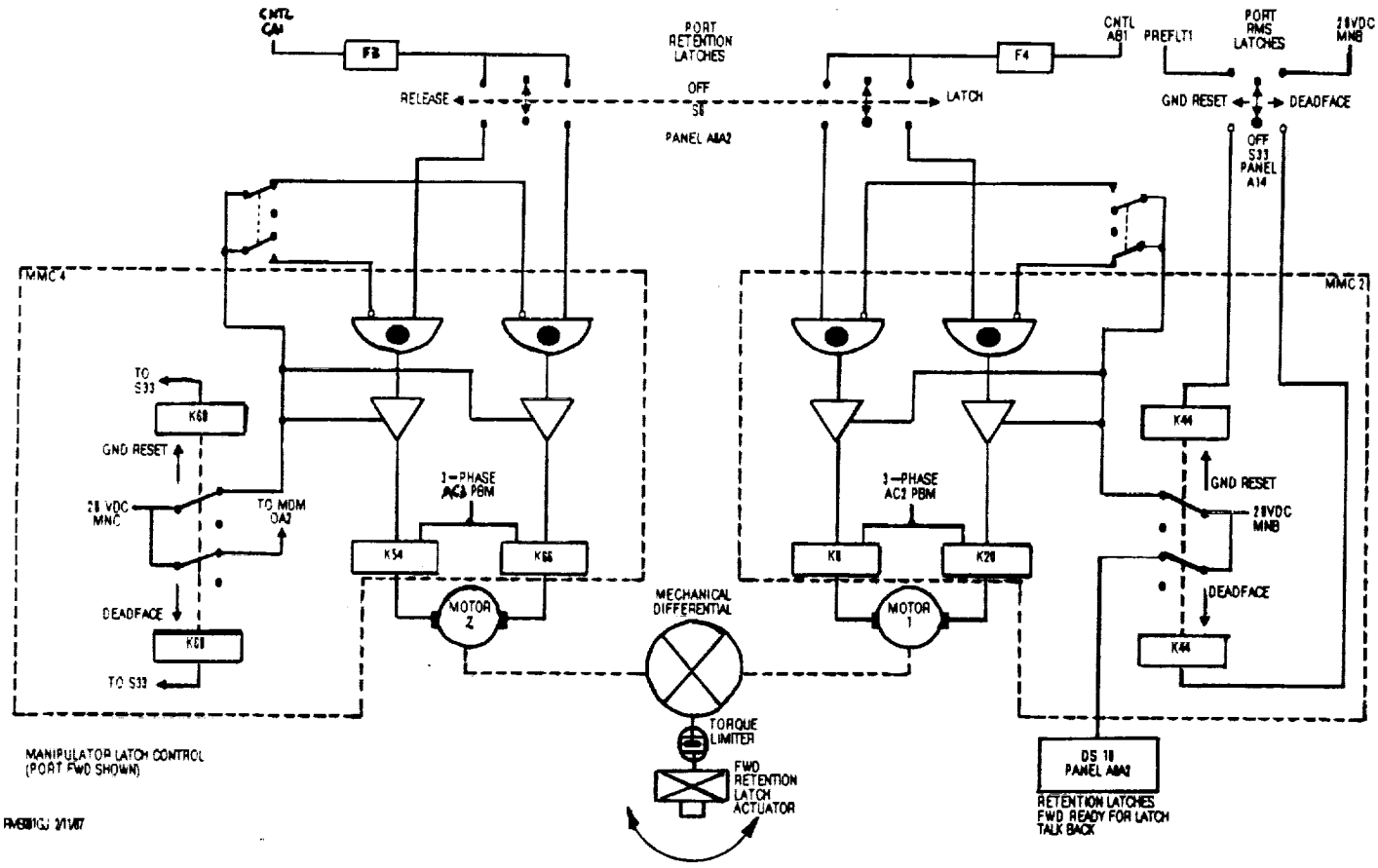


Figure 5 - EPD&C/RMS MANIPULATOR LATCH CONTROL (05-6IC)

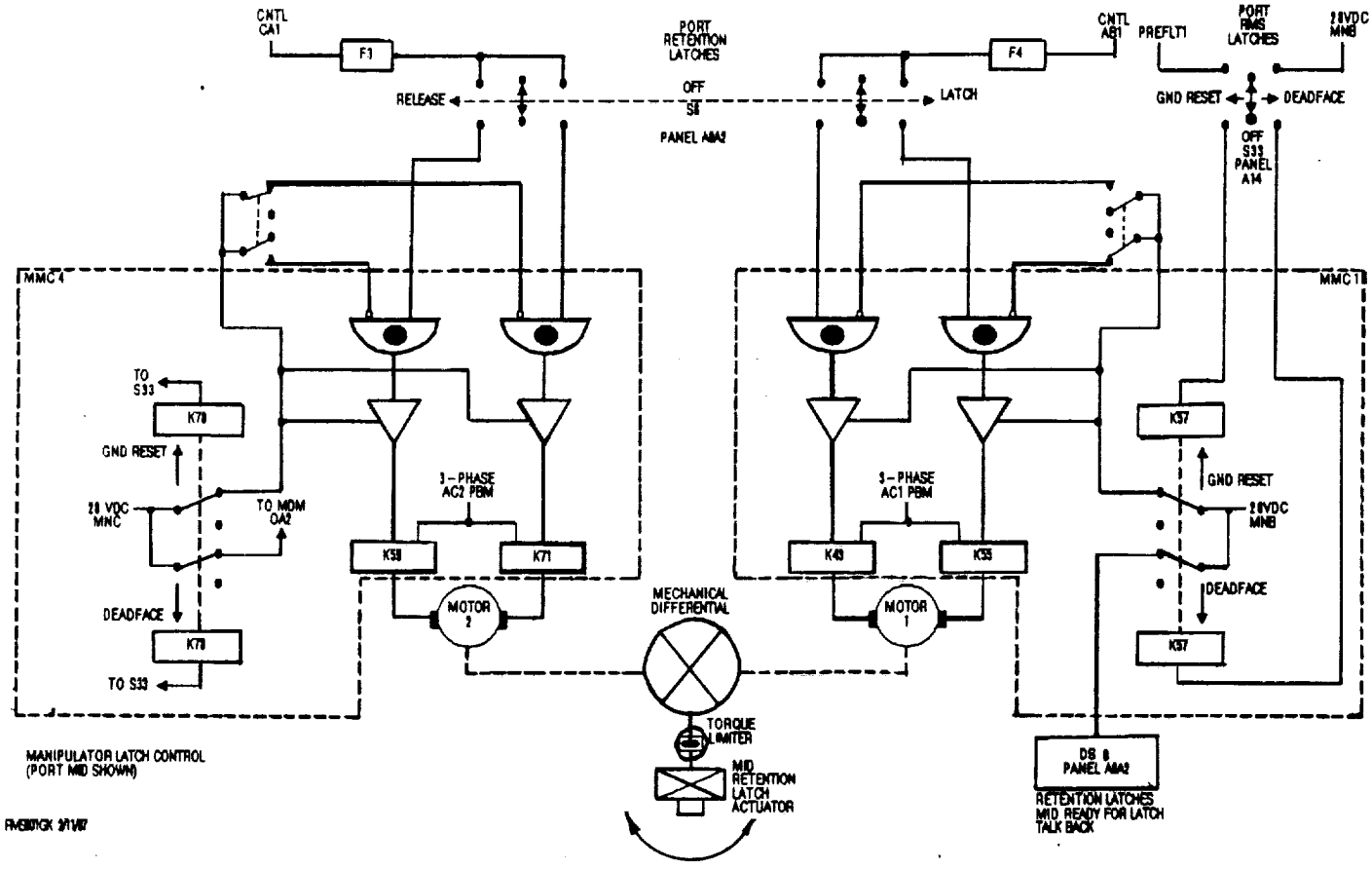


Figure 5 - EPD&C/RMS MANIPULATOR LATCH CONTROL (05-6IC) - CONTINUED

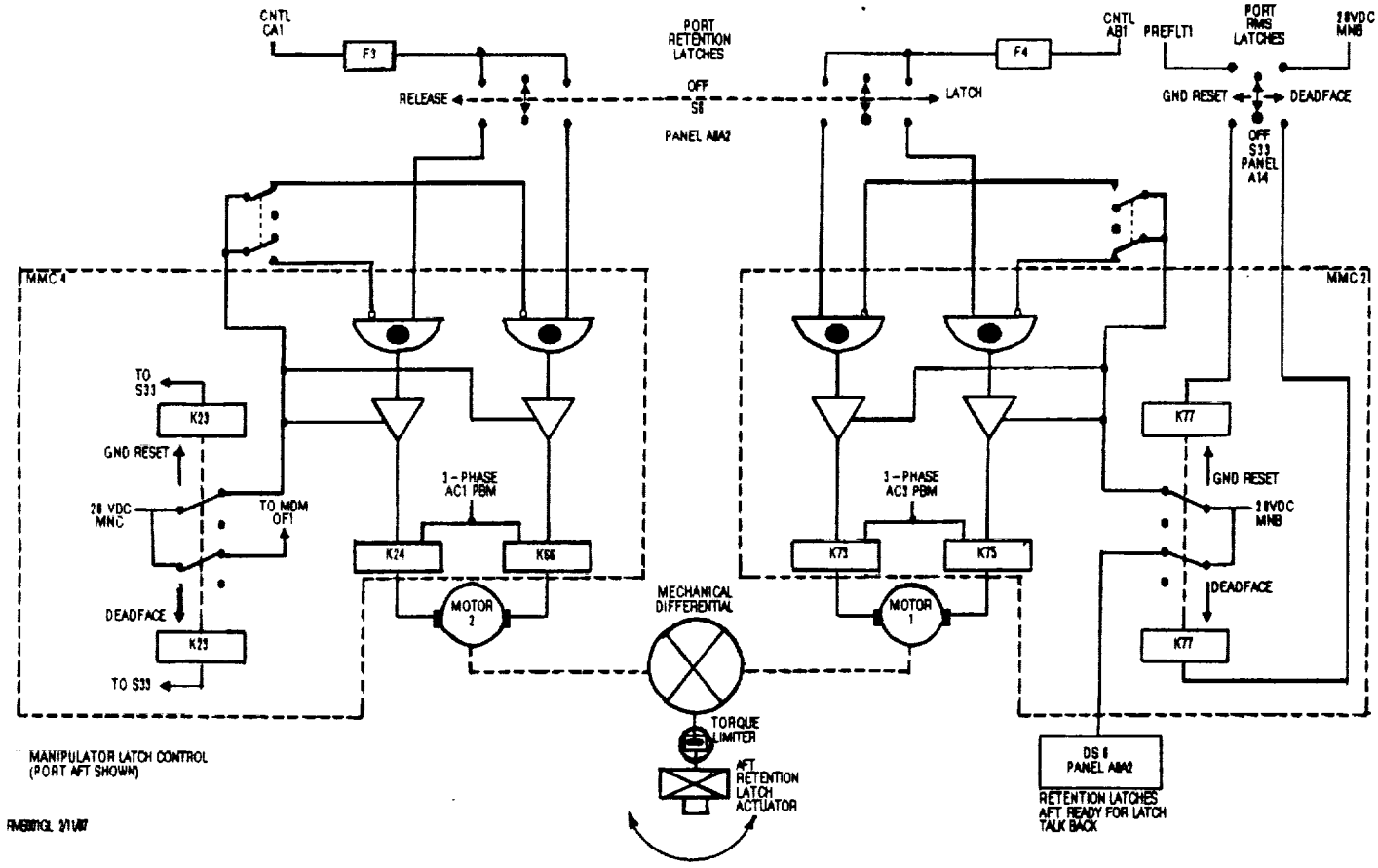


Figure 5 - EPD&C/RMS MANIPULATOR LATCH CONTROL (05-6IC) - CONCLUDED

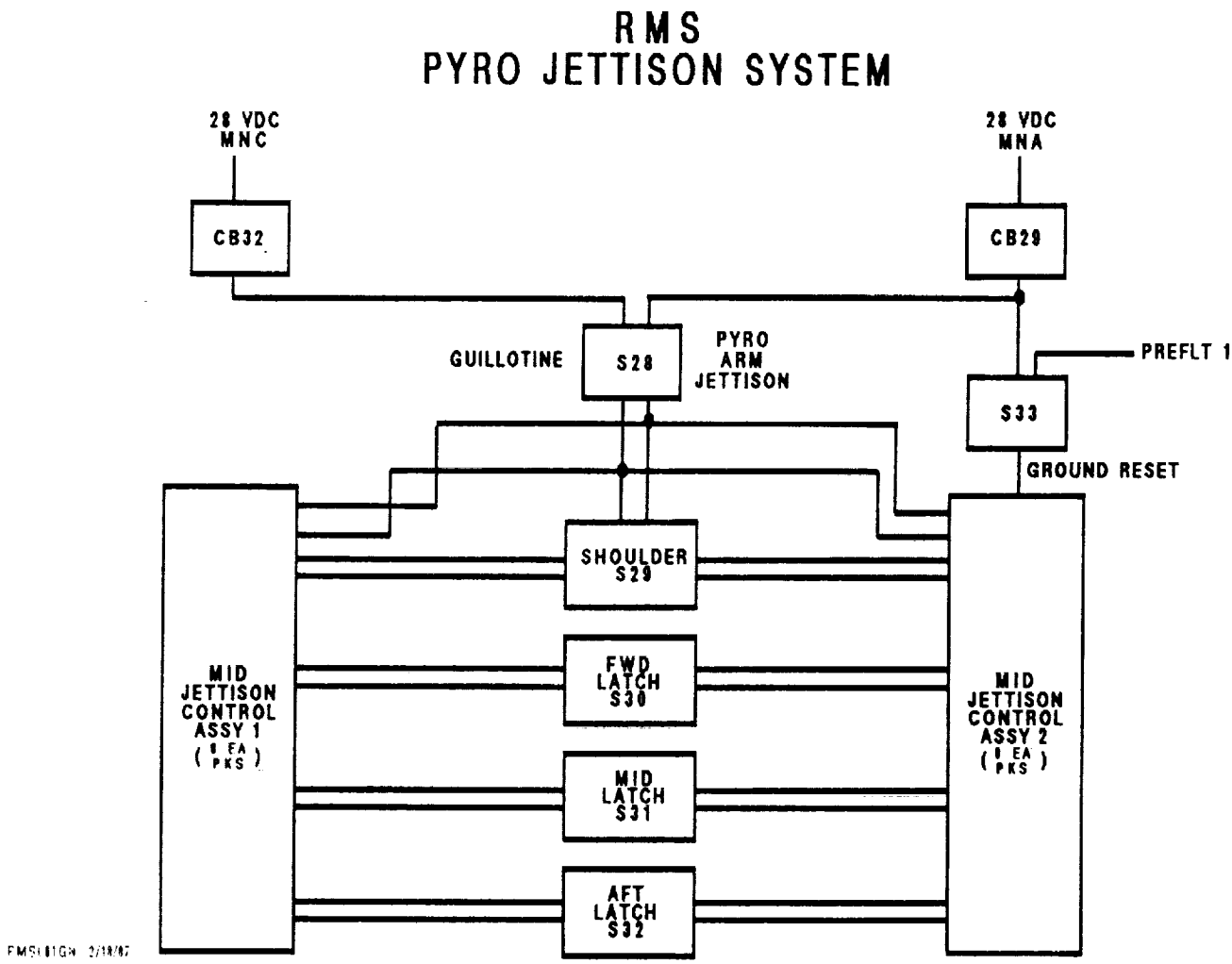


Figure 6 - EPD&C/RMS MANIPULATOR ARM SHOULDER JETTISON AND RETENTION ARM JETTISON (05-6ID)

4.0 ANALYSIS RESULTS

Detailed analysis results for each of the identified failure modes are presented in Appendix C. Table I presents a summary of the failure criticalities for each of the four major subdivisions of the RMS/EPD&C. Further discussions of each of the subdivisions and the applicable failure modes is provided in subsequent paragraphs.

TABLE I Summary of IOA Failure Modes and Criticalities

Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
05-6IA :	3	15	13	0	8	9	48
05-6IB :	10	2	2	0	30	30	74
05-6IC :	0	0	0	0	70	74	144
05-6ID :	10	62	0	0	1	6	79
TOTAL	23	79	15	0	109	119	345

Of the three hundred and forty-five (345) failure modes analyzed, twenty-three (23) single failures were determined to result in possible loss of crew or vehicle, and fifteen (15) were determined to result in loss of mission. A summary of the potential critical items is presented in Table II. Appendix D presents a cross reference between each Potential Critical Item (PCI) and a specific worksheet in appendix C.

TABLE II Summary of IOA Potential Critical Items

Criticality:	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
TOTAL	23	79	15	0	0	117

4.1 Analysis Results - Remote Manipulator Arm (05-6IA)

The EPD&C/RMS Remote Manipulator Arm subdivision provides the DC and AC electrical power to the port and the starboard systems for operation of the control electronics, heaters, lights and drive motors. There are forty-eight (48) failure modes identified for this subdivision. Of these, three (3) are Criticality 1/1; fifteen (15) are Criticality 2/1R; thirteen (13) are Criticality 2/2; eight (8) are Criticality 3/2R; and nine (9) are Criticality 3/3.

4.2 Analysis Result - Manipulator Deploy Control (05-6IB)

The EPD&C/RMS Manipulator Deploy Control subdivision provides the DC and AC electrical power to the port and the starboard systems for control and operation of the Manipulator Positioning Mechanisms to stow and deploy the respective arms. There are seventy-four (74) failure modes identified for this division. Of these, ten (10) are Criticality 1/1; two (2) are Criticality 2/1R; two (2) are Criticality 2/2; thirty (30) are Criticality 3/2R; and thirty (30) are Criticality 3/3.

4.3 Analysis Results - Manipulator Latch Control (05-6IC)

The EPD&C/RMS Manipulator Latch Control subdivision provides the DC and AC electrical power to the port and the starboard systems for control and operation of the retention latch actuators to latch and release the respective forward, mid and aft retention latch mechanisms. There are one hundred and forty-four (144) failure modes identified for this division. Of these, seventy (70) are Criticality 3/2R; and seventy-four (74) are Criticality 3/3.

4.4 Analysis Results - Manipulator Arm Shoulder Jettison and Retention Arm Jettison (05-6ID)

The EPD&C/RMS Manipulator Arm Shoulder Jettison and Retention Arm Jettison (05-6ID) subdivision provides the 28 volts DC and control switching to safely arm and fire the Pyro Initiator Controllers (PICs) that enable the detonation of the explosives to guillotine the necessary RMS cables and jettison either or both the port or starboard arms if it becomes necessary for crew/vehicle safety. There are seventy-nine (79) failure modes identified for this division. Of these, ten (10) are Criticality 1/1; sixty-two are (62) Criticality 2/1R; one is Criticality 3/2R; and six (6) are Criticality 3/3.

5.0 REFERENCES

Reference documentation available from NASA and Rockwell International Space Division was used in the analysis. The documentation used in the analysis includes the following:

1. NSTS 22206, Instructions for Preparation of Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL), Oct. 10, 1986

2. JSC-11174, Space Shuttle Systems Handbook, Rev. C, DCN-5, Sep. 13, 1985

3. VS72-956099, Rockwell International Electrical Schematics, Remote Manipulator System

4. Rockwell, International Space Division Reliability Desk Instruction No. 100-2G, Flight Hardware Failure Mode Effects Analysis (FMEA) & Critical Items List (CIL), January 31, 1984.

APPENDIX A

ACRONYNS and ABBREVIATIONS

AC	- Alternating Current
AOA	- Abort Once Around
AMP	- Ampere
ATO	- Abort To Orbit
CB	- Circuit Breaker
CIL	- Critical Items List
CKT	- Circuit
CUR	- Current
DC	- Direct Current
EPD&C	- Electrical Power Distribution and Control
FMC	- Forward Motor Controller
FMEA	- Failure Mode Effects Analysis
FPC	- Forward Power Controller
FUNC	- Functional
FWD	- Forward
GUILL	- Guillotine
HDW	- Hardware
HERM	- Hermetically
HW/F	- Hardware/Functional
HZ	- Hertz (cycles per second)
IOA	- Independent Orbiter Analysis
JETT	- Jettison
LIM	- Limiting
MCIU	- Manipulator Controller Interface Unit
MDAC	- McDonnell Douglas Astronautics Company
MDM	- Multiplexer/Demultiplexer
MFR	- Manned Foot Restraint
MMC	- Mid Motor Controller
MN	- Main 28 VDC Power Bus
MPC	- Mid Power Controller
NASA	- National Aeronautics and Space Administration
NSTS	- National Space Transportation System
N/A	- Not Applicable
OA	- Operational Aft
OF	- Operational Forward

P	- Pass
PBM	- Payload Bay Mechanical
PCA	- Power Controller Assembly
PCI	- Potential Critical Item
PH	- Phase
PIC	- Pyro Initiator Controller
POS	- Position
PYRO	- Pyrotechnic
RMS	- Remote Manipulator System
RPC	- Remote Power Controller
RTLS	- Return To Launch Site
STBD	- Starboard
TAL	- TransAtlantic Abort Landing
VAC	- Volts Alternating Current
VDC	- Volts Direct Current
1-PH	- Single Phase
3-PH	- Three Phase

APPENDIX B

DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

APPENDIX B
DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.1 Definitions

Definitions contained in NSTS 22206, Instructions For Preparation of FMEA/CIL, 10 October 1986, were used with the following amplifications and additions.

INTACT ABORT DEFINITIONS:

RTLS - begins at transition to OPS 6 and ends at transition to OPS 9, post-flight

TAL - begins at declaration of the abort and ends at transition to OPS 9, post-flight

AOA - begins at declaration of the abort and ends at transition to OPS 9, post-flight

ATO - begins at declaration of the abort and ends at transition to OPS 9, post-flight

CREDIBLE (CAUSE) - an event that can be predicted or expected in anticipated operational environmental conditions. Excludes an event where multiple failures must first occur to result in environmental extremes

CONTINGENCY CREW PROCEDURES - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

EARLY MISSION TERMINATION - termination of onorbit phase prior to planned end of mission

EFFECTS/RATIONALE - description of the case which generated the highest criticality

HIGHEST CRITICALITY - the highest functional criticality determined in the phase-by-phase analysis

MAJOR MODE (MM) - major sub-mode of software operational sequence (OPS)

MC - Memory Configuration of Primary Avionics Software System (PASS)

MISSION - assigned performance of a specific Orbiter flight with payload/objective accomplishments including orbit phasing and altitude (excludes secondary payloads such as GAS cans, middeck P/L, etc.)

MULTIPLE ORDER FAILURE - describes the failure due to a single cause or event of all units which perform a necessary (critical) function

OFF-NOMINAL CREW PROCEDURES - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

OPS - software operational sequence

PRIMARY MISSION OBJECTIVES - worst case primary mission objectives are equal to mission objectives

PHASE DEFINITIONS:

PRELAUNCH PHASE - begins at launch count-down Orbiter power-up and ends at moding to OPS Major Mode 102 (liftoff)

LIFTOFF MISSION PHASE - begins at SRB ignition (MM 102) and ends at transition out of OPS 1 (Synonymous with ASCENT)

ONORBIT PHASE - begins at transition to OPS 2 or OPS 8 and ends at transition out of OPS 2 or OPS 8

DEORBIT PHASE - begins at transition to OPS Major Mode 301 and ends at first main landing gear touchdown

LANDING/SAFING PHASE - begins at first main gear touchdown and ends with the completion of post-landing safing operations

B.2 IOA Project Level Ground Rules and Assumptions

The philosophy embodied in NSTS 22206, Instructions for Preparation of FMEA/CIL, 10 October 1986, was employed with the following amplifications and additions.

1. The operational flight software is an accurate implementation of the Flight System Software Requirements (FSSRs).

   RATIONALE: Software verification is out-of-scope of this task.

2. After liftoff, any parameter which is monitored by system management (SM) or which drives any part of the Caution and Warning System (C&W) will support passage of Redundancy Screen B for its corresponding hardware item.

   RATIONALE: Analysis of on-board parameter availability and/or the actual monitoring by the crew is beyond the scope of this task.

3. Any data employed with flight software is assumed to be functional for the specific vehicle and specific mission being flown.

   RATIONALE: Mission data verification is out-of-scope of this task.

4. All hardware (including firmware) is manufactured and assembled to the design specifications/drawings.

   RATIONALE: Acceptance and verification testing is designed to detect and identify problems before the item is approved for use.

5. All Flight Data File crew procedures will be assumed performed as written, and will not include human error in their performance.

   RATIONALE: Failures caused by human operational error are out-of-scope of this task.

6. All hardware analyses will, as a minimum, be performed at the level of analysis existent within NASA/Prime Contractor Orbiter FMEA/CILs, and will be permitted to go to greater hardware detail levels but not lesser.

   RATIONALE: Comparison of IOA analysis results with other analyses requires that both analyses be performed to a comparable level of detail.

7. Verification that a telemetry parameter is actually monitored during AOS by ground-based personnel is not required.

   RATIONALE: Analysis of mission-dependent telemetry availability and/or the actual monitoring of applicable data by ground-based personnel is beyond the scope of this task.

8. The determination of criticalities per phase is based on the worst case effect of a failure for the phase being analyzed. The failure can occur in the phase being analyzed or in any previous phase, whichever produces the worst case effects for the phase of interest.

   RATIONALE: Assigning phase criticalities ensures a thorough and complete analysis.

9. Analysis of wire harnesses, cables, and electrical connectors to determine if FMEAs are warranted will not be performed nor FMEAs assessed.

   RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

10. Analysis of welds or brazed joints that cannot be inspected will not be performed nor FMEAs assessed.

    RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

11. Emergency system or hardware will include burst discs and will exclude the EMU Secondary Oxygen Pack (SOP), pressure relief valves and the landing gear pyrotechnics.

    RATIONALE: Clarify definition of emergency systems to ensure consistency throughout IOA project.

B.3 EPD&C/RMS-Specific Ground Rules and Assumptions

The IOA analysis was performed to the component level wherever it was deemed appropriate and the components were identifiable on the drawings. The analysis was performed to the assembly level for those assemblies that are common to general EPD&C usage. The analysis considered the worst case effects of the hardware or functional failure on the subsystem, mission, and crew and vehicle safety.

1. Component age life was not considered in the analysis.

   RATIONALE: Component age analysis is beyond the scope of this task.

2. A RMS mission is considered to be uncradling, grappling a berthed payload, unberthing it, deploying it, and then retrieving a rotating payload, reberthing it, and performing Manned Foot Restraint (MFR) operations. Any failure that prevents the completion of any of these tasks is considered to be loss of mission.

   RATIONALE: This is the most demanding RMS mission possible. This causes the worst case criticalities for certain failures because they will prevent completion of this mission.

3. Any failure that causes uncommanded motion of any part of the RMS will be considered to be the highest criticality until it is definitely established that there is no time at which the given uncommanded motion would be of no consequence or absolutely could not occur.

   RATIONALE: Uncommanded motion in its worst case could possibly cause physical damage to the vehicle that would preclude safe reentry.

4. The loss of primary power causes loss of primary mode of operation of the RMS, which will cause loss of mission.

   RATIONALE: Backup RMS power is standby redundant and provides for safe release of the payload and cradling the arm for some failures. Therefore, loss of primary power is considered to be Criticality 2 even though backup power is available since loss of primary power causes loss of primary mode of operation of a RMS.

5. EPD&C/RMS failures are only considered for the on-orbit phase.

   RATIONALE: During ascent, entry, and aborts the RMS is latched and unpowered. Inadvertent power application to the retention latch mechanism or stow/deploy actuator motors would require multiple failure combinations which is beyond the scope of this analysis. Prelaunch failures are not included as part of the EPD&C/RMS analysis since failures that could occur during prelaunch would be general EPD&C and are covered in that analysis.

6. Failure modes for port and starboard arms were analyzed as individual failures and no consideration was given to any provision of redundancy that could exist on a two RMS mission.

   RATIONALE: The individual analysis was done to ensure that, indeed, the port and starboard RMS were similar. There are differences, however, in remote power control and power bus assignments that are a function of port or starboard location.

APPENDIX C
DETAILED ANALYSIS

This section contains the IOA analysis worksheets generated during the analysis of this subsystem. The information on these worksheets is intentionally similar to the NASA FMEAs. Each of these sheets identifies the hardware item being analyzed, and the parent assembly, as well as the function. For each failure mode, the possible causes are outlined, and the assessed hardware and functional criticality for each mission phase is listed, as described in the NSTS 22206, Instructions for Preparation of FMEA and CIL, 10 October 1986. Finally, effects are entered at the bottom of each sheet, and the worst case criticality is entered at the top.

LEGEND FOR IOA ANALYSIS WORKSHEETS

Hardware Criticalities:

- 1 = Loss of life or vehicle
- 2 = Loss of mission or next failure of any redundant item (like or unlike) could cause loss of life/vehicle
- 3 = All others

Functional Criticalities:

- 1R = Redundant hardware items (like or unlike) all of which, if failed, could cause loss of life or vehicle.
- 2R = Redundant hardware items (like or unlike) all of which, if failed, could cause loss of mission.

Redundancy Screen A:

- 1 = Is Checked Out PreFlight
- 2 = Is Capable of Check Out PreFlight
- 3 = Not Capable of Check Out PreFlight
- NA = Not Applicable

Redundancy Screens B and C:

- P = Passed Screen
- F = Failed Screen
- NA = Not Applicable

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/29/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/2
MDAC ID: 4001 ABORT: /NA

ITEM: SWITCH, S4
FAILURE MODE: FAILS TO SWITCH FROM OFF POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS POWER SWITCH, PRIMARY/OFF/BACKUP
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 4-POLE, 3-POSITION
7) SWITCH, S4
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/2	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A8A2S4
PART NUMBER: ME452-0102-7403

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE EITHER PRIMARY OR BACKUP 28 VDC AND 115 VAC POWER TO EITHER THE PORT OR STBD REMOTE MANIPULATOR ARM. INABILITY TO PROVIDE ELECTRICAL POWER TO THE RMS NEGATES ITS USE FOR MISSION FUNCTIONS. LOSS OF MISSION RESULTS.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/29/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4002 ABORT: /NA

ITEM: SWITCH, S4
FAILURE MODE: CONTACTS SHORT TO GROUND WHILE RMS IS IN USE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS POWER SWITCH, PRIMARY/OFF/BACKUP
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 4-POLE, 3-POSITION
7) SWITCH, S4
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A8A2S4
PART NUMBER: ME452-0102-7403

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE EITHER PRIMARY OR BACKUP 28 VDC AND 115 VAC POWER TO EITHER THE PORT OR STBD REMOTE MANIPULATOR ARM.
LOSS OF POWER TO AN RMS IN USE COULD REQUIRE JETTISON OF THE RMS IF SAFE JETTISON IS AN OPTION. IF THE RMS CANNOT BE SAFELY JETTISONED, LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/29/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/2
MDAC ID: 4003 ABORT: /NA

ITEM: SWITCH, S4
FAILURE MODE: FAILS TO SWITCH PRIMARY POWER ON.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS POWER SWITCH, PRIMARY/OFF/BACKUP
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 4-POLE, 3-POSITION
7) SWITCH, S4
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/2	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A8A2S4
PART NUMBER: ME452-0102-7403

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE PRIMARY 28VDC AND 115 VAC POWER TO EITHER THE PORT OR STBD REMOTE MANIPULATOR ARM.
LOSS OF PRIMARY POWER RESULTS IN LOSS OF PRIME MODE OF OPERATION OF THE RMS. THE ARM CAN BE SAFELY STOWED WITH BACKUP POWER. LOSS OF USE OF THE RMS RESULTS IN LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/29/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/2
MDAC ID: 4004 ABORT: /NA

ITEM: SWITCH, S4
FAILURE MODE: FAILS TO SWITCH BACKUP POWER ON.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS POWER SWITCH, PRIMARY/OFF/BACKUP
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 4-POLE, 3-POSITION
7) SWITCH, S4
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/2	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A8A2S4
PART NUMBER: ME452-0102-7403

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE BACKUP 28VDC POWER TO THE REMOTE MANIPULATOR ARM. BACKUP POWER TO THE RMS IS STANDBY REDUNDANT.
BACKUP POWER IS REQUIRED TO POSITION AND STOW THE ARM IN THE EVENT OF FAILURE OF PRIMARY POWER SYSTEM. WITH NO POWER REDUNDANCY AVAILABLE, THE ARM COULD NOT SAFELY BE USED TO FULFILL MISSION REQUIREMENTS, THUS LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/29/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4005 ABORT: /NA

ITEM: SWITCH, S4
FAILURE MODE: PRIMARY POWER FAILS OPEN WHILE ARM IS IN USE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS POWER SWITCH, PRIMARY/OFF/BACKUP
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 4-POLE, 3-POSITION
7) SWITCH, S4
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [NA] C [NA]

LOCATION: 36V73A8A2S4
PART NUMBER: ME452-0102-7403

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF PRIMARY 28VDC AND 115 VAC POWER TO THE RMS. BACKUP POWER TO THE RMS IS STANDBY REDUNDANT.
IF LOSS OF PRIMARY POWER OCCURRED AT A TIME WHEN THE ARM WAS IN A POSITION SUCH THAT IT COULD NOT BE SAFELY JETTISONED, A SUBSEQUENT FAILURE IN THE BACKUP POWER SYSTEM COULD CAUSE LOSS OF VEHICLE/CREW.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/29/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4006 ABORT: /NA

ITEM: SWITCH, S4
FAILURE MODE: FAILS CLOSED IN PRIMARY POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS POWER SWITCH, PRIMARY/OFF/BACKUP
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 4-POLE, 3-POSITION
7) SWITCH, S4
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A8A2S4
PART NUMBER: ME452-0102-7403

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNABLE TO POWER DOWN THE RMS WITH THE POWER SWITCH.
NO EFFECT. PRIMARY POWER TO THE CIRCUIT COULD BE INTERRUPTED USING SWITCH S1 (MN A) AND CIRCUIT BREAKER CB17 (AC1).

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/30/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/2
MDAC ID: 4007 ABORT: /NA

ITEM: SWITCH, S1
FAILURE MODE: FAILS TO SWITCH FROM OFF POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS SELECT SWITCH, PORT/OFF/STBD
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S1
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/2	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A8A2S1
PART NUMBER: ME452-0102-7203

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE EITHER 28 VDC PRIMARY OR BACKUP POWER TO EITHER PORT OR STBD REMOTE MANIPULATOR ARMS. THE 'RMS SELECT' SWITCH (S1) IS A SINGLE POINT FAILURE ITEM.
LOSS OF USE OF THE RMS TO FULFILL MISION REQUIREMENTS, THUS LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/30/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4008 ABORT: /NA

ITEM: SWITCH, S1
FAILURE MODE: CONTACTS SHORTS TO GROUND WHILE RMS IS IN USE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS SELECT SWITCH, PORT/OFF/STBD
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S1
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A8A2S1
PART NUMBER: ME452-0102-7203

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE EITHER 28 VDC PRIMARY OR BACKUP POWER TO THE REMOTE MANIPULATOR ARM BEING USED (AND ALSO THE OTHER ARM). THE 'RMS SELECT' SWITCH (S1) IS A SINGLE POINT FAILURE ITEM.
LOSS OF POWER TO AN RMS IN USE WOULD RESULT IN LOSS OF MISSION. POSSIBLE LOSS OF VEHICLE/CREW IF ARM IN USE CANNOT BE STOWED OR SAFELY JETTISIONED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/30/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4009 ABORT: /NA

ITEM: SWITCH, S1
FAILURE MODE: FAILS OPEN WHILE EITHER ARM IS IN USE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS SELECT SWITCH, PORT/OFF/STBD
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S1
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A8A2S1
PART NUMBER: ME452-0102-7203

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF BOTH PRIMARY AND SECONDARY POWER TO THE REMOTE MANIPULATOR ARM BEING USED.
LOSS OF BOTH PRIMARY AND BACKUP POWER TO THE RMS WOULD CAUSE LOSS OF MISSION AND POSSIBLY LOSS OF VEHICLE/CREW IF THE ARM IN USE CANNOT BE STOWED OR SAFELY JETTISONED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/31/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4010 ABORT: /NA

ITEM: SWITCH, S8
FAILURE MODE: FAILS OFF WHILE ARM IS IN USE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) PORT RMS HEATER A, AUTO/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S8
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 36V73A8A2S8
PART NUMBER: ME452-0102-7101

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO CONTROL RPC 27 IN MPC1 TO ENABLE THE PORT RMS MN A 28 VDC HEATER BUS.
ANY SUBSEQUENT FAILURE IN THE PORT RMS HEATER SYSTEM B COULD CAUSE LOSS OF MANIPULATOR POSITIONING CAPABILITY, WHICH COULD CAUSE LOSS OF MISSION AND POSSIBLY LOSS OF VEHICLE/CREW IF ARM COULD NOT BE STOWED OR SAFELY JETTISONED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/31/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4011 ABORT: /NA

ITEM: SWITCH, S10
FAILURE MODE: FAILS OFF WHILE ARM IS IN USE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) PORT RMS HEATER B, AUTO/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S10
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 36V73A8A2S10
PART NUMBER: ME452-0102-7101

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO CONTROL RPC 28 IN MPC2 TO ENABLE THE PORT RMS MN B 28 VDC HEATER BUS.
ANY SUBSEQUENT FAILURE IN THE PORT RMS HEATER SYSTEM A COULD CAUSE LOSS OF MANIPULATOR POSITIONING CAPABILITY, WHICH COULD CAUSE LOSS OF MISSION AND POSSIBLY LOSS OF VEHICLE/CREW IF ARM COULD NOT BE STOWED OR SAFELY JETTISONED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/31/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/2
MDAC ID: 4012 ABORT: /NA

ITEM: SWITCHES, S8, S10
FAILURE MODE: FAILS TO SWITCH FROM OFF TO AUTO POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) PORT RMS HEATERS A & B, AUTO/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 2-POLE, 3-POSITION, 2 EACH
7) SWITCHES, S8, S10
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/2	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A8A2S8, S10
PART NUMBER: ME452-0102-7101

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO ENABLE AUTO CONTROL OF EITHER OR BOTH PORT RMS HEATER BUS POWER SYSTEMS A/B.
BOTH HEATER SYSTEMS A & B ARE THERMOSTATICALLY CONTROLLED AND ARE NOMINALLY USED WITH BOTH IN THE AUTO POSITION WHILE OPERATING THE ARM. LOSS OF REDUNDANCY IN THE HEATER SYSTEMS WOULD PRECLUDE OPERATION OF THE ARM THUS RESULTING IN LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/31/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4013 ABORT: /NA

ITEM: SWITCH, S7
FAILURE MODE: FAILS OFF WHILE ARM IS IN USE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) STBD RMS HEATER A, AUTO/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S7
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 36V73A8A2S7
PART NUMBER: ME452-0102-7101

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO CONTROL RPC 26 IN MPC1 TO ENABLE THE STBD RMS MN A 28 VDC HEATER BUS.
ANY SUBSEQUENT FAILURE IN THE STBD RMS HEATER SYSTEM B COULD CAUSE LOSS OF MANIPULATOR POSITIONING CAPABILITY, WHICH COULD CAUSE LOSS OF MISSION AND POSSIBLY LOSS OF VEHICLE/CREW IF ARM COULD NOT BE STOWED OR SAFELY JETTISONED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/31/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4014 ABORT: /NA

ITEM: SWITCH, S9
FAILURE MODE: FAILS TO SWITCH FROM OFF TO AUTO POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) STBD RMS HEATER B, AUTO/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S9
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 36V73A8A2S9
PART NUMBER: ME452-0102-7101

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO CONTROL RPC 29 IN MPC2 TO ENABLE THE STBD RMS MN B 28 VDC HEATER BUS.
ANY SUBSEQUENT FAILURE IN THE STBD RMS HEATER SYSTEM A COULD CAUSE LOSS OF MANIPULATOR POSITIONING CAPABILITY, WHICH COULD CAUSE LOSS OF MISSION AND POSSIBLY LOSS OF VEHICLE IF ARM COULD NOT BE STOWED OR SAFELY JETTISONED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/31/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/2
MDAC ID: 4015 ABORT: /NA

ITEM: SWITCHES, S7, S9
FAILURE MODE: FAILS TO SWITCH FROM AUTO TO OFF POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) STBD RMS HEATER A & B, AUTO/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 2-POLE, 3-POSITION, 2 EACH
7) SWITCHES, S7, S9
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/2	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A8A2S7, S9
PART NUMBER: ME452-0102-7101

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO ENABLE AUTO CONTROL OF EITHER OR BOTH THE STBD RMS HEATER SYSTEMS A/B.
BOTH HEATER SYSTEMS A & B ARE THERMOSTATICALLY CONTROLLED AND ARE NOMINALLY USED IN THE AUTO POSITION WHILE OPERATING THE ARM. LOSS OF REDUNDANCY IN THE HEATER SYSTEMS WOULD PRECLUDE OPERATION OF THE ARM THUS RESULTING IN LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/31/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/2
MDAC ID: 4016 ABORT: /NA

ITEM: FUSE, F1
FAILURE MODE: FAILS OPEN PRIOR TO ARM DEPLOYMENT.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS POWER SWITCH, S4
5) PRIMARY SWITCH POSITION, (MN A) FUSE
6) FUSE, 2 AMP
7) FUSE, F1
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/2	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A8A2F1
PART NUMBER: ME451-0018-0200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE PRIMARY (28 VDC MN A) POWER TO EITHER REMOTE MANIPULATOR ARM, THE MCIU, OR LOAD PANEL A8A1. BACKUP POWER IS STANDBY REDUNDANT.
LOSS OF PRIMARY POWER WOULD NEGATE USE OF RMS TO FULFILL MISSION REQUIREMENTS. LOSS OF MISSION RESULTS.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/31/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4017 ABORT: /NA

ITEM: FUSE, F1
FAILURE MODE: FAILS OPEN WHILE ARM IS IN USE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS POWER SWITCH, S4
5) PRIMARY SWITCH POSITION, (MN A) FUSE
6) FUSE, 2 AMP
7) FUSE, F1
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [NA] C [NA]

LOCATION: 36V73A8A2F1
PART NUMBER: ME451-0018-0200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE PRIMARY (28 VDC MN A) POWER TO EITHER REMOTE MANIPULATOR ARM, THE MCIU, OR LOAD PANEL A8A1. BACKUP POWER IS STANDBY REDUNDANT.
ANY SUBSEQUENT FAILURE IN THE BACKUP POWER COULD CAUSE LOSS OF VEHICLE/CREW IF ARM CANNOT BE STOWED OR SAFELY JETTISONNED

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/31/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/2
MDAC ID: 4018 ABORT: /NA

ITEM: FUSE, F2
FAILURE MODE: FAILS OPEN PRIOR TO ARM DEPLOYMENT,

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS POWER SWITCH, S4
5) BACKUP SWITCH POSITION, (MN B) FUSE
6) FUSE, 2 AMP
7) FUSE, F2
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/2	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A8A2F2
PART NUMBER: ME451-0018-0200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE BACKUP (28 VDC MN B) POWER TO EITHER REMOTE MANIPULATOR ARM. BACKUP POWER IS STANDBY REDUNDANT.
LOSS OF BACKUP POWER PRIOR TO DEPLOYMANT WOULD NEGATE THE USE OF THE REMOTE MANIPULATOR ARM TO FULFILL MISSION REQUIREMENTS, THUS LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/31/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4019 ABORT: /NA

ITEM: FUSE, F2
FAILURE MODE: FAILS OPEN WHILE ARM IS IN USE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS POWER SWITCH, S4
5) BACKUP SWITCH POSITION, (MN B) FUSE
6) FUSE, 2 AMP
7) FUSE, F2
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [NA] C [NA]

LOCATION: 36V73A8A2F2
PART NUMBER: ME451-0018-0200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE BACKUP (28 VDC MN B) POWER TO EITHER REMOTE MANIPULATOR ARM. BACKUP POWER IS STANDBY REDUNDANT.
BACKUP POWER WOULD ONLY BE USED AFTER PRIMARY FAILURE OCCURRED WHILE IN USE. LOSS OF BACKUP POWER WHILE REMOTE MANIPULATOR IS USING BACKUP POWER COULD RESULT IN LOSS OF VEHICLE/CREW IF ARM CANNOT BE STOWED OR SAFELY JETTISONED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/31/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4020 ABORT: /NA

ITEM: RESISTOR, A3R2
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) SWITCH, PORT HEATER A, S8
5) RESISTOR, CURRENT LIMITING
6) RESISTOR, 1.2K OHM, 2 WATT
7) RESISTOR, A3R2
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 36V73A8A2A3R2
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO ENABLE RPC 27 (MPC 1, MN A) TO PROVIDE AUTO HEATER A POWER TO PORT REMOTE MANIPULATOR ARM.
ANY SUBSEQUENT FAILURE IN HEATER SYSTEM B COULD CAUSE LOSS OF MANIPULATOR POSITIONING CAPABILITY, THUS LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/31/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4021 ABORT: /NA

ITEM: RESISTOR, A3R3
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) SWITCH, PORT HEATER B, S10
5) RESISTOR, CURRENT LIMITING
6) RESISTOR, 1.2K OHM, 2 WATT
7) RESISTOR, A3R3
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 36V73A8A2A3R3
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO ENABLE RPC 28 (MPC 2, MN B) TO PROVIDE AUTO HEATER B POWER TO PORT REMOTE MANIPULATOR ARM.
ANY SUBSEQUENT FAILURE IN HEATER SYSTEM A COULD CAUSE LOSS OF MANIPULATOR POSITIONING CAPABILITY, THUS LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/31/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4022 ABORT: /NA

ITEM: RESISTOR, A2R2
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) SWITCH, STBD HEATER A, S7
5) RESISTOR, CURRENT LIMITING
6) RESISTOR, 1.2K OHM, 2 WATT
7) RESISTOR, A2R2
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 36V73A8A2A2R2
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO ENABLE RPC 26 (MPC 1, MN A) TO PROVIDE AUTO HEATER A POWER TO STBD REMOTE MANIPULATOR ARM.
ANY SUBSEQUENT FAILURE IN HEATER SYSTEM B COULD CAUSE LOSS OF MANIPULATOR POSITIONING CAPABILITY, THUS LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/31/86
SUBSYSTEM: EPD&C
MDAC ID: 4023

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: /NA

ITEM: RESISTOR, A2R3
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) SWITCH, STBD HEATER B, S9
5) RESISTOR, CURRENT LIMITING
6) RESISTOR, 1.2K OHM, 2 WATT
7) RESISTOR, A2R3
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 36V73A8A2A2R3
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO ENABLE RPC 29 (MPC 2, MN B) TO PROVIDE AUTO HEATER B POWER TO STBD REMOTE MANIPULATOR ARM.
ANY SUBSEQUENT FAILURE IN HEATER SYSTEM A COULD CAUSE LOSS OF MANIPULATOR POSITIONING CAPABILITY, THUS LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4024 ABORT: /NA

ITEM: RESISTOR, A1R1
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS POWER SWITCH SCAN CIRCUIT, MDM OF4
5) PRIMARY POWER ON/OFF (V54S06000E)
6) RESISTOR, ISOLATION
7) RESISTOR, 5.1K OH, 1/4 WATT
8) RESISTOR, A1R1
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A8A2A1R1
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF SWITCH SCAN MEASUREMENT. THE 'RMS PRIMARY POWER ON' MEASUREMENT (V54S0600E) TO MDM OF4 WILL ALWAYS INDICATE 'OFF'. MEASUREMENT NOT CRITICAL TO OPERATION OF SYSTEM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4025 ABORT: /NA

ITEM: RESISTOR, A1R2
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS POWER SWITCH SCAN CIRCUIT, MDM OF4
5) BACKUP POWER ON/OFF (V54S06001E)
6) RESISTOR, ISOLATION
7) RESISTOR, 5.1K OH, 1/4 WATT
8) RESISTOR, A1R2
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A8A2A1R2
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF SWITCH SCAN MEASUREMENT. THE 'RMS BACKUP POWER ON' MEASUREMENT (V54S0601E) TO MDM OF4 WILL ALWAYS INDICATE 'OFF'. MEASUREMENT NOT CRITICAL TO OPERATION OF SYSTEM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4026 ABORT: /NA

ITEM: RESISTOR, A3R1
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS HEATER POWER SWITCH SCAN CIRCUIT, MDM OF4
5) PORT HEATER A POWER AUTO/OFF (V54S0760E)
6) RESISTOR, ISOLATION
7) RESISTOR, 5.1K OH, 1/4 WATT
8) RESISTOR, A3R1
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A8A2A3R1
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF SWITCH SCAN MEASUREMENT. THE 'PORT RMS HEATER A POWER AUTO' MEASUREMENT (V54S0760E) TO MDM OF4 WILL ALWAYS INDICATE 'OFF'.
MEASUREMENT NOT CRITICAL TO OPERATION OF SYSTEM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4027 ABORT: /NA

ITEM: RESISTOR, A2R1
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL A8A2
4) RMS HEATER POWER SWITCH SCAN CIRCUIT, MDM OF4
5) STBD HEATER A POWER AUTO/OFF (V54S0960E)
6) RESISTOR, ISOLATION
7) RESISTOR, 5.1K OH, 1/4 WATT
8) RESISTOR, A2R1
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A8A2A2R1
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF SWITCH SCAN MEASUREMENT. THE 'STBD RMS HEATER A POWER AUTO' MEASUREMENT (V54S0760E) TO MDM OF4 WILL ALWAYS INDICATE 'OFF'.
MEASUREMENT NOT CRITICAL TO OPERATION OF SYSTEM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/2
MDAC ID: 4028 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB17
FAILURE MODE: FAILS OPEN PRIOR TO ARM DEPLOYMENT.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL M73C
4) AC SYSTEM 1 POWER
5) CIRCUIT BREAKER, 1-PH, 3 AMP
6) CIRCUIT BREAKER, CB17
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/2	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 85V73A129CB17
PART NUMBER: MC454-0026-2030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE PRIMARY AC POWER (SYSTEM 1) TO THE RMS LOAD PANEL A8A1 PRIMARY POWER CONTROL CIRCUIT. BACKUP POWER IS STANDBBY REDUNDANT.
LOSS OF PRIMARY POWER CONTROL CIRCUIT POWER WOULD NEGATE USE OF REMOTE MANIPULATOR ARM. LOSS OF MISSION WOULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4029 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB17
FAILURE MODE: FAILS OPEN WHILE ARM IS IN USE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL M73C
4) AC SYSTEM 1 POWER
5) CIRCUIT BREAKER, 1-PH, 3 AMP
6) CIRCUIT BREAKER, CB17
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129CB17
PART NUMBER: MC454-0026-2030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE PRIMARY AC POWER (SYSTEM 1) TO THE RMS LOAD PANEL A8A1 PRIMARY POWER CONTROL CIRCUIT. BACKUP POWER IS STANDBY REDUNDANT.
LOSS OF PRIMARY AC POWER WHILE ARM IS IN USE WOULD CAUSE LOSS OF PRIMARY MODE OF OPERATION, THUS LOSS OF MISSION. ANY SUBSEQUENT FAILURE IN BACKUP SYSTEM COULD CAUSE LOSS OF VEHICLE/CREW IF ARM COULD NOT BE STOWED OR SAFELY JETTISONED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4030 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB17
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL M73C
4) AC SYSTEM 1 POWER
5) CIRCUIT BREAKER, 1-PH, 3 AMP
6) CIRCUIT BREAKER, CB17
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 85V73A129CB17
PART NUMBER: MC454-0026-2030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE CIRCUIT PROTECTION FOR LOAD PANEL A8A1 AC POWER SYSTEM 1 POWER CONTROL CIRCUIT. POWER CAN BE REMOVED BY SWITCH.
CIRCUIT BREAKER IS NORMALLY CLOSED THUS THE FAILURE COULD REMAIN UNDETECTED UNTIL POWERDOWN OF CIRCUIT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/2
MDAC ID: 4031 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB19
FAILURE MODE: FAILS OPEN PRIOR TO DEPLOYMENT OF ARM.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL M73C
4) AC SYSTEM 2 POWER
5) CIRCUIT BREAKER, 1-PH, 3 AMP
6) CIRCUIT BREAKER, CB19
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/2	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 85V73A129CB19
PART NUMBER: MC454-0026-2030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE BACKUP AC POWER (SYSTEM 2) TO THE RMS LOAD PANEL A8A1 BACKUP POWER CONTROL CIRCUIT. BACKUP AC POWER IS STANDBY REDUNDANT.
LOSS OF BACKUP POWER CONTROL CIRCUIT WOULD NEGATE USE OF REMOTE MANIPULATOR ARM FOR SAFETY REASONS THUS LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4032 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB19
FAILURE MODE: FAILS OPEN WHILE ARM IS IN USE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL M73C
4) AC SYSTEM 2 POWER
5) CIRCUIT BREAKER, 1-PH, 3 AMP
6) CIRCUIT BREAKER, CB19
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [NA] C [NA]

LOCATION: 85V73A129CB19
PART NUMBER: MC454-0026-2030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE BACKUP AC POWER (SYSTEM 2) TO THE RMS LOAD PANEL A8A1 BACKUP POWER CONTROL CIRCUIT. BACKUP AC POWER IS STANDBY REDUNDANT.
LOSS OF BACKUP AC POWER WHILE ARM IS IN USE WOULD CAUSE LOSS OF BACKUP MODE OF OPERATION WHICH SHOULD ABORT THE MISSION. ANY SUBSEQUENT FAILURE IN PRIMARY SYSTEM COULD CAUSE LOSS OF VEHICLE/CREW IF ARM CANNOT BE STOWED OR SAFELY JETTISONED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4033 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB19
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PANEL M73C
4) AC SYSTEM 2 POWER
5) CIRCUIT BREAKER, 1-PH, 3 AMP
6) CIRCUIT BREAKER, CB19
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 85V73A129CB19
PART NUMBER: MC454-0026-2030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE CIRCUIT PROTECTION FOR BACKUP AC POWER (SYSTEM 2) TO THE RMS LOAD PANEL A8A1 POWER CONTROL CIRCUIT. POWER CAN BE REMOVED BY SWITCH.
CIRCUIT BREAKER IS NORMALLY CLOSED THUS THE FAILURE COULD REMAIN UNDETECTED UNTIL POWERDOWN OF CIRCUIT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/2
MDAC ID: 4034 ABORT: /NA

ITEM: RELAY, K1
FAILURE MODE: FAILS OPEN PRIOR TO ARM DEPLOYMENT.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PORT PRIMARY POWER (MN A)
4) MID POWER CONTROLLER ASSY (MPC) 1
5) RELAY, 50 AMP FUSED, K1
6) RELAY, K1
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/2	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A25K1
PART NUMBER: MC455-0134-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF PRIMARY (28 VDC MN A) POWER TO THE PORT REMOTE MANIPULATOR ARM. BACKUP POWER IS STANDBY REDUNDANT.
LOSS OF MISSION BY LOSS OF PRIME MODE OF RMS OPERATION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4035 ABORT: /NA

ITEM: RELAY, K1
FAILURE MODE: FAILS OPEN WHILE ARM IS IN USE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PORT PRIMARY POWER (MN A)
4) MID POWER CONTROLLER ASSY (MPC) 1
5) RELAY, 50 AMP FUSED, K1
6) RELAY, K1
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [NA] C [NA]

LOCATION: 40V76A25K1
PART NUMBER: MC455-0134-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF PRIMARY (28 VDC MN A) POWER TO THE PORT REMOTE MANIPULATOR ARM. BACKUP POWER IS STANDBY REDUNDANT. BACKUP POWER IS STANDBY REDUNDANT.
LOSS OF MISSION BY LOSS OF PRIME MODE OF RMS OPERATION. SUBSEQUENT LOSS OF BACKUP POWER COULD RESULT IN LOSS OF VEHICLE IF RMS COULD NOT BE SAFELY JETTISONED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4036 ABORT: /NA

ITEM: RELAY, K1
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PORT PRIMARY POWER (MN A)
4) MID POWER CONTROLLER ASSY (MPC) 1
5) RELAY, 50 AMP FUSED, K1
6) RELAY, K1
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A25K1
PART NUMBER: MC455-0134-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
APPLIES UNTIMELY PRIMARY (28 VDC MN A) POWER TO THE PORT REMOTE MANIPULATOR ARM. POWER CANNOT BE REMOVED FROM ARM.
INABILITY TO DEPOWER THE REMOTE MANIPULATOR ARM BY RELAY ACTION WOULD HAVE NO EFFECT ALONE. SUBSEQUENT FAILURES MAY WARRANT CONSIDERATION OF DEPOWERING MN A BUS IN MPC1

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/2
MDAC ID: 4037 ABORT: /NA

ITEM: RELAY, K2
FAILURE MODE: FAILS OPEN PRIOR TO ARM DEPLOYMENT.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) STBD PRIMARY POWER (MN A)
4) MID POWER CONTROLLER ASSY (MPC) 1
5) RELAY, 50 AMP FUSED, K2
6) RELAY, K2
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/2	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A25K2
PART NUMBER: MC455-0134-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF PRIMARY (28 VDC MN A) POWER TO THE STBD MANIPULATOR ARM. BACKUP POWER IS STANDBY REDUNDANT.
LOSS OF MISSION BY LOSS OF PRIME MODE OF RMS OPERATION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4038 ABORT: /NA

ITEM: RELAY, K2
FAILURE MODE: FAILS OPEN WHILE ARM IS IN USE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) STBD PRIMARY POWER (MN A)
4) MID POWER CONTROLLER ASSY (MPC) 1
5) RELAY, 50 AMP FUSED, K2
6) RELAY, K2
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A25K2
PART NUMBER: MC455-0134-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF PRIMARY (28 VDC MN A) POWER TO THE STBD MANIPULATOR ARM. BACKUP POWER IS STANDBY REDUNDANT.
LOSS OF MISSION BY LOSS OF PRIME MODE OF RMS OPERATION. SUBSEQUENT LOSS OF BACKUP POWER COULD RESULT IN LOSS OF VEHICLE/CREW IF ARM CANNOT BE STOWED OR SAFELY JETTISONED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4039 ABORT: /NA

ITEM: RELAY, K2
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) STBD PRIMARY POWER (MN A)
4) MID POWER CONTROLLER ASSY (MPC) 1
5) RELAY, 50 AMP FUSED, K2
6) RELAY, K2
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A25K2
PART NUMBER: MC455-0134-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
APPLIES UNTIMELY PRIMARY (28 VDC MN A) POWER TO THE STBD MANIPULATOR ARM. POWER CANNOT BE REMOVED FROM ARM.
INABILITY TO DEPOWER THE REMOTE MANIPULATOR ARM BY RELAY ACTION WOULD HAVE NO EFFECT ON THE SYSTEM WITH NO OTHER FAILURES INVOLVED. SUBSEQUENT FAILURES MAY WARRANT CONSIDERATION OF DEPOWERING MN B TO MPC1.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/13/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4040 ABORT: /NA

ITEM: FUSE, F26
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PORT MN BUS A, SYSTEM 1 POWER
4) MID POWER CONTROLLER ASSY (MPC) 1
5) RELAY, K1
6) FUSE, 50 AMP
7) FUSE, F26
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [NA] C [NA]

LOCATION: 40V76A25F27
PART NUMBER: ME451-0016-1050

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF PRIMARY (28 VDC MN A) POWER TO THE PORT REMOTE MANIPULATOR ARM. BACKUP POWER IS STANDBY RESUNDANT.
LOSS OF MISSION BY LOSS OF PRIME MODE OF RMS OPERATION. SUBSEQUENT LOSS OF BACKUP POWER COULD RESULT IN LOSS OF VEHICLE/CREW IF THE ARM CANNOT BE STOWED OR SAFELY JETTISIONED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/13/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4041 ABORT: /NA

ITEM: FUSE, F27
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PORT MN BUS A, SYSTEM 1 POWER
4) MID POWER CONTROLLER ASSY (MPC) 1
5) RELAY, K2
6) FUSE, 50 AMP
7) FUSE, F27
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [NA] C [NA]

LOCATION: 40V76A25F27
PART NUMBER: ME451-0016-1050

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF PRIMARY (28 VDC MN A) POWER TO THE STBD REMOTE MANIPULATOR ARM. BACKUP POWER IS STANDBY REDUNDANT.
LOSS OF MISSION BY LOSS OF PRIME MODE OF RMS OPERATION. SUBSEQUENT LOSS OF BACKUP POWER WHILE ARM IS IN USE COULD RESULT IN LOSS OF VEHICLE IF ARM CANNOT BE STOWED OR SAFELY JETTISIONED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4042 ABORT: /NA

ITEM: REMOTE POWER CONTROLLER, RPC 27
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PORT HEATER A POWER (MN A)
4) MID POWER CONTROLLER ASSY (MPC) 1
5) REMOTE POWER CONTROLLER, 20 AMP
6) REMOTE POWER CONTROLLER, RPC 27
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 40V76A25RPC27
PART NUMBER: MC450-0017-1200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE HEATER A (28 VDC MN A) POWER TO PORT REMOTE MANIPULATOR ARM.
LOSS OF HEATER POWER B TO PORT MANIPULATOR ARM COULD RESULT IN LOSS OF MANIPULATOR POSITIONING CAPABILITY, THUS LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4043 ABORT: /NA

ITEM: REMOTE POWER CONTROLLER, RPC 26
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) STBD HEATER A POWER (MN A)
4) MID POWER CONTROLLER ASSY (MPC) 1
5) REMOTE POWER CONTROLLER, 20 AMP
6) REMOTE POWER CONTROLLER, RPC 26
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 40V76A25RPC26
PART NUMBER: MC450-0017-1200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE HEATER A (28 VDC MN A) POWER TO STBD REMOTE MANIPULATOR ARM.
LOSS OF HEATER POWER B TO STBD MANIPULATOR ARM COULD RESULT IN LOSS OF MANIPULATOR POSITIONING CAPABILITY, THUS LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/2
MDAC ID: 4044 ABORT: /NA

ITEM: REMOTE POWER CONTROLLER, RPC 4
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) MCIU PRIMARY POWER (MN A)
4) FWD POWER CONTROLLER ASSY (MPC) 1
5) REMOTE POWER CONTROLLER, 10 AMP
6) REMOTE POWER CONTROLLER, RPC 4
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/2	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 81V76A22RPC4
PART NUMBER: MC450-0017-1100

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE PRIMARY (28 VDC MN A) POWER TO MANIPULATOR CONTROLLER INTERFACE UNIT (MCIU). THERE ARE NO PROVISIONS TO PROVIDE BACKUP POWER TO THE MCIU.
SINCE THERE ARE NO PROVISIONS TO PROVIDE BACKUP POWER TO THE MCIU, IF RPC 4 FAILS OPEN, THE RESULT IS LOSS OF PRIMARY MODE OF OPERATION OF THE REMOTE MANIPULATOR ARM, THUS LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4045 ABORT: /NA

ITEM: REMOTE POWER CONTROLLER, RPC 31
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PORT BACKUP POWER (MN B)
4) MID POWER CONTROLLER ASSY (MPC) 2
5) REMOTE POWER CONTROLLER, 10 AMP
6) REMOTE POWER CONTROLLER, RPC 31
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [NA] C [NA]

LOCATION: 40V76A26RPC31
PART NUMBER: MC450-0017-1100

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF BACKUP (28 VDC MN B) POWER TO PORT REMOTE MANIPULATOR ARM PRIOR TO START OF ARM DEPLOYMENT WOULD NEGATE USE OF ARM THUS LOSS OF MISSION. BACKUP POWER IS STANDBY REDUNDANT.
LOSS OF BACKUP POWER PRIOR TO DEPLOYMENT OR WHILE ARM IS IN USE WOULD ABORT OPERATION OF ARM THUS LOSS OF MISSION. LOSS OF BACKUP AFTER LOSS OF PRIMARY WHILE ARM IS IN USE COULD RESULT IN LOSS OF VEHICLE IF ARM CANNOT BE STOWED OR SAFELY JETTISONED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4046 ABORT: /NA

ITEM: REMOTE POWER CONTROLLER, RPC 30
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) STBD BACKUP POWER (MN B)
4) MID POWER CONTROLLER ASSY (MPC) 2
5) REMOTE POWER CONTROLLER, 10 AMP
6) REMOTE POWER CONTROLLER, RPC 30
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [NA] C [NA]

LOCATION: 40V76A26RPC30
PART NUMBER: MC450-0017-1100

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF BACKUP (28 VDC MN B) POWER TO STBD REMOTE MANIPULATOR ARM PRIOR TO START OF ARM DEPLOYMENT WOULD NEGATE USE OF ARM THUS LOSS OF MISSION. BACKUP POWER IS STANDBY REDUNDANT.
LOSS OF BACKUP POWER PRIOR TO DEPLOYMENT OR WHILE ARM IS IN USE WOULD ABORT OPERATION OF ARM THUS LOSS OF MISSION. LOSS OF BACKUP AFTER LOSS OF PRIMARY WHILE ARM IS IN USE COULD RESULT IN LOSS OF VEHICLE IF ARM CANNOT BE STOWED OR SAFELY JETTISONED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4047 ABORT: /NA

ITEM: REMOTE POWER CONTROLLER, RPC 28
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) PORT HEATER B POWER (MN B)
4) MID POWER CONTROLLER ASSY (MPC) 2
5) REMOTE POWER CONTROLLER, 10 AMP
6) REMOTE POWER CONTROLLER, RPC 28
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 40V76A26RPC28
PART NUMBER: MC450-0017-1100

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE HEATER B (28 VDC MN B) POWER TO PORT REMOTE MANIPULATOR ARM.
LOSS OF BOTH HEATER POWER B AND HEATER POWER A COULD RESULT IN LOSS OF MANIPULATOR POSITIONING CAPABILITY.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4048 ABORT: /NA

ITEM: REMOTE POWER CONTROLLER, RPC 29
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IA
2) REMOTE MANIPULATOR ARM
3) STBD HEATER B POWER (MN B)
4) MID POWER CONTROLLER ASSY (MPC) 2
5) REMOTE POWER CONTROLLER, 10 AMP
6) REMOTE POWER CONTROLLER, RPC 29
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 40V76A26RPC29
PART NUMBER: MC450-0017-1100

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF ABILITY TO PROVIDE HEATER B (28 VDC MN B) POWER TO STBD REMOTE MANIPULATOR ARM.
LOSS OF BOTH HEATER POWER B AND HEATER POWER A COULD RESULT IN LOSS OF MANIPULATOR POSITIONING CAPABILITY.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4101 ABORT: /NA

ITEM: SWITCH, S1
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL R13A2
4) PL BAY MECH (PBM), SYS 1, 3-PH AC POWER, ON/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH. 4-POLE, 2-POS
7) SWITCH, S1
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 32V73RI3A2S1
PART NUMBER: ME452-0102-7401

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE PAYLOAD BAY MECHANICAL (PBM) SYSTEM 1, 3-PHASE AC POWER. ALTHOUGH PBM POWER IS USED BY OTHER PAYLOAD BAY SYSTEMS, ONLY THE RMS EFFECTS ARE CONSIDERED HERE.
INABILITY TO PROVIDE SYSTEM 1, 3-PHASE AC POWER TO REMOTE MANIPULATOR RETENTION SYSTEM. FAILURE OF SYSTEM 2 COULD CAUSE LOSS OF MISSION AND POSSIBLY LOSS OF VEHICLE.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4102 ABORT: /NA

ITEM: SWITCH, S1
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL R13A2
4) PL BAY MECH (PBM), SYS 1, 3-PH AC POWER, ON/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH. 4-POLE, 2-POS
7) SWITCH, S1
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 32V73RI3A2S1
PART NUMBER: ME452-0102-7401

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNINTENTIONAL APPLICATION OF PAYLOAD BAY MECHANICAL (PBM) SYSTEM 1, 3-PHASE AC POWER.
UNINTENTIONAL APPLICATION OF SYSTEM 1, 3-PHASE AC PBM POWER SHOULD HAVE NO EFFECT AS A SINGLE FAILURE. WITH SWITCH FAILED CLOSED. POWER CAN BE REMOVED BY CIRCUIT BREAKER OPERATION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4103 ABORT: /NA

ITEM: SWITCH, S2
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL R13A2
4) PL BAY MECH (PBM), SYS 2, 3-PH AC POWER, ON/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH. 4-POLE, 2-POS
7) SWITCH, S2
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 32V73RI3A2S2
PART NUMBER: ME452-0102-7401

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE PAYLOAD BAY MECHANICAL (PBM) SYSTEM 2, 3-PHASE AC POWER. ALTHOUGH PBM POWER IS USED BY PAYLOAD BAY SYSTEMS ONLY THE RMS IS CONSIDERED HERE.
INABILITY TO PROVIDE SYSTEM 2, 3-PHASE AC PBM POWER TO REMOTE MANIPULATOR RETENTION SYSTEM. FAILURE OF SYSTEM 1 COULD CAUSE LOSS OF VEHICLE OR MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4104 ABORT: /NA

ITEM: SWITCH, S2
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL R13A2
4) PL BAY MECH (PBM), SYS 2, 3-PH AC POWER, ON/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH. 4-POLE, 2-POS
7) SWITCH, S2
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 32V73RI3A2S2
PART NUMBER: ME452-0102-7401

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNINTENTIONAL APPLICATION OF PAYLOAD BAY MECHANICAL (PBM) SYSTEM 2, 3-PHASE AC POWER.
UNINTENTIONAL APPLICATION OF SYSTEM 2, 3-PHASE AC PBM POWER SHOULD HAVE NO EFFECT. WITH THE SWITCH FAILED CLOSED. POWER COULD BE REMOVED BY CIRCUIT BREAKER OPERATION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/2
MDAC ID: 4105 ABORT: /NA

ITEM: SWITCH, S5
FAILURE MODE: OPEN, FAILS TO CLOSE TO EITHER DEPLOY OR STOW.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL A8A2
4) PORT RMS DEPLOY/STOW
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH. 2-POLE, 2-POS
7) SWITCH, S5
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/2	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 32V73A8A2S5
PART NUMBER: ME452-0102-7201

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE CONTROL VOLTAGE TO OPERATE THE STOW/DEPLOY ACTUATOR.
LOSS OF OPERATION OF THE STOW/DEPLOY ACTUATOR WOULD CAUSE LOSS OF MISSION AND POSSIBLY REQUIRE JETTISON OF REMOTE MANIPULATOR ARM IF IT CANNOT BE SAFELY STOWED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4106 ABORT: /NA

ITEM: SWITCH, S5
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL A8A2
4) PORT RMS DEPLOY/STOW
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH. 2-POLE, 2-POS
7) SWITCH, S5
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 32V73A8A2S5
PART NUMBER: ME452-0102-7201

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNINTENTIONAL APPLICATION OF POWER TO THE STOW/DEPLOY ACTUATOR MOTORS.
UNTIMELY OPERATION OF THE STOW/DEPLOY ACTUATOR MOTORS COULD CAUSE PHYSICAL DAMAGE TO THE RMS/PAYLOADS/ORBITER. POSSIBLE LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/2
MDAC ID: 4107 ABORT: /NA

ITEM: SWITCH, S2
FAILURE MODE: OPEN, FAILS TO CLOSE TO EITHER DEPLOY OR STOW.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL A8A2
4) STBD RMS DEPLOY/STOW
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH. 2-POLE, 2-POS
7) SWITCH, S2
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/2	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 32V73A8A2S2
PART NUMBER: ME452-0102-7201

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE CONTROL VOLTAGE TO OPERATE THE STOW/DEPLOY ACTUATOR.
LOSS OF OPERATION OF THE STOW/DEPLOY ACTUATOR COULD CAUSE LOSS OF MISSION AND POSSIBLY REQUIRE JETTISON OF THE REMOTE MANIPULATOR ARM IF IT CANNOT BE SAFELY STOWED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4108 ABORT: /NA

ITEM: SWITCH, S2
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL A8A2
4) STBD RMS DEPLOY/STOW
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH. 4-POLE, 2-POS
7) SWITCH, S2
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 32V73A8A2S2
PART NUMBER: ME452-0102-7201

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNINTENTIONAL APPLICATION OF POWER TO THE STOW/DEPLOY ACTUATOR MOTORS.
UNTIMELY OPERATION OF THE STOW/DEPLOY ACTUATOR MOTORS COULD CAUSE PHYSICAL DAMAGE TO THE RMS/PAYLOADS/ORBITER. POSSIBLE LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4109 ABORT: /NA

ITEM: FUSE, F6
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL A8A2
4) PORT RMS DEPLOY/STOW SWITCH, S5
5) FUSE, CONTROL VOLT CA2
6) FUSE, 1 AMP
7) FUSE, F6
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 36V73A8A2F6
PART NUMBER: ME451-0018-0100

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE CONTROL VOLTAGE TO STOW/DEPLOY SYSTEM 1 SWITCH POSITION.
A SUBSEQUENT FAILURE IN MANIPULATOR DEPLOY CONTROL SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO STOW/DEPLOY THE REMOTE MANIPULATOR ARM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4110 ABORT: /NA

ITEM: FUSE, F5
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL A8A2
4) PORT RMS DEPLOY/STOW SWITCH, S5
5) FUSE, CONTROL VOLT BC1
6) FUSE, 1 AMP
7) FUSE, F11
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 36V73A8A2F5
PART NUMBER: ME451-0018-0100

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE CONTROL VOLTAGE TO STOW/DEPLOY SYSTEM 2 SWITCH POSITION.
A SUBSEQUENT FAILURE IN MANIPULATOR DEPLOY CONTROL SYSTEM 1 WOULD CAUSE LOSS OF ABILITY TO STOW/DEPLOY THE REMOTE MANIPULATOR ARM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4111 ABORT: /NA

ITEM: FUSE, F11
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL A8A2
4) STBD RMS DEPLOY/STOW SWITCH, S6
5) FUSE, CONTROL VOLT CA2
6) FUSE, 1 AMP
7) FUSE, F5
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 36V73A8A2F11
PART NUMBER: ME451-0018-0100

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE CONTROL VOLTAGE TO STOW/DEPLOY SYSTEM 1 SWITCH POSITION.
A SUBSEQUENT FAILURE IN MANIPULATOR DEPLOY CONTROL SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO STOW/DEPLOY THE REMOTE MANIPULATOR ARM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4112 ABORT: /NA

ITEM: FUSE, F10
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL A8A2
4) STBD RMS DEPLOY/STOW SWITCH, S6
5) FUSE, CONTROL VOLT BC1
6) FUSE, 1 AMP
7) FUSE, F10
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 36V73A8A2F10
PART NUMBER: ME451-0018-0100

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE CONTROL VOLTAGE TO STOW/DEPLOY SYSTEM 2 SWITCH POSITION.
A SUBSEQUENT FAILURE IN MANIPULATOR DEPLOY CONTROL SYSTEM 1 WOULD CAUSE LOSS OF ABILITY TO STOW/DEPLOY THE REMOTE MANIPULATOR ARM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	12/03/86	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	EPD&C	FLIGHT:	3/2R
MDAC ID:	4113	ABORT:	/NA

ITEM: HYBRID RELAY, K72
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PORT MANIPULATOR DEPLOY SYSTEM 1
4) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
5) DEPLOY ACTUATOR MOTOR POWER, AC3PBM
6) HYBRID RELAY, ACTUATOR DEPLOY
7) HYBRID RELAY, 3-PHASE
8) HYBRID RELAY, K72
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 40V76A120K72
PART NUMBER: MC452-0123-0003

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE 3-PHASE, AC3 PBM VOLTAGE TO ACTUATOR SYSTEM 1 MOTOR TO DRIVE TO DEPLOY POSITION.
A SUBSEQUENT FAILURE IN MANIPULATOR DEPLOY CONTROL SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO DEPLOY THE REMOTE MANIPULATOR ARM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4114 ABORT: /NA

ITEM: HYBRID RELAY, K72
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PORT MANIPULATOR DEPLOY SYSTEM 1
4) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
5) DEPLOY ACTUATOR MOTOR POWER, AC3PBM
6) HYBRID RELAY, ACTUATOR DEPLOY
7) HYBRID RELAY, 3-PHASE
8) HYBRID RELAY, K72
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120K72
PART NUMBER: MC452-0123-0003

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNINTENTIONAL APPLICATION OF 3-PHASE, AC3 PBM VOLTAGE TO ACTUATOR SYSTEM 1 MOTOR TO DRIVE TO DEPLOY POSITION.
UNTIMELY OPERATION OF A DEPLOY ACTUATOR MOTOR COULD CAUSE PHYSICAL DAMAGE TO THE RMS/PAYLOADS/ORBITER. LOSS OF MISSION AND POSSIBLY LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4115 ABORT: /NA

ITEM: HYBRID RELAY, K49
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) STBD MANIPULATOR DEPLOY SYSTEM 1
4) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
5) DEPLOY ACTUATOR MOTOR POWER, AC2PBM
6) HYBRID RELAY, ACTUATOR DEPLOY
7) HYBRID RELAY, 3-PHASE
8) HYBRID RELAY, K49
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 40V76A118K49
PART NUMBER: MC452-0123-0003

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE 3-PHASE, AC2 PBM VOLTAGE TO ACTUATOR SYSTEM 1 MOTOR TO DRIVE TO DEPLOY POSITION.
A SUBSEQUENT FAILURE IN MANIPULATOR DEPLOY CONTROL SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO DEPLOY THE REMOTE MANIPULATOR ARM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4116 ABORT: /NA

ITEM: HYBRID RELAY, K49
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) STBD MANIPULATOR DEPLOY SYSTEM 1
4) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
5) DEPLOY ACTUATOR MOTOR POWER, AC2PBM
6) HYBRID RELAY, ACTUATOR DEPLOY
7) HYBRID RELAY, 3-PHASE
8) HYBRID RELAY, K49
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118K49
PART NUMBER: MC452-0123-0003

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNINTENTIONAL APPLICATION OF 3-PHASE, AC2 PBM VOLTAGE TO ACTUATOR SYSTEM 1 MOTOR TO DRIVE TO DEPLOY POSITION.
UNTIMELY OPERATION OF A DEPLOY ACTUATOR MOTOR COULD CAUSE PHYSICAL DAMAGE TO THE RMS/PAYLOADS/ORBITER. LOSS OF MISSION AND POSSIBLY LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4117 ABORT: /NA

ITEM: HYBRID RELAY, K60
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PORT MANIPULATOR DEPLOY SYSTEM 1
4) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
5) DEPLOY ACTUATOR MOTOR POWER, AC3PBM
6) HYBRID RELAY, ACTUATOR STOW
7) HYBRID RELAY, 3-PHASE
8) HYBRID RELAY, K60
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 40V76A120K60
PART NUMBER: MC452-0123-0003

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE 3-PHASE, AC3 PBM VOLTAGE TO ACTUATOR SYSTEM 1 MOTOR TO DRIVE TO STOW POSITION.
A SUBSEQUENT FAILURE IN MANIPULATOR DEPLOY CONTROL SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO STOW THE REMOTE MANIPULATOR ARM WHICH COULD REQUIRE JETTISON OF THE ARM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4118 ABORT: /NA

ITEM: HYBRID RELAY, K60
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PORT MANIPULATOR DEPLOY SYSTEM 1
4) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
5) DEPLOY ACTUATOR MOTOR POWER, AC3PBM
6) HYBRID RELAY, ACTUATOR STOW
7) HYBRID RELAY, 3-PHASE
8) HYBRID RELAY, K60
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120K60
PART NUMBER: MC452-0123-0003

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNINTENTIONAL APPLICATION OF 3-PHASE, AC3 PBM VOLTAGE TO ACTUATOR SYSTEM 1 MOTOR TO DRIVE TO STOW POSITION.
UNTIMELY OPERATION OF A STOW ACTUATOR MOTOR COULD CAUSE PHYSICAL DAMAGE TO THE RMS/PAYLOADS/ORBITER. LOSS OF MISSION AND POSSIBLY CAUSE LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4119 ABORT: /NA

ITEM: HYBRID RELAY, K51
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) STBD MANIPULATOR DEPLOY SYSTEM 1
4) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
5) DEPLOY ACTUATOR MOTOR POWER, AC2PBM
6) HYBRID RELAY, ACTUATOR STOW
7) HYBRID RELAY, 3-PHASE
8) HYBRID RELAY, K51
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 40V76A118K51
PART NUMBER: MC452-0123-0003

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE 3-PHASE, AC3 PBM VOLTAGE TO ACTUATOR SYSTEM 1 MOTOR TO DRIVE TO THE STOW POSITION.
A SUBSEQUENT FAILURE IN MANIPULATOR DEPLOY CONTROL SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO STOW THE REMOTE MANIPULATOR ARM WHICH COULD REQUIRE JETTISON OF THE ARM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4120 ABORT: /NA

ITEM: HYBRID RELAY, K51
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) STBD MANIPULATOR DEPLOY SYSTEM 1
4) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
5) DEPLOY ACTUATOR MOTOR POWER, AC2PBM
6) HYBRID RELAY, ACTUATOR STOW
7) HYBRID RELAY, 3-PHASE
8) HYBRID RELAY, K51
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118K51
PART NUMBER: MC452-0123-0003

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNINTENTIONAL APPLICATION OF 3-PHASE, AC3 PBM VOLTAGE TO ACTUATOR SYSTEM 1 MOTOR TO DRIVE TO THE STOW POSITION.
UNTIMELY OPERATION OF A STOW ACTUATOR MOTOR COULD CAUSE PHYSICAL DAMAGE TO THE RMS/PAYLOADS/ORBITER. LOSS OF MISSION AND POSSIBLY LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4121 ABORT: /NA

ITEM: HYBRID RELAY, K22
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PORT MANIPULATOR DEPLOY SYSTEM 2
4) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
5) DEPLOY ACTUATOR MOTOR POWER, AC2PBM
6) HYBRID RELAY, ACTUATOR DEPLOY
7) HYBRID RELAY, 3-PHASE
8) HYBRID RELAY, K22
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 40V76A118K22
PART NUMBER: MC452-0123-0003

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE 3-PHASE, AC2 PBM VOLTAGE TO ACTUATOR SYSTEM 2 MOTOR TO DRIVE TO THE DEPLOY POSITION.
A SUBSEQUENT FAILURE IN MANIPULATOR DEPLOY CONTROL SYSTEM 1 WOULD CAUSE INABILITY TO DEPLOY THE REMOTE MANIPULATOR ARM THUS CAUSING LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4122 ABORT: /NA

ITEM: HYBRID RELAY, K22
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PORT MANIPULATOR DEPLOY SYSTEM 2
4) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
5) DEPLOY ACTUATOR MOTOR POWER, AC2PBM
6) HYBRID RELAY, ACTUATOR DEPLOY
7) HYBRID RELAY, 3-PHASE
8) HYBRID RELAY, K22
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118K22
PART NUMBER: MC452-0123-0003

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNINTENTIONAL APPLICATION OF 3-PHASE, AC2 PBM VOLTAGE TO ACTUATOR SYSTEM 2 MOTOR TO DRIVE TO THE DEPLOY POSITION.
UNTIMELY OPERATION OF A DEPLOY ACTUATOR MOTOR COULD CAUSE PHYSICAL DAMAGE TO THE RMS/PAYLOADS/ORBITER. LOSS OF MISSION AND POSSIBLY LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4123 ABORT: /NA

ITEM: HYBRID RELAY, K62
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) STBD MANIPULATOR DEPLOY SYSTEM 2
4) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
5) DEPLOY ACTUATOR MOTOR POWER, AC3PBM
6) HYBRID RELAY, ACTUATOR DEPLOY
7) HYBRID RELAY, 3-PHASE
8) HYBRID RELAY, K62
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 40V76A118K62
PART NUMBER: MC452-0123-0003

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE 3-PHASE, AC2 PBM VOLTAGE TO ACTUATOR SYSTEM 2 MOTOR TO DRIVE TO THE DEPLOY POSITION.
A SUBSEQUENT FAILURE IN MANIPULATOR DEPLOY CONTROL SYSTEM 1 WOULD CAUSE INABILITY TO DEPLOY THE REMOTE MANIPULATOR ARM THUS CAUSING LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4124 ABORT: /NA

ITEM: HYBRID RELAY, K62
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) STBD MANIPULATOR DEPLOY SYSTEM 2
4) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
5) DEPLOY ACTUATOR MOTOR POWER, AC3PBM
6) HYBRID RELAY, ACTUATOR DEPLOY
7) HYBRID RELAY, 3-PHASE
8) HYBRID RELAY, K62
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118K62
PART NUMBER: MC452-0123-0003

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNINTENTIONAL APPLICATION OF 3-PHASE, AC2 PBM VOLTAGE TO ACTUATOR SYSTEM 2 MOTOR TO DRIVE TO THE DEPLOY POSITION.
UNTIMELY OPERATION OF A DEPLOY ACTUATOR MOTOR COULD CAUSE PHYSICAL DAMAGE TO THE RMS/PAYLOADS/ORBITER. LOSS OF MISSION AND POSSIBLY LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4125 ABORT: /NA

ITEM: HYBRID RELAY, K24
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PORT MANIPULATOR DEPLOY SYSTEM 2
4) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
5) DEPLOY ACTUATOR MOTOR POWER, AC2PBM
6) HYBRID RELAY, ACTUATOR STOW
7) HYBRID RELAY, 3-PHASE
8) HYBRID RELAY, K24
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 40V76A118K24
PART NUMBER: MC452-0123-0003

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE 3-PHASE, AC3 PBM VOLTAGE TO ACTUATOR SYSTEM 2 MOTOR TO DRIVE TO THE STOW POSITION.
A SUBSEQUENT FAILURE IN MANIPULATOR DEPLOY CONTROL SYSTEM 1 WOULD CAUSE LOSS OF ABILITY TO STOW THE REMOTE MANIPULATOR ARM THUS REQUIRING JETTISON OF THE ARM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4126 ABORT: /NA

ITEM: HYBRID RELAY, K24
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PORT MANIPULATOR DEPLOY SYSTEM 2
4) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
5) DEPLOY ACTUATOR MOTOR POWER, AC2PBM
6) HYBRID RELAY, ACTUATOR STOW
7) HYBRID RELAY, 3-PHASE
8) HYBRID RELAY, K24
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118K24
PART NUMBER: MC452-0123-0003

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNINTENTIONAL APPLICATION OF 3-PHASE, AC3 PBM VOLTAGE TO ACTUATOR SYSTEM 2 MOTOR TO DRIVE TO THE STOW POSITION.
UNTIMELY OPERATION OF A STOW ACTUATOR MOTOR COULD CAUSE PHYSICAL DAMAGE TO THE RMS/PAYLOADS/ORBITER. LOSS OF MISSION AND POSSIBLY LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4127 ABORT: /NA

ITEM: HYBRID RELAY, K50
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) STBD MANIPULATOR DEPLOY SYSTEM 2
4) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
5) DEPLOY ACTUATOR MOTOR POWER, AC3PBM
6) HYBRID RELAY, ACTUATOR STOW
7) HYBRID RELAY, 3-PHASE
8) HYBRID RELAY, K50
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [P] C [P]

LOCATION: 40V76A118K50
PART NUMBER: MC452-0123-0003

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE 3-PHASE, AC3 PBM VOLTAGE TO ACTUATOR SYSTEM 2 MOTOR TO DRIVE TO THE STOW POSITION.
A SUBSEQUENT FAILURE IN MANIPULATOR DEPLOY CONTROL SYSTEM 1 WOULD CAUSE LOSS OF ABILITY TO STOW THE REMOTE MANIPULATOR ARM AND POSSIBLY REQUIRE JETTISON OF THE ARM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4128 ABORT: /NA

ITEM: HYBRID RELAY, K50
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) STBD MANIPULATOR DEPLOY SYSTEM 2
4) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
5) DEPLOY ACTUATOR MOTOR POWER, AC3PBM
6) HYBRID RELAY, ACTUATOR STOW
7) HYBRID RELAY, 3-PHASE
8) HYBRID RELAY, K50
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118K50
PART NUMBER: MC452-0123-0003

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNINTENTIONAL APPLICATION OF 3-PHASE, AC3 PBM VOLTAGE TO ACTUATOR SYSTEM 1 MOTOR TO DRIVE TO THE STOW POSITION.
UNTIMELY OPERATION OF A STOW ACTUATOR MOTOR COULD CAUSE PHYSICAL DAMAGE TO THE RMS/PAYLOADS/ORBITER. LOSS OF MISSION AND POSSIBLY CAUSE LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4129 ABORT: /NA

ITEM: HYBRID DRIVERS, AR9, 11
FAILURE MODE: FAILS OPEN, ONE OR BOTH.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PORT MANIPULATOR DEPLOY SYSTEM 1
4) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
5) PORT RMS DEPLOY TALKBACK INDICATOR DS4
6) HYBRID DRIVERS, TYPE 1, 2 EACH
7) HYBRID DRIVERS, AR9, 11
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A119AR9, 11
PART NUMBER: ME477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT AS LONG AS SYSTEM 2 IS FUNCTIONAL.
SUBSEQUENT SIMILAR FAILURE IN SYSTEM 2 WOULD NOT PROVIDE POWER TO DRIVE THE TALKBACK INDICATOR DS4 ON SWITCH S5 ON PANEL A8A2 TO INDICATE 'DEPLOYED'.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4130 ABORT: /NA

ITEM: HYBRID DRIVERS, AR9, 11
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PORT MANIPULATOR DEPLOY SYSTEM 1
4) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
5) PORT RMS DEPLOY TALKBACK INDICATOR DS4
6) HYBRID DRIVERS, TYPE 1, 2 EACH
7) HYBRID DRIVERS, AR9, 11
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A119AR9, 11
PART NUMBER: ME477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
COULD GIVE ERRONEOUS SIGNAL TO TALKBACK INDICATOR.
'DEPLOYED' TALKBACK INDICATION NOT CRITICAL.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4131 ABORT: /NA

ITEM: HYBRID DRIVERS, AR13, 15
FAILURE MODE: FAILS OPEN, ONE OR BOTH.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PORT MANIPULATOR DEPLOY SYSTEM 2
4) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
5) PORT RMS DEPLOY TALKBACK INDICATOR DS4
6) HYBRID DRIVERS, TYPE 1, 2 EACH
7) HYBRID DRIVERS, AR13, 15
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118AR13, 15
PART NUMBER: ME477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT AS LONG AS SYSTEM 1 IS FUNCTIONAL.
SUBSEQUENT SIMILAR FAILURE IN SYSTEM 2 WOULD NOT PROVIDE POWER TO DRIVE THE TALKBACK INDICATOR DS4 ON SWITCH S5 ON PANEL A8A2 TO INDICATE DEPLOYED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4132 ABORT: /NA

ITEM: HYBRID DRIVERS, AR13, 15
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PORT MANIPULATOR DEPLOY SYSTEM 2
4) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
5) PORT RMS DEPLOY TALKBACK INDICATOR DS4
6) HYBRID DRIVERS, TYPE 1, 2 EACH
7) HYBRID DRIVERS, AR13, 15
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118AR13, 15
PART NUMBER: ME477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
COULD GIVE ERRONEOUS SIGNAL TO TALKBACK INDICATOR.
'DEPLOYED' TALKBACK INDICATION NOT CRITICAL.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4133 ABORT: /NA

ITEM: HYBRID DRIVERS, AR8, 10
FAILURE MODE: FAILS OPEN, ONE OR BOTH.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PORT MANIPULATOR DEPLOY SYSTEM 1
4) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
5) PORT RMS STOW TALKBACK INDICATOR DS4
6) HYBRID DRIVERS, TYPE 1, 2 EACH
7) HYBRID DRIVERS, AR8, 10
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A119AR8, 10
PART NUMBER: ME477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT AS LONG AS SYSTEM 2 IS FUNCTIONAL.
SUBSEQUENT SIMILAR FAILURE IN SYSTEM 2 WOULD NOT PROVIDE POWER TO DRIVE THE TALKBACK INDICATOR DS4 ON SWITCH S5 ON PANEL A8A2 TO INDICATE STOWED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4134 ABORT: /NA

ITEM: HYBRID DRIVERS, AR8, 10
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PORT MANIPULATOR DEPLOY SYSTEM 1
4) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
5) PORT RMS STOW TALKBACK INDICATOR DS4
6) HYBRID DRIVERS, TYPE 1, 2 EACH
7) HYBRID DRIVERS, AR8, 10
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A119AR8, 10
PART NUMBER: ME477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
COULD GIVE ERRONEOUS SIGNAL TO TALKBACK INDICATOR.
THE CRT DISPLAY STOWED INDICATION WOULD DISAGREE WITH THE TALKBACK INDICATOR.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4135 ABORT: /NA

ITEM: HYBRID DRIVERS, AR12, 14
FAILURE MODE: FAILS OPEN, ONE OR BOTH.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PORT MANIPULATOR DEPLOY SYSTEM 2
4) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
5) PORT RMS STOW TALKBACK INDICATOR DS4
6) HYBRID DRIVERS, TYPE 1, 2 EACH
7) HYBRID DRIVERS, AR12, 14
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118AR12, 14
PART NUMBER: ME477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT AS LONG AS SYSTEM 1 IS FUNCTIONAL.
SUBSEQUENT SIMILAR FAILURE IN SYSTEM 2 WOULD NOT PROVIDE POWER TO DRIVE THE TALKBACK INDICATOR DS4 ON SWITCH S5 ON PANEL A8A2 TO INDICATE STOWED STATE.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4136 ABORT: /NA

ITEM: HYBRID DRIVERS, AR12, 14
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PORT MANIPULATOR DEPLOY SYSTEM 2
4) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
5) PORT RMS STOW TALKBACK INDICATOR DS4
6) HYBRID DRIVERS, TYPE 1, 2 EACH
7) HYBRID DRIVERS, AR12, 14
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118AR12, 14
PART NUMBER: ME477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
COULD GIVE ERRONEOUS SIGNAL TO TALKBACK INDICATOR.
THE CRT DISPLAY STOWED INDICATION WOULD DISAGREE WITH THE TALKBACK INDICATOR.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4137 ABORT: /NA

ITEM: HYBRID DRIVERS, AR14, 18
FAILURE MODE: FAILS OPEN, ONE OR BOTH.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) STBD MANIPULATOR DEPLOY SYSTEM 1
4) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
5) STBD RMS DEPLOY TALKBACK INDICATOR DS4
6) HYBRID DRIVERS, TYPE 1, 2 EACH
7) HYBRID DRIVERS, AR14,18
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A117AR14, 18
PART NUMBER: ME477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT AS LONG AS SYSTEM 2 IS FUNCTIONAL.
SUBSEQUENT SIMILAR FAILURE IN SYSTEM 2 WOULD NOT PROVIDE POWER TO DRIVE THE TALKBACK INDICATOR DS4 ON SWITCH S5 ON PANEL A8A2 TO INDICATE DEPLOYED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4138 ABORT: /NA

ITEM: HYBRID DRIVERS, AR14, 18
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) STBD MANIPULATOR DEPLOY SYSTEM 1
4) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
5) STBD RMS DEPLOY TALKBACK INDICATOR DS4
6) HYBRID DRIVERS, TYPE 1, 2 EACH
7) HYBRID DRIVERS, AR14,18
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A117AR14, 18
PART NUMBER: ME477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
COULD GIVE ERRONEOUS SIGNAL TO TALKBACK INDICATOR.
'DEPLOYED' TALKBACK INDICATION NOT CRITICAL.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4139 ABORT: /NA

ITEM: HYBRID DRIVERS, AR6, 8
FAILURE MODE: FAILS OPEN, ONE OR BOTH.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) STBD MANIPULATOR DEPLOY SYSTEM 2
4) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
5) STBD RMS DEPLOY TALKBACK INDICATOR DS4
6) HYBRID DRIVERS, TYPE 1, 2 EACH
7) HYBRID DRIVERS, AR6, 8
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120AR6, 8
PART NUMBER: ME477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT AS LONG AS SYSTEM 1 IS FUNCTIONAL.
SUBSEQUENT SIMILAR FAILURE IN SYSTEM 2 WOULD NOT PROVIDE POWER TO DRIVE THE TALKBACK INDICATOR DS4 ON SWITCH S5 ON PANEL A8A2 TO INDICATE DEPLOYED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4140 ABORT: /NA

ITEM: HYBRID DRIVERS, AR6, 8
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) STBD MANIPULATOR DEPLOY SYSTEM 2
4) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
5) STBD RMS DEPLOY TALKBACK INDICATOR DS4
6) HYBRID DRIVERS, TYPE 1, 2 EACH
7) HYBRID DRIVERS, AR6, 8
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120AR6, 8
PART NUMBER: ME477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
COULD GIVE ERRONEOUS SIGNAL TO TALKBACK INDICATOR.
'DEPLOYED' TALKBACK INDICATION NOT CRITICAL.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4141 ABORT: /NA

ITEM: HYBRID DRIVERS, AR12, 16
FAILURE MODE: FAILS OPEN, ONE OR BOTH.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) STBD MANIPULATOR DEPLOY SYSTEM 1
4) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
5) STBD RMS STOW TALKBACK INDICATOR DS4
6) HYBRID DRIVERS, TYPE 1, 2 EACH
7) HYBRID DRIVERS, AR12, 16
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A117AR12, 16
PART NUMBER: ME477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT AS LONG AS SYSTEM 2 IS FUNCTIONAL.
SUBSEQUENT SIMILAR FAILURE IN SYSTEM 2 WOULD NOT PROVIDE POWER TO DRIVE THE TALKBACK INDICATOR DS4 ON SWITCH S5 ON PANEL A8A2 TO INDICATE STOWED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4142 ABORT: /NA

ITEM: HYBRID DRIVERS, AR12, 16
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) STBD MANIPULATOR DEPLOY SYSTEM 1
4) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
5) STBD RMS STOW TALKBACK INDICATOR DS4
6) HYBRID DRIVERS, TYPE 1, 2 EACH
7) HYBRID DRIVERS, AR12, 16
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A117AR12, 16
PART NUMBER: ME477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
COULD GIVE ERRONEOUS SIGNAL TO TALKBACK INDICATOR.
THE CRT DISPLAY STOWED INDICATION WOULD DISAGREE WITH THE TALKBACK INDICATOR.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4143 ABORT: /NA

ITEM: HYBRID DRIVERS, AR2, 4
FAILURE MODE: FAILS OPEN, ONE OR BOTH.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) STBD MANIPULATOR DEPLOY SYSTEM 2
4) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
5) STBD RMS STOW TALKBACK INDICATOR DS4
6) HYBRID DRIVERS, TYPE 1, 2 EACH
7) HYBRID DRIVERS, AR2, 4
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120AR2, 4
PART NUMBER: ME477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT AS LONG AS SYSTEM 1 IS FUNCTIONAL.
SUBSEQUENT SIMILAR FAILURE IN SYSTEM 2 WOULD NOT PROVIDE POWER TO DRIVE THE TALKBACK INDICATOR DS4 ON SWITCH S5 ON PANEL A8A2 TO INDICATE STOWED.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4144 ABORT: /NA

ITEM: HYBRID DRIVERS, AR2, 4
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) STBD MANIPULATOR DEPLOY SYSTEM 2
4) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
5) STBD RMS STOW TALKBACK INDICATOR DS4
6) HYBRID DRIVERS, TYPE 1, 2 EACH
7) HYBRID DRIVERS, AR2, 4
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120AR2, 4
PART NUMBER: ME477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
COULD GIIVE ERRONEOUS SIGNAL TO TALKBACK INDICATOR.
THE CRT DISPLAY STOWED INDICATION WOULD DISAGREE WITH THE TALKBACK INDICATOR.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4145 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB2
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) PBM POWER, SYSTEM 1, MCA LOGIC
5) MCA POWER, AC 1, 3-PHASE, MID 1
6) CIRCUIT BREAKER, 3-PH, 3 AMP
7) CIRCUIT BREAKER, CB2
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129CB2
PART NUMBER: ME454-0032-3030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE AC1 3-PHASE POWER TO AC1 PBM BUS IN MMC1.
LOSS OF AC 3-PHASE POWER TO DRIVE SYSTEM 1 MID RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE MID RETENTION LATCH ACTUATOR MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4146 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB2
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) PBM POWER, SYSTEM 1, MCA LOGIC
5) MCA POWER, AC 1, 3-PHASE, MID 1
6) CIRCUIT BREAKER, 3-PH, 3 AMP
7) CIRCUIT BREAKER, CB2
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 85V73A129CB2
PART NUMBER: ME454-0032-3030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT. POWER CAN BE REMOVED BY SWITCH OR RELAY ACTION.
NO EFFECT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4147 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB7
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) PBM POWER, SYSTEM 1, MCA LOGIC
5) MCA POWER, AC 2, 3-PHASE, MID 2
6) CIRCUIT BREAKER, 3-PH, 3 AMP
7) CIRCUIT BREAKER, CB7
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129CB7
PART NUMBER: ME454-0032-3030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE AC2 3-PHASE POWER TO AC2 PBM BUS IN MMC2.
LOSS OF AC 3-PHASE POWER TO DRIVE SYSTEM 1 FWD RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE FWD RETENTION LATCH ACTUATOR MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4148 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB7
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) PBM POWER, SYSTEM 1, MCA LOGIC
5) MCA POWER, AC 2, 3-PHASE, MID 2
6) CIRCUIT BREAKER, 3-PH, 3 AMP
7) CIRCUIT BREAKER, CB7
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 85V73A129CB7
PART NUMBER: ME454-0032-3030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT. POWER CAN BE REMOVED BY SWITCH OR RELAY ACTION.
NO EFFECT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4149 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB12
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) PBM POWER, SYSTEM 1, MCA LOGIC
5) MCA POWER, AC 3, 3-PHASE, MID 2
6) CIRCUIT BREAKER, 3-PH, 3 AMP
7) CIRCUIT BREAKER, CB12
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129CB12
PART NUMBER: ME454-0032-3030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE AC3 3-PHASE POWER TO AC3 PBM BUS IN MMC2.
LOSS OF AC 3-PHASE POWER TO DRIVE SYSTEM 1 AFT RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE AFT RETENTION LATCH ACTUATOR MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4150 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB12
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) PBM POWER, SYSTEM 1, MCA LOGIC
5) MCA POWER, AC 3, 3-PHASE, MID 2
6) CIRCUIT BREAKER, 3-PH, 3 AMP
7) CIRCUIT BREAKER, CB12
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 85V73A129CB12
PART NUMBER: ME454-0032-3030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT. POWER CAN BE REMOVED BY SWITCH OR RELAY ACTION.
NO EFFECT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4151 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB3
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) PBM POWER, SYSTEM 2, MCA LOGIC
5) MCA POWER, AC 1, 3-PHASE, MID 3
6) CIRCUIT BREAKER, 3-PH, 3 AMP
7) CIRCUIT BREAKER, CB3
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129CB3
PART NUMBER: ME454-0032-3030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE AC1 3-PHASE POWER TO AC1 PBM BUS IN MMC3. LOSS OF AC 3-PHASE POWER TO DRIVE SYSTEM 2 AFT RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE AFT RETENTION LATCH ACTUATOR MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4152 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB3
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) PBM POWER, SYSTEM 2, MCA LOGIC
5) MCA POWER, AC 1, 3-PHASE, MID 3
6) CIRCUIT BREAKER, 3-PH, 3 AMP
7) CIRCUIT BREAKER, CB3
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 85V73A129CB3
PART NUMBER: ME454-0032-3030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT. POWER CAN BE REMOVED BY SWITCH OR RELAY ACTION.
NO EFFECT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4153 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB9
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) PBM POWER, SYSTEM 2, MCA LOGIC
5) MCA POWER, AC 2, 3-PHASE, MID 4
6) CIRCUIT BREAKER, 3-PH, 3 AMP
7) CIRCUIT BREAKER, CB9
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129CB9
PART NUMBER: ME454-0032-3030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE AC2 3-PHASE POWER TO AC2 PBM BUS IN MMC4.
LOSS OF AC 3-PHASE POWER TO DRIVE SYSTEM 2 MID RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE FWD RETENTION LATCH ACTUATOR MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4154 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB9
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) PBM POWER, SYSTEM 2, MCA LOGIC
5) MCA POWER, AC 2, 3-PHASE, MID 4
6) CIRCUIT BREAKER, 3-PH, 3 AMP
7) CIRCUIT BREAKER, CB9
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 85V73A129CB9
PART NUMBER: ME454-0032-3030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT. POWER CAN BE REMOVED BY SWITCH OR RELAY ACTION.
NO EFFECT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4155 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB13
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) PBM POWER, SYSTEM 2, MCA LOGIC
5) MCA POWER, AC 3, 3-PHASE, MID 4
6) CIRCUIT BREAKER, 3-PH, 3 AMP
7) CIRCUIT BREAKER, CB13
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129CB13
PART NUMBER: ME454-0032-3030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE AC3 3-PHASE POWER TO AC3 PBM BUS IN MMC4.
LOSS OF AC 3-PHASE POWER TO DRIVE SYSTEM 2 FWD RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE FWD RETENTION LATCH ACTUATOR MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4156 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB13
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) PBM POWER, SYSTEM 2, MCA LOGIC
5) MCA POWER, AC 3, 3-PHASE, MID 4
6) CIRCUIT BREAKER, 3-PH, 3 AMP
7) CIRCUIT BREAKER, CB13
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 85V73A129CB13
PART NUMBER: ME454-0032-3030

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT. POWER CAN BE REMOVED BY SWITCH OR RELAY ACTION.
NO EFFECT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4157 ABORT: /NA

ITEM: SWITCH, S2
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN A POWER, MID 1, ON/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 1-POLE, 2-POSITION
7) SWITCH, S2
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129S2
PART NUMBER: ME452-0102-7401

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO DRIVE RPC TO PROVIDE MN A 28VDC POWER TO MMC1.
LOSS OF MN A 28 VDC POWER TO MMC1 DISABLES OPERATION OF SYSTEM 1 MID RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT LOSS OF SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE MID RETENTION LATCH ACTUATOR MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4158 ABORT: /NA

ITEM: SWITCH, S2
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN A POWER, MID 1, ON/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 1-POLE, 2-POSITION
7) SWITCH, S2
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 85V73A129S2
PART NUMBER: ME452-0102-7401

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT.
NO EFFECT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4159 ABORT: /NA

ITEM: SWITCH, S3
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN A POWER, MID 3, ON/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 1-POLE, 2-POSITION
7) SWITCH, S3
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129S3
PART NUMBER: ME452-0102-7401

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO DRIVE RPC TO PROVIDE MN A 28VDC POWER TO MMC3.
LOSS OF MN A 28 VDC POWER TO MMC3 DISABLES OPERATION OF SYSTEM 2 AFT RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT LOSS OF SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE MID RETENTION LATCH ACTUATOR MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4160 ABORT: /NA

ITEM: SWITCH, S3
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN A POWER, MID 3, ON/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 1-POLE, 2-POSITION
7) SWITCH, S3
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 85V73A129S3
PART NUMBER: ME452-0102-7401

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT.
NO EFFECT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4161 ABORT: /NA

ITEM: SWITCH, S7
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN B POWER, MID 2, ON/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 1-POLE, 2-POSITION
7) SWITCH, S7
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129S7
PART NUMBER: ME452-0102-7401

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO DRIVE RPC TO PROVIDE MN B 28VDC POWER TO MMC2.
LOSS OF MN B 28 VDC POWER TO MMC2 DISABLES OPERATION OF SYSTEM 1 FWD RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT LOSS OF SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE MID RETENTION LATCH ACTUATOR MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4162 ABORT: /NA

ITEM: SWITCH, S7
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN B POWER, MID 2, ON/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 1-POLE, 2-POSITION
7) SWITCH, S7
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 85V73A129S7
PART NUMBER: ME452-0102-7401

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT.
NO EFFECT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4163 ABORT: /NA

ITEM: SWITCH, S9
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN B POWER, MID 4, ON/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 1-POLE, 2-POSITION
7) SWITCH, S9
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129S9
PART NUMBER: ME452-0102-7401

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO DRIVE RPC TO PROVIDE MN B 28VDC POWER TO MMC4. LOSS OF MN B 28 VDC POWER TO MMC4 DISABLES OPERATION OF SYSTEM 2 MID RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT LOSS OF SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE MID RETENTION LATCH ACTUATOR MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4164 ABORT: /NA

ITEM: SWITCH, S9
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN B POWER, MID 4, ON/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 1-POLE, 2-POSITION
7) SWITCH, S9
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 85V73A129S9
PART NUMBER: ME452-0102-7401

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT.
NO EFFECT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4165 ABORT: /NA

ITEM: SWITCH, S12
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN C POWER, MID 2, ON/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 1-POLE, 2-POSITION
7) SWITCH, S12
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129S12
PART NUMBER: ME452-0102-7401

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO DRIVE RPC TO PROVIDE MN C 28VDC POWER TO MMC2.
LOSS OF MN C 28 VDC POWER TO MMC2 DISABLES OPERATION OF SYSTEM 1 AFT RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT LOSS OF SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE MID RETENTION LATCH ACTUATOR MECHANISM. LOSS OF MISSION COULD RESULT

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4166 ABORT: /NA

ITEM: SWITCH, S12
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN C POWER, MID 2, ON/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 1-POLE, 2-POSITION
7) SWITCH, S12
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 85V73A129S12
PART NUMBER: ME452-0102-7401

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT.
NO EFFECT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4167 ABORT: /NA

ITEM: SWITCH, S13
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN C POWER, MID 4, ON/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 1-POLE, 2-POSITION
7) SWITCH, S13
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129S13
PART NUMBER: ME452-0102-7401

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO DRIVE RPC TO PROVIDE MN C 28VDC POWER TO MMC4.
LOSS OF MN C 28 VDC POWER TO MMC4 DISABLES OPERATION OF SYSTEM 2 FWD RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT LOSS OF SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE MID RETENTION LATCH ACTUATOR MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4168 ABORT: /NA

ITEM: SWITCH, S13
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN C POWER, MID 4, ON/OFF
5) SWITCH, TOGGLE, MAINTAINED
6) SWITCH, 1-POLE, 2-POSITION
7) SWITCH, S13
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 85V73A129S13
PART NUMBER: ME452-0102-7401

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT.
NO EFFECT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4169 ABORT: /NA

ITEM: RESISTOR, R2
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN A POWER, MID 1, ON/OFF, S2
5) RESISTOR, CURRENT LIMITING
6) RESISTOR, 1.2K OHM 2 WATT
7) RESISTOR, R2
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129R2
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
SWITCH S2 WILL NOT FUNCTION TO DRIVE RPC TO PROVIDE MN A 28VDC POWER TO MMC1.
LOSS OF MN A 28 VDC POWER TO MMC1 DISABLES OPERATION OF SYSTEM 1 MID RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT FAILURE IN SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE MID RETENTION LATCH MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4170 ABORT: /NA

ITEM: RESISTOR, R3
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN A POWER, MID 3, ON/OFF, S3
5) RESISTOR, CURRENT LIMITING
6) RESISTOR, 1.2K OHM 2 WATT
7) RESISTOR, R3
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129R3
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
SWITCH S3 WILL NOT FUNCTION TO DRIVE RPC TO PROVIDE MN A 28VDC POWER TO MMC1.
LOSS OF MN A 28 VDC POWER TO MMC3 DISABLES OPERATION OF SYSTEM 2 MID RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT FAILURE IN SYSTEM 1 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE MID RETENTION LATCH MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4171 ABORT: /NA

ITEM: RESISTOR, R7
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN B POWER, MID 2, ON/OFF, S7
5) RESISTOR, CURRENT LIMITING
6) RESISTOR, 1.2K OHM 2 WATT
7) RESISTOR, R7
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129R7
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
SWITCH S7 WILL NOT FUNCTION TO DRIVE RPC TO PROVIDE MN A 28VDC POWER TO MMC1.
LOSS OF MN A 28 VDC POWER TO MMC2 DISABLES OPERATION OF SYSTEM 1 MID RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT FAILURE IN SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE MID RETENTION LATCH MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4172 ABORT: /NA

ITEM: RESISTOR, R9
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN B POWER, MID 4, ON/OFF, S9
5) RESISTOR, CURRENT LIMITING
6) RESISTOR, 1.2K OHM 2 WATT
7) RESISTOR, R9
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129R9
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
SWITCH S9 WILL NOT FUNCTION TO DRIVE RPC TO PROVIDE MN A 28VDC POWER TO MMC1.
LOSS OF MN A 28 VDC POWER TO MMC4 DISABLES OPERATION OF SYSTEM 2 MID RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT FAILURE IN SYSTEM 1 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE MID RETENTION LATCH MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4173 ABORT: /NA

ITEM: RESISTOR, R12
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN C POWER, MID 2, ON/OFF, S12
5) RESISTOR, CURRENT LIMITING
6) RESISTOR, 1.2K OHM 2 WATT
7) RESISTOR, R12
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129R12
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
SWITCH S12 WILL NOT FUNCTION TO DRIVE RPC TO PROVIDE MN A 28VDC POWER TO MMC1.
LOSS OF MN A 28 VDC POWER TO MMC2 DISABLES OPERATION OF SYSTEM 1 MID RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT FAILURE IN SYSTEM 2 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE MID RETENTION LATCH MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4174 ABORT: /NA

ITEM: RESISTOR, R13
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IB
2) MANIPULATOR DEPLOY CONTROL
3) PANEL MA73C
4) MCA LOGIC, MN C POWER, MID 4, ON/OFF, S13
5) RESISTOR, CURRENT LIMITING
6) RESISTOR, 1.2K OHM 2 WATT
7) RESISTOR, R13
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 85V73A129R13
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
SWITCH S13 WILL NOT FUNCTION TO DRIVE RPC TO PROVIDE MN A 28VDC POWER TO MMC1.
LOSS OF MN A 28 VDC POWER TO MMC4 DISABLES OPERATION OF SYSTEM 2 MID RETENTION LATCH ACTUATOR MOTOR. SUBSEQUENT FAILURE IN SYSTEM 1 WOULD CAUSE LOSS OF ABILITY TO OPERATE THE MID RETENTION LATCH MECHANISM. LOSS OF MISSION COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4201 ABORT: /NA

ITEM: HYBRID RELAY, K20
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) FWD ACTUATOR SYS 1, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K20
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118K20
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-2 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR TO DRIVE THE PORT MANIPULATOR FWD RETENTION LATCH ACTUATOR TO THE LATCH POSITION.
ANY SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 WOULD RESULT IN INABILITY TO LATCH THE PORT FWD LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4202 ABORT: /NA

ITEM: HYBRID RELAY, K20
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) FWD ACTUATOR SYS 1, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K20
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118K20
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF PLBM AC-2 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR COULD DRIVE THE PORT MANIPULATOR FWD RETENTION LATCH ACTUATOR TO THE LATCH POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR LATCHING COULD CAUSE PHYSICAL DAMAGE TO RMS/ORBITER/PAYLOADS. IF FAILURE OCCURRED WHILE POWER APPLIED TO THE RELEASE DRIVE MOTOR, MOTOR FAILURE COULD RESULT. SUBSEQUENT FAILURE OF THE REDUNDANT SYSTEM RESULTS IN INABILITY TO LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4203 ABORT: /NA

ITEM: HYBRID RELAY, K52
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACTUATOR SYS 1, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K52
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K52
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-3 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR TO DRIVE THE STBD MANIPULATOR FWD RETENTION LATCH ACTUATOR TO THE LATCH POSITION.
ANY SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 WOULD RESULT IN INABILITY TO LATCH THE STARBOARD FWD LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4204 ABORT: /NA

ITEM: HYBRID RELAY, K52
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACTUATOR SYS 1, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K52
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K52
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF PLBM AC-3 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR COULD DRIVE THE STBD MANIPULATOR FWD RETENTION LATCH ACTUATOR TO THE LATCH POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR LATCHING COULD CAUSE PHYSICAL DAMAGE TO THE RMS/ORBITER/PAYLOADS. IF FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD RESULT. SUBSEQUENT FAILURE IN THE REDUNDANT SYSTEM RESULTS IN INABILITY TO LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4205 ABORT: /NA

ITEM: HYBRID RELAY, K8
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) FWD ACTUATOR SYS 1, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K8
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118K8
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-2 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR TO DRIVE THE PORT MANIPUILATOR FWD RETENTION LATCH ACTUATOR TO THE RELEASE POSITION.
ANY SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 WOULD RESULT IN INABILITY TO RELEASE THE PORT FWD LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4206 ABORT: /NA

ITEM: HYBRID RELAY, K8
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) FWD ACTUATOR SYS 1, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K8
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118K8
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF PLBM AC-2 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR COULD DRIVE THE PORT MANIPULATOR FWD RETENTION LATCH ACTUATOR TO THE RELEASE POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR RELEASE COULD CAUSE PHYSICAL DAMAGE TO THE RMS/ORBITER/PAYLOADS. IF THE FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO LATCH, MOTOR FAILURE COULD OCCUR. SUBSEQUENT FAILURE IN REDUNDANT SYSTEM WOULD RESULT IN INABILITY TO RELEASE.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4207 ABORT: /NA

ITEM: HYBRID RELAY, K64
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STRD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACTUATOR SYS 1, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K64
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K64
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-3 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR TO DRIVE THE STBD MANIPULATOR FWD RETENTION LATCH ACTUATOR TO THE RELEASE POSITION.
ANY SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 2 WOULD RESULT IN INABILITY TO RELEASE THE STARBOARD FWD LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4208 ABORT: /NA

ITEM: HYBRID RELAY, K64
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STRD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACTUATOR SYS 1, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K64
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K64
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLLICATION OF PLBM AC-3 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR COULD DRIVE THE STBD MANIPULATOR FWD RETENTION LATCH ACTUATOR TO THE RELEASE POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR RELEASE COULD CAUSE PHYSICAL DAMAGE TO THE RMS/ORBITER/PAYLOADS. IF THE FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO LATCH, MOTOR FAILURE COULD OCCUR. SUBSEQUENT FAILURE IN REDUNDANT SYSTEM WOULD RESULT IN INABILITY TO RELEASE.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4209 ABORT: /NA

ITEM: RELAY, K44
FAILURE MODE: FAILS CLOSED IN RESET OR DEADFACE POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) FWD ACTUATOR SYS 1, GND-RESET/DFACE RELAY
7) RELAY, LATCHING, 2-POLE
8) RELAY, K44
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118K44
PART NUMBER: MC455-0128-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT ALLOW RESET OR DEADFACE OF THE PORT FWD MOTOR CONTROL CIRCUIT AS REQUIRED.
IF FAILED IN THE DEADFACE POSITION, NEITHER THE LATCH OR RELEASE FUNCTION OF PORT SYSTEM 1 FWD ACTUATOR COULD BE OPERATED. LOSS OF ABILITY TO DEADFACE IF FAILED IN RESET POSITION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4210 ABORT: /NA

ITEM: RELAY, K76
FAILURE MODE: FAILS CLOSED IN RESET OR DEADFACE POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACTUATOR SYS 1, GND-RESET/DFACE RELAY
7) RELAY, LATCHING, 2-POLE
8) RELAY, K76
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K76
PART NUMBER: MC455-0128-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT ALLOW RESET OR DEADFACE OF THE STBD FWD MOTOR CONTROL CIRCUIT AS REQUIRED.
IF FAILED IN THE DEADFACE POSITION, NEITHER THE LATCH OR RELEASE FUNCTION OF STBD SYSTEM 1 FWD ACTUATOR COULD BE OPERATED. LOSS OF ABILITY TO DEADFACE IF FAILED IN RESET POSITION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4211 ABORT: /NA

ITEM: FUSE, F4
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) FWD READY-TO-LATCH SW ASSY 1 (V54X0840E)
7) FUSE, 2 AMP, (K44-B3)
8) FUSE, F4
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118F4
PART NUMBER: MC451-0018-0200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PORT FWD SYSTEM 1 'FWD READY TO LATCH' SIGNAL (V54X0837E) TO EVENT INDICATOR DS10 ON PANEL A8A2 OR (V54X0840E) TO MDM OA2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4212 ABORT: /NA

ITEM: FUSE, F6
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD READY-TO-LATCH SW ASSY 1 (V54X1040E)
7) FUSE, 2 AMP, (K76-B3)
8) FUSE, F6
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120F6
PART NUMBER: MC451-0018-0200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE STBD FWD SYSTEM 1 'FWD READY TO LATCH' SIGNAL (V54X1037E) TO EVENT INDICATOR DS9 ON PANEL A8A2 OR (V54X1040E) TO MDM OA2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4213 ABORT: /NA

ITEM: RESISTOR, R27
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) FWD READY-TO-LATCH SW ASSY 1 (V54X0840E)
7) RESISTOR, ISOL, 2.2K OHM
8) RESISTOR, R27
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118R27
PART NUMBER: RLR2002201GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PORT FWD SYSTEM 1 'FWD READY TO LATCH' SIGNAL (V54X0840E) TO MDM OA2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4214 ABORT: /NA

ITEM: RESISTOR, R67
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD READY-TO-LATCH SW ASSY 1 (V54X1040E)
7) RESISTOR, ISOL, 2.2K OHM
8) RESISTOR, R67
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R67
PART NUMBER: RLR2002201GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE STBD FWD SYSTEM 1 'FWD READY TO LATCH' SIGNAL (V54X1040E) TO MDM OA2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4215 ABORT: /NA

ITEM: RESISTOR, R28
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) FWD READY-TO-LATCH SW ASSY 1 (V54X0840E)
7) RESISTOR, BLEED, 1.8K OHM
8) RESISTOR, R28
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118R28
PART NUMBER: RLR0701801GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PORT FWD SYSTEM 1 'FWD READY TO LATCH' SIGNAL (V54X0840E) TO MDM OA2 (V54X0840E).
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4216 ABORT: /NA

ITEM: RESISTOR, R63
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD READY-TO-LATCH SW ASSY 1 (V54X1040E)
7) RESISTOR, BLEED, 1.8K OHM
8) RESISTOR, R63
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R63
PART NUMBER: RLR0701801GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE STBD FWD SYSTEM 1 'FWD READY TO LATCH' SIGNAL (V54X1040E) TO MDM OA2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4217 ABORT: /NA

ITEM: RESISTOR, R2
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) FWD ACTUATOR SYS 1, LATCH/RELEASE (K44-A3)
7) RESISTOR, ISOL, 1.2K OHM, 2 WATT
8) RESISTOR, R2
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118R2
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PORT FWD SYSTEM 1 LATCH/RELEASE ENABLE SIGNAL TO APPROPRIATE ACTUATOR MOTOR RELAY K20/K8.
LOSS OF ABILITY TO OPERATE PORT SYSTEM 1 FWD RETENTION LATCH ACTUATOR TO EITHER LATCH OR RELEASE. SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 COULD RESULT IN LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4218 ABORT: /NA

ITEM: RESISTOR, R14
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACTUATOR SYS 1, LATCH/RELEASE (K76-A3)
7) RESISTOR, ISOL, 1.2K OHM, 2 WATT
8) RESISTOR, R14
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R14
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE STBD FWD SYSTEM 1 LATCH/RELEASE ENABLE SIGNAL TO APPROPRIATE ACTUATOR MOTOR RELAY K52/K64.
LOSS OF ABILITY TO OPERATE STBD SYSTEM 1 FWD RETENTION LATCH ACTUATOR TO EITHER LATCH OR RELEASE. SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 COULD RESULT IN LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4219 ABORT: /NA

ITEM: RESISTOR, R25
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) FWD ACTUATOR SYS 1, K20 LATCHED, (V54X0860E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R25
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118R25
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PORT FWD SYSTEM 1 LATCH ENABLE MONITORING MEASUREMENT (V54X0860E) TO MDM OA2 OR (V54X0859E) TO EVENT INDICATOR ON PANEL A8A2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4220 ABORT: /NA

ITEM: RESISTOR, R32
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACTUATOR SYS 1, K52 LATCHED, (V54X1060E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R32
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R32
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE STBD FWD SYSTEM 1 LATCH ENABLE MONITORING MEASUREMENT (V54X1060E) TO MDM OA2 OR (V54X1059E) TO EVENT INDICATOR ON PANEL A8A2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4221 ABORT: /NA

ITEM: RESISTOR, R26
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) FWD ACTUATOR SYS 1, K8 RELEASED, (V54X0870E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R26
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118R26
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PORT FWD SYSTEM 1 RELEASE ENABLE MONITORING MEASUREMENT (V54X0870E) TO MDM OA2 OR (V54X0869E) TO EVENT INDICATOR ON PANEL A8A2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4222 ABORT: /NA

ITEM: RESISTOR, R33
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACTUATOR SYS 1, K64 RELEASED, (V54X1070E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R33
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R33
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE STBD FWD SYSTEM 1 RELEASE ENABLE MONITORING MEASUREMENT (V54X1070E) TO MDM OA2 OR (V54X1069E) TO EVENT INDICATOR ON PANEL A8A2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4223 ABORT: /NA

ITEM: HYBRID DRIVER, AR4
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) FWD ACT SYS 1, LATCH EVENT, A8A2S6DS5, (V5X40859E)
7) HYBRID DRIVER, TYPE 1
8) HYBRID DRIVER, AR4
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118AR4
PART NUMBER: MC477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PORT FWD SYSTEM 1 LATCH ENABLE SIGNAL (V54X0859E) TO EVENT INDICATOR DS5 ON PANEL A8A2 SWITCH S6.
LOSS OF EVENT INDICATION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4224 ABORT: /NA

ITEM: HYBRID DRIVER, AR4
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) FWD ACT SYS 1, LATCH EVENT, A8A2S6DS5, (V5X40859E)
7) HYBRID DRIVER, TYPE 1
8) HYBRID DRIVER, AR4
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118AR4
PART NUMBER: MC477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE ERRONEOUS PORT FWD SYSTEM 1 LATCH ENABLE SIGNAL (V54X0859E) TO EVENT INDICATOR DS5 ON PANEL A8A2 SWITCH S6.
LOSS OF EVENT INDICATION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4225 ABORT: /NA

ITEM: HYBRID DRIVER, AR10
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACT SYS 1, LATCH EVENT, A8A2S3DS10, (V54X1059E)
7) HYBRID DRIVER, TYPE 1
8) HYBRID DRIVER, AR10
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120AR10
PART NUMBER: MC477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE STBD FWD SYSTEM 1 LATCH ENABLE SIGNAL (V54X1059E) TO EVENT INDICATOR DS5 ON PANEL A8A2 SWITCH S3.
LOSS OF EVENT INDICATION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4226 ABORT: /NA

ITEM: HYBRID DRIVER, AR10
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACT SYS 1, LATCH EVENT, A8A2S3DS10, (V54X1059E)
7) HYBRID DRIVER, TYPE 1
8) HYBRID DRIVER, AR10
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120AR10
PART NUMBER: MC477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE ERRONEOUS STBD FWD SYSTEM 1 LATCH ENABLE SIGNAL (V54X1059E) TO EVENT INDICATOR DS5 ON PANEL A8A2 SWITCH S3.
LOSS OF EVENT INDICATION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4227 ABORT: /NA

ITEM: HYBRID DRIVER, AR5
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) FWD ACT SYS 1, RELEASE EVENT, A8A2S6DS5, (V54X0859E)
7) HYBRID DRIVER, TYPE 1
8) HYBRID DRIVER, AR5
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118AR5
PART NUMBER: MC477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PORT FWD SYSTEM 1 RELEASE ENABLE SIGNAL (V54X0869E) TO EVENT INDICATOR DS5 ON PANEL A8A2 SWITCH S6.
LOSS OF EVENT INDICATION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4228 ABORT: /NA

ITEM: HYBRID DRIVER, AR5
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) FWD ACT SYS 1, RELEASE EVENT, A8A2S6DS5, (V54X0859E)
7) HYBRID DRIVER, TYPE 1
8) HYBRID DRIVER, AR5
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118AR5
PART NUMBER: MC477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE ERRONEOUS PORT FWD SYSTEM 1 RELEASE ENABLE SIGNAL (V54X0869E) TO EVENT INDICATOR DS5 ON PANEL A8A2 SWITCH S6.
LOSS OF EVENT INDICATION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4229 ABORT: /NA

ITEM: HYBRID DRIVER, AR13
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACT SYS 1, RELEASE EVENT, A8A2S3DS10, (V54X1059E)
7) HYBRID DRIVER, TYPE 1
8) HYBRID DRIVER, AR13
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120AR13
PART NUMBER: MC477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE STBD FWD SYSTEM 1 RELEASE ENABLE SIGNAL (V54X1069E) TO EVENT INDICATOR DS5 ON PANEL A8A2 SWITCH S3.
LOSS OF EVENT INDICATION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4230 ABORT: /NA

ITEM: HYBRID DRIVER, AR13
FAILURE MODE: FAILS CLOSED.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACT SYS 1, RELEASE EVENT, A8A2S3DS10, (V54X1059E)
7) HYBRID DRIVER, TYPE 1
8) HYBRID DRIVER, AR13
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120AR13
PART NUMBER: MC477-0261-0002

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE ERRONEOUS STBD FWD SYSTEM 1 RELEASE ENABLE SIGNAL (V54X1069E) TO EVENT INDICATOR DS5 ON PANEL A8A2 SWITCH S3.
LOSS OF EVENT INDICATION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4231 ABORT: /NA

ITEM: FUSE, AR4F1
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) HYBRID DRIVER, AR4, FUSE
7) FUSE, 2 AMP
8) FUSE, AR4F1
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118AR4F1
PART NUMBER: MC451-0018-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PORT FWD SYSTEM 1 LATCH ENABLE SIGNAL (V54X0859E) TO EVENT INDICATOR DS5 ON PANEL A8A2 SWITCH S6.
LOSS OF EVENT INDICATION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4232 ABORT: /NA

ITEM: FUSE, AR10F1
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) HYBRID DRIVER, AR10, FUSE
7) FUSE, 2 AMP
8) FUSE, AR10F1
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120AR10F1
PART NUMBER: MC451-0018-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE STBD FWD SYSTEM 1 LATCH ENABLE SIGNAL (V54X1059E) TO EVENT INDICATOR DS9 ON PANEL A8A2 SWITCH S3.
LOSS OF EVENT INDICATION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4233 ABORT: /NA

ITEM: FUSE, AR5F1
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) HYBRID DRIVER, AR5, FUSE
7) FUSE, 2 AMP
8) FUSE, AR5F1
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118AR5F1
PART NUMBER: MC451-0018-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PORT FWD SYSTEM 1 RELEASE ENABLE SIGNAL (V54X0869E) TO EVENT INDICATOR DS5 ON PANEL A8A2 SWITCH S6.
LOSS OF EVENT INDICATION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4234 ABORT: /NA

ITEM: FUSE, AR13F1
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) HYBRID DRIVER, AR13, FUSE
7) FUSE, 2 AMP
8) FUSE, AR13F1
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120AR13F1
PART NUMBER: MC451-0018-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE STBD FWD SYSTEM 1 RELEASE ENABLE SIGNAL (V54X1069E) TO EVENT INDICATOR DS5 ON PANEL A8A2 SWITCH S3.
LOSS OF EVENT INDICATION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4235 ABORT: /NA

ITEM: HYBRID RELAY, K55
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) MID ACTUATOR SYS 1, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K55
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A117K55
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-1 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR TO DRIVE THE PORT MANIPULATOR MID RETENTION LATCH ACTUATOR TO THE LATCH POSITION.
ANY SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 WOULD RESULT IN INABILITY TO LATCH THE PORT MID LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4236 ABORT: /NA

ITEM: HYBRID RELAY, K55
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) MID ACTUATOR SYS 1, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K55
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A117K55
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF PLBM AC-1 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR COULD DRIVE THE PORT MANIPULATOR MID RETENTION LATCH ACTUATOR TO THE LATCH POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF THE FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD RESULT. ANY SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 WOULD RESULT IN INABILITY TO LATCH THE PORT MID LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4237 ABORT: /NA

ITEM: HYBRID RELAY, K69
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYS 1, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K69
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K69
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-2 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR TO DRIVE THE STARBOARD MANIPULATOR MID RETENTION LATCH ACTUATOR TO THE LATCH POSITION.
ANY SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 WOULD RESULT IN INABILITY TO LATCH THE STBD MID LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4238 ABORT: /NA

ITEM: HYBRID RELAY, K69
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYS 1, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K69
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K69
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF PLBM AC-2 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR COULD DRIVE THE STARBOARD MANIPULATOR MID RETENTION LATCH ACTUATOR TO THE LATCH POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF THE FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD RESULT. ANY SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 WOULD RESULT IN INABILITY TO LATCH THE STBD MID LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4239 ABORT: /NA

ITEM: HYBRID RELAY, K43
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) MID ACTUATOR SYS 1, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K43
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A117K43
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-1 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR TO DRIVE THE PORT MANIPULATOR MID RETENTION LATCH ACTUATOR TO THE RELEASE POSITION.
ANY SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 WOULD RESULT IN INABILITY TO RELEASE THE PORT MID LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4240 ABORT: /NA

ITEM: HYBRID RELAY, K43
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) MID ACTUATOR SYS 1, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K43
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A117K43
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF PLBM AC-1 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR COULD DRIVE THE PORT MANIPULATOR MID RETENTION LATCH ACTUATOR TO THE RELEASE POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF THE FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO LATCH, MOTOR FAILURE COULD RESULT. ANY SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 WOULD RESULT IN INABILITY TO RELEASE THE PORT MID LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

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INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4241 ABORT: /NA

ITEM: HYBRID RELAY, K57
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYS 1, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K57
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K57
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-2 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR TO DRIVE THE STARBOARD MID MANIPULATOR RETENTION LATCH ACTUATOR TO THE RELEASE POSITION.
ANY SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 WOULD RESULT IN INABILITY TO RELEASE THE STBD MID LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4242 ABORT: /NA

ITEM: HYBRID RELAY, K57
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYS 1, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K57
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K57
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF PLBM AC-2 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR COULD DRIVE THE STARBOARD MID MANIPULATOR RETENTION LATCH ACTUATOR TO THE RELEASE POSITION AS AN UNSCHEDULED EVENT.

UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF THE FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO LATCH, MOTOR FAILURE COULD RESULT. ANY SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 WOULD RESULT IN INABILITY TO RELEASE THE STBD MID LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4243 ABORT: /NA

ITEM: RELAY, K57
FAILURE MODE: FAILS CLOSED IN RESET OR DEADFACE POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) MID ACTUATOR SYS 1, GND-RESET/DFACE RELAY
7) RELAY, LATCHING, 2-POLE
8) RELAY, K57
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A117K57
PART NUMBER: MC455-0128-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT ALLOW RESET OR DEADFACE OF THE MID MOTOR CONTROL CIRCUIT AS REQUIRED.
IF FAILED IN THE DEADFACE POSITION NEITHER THE LATCH OR RELEASE FUNCTION OF THE PORT SYSTEM 1 MID RETENTION LATCH ACTUATOR COULD BE OPERATED. LOSS OF ABILITY TO DEADFACE IF FAILED IN THE RESET POSITION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4244 ABORT: /NA

ITEM: RELAY, K80
FAILURE MODE: FAILS CLOSED IN RESET OR DEADFACE POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYS 1, GND-RESET/DFACE RELAY
7) RELAY, LATCHING, 2-POLE
8) RELAY, K88
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K80
PART NUMBER: MC455-0128-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT ALLOW RESET OR DEADFACE OF THE MID MOTOR CONTROL CIRCUIT AS REQUIRED.
IF FAILED IN THE DEADFACE POSITION NEITHER THE LATCH OR RELEASE FUNCTION OF THE STBD SYSTEM 1 MID RETENTION LATCH ACTUATOR COULD BE OPERATED. LOSS OF ABILITY TO DEADFACE IF FAILED IN THE RESET POSITION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4245 ABORT: /NA

ITEM: FUSE, F2
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) MID READY-TO-LATCH SW ASSY 2 (V54X0842E)
7) FUSE, 2 AMP, (K57-B3)
8) FUSE, F2
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A117F2
PART NUMBER: MC451-0018-0200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 1 'MID READY-TO-LATCH' MEASUREMENT (V54X0842E) TO MDM OF4 OR (V54X0838E) TO EVENT INDICATOR DS8 ON PANEL A8A2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4246 ABORT: /NA

ITEM: FUSE, F4
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID READY-TO-LATCH SW ASSY 2 (V54X1042E)
7) FUSE, 2 AMP, (K57-B3)
8) FUSE, F4
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120F4
PART NUMBER: MC451-0018-0200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 1 'MID READY-TO-LATCH' MEASUREMENT (V54X1042E) TO MDM OA1 OR (V54X1038E) TO EVENT INDICATOR DS7 ON PANEL A8A2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4247 ABORT: /NA

ITEM: RESISTOR, R29
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) MID READY-TO-LATCH SW ASSY 2 (V54X0842E)
7) RESISTOR, ISOL, 2.2K OHM
8) RESISTOR, R29
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A117R29
PART NUMBER: RLR2002201GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 1 'MID READY-TO-LATCH' MEASUREMENT (V54X0842E) TO MDM OF4.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4248 ABORT: /NA

ITEM: RESISTOR, R65
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID READY-TO-LATCH SW ASSY 2 (V54X1042E)
7) RESISTOR, ISOL, 2.2K OHM
8) RESISTOR, R65
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R65
PART NUMBER: RLR2002201GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 1 'MID READY-TO-LATCH' MEASUREMENT (V54X1042E) TO MDM OA1.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4249 ABORT: /NA

ITEM: RESISTOR, R28
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) MID READY-TO-LATCH SW ASSY 2 (V54X0842E)
7) RESISTOR, BLEED, 1.8K OHM
8) RESISTOR, R28
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A117R28
PART NUMBER: RLR0701801GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 1 'MID READY-TO-LATCH' MEASUREMENT (V54X0842E) TO MDM OF4.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4250 ABORT: /NA

ITEM: RESISTOR, R61
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID READY-TO-LATCH SW ASSY 2 (V54X1042E)
7) RESISTOR, BLEED, 1.8K OHM
8) RESISTOR, R61
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R61
PART NUMBER: RLR0701801GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 1 'MID READY-TO-LATCH' MEASUREMENT (V54X1042E) TO MDM OA1.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4251 ABORT: /NA

ITEM: RESISTOR, R1
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) MID ACTUATOR SYSTEM 1, LATCH/RELEASE (K57-A3)
7) RESISTOR, ISO, 1.2K OHM, 2 WATT
8) RESISTOR, R1
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A117R1
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 1 LATCH/RELEASE ENABLE SIGNAL TO APPROPRIATE ACTUATOR MOTOR RELAY K55/K43.
LOSS OF ABILITY TO OPERATE PORT SYSTEM 1 MID RETENTION LATCH ACTUATOR TO EITHER LATCH OR RELEASE. SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 2 COULD CAUSE LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4252 ABORT: /NA

ITEM: RESISTOR, R11
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYSTEM 1, LATCH/RELEASE (K80-A3)
7) RESISTOR, ISO;, 1.2K OHM, 2 WATT
8) RESISTOR, R11
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120R11
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 1 LATCH/RELEASE ENABLE SIGNAL TO APPROPRIATE ACTUATOR MOTOR RELAY K69/H57.
LOSS OF ABILITY TO OPERATE STBD SYSTEM 1 MID RETENTION LATCH ACTUATOR TO EITHER LATCH OR RELEASE. SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 2 COULD CAUSE LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4253 ABORT: /NA

ITEM: RESISTOR, R25
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) MID ACTUATOR SYSTEM 1, K55 LATCHED, (V54X0862E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R25
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A117R25
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 1 LATCH ENABLE MONITORING MEASUREMENT (V54X0872E) TO MDM OF4.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4254 ABORT: /NA

ITEM: RESISTOR, R14
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYSTEM 1, K69 LATCHED, (V54X1062E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R14
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R14
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 1 LATCH ENABLE MONITORING MEASUREMENT (V54X1062E) TO MDM OA1.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4255 ABORT: /NA

ITEM: RESISTOR, R26
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) MID ACTUATOR SYSTEM 1, K43 LATCHED, (V54X1062E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R26
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A117R26
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 1 RELEASE ENABLE MONITORING MEASUREMENT (V54X0872E) TO MDM OF4.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4256 ABORT: /NA

ITEM: RESISTOR, R15
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYSTEM 1, K57 RELEASED, (V54X1072E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R15
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R15
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 1 RELEASE ENABLE MONITORING MEASUREMENT (V54X1072E) TO MDM OA1.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4257 ABORT: /NA

ITEM: HYBRID RELAY, K75
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) AFT ACTUATOR SYS 1, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K75
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118K75
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-3 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR TO DRIVE THE PORT MANIPULATOR AFT RETENTION LATCH ACTUATOR TO THE LATCH POSITION.
ANY SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 WOULD RESULT IN INABILITY TO LATCH THE PORT AFT LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4258 ABORT: /NA

ITEM: HYBRID RELAY, K75
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) AFT ACTUATOR SYS 1, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K75
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118K75
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE UNTIMELY PLBM AC-3 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR WHICH COULD DRIVE THE PORT MANIPULATOR AFT RETENTION LATCH ACTUATOR TO THE LATCH POSITION AS AN UNSCHEDULED EVENT.

UNTIMELY ACTUATOR LATCHING COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD RESULT. SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 COULD RESULT IN INABILITY TO LATCH/RELEASE THE STBD AFT LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4259 ABORT: /NA

ITEM: HYBRID RELAY, K78
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYS 1, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K78
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A119K78
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-1 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR TO DRIVE THE STARBOARD MANIPULATOR AFT RETENTION LATCH ACTUATOR TO THE LATCH POSITION.
ANY SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 WOULD RESULT IN INABILITY TO LATCH THE STBD AFT LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4260 ABORT: /NA

ITEM: HYBRID RELAY, K78
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYS 1, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K78
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A119K78
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE UNTIMELY PLBM AC-1 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR WHICH COULD DRIVE THE STBD MANIPULATOR AFT RETENTION LATCH ACTUATOR TO THE LATCH POSITION AS AN UNSCHEDULED EVENT.

UNTIMELY ACTUATOR LATCHING COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD RESULT. SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 COULD RESULT IN INABILITY TO LATCH/RELEASE THE STBD AFT LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4261 ABORT: /NA

ITEM: HYBRID RELAY, K73
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) AFT ACTUATOR SYS 1, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K73
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118K73
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-3 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR TO DRIVE THE PORT MANIPULATOR AFT RETENTION LATCH ACTUATOR TO THE LATCH POSITION.
ANY SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 WOULD RESULT IN INABILITY TO RELEASE THE PORT AFT LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4262 ABORT: /NA

ITEM: HYBRID RELAY, K73
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) AFT ACTUATOR SYS 1, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K73
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118K73
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE UNTIMELY PLBM AC-3 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR WHICH COULD DRIVE THE PORT MANIPULATOR AFT RETENTION LATCH ACTUATOR TO THE LATCH POSITION AS AN UNSCHEDULED EVENT.

UNTIMELY ACTUATOR LATCHING COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD RESULT. SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 COULD RESULT IN INABILITY TO LATCH/RELEASE THE PORT AFT LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4263 ABORT: /NA

ITEM: HYBRID RELAY, K76
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYS 1, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K76
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A119K76
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-1 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR TO DRIVE THE STARBOARD MANIPULATOR AFT RETENTION LATCH ACTUATOR TO THE LATCH POSITION.
ANY SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 WOULD RESULT IN INABILITY TO RELEASE THE STBD AFT LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4264 ABORT: /NA

ITEM: HYBRID RELAY, K76
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYS 1, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K76
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A119K76
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE UNTIMELY PLBM AC-1 115 VAC 400 Hz POWER TO THE SYSTEM 1 MOTOR WHICH COULD DRIVE THE STARBOARD MANIPULATOR AFT RETENTION LATCH ACTUATOR TO THE LATCH POSITION AS AN UNSCHEDULED EVENT.

UNTIMELY ACTUATOR LATCHING COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD RESULT. SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 2 COULD RESULT IN INABILITY TO LATCH/RELEASE THE STBD AFT LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4265 ABORT: /NA

ITEM: RELAY, K77
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) AFT ACTUATOR SYS 1, GND-RESET/DFACE RELAY
7) RELAY, LATCHING, 2-POLE
8) RELAY, K77
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118K77
PART NUMBER: MC455-0128-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT ALLOW RESET OR DEADFACE OF THE AFT MOTOR CONTROL CIRCUIT AS REQUIRED.
IF FAILED IN THE DEADFACE POSITION NEITHER THE LATCH OR RELEASE FUNCTION OF THE PORT SYSTEM 1 AFT RETENTION LATCH ACTUATOR COULD BE OPERATED. LOSS OF ABILITY TO DEADFACE IF FAILED IN THE RESET POSITION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4266 ABORT: /NA

ITEM: RELAY, K11
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYS 1, GND-RESET/DFACE RELAY
7) RELAY, LATCHING, 2-POLE
8) RELAY, K11
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A119K11
PART NUMBER: MC455-0128-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT ALLOW RESET OR DEADFACE OF THE AFT MOTOR CONTROL CIRCUIT AS REQUIRED.
IF FAILED IN THE DEADFACE POSITION NEITHER THE LATCH OR RELEASE FUNCTION OF THE STBD SYSTEM 1 AFT RETENTION LATCH ACTUATOR COULD BE OPERATED. LOSS OF ABILITY TO DEADFACE IF FAILED IN THE RESET POSITION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4267 ABORT: /NA

ITEM: FUSE, F8
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) AFT READY-TO-LATCH SW ASSY 3 (V54X0844E)
7) FUSE, 2-AMP (K77-A3)
8) FUSE, F8
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118F8
PART NUMBER: MC451-0018-0200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 1 'AFT READY-TO-LATCH' MEASUREMENT (V540844E) TO MDM OF1 OR (V54X0839E) TO EVENT INDICATOR DS6 ON PANEL A8A2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4268 ABORT: /NA

ITEM: FUSE, F2
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT READY-TO-LATCH SW ASSY 3 (V54X1044E)
7) FUSE, 2-AMP (K11-A3)
8) FUSE, F2
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A119F2
PART NUMBER: MC451-0018-0200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 1 'AFT READY-TO-LATCH' MEASUREMENT (V541044E) TO MDM OF1 OR (V54X1039E) TO EVENT INDICATOR DS3 ON PANEL A8A2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4269 ABORT: /NA

ITEM: RESISTOR, R61
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) AFT READY-TO-LATCH SW ASSY 3 (V54X0844E)
7) RESISTOR, ISOL, 2.2K OHM
8) RESISTOR, R61
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118R61
PART NUMBER: RLR2002201GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 1 'AFT READY-TO-LATCH' MEASUREMENT (V540844E) TO MDM OF1.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/28/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4270 ABORT: /NA

ITEM: RESISTOR, R41
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT READY-TO-LATCH SW ASSY 3 (V54X1044E)
7) RESISTOR, ISOL, 2.2K OHM
8) RESISTOR, R41
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A119R41
PART NUMBER: RLR2002201GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 1 'AFT READY-TO-LATCH' MEASUREMENT (V541044E) TO MDM OF1.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/28/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4271 ABORT: /NA

ITEM: RESISTOR, R62
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) AFT READY-TO-LATCH SW ASSY 3 (V54X0844E)
7) RESISTOR, BLEED, 1.8K OHM
8) RESISTOR, R62
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118R62
PART NUMBER: RLR0701801GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 1 'AFT READY-TO-LATCH' MEASUREMENT (V540844E) TO MDM OF1.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/28/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4272 ABORT: /NA

ITEM: RESISTOR, R40
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT READY-TO-LATCH SW ASSY 3 (V54X1044E)
7) RESISTOR, BLEED, 1.8K OHM
8) RESISTOR, R40
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A119R40
PART NUMBER: RLR0701801GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 1 'AFT READY-TO-LATCH' MEASUREMENT (V541044E) TO MDM OF1.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/28/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4273 ABORT: /NA

ITEM: RESISTOR, R14
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) AFT ACTUATOR SYSTEM 1, LATCH/RELEASE (K77-A3)
7) RESISTOR, ISOL, 1.2K OHM, 2 WATT
8) RESISTOR, R14
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118R14
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 1 LATCH/RELEASE ENABLE SIGNAL TO APPROPRIATE ACTUATOR MOTOR RELAY K78/K76.
LOSS OF ABILITY TO OPERATE THE PORT SYSTEM 1 AFT RETENTION LATCH ACTUATOR TO EITHER RELEASE OR LATCH. SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 2 COULD CAUSE LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/28/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4274 ABORT: /NA

ITEM: RESISTOR, R2
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYSTEM 1, LATCH/RELEASE (K11-A3)
7) RESISTOR, ISOL, 1.2K OHM, 2 WATT
8) RESISTOR, R2
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A119R2
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 1 LATCH/RELEASE ENABLE SIGNAL TO APPROPRIATE ACTUATOR MOTOR RELAY K78/K76.
LOSS OF ABILITY TO OPERATE THE STBD SYSTEM 1 AFT RETENTION LATCH ACTUATOR TO EITHER RELEASE OR LATCH. SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 2 COULD CAUSE LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/28/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4275 ABORT: /NA

ITEM: RESISTOR, R59
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) AFT ACTUATOR SYSTEM 1, K75 LATCHED, (V54X0864E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R59
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118R59
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 1 LATCH ENABLE MONITORING MEASUREMENT (V540864E) TO MDM OA3.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/28/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4276 ABORT: /NA

ITEM: RESISTOR, R31
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYSTEM 1, K78 LATCHED, (V54X1064E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R31
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A119R31
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 1 LATCH ENABLE MONITORING MEASUREMENT (V541064E) TO MDM OF1.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/28/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4277 ABORT: /NA

ITEM: RESISTOR, R60
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) AFT ACTUATOR SYSTEM 1, K73 RELEASED, (V54X0874E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R60
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118R60
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 1 RELEASE ENABLE MONITORING MEASUREMENT (V540874E) TO MDM OA3.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/28/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4278 ABORT: /NA

ITEM: RESISTOR, R33
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 1
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYSTEM 1, K76 RELEASED, (V54X1074E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R33
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A119R33
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 1 RELEASE ENABLE MONITORING MEASUREMENT (V541074E) TO MDM OF1.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4279 ABORT: /NA

ITEM: HYBRID RELAY, K54
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACTUATOR SYS 2, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K54
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K54
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-3 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR TO DRIVE THE PORT FWD RETENTION LATCH ACTUATOR TO THE LATCH POSITION.
ANY SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 WOULD RESULT IN INABILITY TO LATCH THE PORT FORWARD RETENTION LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4280 ABORT: /NA

ITEM: HYBRID RELAY, K54
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACTUATOR SYS 2, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K54
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K54
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE UNTIMELY PLBM AC-3 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR WHICH COULD DRIVE THE PORT FWD RETENTION LATCH ACTUATOR TO THE LATCH POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD RESULT. SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 1 COULD RESULT IN INABILITY TO LATCH/RELEASE THE PORT FWD LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4281 ABORT: /NA

ITEM: HYBRID RELAY, K56
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) FWD ACTUATOR SYS 2, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K56
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A117K56
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-1 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR TO DRIVE THE STARBOARD FWD RETENTION LATCH ACTUATOR TO THE LATCH POSITION.
ANY SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 WOULD RESULT IN INABILITY TO LATCH THE STBD FWD LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4282 ABORT: /NA

ITEM: HYBRID RELAY, K56
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) FWD ACTUATOR SYS 2, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K56
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A117K56
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE UNTIMELY PLBM AC-1 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR SHICH COULD DRIVE THE STARBOARD FWD RETENTION LATCH ACTUATOR TO THE LATCH POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD RESULT. SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 1 COULD RESULT IN INABILITY TO LATCH/RELEASE THE STBD FWD LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4283 ABORT: /NA

ITEM: HYBRID RELAY, K66
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACTUATOR SYS 2, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K66
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K66
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-3 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR TO DRIVE THE PORT FWD RETENTION LATCH ACTUATOR TO THE RELEASE POSITION.
ANY SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 WOULD RESULT IN INABILITY TO RELEASE THE PORT FWD LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4284 ABORT: /NA

ITEM: HYBRID RELAY, K66
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACTUATOR SYS 2, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K66
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K66
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE UNTIMELY PLBM AC-3 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR WHICH COULD DRIVE THE PORT FWD RETENTION LATCH ACTUATOR TO THE RELEASE POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD RESULT. SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 1 COULD RESULT IN INABILITY TO LATCH/RELEASE THE STBD FWD LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4285 ABORT: /NA

ITEM: HYBRID RELAY, K44
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) FWD ACTUATOR SYS 2, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K44
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A117K44
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-1 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR TO DRIVE THE STARBOARD FWD RETENTION LATCH ACTUATOR TO THE RELEASE POSITION.
ANY SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 WOULD RESULT IN INABILITY TO RELEASE THE STBD LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4286 ABORT: /NA

ITEM: HYBRID RELAY, K44
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) FWD ACTUATOR SYS 2, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K44
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A117K44
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE UNTIMELY PLBM AC-1 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR WHICH COULD DRIVE THE STARBOARD FWD RETENTION LATCH ACTUATOR TO THE RELEASE POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD RESULT. SUBSEQUENT FAILURE OF REDUNDANT SYSTEM 1 COULD RESULT IN INABILITY TO LATCH/RELEASE THE STBD FWD LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4287 ABORT: /NA

ITEM: RELAY, K68
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACTUATOR SYS 2, GND RESET/DFACE RELAY
7) RELAY, LATCHING, 2-POLE
8) RELAY, K68
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K68
PART NUMBER: MC455-0128-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT ALLOW RESET OR DEADFACE OF THE FWD MOTOR CONTROL CIRCUIT AS REQUIRED.
IF FAILED IN THE DEADFACE POSITION NEITHER THE LATCH OR RELEASE FUNCTION OF THE PORT SYSTEM 2 FWD RETENTION LATCH ACTUATOR COULD BE OPERATED. LOSS OF ABILITY TO DEADFACE IF FAILED IN THE RESET POSITION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4288 ABORT: /NA

ITEM: RELAY, K58
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) FWD ACTUATOR SYS 2, GND RESET/DFACE RELAY
7) RELAY, LATCHING, 2-POLE
8) RELAY, K58
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A117K58
PART NUMBER: MC455-0128-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT ALLOW RESET OR DEADFACE OF THE FWD MOTOR CONTROL CIRCUIT AS REQUIRED.
IF FAILED IN THE DEADFACE POSITION NEITHER THE LATCH OR RELEASE FUNCTION OF THE STBD SYSTEM 2 FWD RETENTION LATCH ACTUATOR COULD BE OPERATED. LOSS OF ABILITY TO DEADFACE IF FAILED IN THE RESET POSITION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4289 ABORT: /NA

ITEM: FUSE, F7
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD READY-TO-LATCH ASSY 1 (V54X0841E)
7) FUSE, 2 AMP, (K68-B3)
8) FUSE, F7
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120F7
PART NUMBER: MC451-0018-0200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE FWD SYSTEM 2 'FWD READY-TO-LATCH' MEASUREMENT (V54X0841E) TO MDM OA2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4290 ABORT: /NA

ITEM: FUSE, F3
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) FWD READY-TO-LATCH ASSY 1 (V54X1041E)
7) FUSE, 2 AMP, (K68-B3)
8) FUSE, F3
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A117F3
PART NUMBER: MC451-0018-0200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE FWD SYSTEM 2 'FWD READY-TO-LATCH' MEASUREMENT (V54X1041E) TO MDM OF4.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4291 ABORT: /NA

ITEM: RESISTOR, R68
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD READY-TO-LATCH ASSY 1 (V54X0841E)
7) ISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R68
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R68
PART NUMBER: RLR2002201GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE FWD SYSTEM 2 'FWD READY-TO-LATCH' MEASUREMENT (V54X0841E) TO MDM OA2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4292 ABORT: /NA

ITEM: RESISTOR, R34
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) FWD READY-TO-LATCH ASSY 1 (V54X1041E)
7) RESISTOR, ISOL, 2.2K OHM
8) RESISTOR, R34
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A117R34
PART NUMBER: RLR2002201GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE FWD SYSTEM 2 'FWD READY-TO-LATCH' MEASUREMENT (V54X1041E) TO MDM OF4.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4293 ABORT: /NA

ITEM: RESISTOR, R64
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD READY-TO-LATCH ASSY 1 (V54X0841E)
7) RESISTOR, BLEED, 1.8K OHM
8) RESISTOR, R64
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R64
PART NUMBER: RLR0701801GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE FWD SYSTEM 2 'FWD READY-TO-LATCH' MEASUREMENT (V54X0841E) TO MDM OA2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4294 ABORT: /NA

ITEM: RESISTOR, R33
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) FWD READY-TO-LATCH ASSY 1 (V54X1041E)
7) RESISTOR, BLEED, 1.8K OHM
8) RESISTOR, R33
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A117R33
PART NUMBER: RLR0701801GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE FWD SYSTEM 2 'FWD READY-TO-LATCH' MEASUREMENT (V54X1041E) TO MDM OF4.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4295 ABORT: /NA

ITEM: RESISTOR, R12
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACTUATOR SYSTEM 2, LATCH/RELEASE (K68-A3)
7) RESISTOR, ISOL, 1.2K OHM, 2 WATT
8) RESISTOR, R12
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120R12
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE FWD SYSTEM 2 LATCH/RELEASE ENABLE SIGNAL TO THE APPROPRIATE ACTUATOR RELAY K54/K66.
LOSS OF ABILITY TO OPERATE THE PORT SYSTEM 2 FWD RETENTION LATCH ACTUATOR TO EITHER RELEASE OR LATCH POSITION. SUBSEQUENT LOSS OF REDUNDANT SYSTEM 1 COULD CAUSE LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4296 ABORT: /NA

ITEM: RESISTOR, R2
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) FWD ACTUATOR SYSTEM 2, LATCH/RELEASE (K58-A3)
7) RESISTOR, ISOL, 1.2K OHM, 2 WATT
8) RESISTOR, R2
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A117R2
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE FWD SYSTEM 2 LATCH/RELEASE ENABLE SIGNAL TO THE APPROPRIATE ACTUATOR RELAY K56/K44.
LOSS OF ABILITY TO OPERATE THE STBD SYSTEM 2 FWD RETENTION LATCH ACTUATOR TO EITHER RELEASE OR LATCH POSITION. SUBSEQUENT LOSS OF REDUNDANT SYSTEM 1 COULD CAUSE LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4297 ABORT: /NA

ITEM: RESISTOR, R35
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACTUATOR SYSTEM 2, K54 LATCHED, (V54X0861E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R35
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R35
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE FWD SYSTEM 2 LATCH ENABLE MONITORING MEASUREMENT (V540861E) TO MDM OA2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4298 ABORT: /NA

ITEM: RESISTOR, R31
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) FWD ACTUATOR SYSTEM 2, K56 LATCHED, (V54X1061E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R31
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A117R31
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE FWD SYSTEM 2 LATCH ENABLE MONITORING MEASUREMENT (V541061E) TO MDM OF4.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4299 ABORT: /NA

ITEM: RESISTOR, R34
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A5)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) FWD ACTUATOR SYSTEM 2, K66 RELEASED, (V54X0871E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R34
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R34
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE FWD SYSTEM 2 RELEASE ENABLE MONITORING MEASUREMENT (V540861E) TO MDM OA2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4300 ABORT: /NA

ITEM: RESISTOR, R30
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) FWD LATCH ACTUATOR (40V54A15)
5) MID MOTOR CONTROLLER (MMC)-1 (40V76A117)
6) FWD ACTUATOR SYSTEM 2, K44 RELEASED, (V54X1071E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R30
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A117R30
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE FWD SYSTEM 2 RELEASE ENABLE MONITORING MEASUREMENT (V541061E) TO MDM OF4.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4301 ABORT: /NA

ITEM: HYBRID RELAY, K59
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYS 2, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K59
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K59
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-2 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR TO DRIVE THE PORT MID RETENTION LATCH ACTUATOR TO THE LATCH POSITION.
ANY SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 WOULD RESULT IN INABILITY TO LATCH THE PORT MID RETENTION LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4302 ABORT: /NA

ITEM: HYBRID RELAY, K59
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYS 2, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K59
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K59
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE UNTIMELY PLBM AC-2 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR WHICH COULD DRIVE THE PORT MID RETENTION LATCH ACTUATOR TO THE LATCH POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD RESULT. SUBSEQUENT FAILURE IN SYSTEM 1 WOULD RESULT IN INABILITY TO LATCH/RELEASE THE PORT MID RETENTION LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4303 ABORT: /NA

ITEM: HYBRID RELAY, K76
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYS 2, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K76
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K76
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-3 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR TO DRIVE THE STARBOARD MID RETENTION LATCH ACTUATOR TO THE LATCH POSITION.
ANY SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 WOULD RESULT IN INABILITY TO LATCH THE STBD MID RETENTION LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4304 ABORT: /NA

ITEM: HYBRID RELAY, K76
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYS 2, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K76
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K76
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE UNTIMELY PLBM AC-3 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR WHICH COULD DRIVE THE STARBOARD MID RETENTION LATCH ACTUATOR TO THE LATCH POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD RESULT. SUBSEQUENT FAILURE IN SYSTEM 1 WOULD RESULT IN INABILITY TO LATCH/RELEASE THE PORT MID RETENTION LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4305 ABORT: /NA

ITEM: HYBRID RELAY, K71
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYS 2, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K71
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K71
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-2 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR TO DRIVE THE PORT MID RETENTION LATCH ACTUATOR TO THE RELEASE POSITION.
ANY SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 WOULD RESULT IN INABILITY TO RELEASE THE STBD MID RETENTION LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4306 ABORT: /NA

ITEM: HYBRID RELAY, K71
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYS 2, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K71
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K71
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE UNTIMELY PLBM AC-2 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR WHICH COULD DRIVE THE PORT MID RETENTION LATCH ACTUATOR TO THE RELEASE POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD RESULT. SUBSEQUENT FAILURE IN SYSTEM 1 WOULD RESULT IN INABILITY TO LATCH/RELEASE THE PORT MID RETENTION LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4307 ABORT: /NA

ITEM: HYBRID RELAY, K74
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYS 2, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K74
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K74
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-3 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR TO DRIVE THE STARBOARD MID RETENTION LATCH ACTUATOR TO THE RELEASE POSITION.
ANY SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 WOULD RESULT IN INABILITY TO RELEASE THE PORT MID RETENTION LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4308 ABORT: /NA

ITEM: HYBRID RELAY, K74
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYS 2, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K74
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K74
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-3 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR WHICH COULD DRIVE THE STARBOARD MID RETENTION LATCH ACTUATOR TO THE RELEASE POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD RESULT. SUBSEQUENT FAILURE IN SYSTEM 1 WOULD RESULT IN INABILITY TO LATCH/RELEASE THE PORT MID RETENTION LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4309 ABORT: /NA

ITEM: RELAY, K78
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYS 2, GND RESET/DFACE RELAY
7) RELAY, LATCHING, 2-POLE
8) RELAY, K78
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K78
PART NUMBER: MC455-0128-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT ALLOW RESET OR DEADFACE OF THE MID MOTOR CONTROL CIRCUIT AS REQUIRED
IF FAILED IN THE DEADFACE POSITION NEITHER THE RELEASE OR LATCH FUNCTION OF THE PORT SYSTEM 2 MID RETENTION LATCH MECHANISM COULD BE OPERATED. LOSS OF ABILITY TO DEADFACE IF FAILED IN THE RESET POSITION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4310 ABORT: /NA

ITEM: RELAY, K78
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYS 2, GND RESET/DFACE RELAY
7) RELAY, LATCHING, 2-POLE
8) RELAY, K78
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120K78
PART NUMBER: MC455-0128-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT ALLOW RESET OR DEADFACE OF THE MID MOTOR CONTROL CIRCUIT AS REQUIRED
IF FAILED IN THE DEADFACE POSITION NEITHER THE RELEASE OR LATCH FUNCTION OF THE STBD SYSTEM 2 MID RETENTION LATCH MECHANISM COULD BE OPERATED. LOSS OF ABILITY TO DEADFACE IF FAILED IN THE RESET POSITION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4311 ABORT: /NA

ITEM: FUSE, F5,
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID READY-TO-LATCH ASSY 2 (V54X0843E)
7) FUSE, 2 AMP, (K78-B3)
8) FUSE, F5
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120F5
PART NUMBER: MC451-0018-0200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 2 'MID READY-TO-LATCH' MEASUREMENT (V54X0843E) TO MDM OF4.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4312 ABORT: /NA

ITEM: FUSE, F9
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID READY-TO-LATCH ASSY 2 (V54X1043E)
7) FUSE, 2 AMP, (K78-B3)
8) FUSE, F9
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120F9
PART NUMBER: MC451-0018-0200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 2 'MID READY-TO-LATCH' MEASUREMENT (V54X1043E) TO MDM OA3.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4313 ABORT: /NA

ITEM: RESISTOR, R66
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID READY-TO-LATCH ASSY 2 (V54X0843E)
7) RESISTOR, ISOL, 2.2K OHM
8) RESISTOR, R66
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R66
PART NUMBER: RLR2002201GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 2 'MID READY-TO-LATCH' MEASUREMENT (V54X0843E) TO MDM OF4.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4314 ABORT: /NA

ITEM: RESISTOR, R66
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID READY-TO-LATCH ASSY 2 (V54X1043E)
7) RESISTOR, ISOL, 2.2K OHM
8) RESISTOR, R66
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R66
PART NUMBER: RLR2002201GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 2 'MID READY-TO-LATCH' MEASUREMENT (V54X1043E) TO MDM OA3.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4315 ABORT: /NA

ITEM: RESISTOR, R62
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID READY-TO-LATCH ASSY 2 (V54X0843E)
7) RESISTOR, BLEED, 1.8K OHM
8) RESISTOR, R62
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R62
PART NUMBER: RLR0701801GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 2 'MID READY-TO-LATCH' MEASUREMENT (V54X0843E) TO MDM OF4.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4316 ABORT: /NA

ITEM: RESISTOR, R67
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID READY-TO-LATCH ASSY 2 (V54X1043E)
7) RESISTOR, BLEED, 1.8K OHM
8) RESISTOR, R67
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R67
PART NUMBER: RLR0701801GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 2 'MID READY-TO-LATCH' MEASUREMENT (V54X1043E) TO MDM OA3.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4317 ABORT: /NA

ITEM: RESISTOR, R10
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYSTEM 2, LATCH/RELEASE (K78-A3)
7) RESISTOR, ISOL, 1.2K OHM, 2 WATT
8) RESISTOR, R10
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120R10
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 2 LATCH/RELEASE ENABLE SIGNAL TO THE APPROPRIATE RELAY K76/K74.
LOSS OF ABILITY TO OPERATE THE PORT SYSTEM 2 MID RETENTION LATCH ACTUATOR TO EITHER THE RELEASE OR LATCH POSITION. SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 COULD CAUSE LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4318 ABORT: /NA

ITEM: RESISTOR, R2
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYSTEM 2, LATCH/RELEASE (K78-A3)
7) RESISTOR, ISOL, 1.2K OHM, 2 WATT
8) RESISTOR, R2
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A120R2
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 2 LATCH/RELEASE ENABLE SIGNAL TO THE APPROPRIATE RELAY K76/K74.
LOSS OF ABILITY TO OPERATE THE STBD SYSTEM 2 MID RETENTION LATCH ACTUATOR TO EITHER THE RELEASE OR LATCH POSITION. SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 COULD CAUSE LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4319 ABORT: /NA

ITEM: RESISTOR, R16
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYSTEM 2, K59 LATCHED, (V54X0863E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R16
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R16
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 2 LATCH ENABLE MONITORING MEASUREMENT (V54X0863E) TO MDM OA3.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4320 ABORT: /NA

ITEM: RESISTOR, R64
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYSTEM 2, K76 LATCHED, (V54X1063E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R64
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R64
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 2 LATCH ENABLE MONITORING MEASUREMENT (V54X1063E) TO MDM OA3.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4321 ABORT: /NA

ITEM: RESISTOR, R17
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A6)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYSTEM 2, K71 RELEASED, (V54X0873E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R17
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R17
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 2 RELEASE MONITORING MEASUREMENT (V54X0863E) TO MDM OA2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4322 ABORT: /NA

ITEM: RESISTOR, R65
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) MID LATCH ACTUATOR (40V54A16)
5) MID MOTOR CONTROLLER (MMC)-4 (40V76A120)
6) MID ACTUATOR SYSTEM 2, K74 RELEASED, (V54X1073E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R65
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A120R65
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE MID SYSTEM 2 RELEASE ENABLE MONITORING MEASUREMENT (V54X1063E) TO MDM OA3.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4323 ABORT: /NA

ITEM: HYBRID RELAY, K24
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYS 2, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K24
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A119K24
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-1 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR TO DRIVE THE PORT AFT LATCH ACTUATOR TO THE LATCH POSITION.
ANY SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 WOULD RESULT IN INABILITY TO LATCH THE PORT AFT RETENTION LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4324 ABORT: /NA

ITEM: HYBRID RELAY, K24
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYS 2, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K24
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A119K24
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE UNTIMELY PLBM AC-1 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR WHICH COULD DRIVE THE PORT AFT LATCH ACTUATOR TO THE LATCH POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD OCCUR. SUBSEQUENT FAILURE IN SYSTEM 1 WOULD RESULT IN INABILITY TO LATCH/RELEASE THE PORT AFT RETENTION LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4325 ABORT: /NA

ITEM: HYBRID RELAY, K27
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) AFT ACTUATOR SYS 2, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K27
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118K27
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-2 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR TO DRIVE THE STARBOARD AFT LATCH ACTUATOR TO THE LATCH POSITION.
ANY SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 WOULD RESULT IN INABILITY TO LATCH THE STBD AFT RETENTION LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4326 ABORT: /NA

ITEM: HYBRID RELAY, K27
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-2 (40V76A118)
6) AFT ACTUATOR SYS 2, LATCH RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K27
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118K27
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE UNTIMELY PLBM AC-2 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR WHICH COULD DRIVE THE STARBOARD AFT LATCH ACTUATOR TO THE LATCH POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD OCCUR. SUBSEQUENT FAILURE IN SYSTEM 1 WOULD RESULT IN INABILITY TO LATCH/RELEASE THE STBD AFT RETENTION LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4327 ABORT: /NA

ITEM: HYBRID RELAY, K12
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYS 2, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K12
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A119K12
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-1 115 VAC 400 HZ POWER TO THE SYSTEM 1 MOTOR TO DRIVE THE PORT AFT LATCH ACTUATOR TO THE RELEASE POSITION.
ANY SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 WOULD RESULT IN INABILITY TO RELEASE THE PORT AFT RETENTION LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4328 ABORT: /NA

ITEM: HYBRID RELAY, K12
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYS 2, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K12
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A119K12
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE UNIIMRLY PLBM AC-1 115 VAC 400 HZ POWER TO THE SYSTEM 1 MOTOR WHICH COULD DRIVE THE PORT AFT LATCH ACTUATOR TO THE RELEASE POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILE POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD OCCUR. SUBSEQUENT FAILURE IN SYSTEM 1 WOULD RESULT IN INABILITY TO LATCH/RELEASE THE PORT AFT RETENTION LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4328 ABORT: /NA

ITEM: HYBRID RELAY, K12
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYS 2, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K12
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A119K12
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE UNYIMRLY PLBM AC-1 115 VAC 400 HZ POWER TO THE SYSTEM 1 MOTOR WHICH COULD DRIVE THE PORT AFT LATCH ACTUATOR TO THE RELEASE POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILD POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD OCCUR. SUBSEQUENT FAILURE IN SYSTEM 1 WOULD RESULT IN INABILITY TO LATCH/RELEASE THE PORT AFT RETENTION LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4329 ABORT: /NA

ITEM: HYBRID RELAY, K29
FAILURE MODE: OPEN, FAILS TO CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A118)
6) AFT ACTUATOR SYS 2, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K29
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118K29
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE PLBM AC-1 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR TO DRIVE THE STARBOARD AFT LATCH ACTUATOR TO THE RELEASE POSITION.
ANY SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 WOULD RESULT IN INABILITY TO RELEASE THE STBD AFT RETENTION LATCH MECHANISM.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4330 ABORT: /NA

ITEM: HYBRID RELAY, K29
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A118)
6) AFT ACTUATOR SYS 2, RELEASE RELAY
7) HYBRID RELAY, 3-POLE
8) HYBRID RELAY, K29
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118K29
PART NUMBER: MC455-0135-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL PROVIDE UNTIMELY PLBM AC-1 115 VAC 400 HZ POWER TO THE SYSTEM 2 MOTOR WHICH COULD DRIVE THE STARBOARD AFT LATCH ACTUATOR TO THE RELEASE POSITION AS AN UNSCHEDULED EVENT.
UNTIMELY ACTUATOR OPERATION COULD CAUSE PHYSICAL DAMAGE. IF FAILURE OCCURRED WHILD POWER WAS BEING APPLIED TO RELEASE, MOTOR FAILURE COULD OCCUR. SUBSEQUENT FAILURE IN SYSTEM 1 WOULD RESULT IN INABILITY TO LATCH/RELEASE THE STBD AFT RETENTION LATCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4331 ABORT: /NA

ITEM: RELAY, K23
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYS 2, GND RESET/DFACE RELAY
7) RELAY LATCHING, 2-POLE
8) RELAY, K23
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A119K23
PART NUMBER: MC455-0128-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT ALLOW RESET OR DEADFACE OF THE AFT MOTOR CONTROL CIRCUIT AS REQUIRED/
IF FAILED IN THE DEADFACE POSITION NEITHER THE RELEASE OR LATCH FUNCTION OF THE PORT SYSTEM 2 AFT RETENTION LATCH MECHANISM COULD BE OPERATED. LOSS OF ABILITY TO DEADFACE IF FAILED IN THE RESET POSITION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4332 ABORT: /NA

ITEM: RELAY, K17
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A118)
6) AFT ACTUATOR SYS 2, GND RESET/DFACE RELAY
7) RELAY LATCHING, 2-POLE
8) RELAY, K17
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118K17
PART NUMBER: MC455-0128-0001

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT ALLOW RESET OR DEADFACE OF THE AFT MOTOR CONTROL CIRCUIT AS REQUIRED/
IF FAILED IN THE DEADFACE POSITION NEITHER THE RELEASE OR LATCH FUNCTION OF THE STBD SYSTEM 2 AFT RETENTION LATCH MECHANISM COULD BE OPERATED. LOSS OF ABILITY TO DEADFACE IF FAILED IN THE RESET POSITION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4333 ABORT: /NA

ITEM: FUSE, 2 AMP, F3
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT READY-TO-LATCH ASSY 3, (V54X0845E)
7) FUSE, 2 AMP, (K23-B3)
8) FUSE, F3
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A119F3
PART NUMBER: MC451-0018-0200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 2 'AFT READY-TO-LATCH' MEASUREMENT (V54X0845E) TO MDM OF1.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4334 ABORT: /NA

ITEM: FUSE, 2 AMP, F3
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A118)
6) AFT READY-TO-LATCH ASSY 3, (V54X1045E)
7) FUSE, 2 AMP, (K17-B3)
8) FUSE, F3
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118F3
PART NUMBER: MC451-0018-0200

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 2 'AFT READY-TO-LATCH' MEASUREMENT (V54X0105E) TO MDM OA2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4335 ABORT: /NA

ITEM: RESISTOR, R49
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT READY-TO-LATCH ASSY 3, (V54X0845E)
7) RESISTOR, ISOL, 1.2K OHM, 2 WATT
8) RESISTOR, R49
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A119R49
PART NUMBER: RLR0022201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 2 'AFT READY-TO-LATCH' MEASUREMENT (V54X0845E) TO MDM OF1.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4336 ABORT: /NA

ITEM: RESISTOR, R22
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A118)
6) AFT READY-TO-LATCH ASSY 3, (V54X1045E)
7) RESISTOR, ISOL, 1.2K OHM, 2 WATT
8) RESISTOR, R22
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118R22
PART NUMBER: RLR0022201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 2 'AFT READY-TO-LATCH' MEASUREMENT (V54X1045E) TO MDM OA2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4337 ABORT: /NA

ITEM: RESISTOR, R42
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT READY-TO-LATCH ASSY 3, (V54X0845E)
7) RESISTOR, BLEED, 1.8K OHM
8) RESISTOR, R42
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A119R42
PART NUMBER: RLR0701801GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 2 'AFT READY-TO-LATCH' MEASUREMENT (V54X0845E) TO MDM OF1.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4338 ABORT: /NA

ITEM: RESISTOR, R23
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A118)
6) AFT READY-TO-LATCH ASSY 3, (V54X1045E)
7) RESISTOR, BLEED, 1.8K OHM
8) RESISTOR, R23
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118R23
PART NUMBER: RLR0701801GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 2 'AFT READY-TO-LATCH' MEASUREMENT (V54X1045E) TO MDM A21.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4339 ABORT: /NA

ITEM: RESISTOR, R2
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYSTEM 2, LATCH/RELEASE (K23-A3)
7) RESISTOR, ISOL, 1.2K OHM, 2 WATT
8) RESISTOR, R2
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A119R2
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 2 LATCH/RELEASE ENABLE SIGNAL TO THE APPROPRIATE RELAY K27/K29.
LOSS OF ABILITY TO OPERATE THE PORT SYSTEM 2 AFT RETENTION LATCH ACTUATOR TO EITHER THE RELEASE OR LATCH POSITION. SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 COULD CAUSE LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4340 ABORT: /NA

ITEM: RESISTOR, R3
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A118)
6) AFT ACTUATOR SYSTEM 2, LATCH/RELEASE (K17-A3)
7) RESISTOR, ISOL, 1.2K OHM, 2 WATT
8) RESISTOR, R3
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [NA] C [NA]

LOCATION: 40V76A118R3
PART NUMBER: RLR4201201GM

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 2 LATCH/RELEASE ENABLE SIGNAL TO THE APPROPRIATE RELAY K27/K29.
LOSS OF ABILITY TO OPERATE THE STBD SYSTEM 2 AFT RETENTION LATCH ACTUATOR TO EITHER THE RELEASE OR LATCH POSITION. SUBSEQUENT FAILURE IN REDUNDANT SYSTEM 1 COULD CAUSE LOSS OF MISSION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4341 ABORT: /NA

ITEM: RESISTOR, R34
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYSTEM 2, K24 LATCHED, (V54X0865E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R34
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A119R34
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 2 LATCH ENABLE MONITORING MEASUREMENT (V54X0865E) TO MDM OF1.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4342 ABORT: /NA

ITEM: RESISTOR, R33
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A17)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A118)
6) AFT ACTUATOR SYSTEM 2, K27 LATCHED, (V54X0865E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R33
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118R33
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 2 LATCH ENABLE MONITORING MEASUREMENT (V54X1065E) TO MDM OA2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4343 ABORT: /NA

ITEM: RESISTOR, R36
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) PORT MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A119)
6) AFT ACTUATOR SYSTEM 2, K12 RELEASED, (V54X0875E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R36
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A119R36
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 2 RELEASE ENABLE MONITORING MEASUREMENT (V54X0875E) TO MDM OF1.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4344 ABORT: /NA

ITEM: RESISTOR, R31
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6IC
2) MANIPULATOR LATCH CONTROL
3) STBD MANIPULATOR LATCH CONTROL, SYSTEM 2
4) AFT LATCH ACTUATOR (40V54A7)
5) MID MOTOR CONTROLLER (MMC)-3 (40V76A118)
6) AFT ACTUATOR SYSTEM 2, K29 RELEASED, (V54X0875E)
7) RESISTOR, CUR LIM, 5.1K OHM, 1/4 WATT
8) RESISTOR, R31
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 40V76A118R31
PART NUMBER: RLR0705101GR

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK, VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
WILL NOT PROVIDE AFT SYSTEM 2 RELEASE ENABLE MONITORING MEASUREMENT (V54X1075E) TO MDM OA2.
LOSS OF MEASUREMENT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4501 ABORT: /NA

ITEM: SWITCH, S21
FAILURE MODE: FAILS LOCKED IN SAFE (CENTER) POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, STBD RMS PYRO ARM, JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S21
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A14S21
PART NUMBER: ME452-0102-7254

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM THE STBD RMS SYSTEM A OR SYSTEM B JETTISON/GUILLOTINE PYRO INITIATOR CONTROLLERS (PICS).
INABILITY TO PERFORM RMS JETTISON WHEN IT IS REQUIRED COULD RESULT IN LOSS OF VEHICLE/CREW.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4502 ABORT: /NA

ITEM: SWITCH, S21
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, STBD RMS PYRO ARM, JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S21
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 36V73A14S21
PART NUMBER: ME452-0102-7254

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF POWER TO ARM THE STBD RMS SYSTEM A AND/OR SYSTEM B JETTISON/GUILLOTINE PICS.
WOULD REQUIRE OTHER PREVIOUS OR SUBSEQUENT FAILURES TO CAUSE UNTIMELY PIC FIRING. POWER CAN BE REMOVED BY OPENING CIRCUIT BREAKERS CB27 & CB33.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4503 ABORT: /NA

ITEM: SWITCH, S28
FAILURE MODE: FAILS LOCKED IN SAFE (CENTER) POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PORT RMS PYRO ARM, JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S28
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A14S28
PART NUMBER: ME452-0102-7254

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM THE PORT RMS SYSTEM A OR SYSTEM B JETTISON/GUILLOTINE PYRO INITIATOR CONTROLLERS (PICs).
INABILITY TO PERFORM RMS JETTISON WHEN IT IS REQUIRED COULD RESULT IN LOSS OF VEHICLE/CREW.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4504 ABORT: /NA

ITEM: SWITCH, S28
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PORT RMS PYRO ARM, JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S28
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 36V73A14S28
PART NUMBER: ME452-0102-7254

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF POWER TO ARM PORT RMS SYSTEM A AND/OR SYSTEM B JETTISON/GUILLOTINE PICS.
WOULD REQUIRE OTHER PREVIOUS OF SUBSEQUENT FAILURES TO CAUSE UNTIMELY PIC FIRING. POWER CAN BE REMOVED BY OPENING CIRCUIT BREAKERS CB29 AND CB32.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4505 ABORT: /NA

ITEM: SWITCH, S25
FAILURE MODE: FAILS LOCKED IN SAFE (CENTER) POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PYRO STBD LATCHES, AFT JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S25
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A14S25
PART NUMBER: ME452-0102-7257

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ACTIVATE THE STBD RMS SYSTEM A OR SYSTEM B AFT LATCH JETTISON/GUILLOTINE PICS.
INABILITY TO PERFORM RMS JETTISON WHEN IT IS REQUIRED COULD RESULT IN LOSS OF VEHICLE/CREW.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4506 ABORT: /NA

ITEM: SWITCH, S25
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PYRO STBD LATCHES, AFT JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S25
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 36V73A14S25
PART NUMBER: ME452-0102-7257

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF POWER TO ACTIVATE THE STBD RMS SYSTEM A AND/OR SYSTEM B AFT LATCH JETTISON/GUILLOTINE PICS.
WOULD REQUIRE OTHER PREVIOUS OR SUBSEQUENT FAILURES TO CAUSE UNTIMELY PIC FIRING.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4507 ABORT: /NA

ITEM: SWITCH, S32
FAILURE MODE: FAILS LOCKED IN SAFE (CENTER) POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PYRO PORT LATCHES, AFT JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S32
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A14S32
PART NUMBER: ME452-0102-7257

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ACTIVATE THE PORT RMS SYSTEM A OR SYSTEM B AFT LATCH JETTISON/GUILLOTINE PICS.
INABILITY TO PERFORM RMS JETTISON WHEN IT IS REQUIRED COULD RESULT IN LOSS OF VEHICLE/CREW.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4508 ABORT: /NA

ITEM: SWITCH, S32
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PYRO PORT LATCHES, AFT JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S32
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 36V73A14S32
PART NUMBER: ME452-0102-7257

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF POWER TO ACTIVATE THE PORT RMS SYSTEM A AND/OR SYSTEM B AFT LATCH JETTISON/GUILLOTINE PICS.
WOULD REQUIRE OTHER PREVIOUS OR SUBSEQUENT FAILURES TO CAUSE UNTIMELY PIC FIRING.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4509 ABORT: /NA

ITEM: SWITCH, S24
FAILURE MODE: FAILS LOCKED IN SAFE (CENTER) POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PYRO STBD LATCHES, MID JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S24
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A14S24
PART NUMBER: ME452-0102-7257

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ACTIVATE THE STBD RMS SYSTEM A OR SYSTEM B MID LATCH JETTISON/GUILLOTINE PICS.
INABILITY TO PERFORM RMS JETTISON WHEN IT IS REQUIRED COULD RESULT IN LOSS OF VEHICLE/CREW.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4510 ABORT: /NA

ITEM: SWITCH, S24
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PYRO STBD LATCHES, MID JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S24
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 36V73A14S24
PART NUMBER: ME452-0102-7257

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF POWER TO ACTIVATE THE STBD RMS SYSTEM A AND/OR SYSTEM B MID LATCH JETTISON/GUILLOTINE PICS.
WOULD REQUIRE OTHER PREVIOUS OR SUBSEQUENT FAILURES TO CAUSE UNTIMELY PIC FIRING.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4511 ABORT: /NA

ITEM: SWITCH, S31
FAILURE MODE: FAILS LOCKED IN SAFE (CENTER) POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PYRO PORT LATCHES, MID JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S31
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A14S31
PART NUMBER: ME452-0102-7257

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ACTIVATE THE PORT RMS SYSTEM A OR SYSTEM B MID LATCH JETTISON/GUILLOTINE PICS.
INABILITY TO PERFORM RMS JETTISON WHEN IT IS REQUIRED COULD RESULT IN LOSS OF VEHICLE/CREW.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4512 ABORT: /NA

ITEM: SWITCH, S31
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PYRO PORT LATCHES, MID JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S31
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 36V73A14S31
PART NUMBER: ME452-0102-7257

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF POWER TO ACTIVATE THE PORT RMS SYSTEM A AND/OR SYSTEM B MID LATCH JETTISON/GUILLOTINE PICS.
WOULD REQUIRE OTHER PREVIOUS OR SUBSEQUENT FAILURES TO CAUSE UNTIMELY PIC FIRING.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4513 ABORT: /NA

ITEM: SWITCH, S23
FAILURE MODE: FAILS LOCKED IN SAFE (CENTER) POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PYRO STBD LATCHES, FWD JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S23
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A14S23
PART NUMBER: ME452-0102-7257

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ACTIVATE THE STBD RMS SYSTEM A OR SYSTEM B FWD LATCH JETTISON/GUILLOTINE PICS.
INABILITY TO PERFORM RMS JETTISON WHEN IT IS REQUIRED COULD RESULT IN LOSS OF VEHICLE/CREW.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4514 ABORT: /NA

ITEM: SWITCH, S23
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PYRO STBD LATCHES, FWD JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S23
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 36V73A14S23
PART NUMBER: ME452-0102-7257

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF POWER TO ACTIVATE THE STBD RMS SYSTEM A AND/OR SYSTEM B FWD LATCH JETTISON/GUILLOTINE PICS.
WOULD REQUIRE OTHER PREVIOUS OR SUBSEQUENT FAILURES TO CAUSE UNTIMELY PIC FIRING.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4515 ABORT: /NA

ITEM: SWITCH, S30
FAILURE MODE: FAILS LOCKED IN SAFE (CENTER) POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PYRO PORT LATCHES, FWD JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S30
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A14S30
PART NUMBER: ME452-0102-7257

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ACTIVATE THE PORT RMS SYSTEM A OR SYSTEM B FWD LATCH JETTISON/GUILLOTINE PICS.
INABILITY TO PERFORM RMS JETTISON WHEN IT IS REQUIRED COULD RESULT IN LOSS OF VEHICLE/CREW.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4516 ABORT: /NA

ITEM: SWITCH, S30
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PYRO PORT LATCHES, FWD JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S30
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 36V73A14S30
PART NUMBER: ME452-0102-7257

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF POWER TO ACTIVATE THE PORT RMS SYSTEM A AND/OR SYSTEM B FWD LATCH JETTISON/GUILLOTINE PICS.
WOULD REQUIRE OTHER PREVIOUS OR UBSEQUENT FAILURES TO CAUSE UNTIMELY PIC FIRING.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4517 ABORT: /NA

ITEM: SWITCH, S22
FAILURE MODE: FAILS LOCKED IN SAFE (CENTER) POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PYRO STBD RMS SHOULDER, JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S22
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A14S22
PART NUMBER: ME452-0102-7257

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ACTIVATE THE STBD RMS SYSTEM A OR SYSTEM B SHOULDER RETRACTOR/GUILLOTINE PICS.
INABILITY TO PERFORM RMS JETTISON WHEN IT IS REQUIRED COULD RESULT IN LOSS OF VEHICLE/CREW.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4518 ABORT: /NA

ITEM: SWITCH, S22
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PYRO STBD RMS SHOULDER, JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S22
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 36V73A14S22
PART NUMBER: ME452-0102-7257

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF POWER TO ACTIVATE THE STBD RMS SYSTEM A AND/OR SYSTEM B SHOULDER RETRACTOR/GUILLOTINE PICS.
WOULD REQUIRE OTHER PREVIOUS OR SUBSEQUENT FAILURES TO CAUSE UNTIMELY PIC FIRING.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 1/1
MDAC ID: 4519 ABORT: /NA

ITEM: SWITCH, S29
FAILURE MODE: FAILS LOCKED IN SAFE (CENTER) POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PYRO PORT RMS SHOULDER, JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S29
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	1/1	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A14S29
PART NUMBER: ME452-0102-7257

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ACTIVATE THE PORT RMS SYSTEM A OR SYSTEM B SHOULDER RETRACTOR/GUILLOTINE PICS.
INABILITY TO PERFORM RMS JETTISON WHEN IT IS REQUIRED COULD RESULT IN LOSS OF VEHICLE/CREW.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4520 ABORT: /NA

ITEM: SWITCH, S29
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PYRO PORT RMS SHOULDER, JETTISON/SAFE/GUILLOTINE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S29
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 36V73A14S29
PART NUMBER: ME452-0102-7257

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY APPLICATION OF POWER TO ACTIVATE THE PORT RMS SYSTEM A AND/OR SYSTEM B SHOULDER RETRACTOR/GUILLOTINE PICS.
WOULD REQUIRE OTHER PREVIOUS OR SUBSEQUENT FAILURES TO CAUSE UNTIMELY PIC FIRING.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4521 ABORT: /NA

ITEM: SWITCH, S33
FAILURE MODE: FAILS LOCKED IN SAFE (CENTER) POSITION.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PORT/STBD RMS LATCHES, GROUND RESET/SAFE/DEADFACE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S33
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A14S33
PART NUMBER: ME452-0102-7254

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PERFORM THE GROUND RESET OR DEADFACE FUNCTIONS FOR THE RMS LATCHES.
ON-ORBIT FAILURE WOULD CAUSE INABILITY TO DEADFACE RMS LATCH CIRCUITS PRIOR TO GUILLOTINE ACTION.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/2R
MDAC ID: 4522 ABORT: /NA

ITEM: SWITCH, S33
FAILURE MODE: FAILS CLOSED, APPLIES UNTIMELY POWER.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) SWITCH, PORT/STBD RMS LATCHES, GROUND RESET/SAFE/DEADFACE
5) SWITCH, TOGGLE, HERM-SEALED, LEVER-LOCKED IN CENTER-POS
6) SWITCH, 2-POLE, 3-POSITION
7) SWITCH, S33
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/2R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 36V73A14S33
PART NUMBER: ME452-0102-7254

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
IF FAILED IN GROUND RESET POSITION, NO EFFECT ON ORBIT SINCE PRE-FLIGHT TEST VOLTAGE IS NOT APPLIED. IF FAILED IN THE DEADFACE POSITION, THE POWER TO THE SWITCH COULD BE REMOVED BY OPENING SYSTEM A CIRCUIT BREAKER.
IF FAILED IN THE DEADFACE POSITION, POWER COULD BE REMOVED BY OPENING THE SYSTEM A CIRCUIT BREAKER (PORT CB29 OR STBD CB27).

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4523 ABORT: /NA

ITEM: FUSE, F27
FAILURE MODE: FAILS OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL A14
4) PREFLIGHT TEST BUS POWER
5) SWITCH, PORT/STBD, RMS LATCHES, GROUND-RESET/SAFE/DEADFACE
6) FUSE, CIRCUIT PROTECTION, 3 AMP
7) FUSE, F27
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 36V73A14F37
PART NUMBER: ME451-0018-0300

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO PROVIDE PRE-FLIGHT TEST BUS VOLTAGE TO SWITCH S33 ON PANEL A14.
INABILITY TO PERFORM GROUND RESET FUNCTION FOR RMS LATCHES. NO EFFECT IN FLIGHT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4524 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB27
FAILURE MODE: FAILS OPEN. WILL NOT CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL ML 86B:D
4) MN A STBD PYRO JETT, SYSTEM A
5) CIRCUIT BREAKER, 5 AMP
6) CIRCUIT BREAKER, CB27
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 80V73A180CB27
PART NUMBER: ME454-0062-2050

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF MN A 28 VDC TO ARM THE STBD RMS SYSTEM A AND SYSTEM B JETTISON/GUILLOTINE PICS
SUBSEQUENT FAILURE OF REDUNDANT SYSTEM WOULD RESULT IN LOSS OF POWER TO ARM THE STBD RMS SYSTEM A AND SYSTEM B JETTISON/GUILLOTINE PICS. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4525 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB27
FAILURE MODE: FAILS CLOSED, WILL NOT OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL ML 86B:D
4) MN A STBD PYRO JETT, SYSTEM A
5) CIRCUIT BREAKER, 5 AMP
6) CIRCUIT BREAKER, CB27
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 80V73A180CB27
PART NUMBER: ME454-0062-2050

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF CIRCUIT PROTECTION FOR MN A 28 VDC THAT IS USED TO ARM THE STBD RMS SYSTEM A AND SYSTEM B JETTISON/GUILLOTINE PICS
NO EFFECT. POWER CAN BE REMOVED BY SWITCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4526 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB29
FAILURE MODE: FAILS OPEN. WILL NOT CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL ML 86B:D
4) MN B PORT PYRO JETT, SYSTEM A
5) CIRCUIT BREAKER, 5 AMP
6) CIRCUIT BREAKER, CB29
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 80V73A180CB29
PART NUMBER: ME454-0062-2050

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF MN B 28 VDC TO ARM THE PORT RMS SYSTEM A AND SYSTEM B JETTISON/GUILLOTINE PICS
SUBSEQUENT FAILURE OF REDUNDANT SYSTEM WOULD RESULT IN LOSS OF POWER TO ARM THE PORT RMS SYSTEM A AND SYSTEM B JETTISON/GUILLOTINE PICS. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4527 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB29
FAILURE MODE: FAILS CLOSED, WILL NOT OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL ML 86B:D
4) MN B PORT PYRO JETT, SYSTEM A
5) CIRCUIT BREAKER, 5 AMP
6) CIRCUIT BREAKER, CB29
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 80V73A180CB29
PART NUMBER: ME454-0062-2050

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF CIRCUIT PROTECTION FOR MN B 28 VDC THAT IS USED TO ARM THE PORT RMS SYSTEM A AND SYSTEM B JETTISON/GUILLOTINE PICS
NO EFFECT. POWER CAN BE REMOVED BY SWITCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4528 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB33
FAILURE MODE: FAILS OPEN. WILL NOT CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL ML 86B:D
4) MN C STBD PYRO JETT, SYSTEM B
5) CIRCUIT BREAKER, 5 AMP
6) CIRCUIT BREAKER, CB33
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 80V73A180CB33
PART NUMBER: ME454-0062-2050

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF MN C 28 VDC TO ARM THE STBD RMS SYSTEM A AND SYSTEM B JETTISON/GUILLOTINE PICS
SUBSEQUENT FAILURE OF REDUNDANT SYSTEM WOULD RESULT IN LOSS OF POWER TO ARM THE STBD RMS SYSTEM A AND SYSTEM B JETTISON/GUILLOTINE PICS. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4529 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB33
FAILURE MODE: FAILS CLOSED, WILL NOT OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL ML 86B:D
4) MN C STBD PYRO JETT, SYSTEM B
5) CIRCUIT BREAKER, 5 AMP
6) CIRCUIT BREAKER, CB33
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 80V73A180CB33
PART NUMBER: ME454-0062-2050

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF CIRCUIT PROTECTION FOR MN C 28 VDC THAT IS USED TO ARM THE STBD RMS SYSTEM A AND SYSTEM B JETTISON/GUILLOTINE PICS
NO EFFECT. POWER CAN BE REMOVED BY SWITCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4530 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB32
FAILURE MODE: FAILS OPEN. WILL NOT CLOSE.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL ML 86B:D
4) MN C PORT PYRO JETT, SYSTEM B
5) CIRCUIT BREAKER, 5 AMP
6) CIRCUIT BREAKER, CB32
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 80V73A180CB32
PART NUMBER: ME454-0062-2050

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF MN C 28 VDC TO ARM THE PORT RMS SYSTEM A AND SYSTEM B JETTISON/GUILLOTINE PICS
SUBSEQUENT FAILURE OF REDUNDANT SYSTEM WOULD RESULT IN LOSS OF POWER TO ARM THE PORT RMS SYSTEM A AND SYSTEM B JETTISON/GUILLOTINE PICS. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 3/3
MDAC ID: 4531 ABORT: /NA

ITEM: CIRCUIT BREAKER, CB32
FAILURE MODE: FAILS CLOSED, WILL NOT OPEN.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) PANEL ML 86B:D
4) MN C PORT PYRO JETT, SYSTEM B
5) CIRCUIT BREAKER, 5 AMP
6) CIRCUIT BREAKER, CB32
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: 80V73A180CB32
PART NUMBER: ME454-0062-2050

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF CIRCUIT PROTECTION FOR MN C 28 VDC THAT IS USED TO ARM THE STBD RMS SYSTEM A AND SYSTEM B JETTISON/GUILLOTINE PICS
NO EFFECT. POWER CAN BE REMOVED BY SWITCH.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4532 ABORT: /NA

ITEM: PIC 1
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR SHOULDER GUILLOTINE SYSTEM B
5) SHOULDER GUILLOTINE PYRO INITIATOR CONTROLLER (PIC)
6) PIC 1
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC1
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE PORT RMS SHOULDER GUILLOTINE SYSTEM B PYRO.
SUBSEQUENT FAILURE OF SYSTEM A WOULD RESULT IN INABILITY TO GUILLOTINE THE PORT SHOULDER CABLES WHICH WOULD NOT ALLOW JETTISON OF THE MANIPULATOR ARM. POSSIBLE LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4533 ABORT: /NA

ITEM: PIC 1
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR SHOULDER GUILLOTINE SYSTEM B
5) SHOULDER GUILLOTINE PYRO INITIATOR CONTROLLER (PIC)
6) PIC 1
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC1
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE STBD RMS SHOULDER GUILLOTINE SYSTEM B PYRO.
SUBSEQUENT FAILURE OF SYSTEM A WOULD RESULT IN INABILITY TO GUILLOTINE THE STBD SHOULDER CABLES WHICH WOULD NOT ALLOW JETTISON OF THE MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4534 ABORT: /NA

ITEM: PIC 12
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR SHOULDER GUILLOTINE SYSTEM A
5) SHOULDER GUILLOTINE PYRO INITIATOR CONTROLLER (PIC)
6) PIC 12
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC12
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE PORT RMS SHOULDER GUILLOTINE SYSTEM A PYRO.
SUBSEQUENT FAILURE OF SYSTEM B WOULD RESULT IN INABILITY TO GUILLOTINE THE PORT SHOULDER CABLES WHICH WOULD NOT ALLOW JETTISON OF THE MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4535 ABORT: /NA

ITEM: PIC 12
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR SHOULDER GUILLOTINE SYSTEM A
5) SHOULDER GUILLOTINE PYRO INITIATOR CONTROLLER (PIC)
6) PIC 12
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC12
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE STBD RMS SHOULDER GUILLOTINE SYSTEM A PYRO.
SUBSEQUENT FAILURE OF SYSTEM B WOULD RESULT IN INABILITY TO GUILLOTINE THE STBD SHOULDER CABLES WHICH WOULD NOT ALLOW JETTISON OF THE MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4536 ABORT: /NA

ITEM: PIC 1, 12
FAILURE MODE: EITHER PIC 1 OR 12 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR SHOULDER GUILLOTINE SYSTEMS A & B
5) SHOULDER GUILLOTINE PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 1, 12
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC1,12
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE PORT RMS SHOULDER GUILLOTINE SYSTEM A OR B PYROS COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN FOUND THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF EITHER PIC.
NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS GUILLOTINE PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4537 ABORT: /NA

ITEM: PIC 1, 12
FAILURE MODE: EITHER PIC 1 OR 12 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR SHOULDER GUILLOTINE SYSTEMS A & B
5) SHOULDER GUILLOTINE PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 1, 12
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC1,12
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE STBD RMS SHOULDER GUILLOTINE SYSTEM A OR B PYROS COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN FOUND THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF EITHER PIC.
NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS GUILLOTINE PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4537 ABORT: /NA

ITEM: PIC 1, 12
FAILURE MODE: EITHER PIC 1 OR 12 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR SHOULDER GUILLOTINE SYSTEMS A & B
5) SHOULDER GUILLOTINE PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 1, 12
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC1,12
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE STBD RMS SHOULDER GUILLOTINE SYSTEM A OR B PYROS COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN FOUND THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF THE EITHER PIC.
NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS GUILLOTINE PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4538 ABORT: /NA

ITEM: PIC 6
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR FWD LATCH GUILLOTINE SYSTEM B
5) FWD LATCH GUILLOTINE PYRO INITIATOR CONTROLLER (PIC)
6) PIC 6
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC6
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE PORT RMS FWD LATCH GUILLOTINE SYSTEM B PYRO.
SUBSEQUENT FAILURE OF SYSTEM A WOULD RESULT IN INABILITY TO GUILLOTINE THE FWD LATCH CABLES WHICH WOULD NOT ALLOW JETTISON OF THE PORT MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4539 ABORT: /NA

ITEM: PIC 6
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR FWD LATCH GUILLOTINE SYSTEM B
5) FWD LATCH GUILLOTINE PYRO INITIATOR CONTROLLER (PIC)
6) PIC 6
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC6
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE STBD RMS FWD LATCH GUILLOTINE SYSTEM B PYRO.
SUBSEQUENT FAILURE OF SYSTEM A WOULD RESULT IN INABILITY TO GUILLOTINE THE FWD LATCH CABLES WHICH WOULD NOT ALLOW JETTISON OF THE STBD MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4540 ABORT: /NA

ITEM: PIC 17
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR FWD LATCH GUILLOTINE SYSTEM A
5) FWD LATCH GUILLOTINE PYRO INITIATOR CONTROLLER (PIC)
6) PIC 17
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC17
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE PORT RMS FWD LATCH GUILLOTINE SYSTEM A PYRO.
SUBSEQUENT FAILURE OF SYSTEM B WOULD RESULT IN INABILITY TO GUILLOTINE THE FWD LATCH CABLES WHICH WOULD NOT ALLOW JETTISON OF THE PORT MANIPULTOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4541 ABORT: /NA

ITEM: PIC 17
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR FWD LATCH GUILLOTINE SYSTEM A
5) FWD LATCH GUILLOTINE PYRO INITIATOR CONTROLLER (PIC)
6) PIC 17
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC17
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE STBD RMS FWD LATCH GUILLOTINE SYSTEM A PYRO.
SUBSEQUENT FAILURE OF SYSTEM B WOULD RESULT IN INABILITY TO GUILLOTINE THE FWD LATCH CABLES WHICH WOULD NOT ALLOW JETTISON OF THE STBD MANIPULTOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4542 ABORT: /NA

ITEM: PIC 6, 17
FAILURE MODE: EITHER PIC 6 OR 17 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR FWD LATCH GUILLOTINE SYSTEMS A & B
5) FWD LATCH GUILLOTINE PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 6, 17
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC6, 17
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE PORT RMS FWD LATCH GUILLOTINE SYSTEM A OR B COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN FOUND THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF EITHER PIC.
NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS GUILLOTINE PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4543 ABORT: /NA

ITEM: PIC 6, 17
FAILURE MODE: EITHER PIC 6 OR 17 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR FWD LATCH GUILLOTINE SYSTEMS A & B
5) FWD LATCH GUILLOTINE PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 6, 17
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC6, 17
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE STBD RMS FWD LATCH GUILLOTINE SYSTEM A OR B COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN FOUND THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF EITHER PIC.
NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS GUILLOTINE PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4544 ABORT: /NA

ITEM: PIC 8
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR MID LATCH GUILLOTINE SYSTEM B
5) MID LATCH GUILLOTINE PYRO INITIATOR CONTROLLER (PIC)
6) PIC 8
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC8
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE PORT RMS MID LATCH GUILLOTINE SYSTEM B PYRO.
SUBSEQUENT FAILURE OF SYSTEM A WOULD RESULT IN INABILITY TO GUILLOTINE THE MID LATCH CABLES WHICH WOULD NOT ALLOW JETTISON OF THE PORT MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4545 ABORT: /NA

ITEM: PIC 8
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR MID LATCH GUILLOTINE SYSTEM B
5) MID LATCH GUILLOTINE PYRO INITIATOR CONTROLLER (PIC)
6) PIC 8
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC8
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE STBD RMS MID LATCH GUILLOTINE SYSTEM B PYRO.
SUBSEQUENT FAILURE OF SYSTEM A WOULD RESULT IN INABILITY TO GUILLOTINE THE MID LATCH CABLES WHICH WOULD NOT ALLOW JETTISON OF THE STBD MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4546 ABORT: /NA

ITEM: PIC 19
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR MID LATCH GUILLOTINE SYSTEM A
5) MID LATCH GUILLOTINE PYRO INITIATOR CONTROLLER (PIC)
6) PIC 19
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC19
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE PORT RMS MID LATCH GUILLOTINE SYSTEM A PYRO.
SUBSEQUENT FAILURE OF SYSTEM B WOULD RESULT IN INABILITY TO GUILLOTINE THE MID LATCH CABLES WHICH WOULD NOT ALLOW JETTISON OF THE PORT MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4547 ABORT: /NA

ITEM: PIC 19
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR MID LATCH GUILLOTINE SYSTEM A
5) MID LATCH GUILLOTINE PYRO INITIATOR CONTROLLER (PIC)
6) PIC 19
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC19
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE STBD RMS MID LATCH GUILLOTINE SYSTEM A PYRO.
SUBSEQUENT FAILURE OF SYSTEM B WOULD RESULT IN INABILITY TO GUILLOTINE THE MID LATCH CABLES WHICH WOULD NOT ALLOW JETTISON OF THE STBD MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4548 ABORT: /NA

ITEM: PIC 8, 19
FAILURE MODE: EITHER PIC 8 OR 19 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR MID LATCH GUILLOTINE SYSTEMS A & B
5) MID LATCH GUILLOTINE PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 8, 19
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC8, 19
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE PORT RMS MID GUILLOTINE SYSTEM A OR B PYROS COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF EITHER PIC.

NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS GUILLOTINE PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4549 ABORT: /NA

ITEM: PIC 8, 19
FAILURE MODE: EITHER PIC 8 OR 19 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR MID LATCH GUILLOTINE SYSTEMS A & B
5) MID LATCH GUILLOTINE PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 8, 19
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC8, 19
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE STBD RMS MID GUILLOTINE SYSTEM A OR B PYROS COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF EITHER PIC.
NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS GUILLOTINE PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4550 ABORT: /NA

ITEM: PIC 10
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR AFT LATCH GUILLOTINE SYSTEM B
5) AFT LATCH GUILLOTINE PYRO INITIATOR CONTROLLER (PIC)
6) PIC 10
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC10
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE PORT RMS AFT LATCH GUILLOTINE SYSTEM B PYRO.
SUBSEQUENT FAILURE OF SYSTEM A WOULD RESULT IN INABILITY TO GUILLOTINE THE AFT LATCH CABLES WHICH WOULD NOT ALLOW JETTISON OF THE PORT MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4551 ABORT: /NA

ITEM: PIC 10
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) PORT MANIPULATOR AFT LATCH GUILLOTINE SYSTEM B
5) AFT LATCH GUILLOTINE PYRO INITIATOR CONTROLLER (PIC)
6) PIC 10
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC10
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE STBD RMS AFT LATCH GUILLOTINE SYSTEM B PYRO.
SUBSEQUENT FAILURE OF SYSTEM A WOULD RESULT IN INABILITY TO GUILLOTINE THE AFT LATCH CABLES WHICH WOULD NOT ALLOW JETTISON OF THE STBD MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4552 ABORT: /NA

ITEM: PIC 21
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR AFT LATCH GUILLOTINE SYSTEM A
5) AFT LATCH GUILLOTINE PYRO INITIATOR CONTROLLER (PIC)
6) PIC 21
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC21
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE PORT RMS AFT LATCH GUILLOTINE SYSTEM A PYRO.
SUBSEQUENT FAILURE OF SYSTEM B WOULD RESULT IN INABILITY TO GUILLOTINE THE AFT LATCH CABLES WHICH WOULD NOT ALLOW JETTISON OF THE PORT MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4553 ABORT: /NA

ITEM: PIC 21
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) PORT MANIPULATOR AFT LATCH GUILLOTINE SYSTEM A
5) AFT LATCH GUILLOTINE PYRO INITIATOR CONTROLLER (PIC)
6) PIC 21
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC21
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE STBD RMS AFT LATCH GUILLOTINE SYSTEM A PYRO.
SUBSEQUENT FAILURE OF SYSTEM B WOULD RESULT IN INABILITY TO GUILLOTINE THE AFT LATCH CABLES WHICH WOULD NOT ALLOW JETTISON OF THE STBD MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4554 ABORT: /NA

ITEM: PIC 10, 21
FAILURE MODE: EITHER PIC 10 OR 21 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR AFT LATCH GUILLOTINE SYSTEMS A & B
5) AFT LATCH GUILLOTINE PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 10, 21
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC10, 21
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE PORT RMS AFT LATCH GUILLOTINE SYSTEM A OR B PYROS COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF EITHER PIC.
NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS GUILLOTINE PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4555 ABORT: /NA

ITEM: PIC 10, 21
FAILURE MODE: EITHER PIC 10 OR 21 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) PORT MANIPULATOR AFT LATCH GUILLOTINE SYSTEMS A & B
5) AFT LATCH GUILLOTINE PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 10, 21
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC10, 21
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE STBD RMS AFT LATCH GUILLOTINE SYSTEM A OR B PYROS COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF EITHER PIC.
NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS GUILLOTINE PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4556 ABORT: /NA

ITEM: PIC 2
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR SHOULDER RETRACTOR SYSTEM B
5) SHOULDER RETRACTOR PYRO INITIATOR CONTROLLER (PIC)
6) PIC 2
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC2
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE PORT RMS SHOULDER RETRACTOR JETTISON SYSTEM B PYRO.
SUBSEQUENT FAILURE OF SYSTEM A WOULD RESULT IN INABILITY TO JETTISON THE PORT MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4557 ABORT: /NA

ITEM: PIC 2
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR SHOULDER RETRACTOR SYSTEM B
5) SHOULDER RETRACTOR PYRO INITIATOR CONTROLLER (PIC)
6) PIC 2
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC2
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE STBD RMS SHOULDER RETRACTOR JETTISON SYSTEM B PYRO.
SUBSEQUENT FAILURE OF SYSTEM A WOULD RESULT IN INABILITY TO JETTISON THE STBD MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4558 ABORT: /NA

ITEM: PIC 13
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR SHOULDER RETRACTOR SYSTEM A
5) SHOULDER RETRACTOR PYRO INITIATOR CONTROLLER (PIC)
6) PIC 13
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC13
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE PORT RMS SHOULDER RETRACTOR JETTISON SYSTEM A PYRO.
SUBSEQUENT FAILURE OF SYSTEM B WOULD RESULT IN INABILITY TO JETTISON THE PORT MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4559 ABORT: /NA

ITEM: PIC 13
FAILURE MODE: FAILS TO ARM AND/OR FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR SHOULDER RETRACTOR SYSTEM A
5) SHOULDER RETRACTOR PYRO INITIATOR CONTROLLER (PIC)
6) PIC 13
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC13
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE STBD RMS SHOULDER RETRACTOR JETTISON SYSTEM A PYRO.
SUBSEQUENT FAILURE OF SYSTEM B WOULD RESULT IN INABILITY TO JETTISON THE STDB MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4560 ABORT: /NA

ITEM: PIC 2, 13
FAILURE MODE: EITHER PIC 2 OR 13 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR SHOULDER RETRACTOR SYSTEMS A & B
5) SHOULDER RETRACTOR PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 2, 13
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC2, 13
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE PORT RMS SHOULDER RETRACTOR JETTISON SYSTEM A OR B PYROS COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF EITHER PIC.
NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4561 ABORT: /NA

ITEM: PIC 2, 13
FAILURE MODE: EITHER PIC 2 OR 13 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR SHOULDER RETRACTOR SYSTEMS A & B
5) SHOULDER RETRACTOR PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 2, 13
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC2, 13
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE STBD RMS SHOULDER RETRACTOR JETTISON SYSTEM A OR B PYROS COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF EITHER PIC.
NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4562 ABORT: /NA

ITEM: PIC 7
FAILURE MODE: FAILS TO ARM, FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR FWD LATCH BOLT SYSTEM B
5) FWD LATCH BOLT PYRO INITIATOR CONTROLLER (PIC)
6) PIC 7
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC7
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE PORT RMS FWD JETTISON LATCH BOLT SYSTEM B PYRO.
SUBSEQUENT FAILURE OF SYSTEM A WOULD RESULT IN INABILITY TO JETTISON THE PORT MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4563 ABORT: /NA

ITEM: PIC 7
FAILURE MODE: FAILS TO ARM, FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR FWD LATCH BOLT SYSTEM B
5) FWD LATCH BOLT PYRO INITIATOR CONTROLLER (PIC)
6) PIC 7
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC7
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE STBD RMS FWD JETTISON LATCH BOLT SYSTEM B PYRO.
SUBSEQUENT FAILURE OF SYSTEM A WOULD RESULT IN INABILITY TO JETTISON THE PORT MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4564 ABORT: /NA

ITEM: PIC 18
FAILURE MODE: FAILS TO ARM, FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR FWD LATCH BOLT SYSTEM A
5) FWD LATCH BOLT PYRO INITIATOR CONTROLLER (PIC)
6) PIC 18
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC18
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE PORT RMS FWD JETTISON LATCH BOLT SYSTEM A PYRO.
SUBSEQUENT FAILURE OF SYSTEM B WOULD RESULT IN INABILITY TO JETTISON THE PORT MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86
SUBSYSTEM: EPD&C
MDAC ID: 4565

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /NA

ITEM: PIC 18
FAILURE MODE: FAILS TO ARM, FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR FWD LATCH BOLT SYSTEM A
5) FWD LATCH BOLT PYRO INITIATOR CONTROLLER (PIC)
6) PIC 18
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC18
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE STBD RMS FWD JETTISON LATCH BOLT SYSTEM A PYRO.
SUBSEQUENT FAILURE OF SYSTEM B WOULD RESULT IN INABILITY TO JETTISON THE PORT MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4566 ABORT: /NA

ITEM: PIC 7, 18
FAILURE MODE: EITHER PIC 7 OR 18 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR FWD LATCH BOLT SYSTEMS A & B
5) FWD LATCH BOLT PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 7, 18
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC7,18
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE PORT RMS FWD JETTISON LATCH BOLT SYSTEM A OR B PYROS COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF EITHER PIC.
NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4567 ABORT: /NA

ITEM: PIC 7, 18
FAILURE MODE: EITHER PIC 7 OR 18 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR FWD LATCH BOLT SYSTEMS A & B
5) FWD LATCH BOLT PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 7, 18
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC7, 18
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE STBD RMS FWD JETTISON LATCH BOLT SYSTEM A OR B PYROS COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF EITHER PIC.
NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4568 ABORT: /NA

ITEM: PIC 9
FAILURE MODE: FAILS TO ARM, FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR MID LATCH BOLT SYSTEMS B
5) MID LATCH BOLT PYRO INITIATOR CONTROLLER (PIC)
6) PIC 9
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC9
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE PORT RMS MID JETTISON LATCH BOLT SYSTEM B PYRO.
SUBSEQUENT FAILURE OF SYSTEM A WOULD RESULT IN INABILITY TO JETTISON THE PORT MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4569 ABORT: /NA

ITEM: PIC 9
FAILURE MODE: FAILS TO ARM, FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR MID LATCH BOLT SYSTEMS B
5) MID LATCH BOLT PYRO INITIATOR CONTROLLER (PIC)
6) PIC 9
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC9
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE STBD RMS MID JETTISON LATCH BOLT SYSTEM B PYRO.
SUBSEQUENT FAILURE OF SYSTEM A WOULD RESULT IN INABILITY TO JETTISON THE STBD MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4570 ABORT: /NA

ITEM: PIC 20
FAILURE MODE: FAILS TO ARM, FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR MID LATCH BOLT SYSTEMS A
5) MID LATCH BOLT PYRO INITIATOR CONTROLLER (PIC)
6) PIC 20
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC20
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE PORT RMS MID JETTISON LATCH BOLT SYSTEM A PYRO.
SUBSEQUENT FAILURE OF SYSTEM B WOULD RESULT IN INABILITY TO JETTISON THE PORT MANIPULATOR ARM. LOSS OF VEHICLE COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4571 ABORT: /NA

ITEM: PIC 20
FAILURE MODE: FAILS TO ARM, FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR MID LATCH BOLT SYSTEMS A
5) MID LATCH BOLT PYRO INITIATOR CONTROLLER (PIC)
6) PIC 20
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC20
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE STBD RMS MID JETTISON LATCH BOLT SYSTEM A PYRO.
SUBSEQUENT FAILURE OF SYSTEM B WOULD RESULT IN INABILITY TO JETTISON THE STBD MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS
JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4572 ABORT: /NA

ITEM: PIC 9, 20
FAILURE MODE: EITHER PIC 9 OR 20 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR MID LATCH BOLT SYSTEMS A & B
5) MID LATCH BOLT PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 9, 20
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC9, 20
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE PORT RMS MID JETTISON LATCH BOLT SYSTEM A OR B PYROS COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF EITHER PIC.
NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4573 ABORT: /NA

ITEM: PIC 9, 20
FAILURE MODE: EITHER PIC 9 OR 20 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR MID LATCH BOLT SYSTEMS A & B
5) MID LATCH BOLT PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 9, 20
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC9, 20
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE STBD RMS MID JETTISON LATCH BOLT SYSTEM A OR B PYROS COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF EITHER PIC.
NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4574 ABORT: /NA

ITEM: PIC 11
FAILURE MODE: FAILS TO ARM, FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR AFT LATCH BOLT SYSTEMS B
5) AFT LATCH BOLT PYRO INITIATOR CONTROLLER (PIC)
6) PIC 11
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC11
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE PORT RMS AFT JETTISON LATCH BOLT SYSTEM B PYRO.
SUBSEQUENT FAILURE OF SYSTEM A WOULD RESULT IN INABILITY TO JETTISON THE PORT MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4575 ABORT: /NA

ITEM: PIC 11
FAILURE MODE: FAILS TO ARM, FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR AFT LATCH BOLT SYSTEMS B
5) AFT LATCH BOLT PYRO INITIATOR CONTROLLER (PIC)
6) PIC 11
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC11
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE STBD RMS AFT JETTISON LATCH BOLT SYSTEM B PYRO.
SUBSEQUENT FAILURE OF SYSTEM A WOULD RESULT IN INABILITY TO JETTISON THE STBD MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4576 ABORT: /NA

ITEM: PIC 22
FAILURE MODE: FAILS TO ARM, FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR AFT LATCH BOLT SYSTEMS A
5) AFT LATCH BOLT PYRO INITIATOR CONTROLLER (PIC)
6) PIC 22
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC22
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE PORT RMS AFT JETTISON LATCH BOLT SYSTEM A PYRO.
SUBSEQUENT FAILURE OF SYSTEM B WOULD RESULT IN INABILITY TO JETTISON THE PORT MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4577 ABORT: /NA

ITEM: PIC 22
FAILURE MODE: FAILS TO ARM, FAILS TO FIRE (EITHER/BOTH).

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR AFT LATCH BOLT SYSTEMS A
5) AFT LATCH BOLT PYRO INITIATOR CONTROLLER (PIC)
6) PIC 22
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC22
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
INABILITY TO ARM/FIRE THE STBD RMS AFT JETTISON LATCH BOLT SYSTEM A PYRO.
SUBSEQUENT FAILURE OF SYSTEM B WOULD RESULT IN INABILITY TO JETTISON THE STBD MANIPULATOR ARM. LOSS OF VEHICLE/CREW COULD RESULT.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4578 ABORT: /NA

ITEM: PIC 11, 22
FAILURE MODE: EITHER PIC 11 OR 22 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 1
4) PORT MANIPULATOR AFT LATCH BOLT SYSTEMS A & B
5) AFT LATCH BOLT PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 11, 22
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A137PIC11, 22
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE PORT RMS AFT JETTISON LATCH BOLT SYSTEM A OR B PYROS COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF EITHER PIC.
NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C FLIGHT: 2/1R
MDAC ID: 4579 ABORT: /NA

ITEM: PIC 11, 22
FAILURE MODE: EITHER PIC 11 OR 22 ARMS/FIRES PREMATURELY.

LEAD ANALYST: ROBINSON SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:
1) RMS, 05-6ID
2) MANIPULATOR ARM/SHOULDER JETTISON & RETENTION ARM JETTISON
3) MID JETTISON CONTROL CONTROL ASSEMBLY 2
4) STBD MANIPULATOR AFT LATCH BOLT SYSTEMS A & B
5) AFT LATCH BOLT PYRO INITIATOR CONTROLLERS (PICS)
6) PIC 11, 22
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	2/1R	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: 40V76A138PIC11, 22
PART NUMBER: ME450-0018-0004

CAUSES: MECHANICAL/STRUCTURAL MALFUNCTION, SHOCK VIBRATION, CORROSION, CONTAMINATION

EFFECTS/RATIONALE:
UNTIMELY ARMING/FIRING THE STBD RMS AFT JETTISON LATCH BOLT SYSTEM A OR B PYROS COULD CAUSE LOSS OF VEHICLE. NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT CAN CAUSE UNTIMELY ARMING AND UNTIMELY FIRING OF EITHER PIC.
NO SINGLE FAILURE HAS BEEN IDENTIFIED THAT COULD CAUSE BOTH PREMATURE ARMING AND PREMATURE FIRING OF AN RMS PYRO.

REFERENCES: VS72-956099, ROCKWELL ELECTRICAL SCHEMATIC, RMS JSC-11174, SPACE SHUTTLE SYSTEMS HANDBOOK

APPENDIX D

POTENTIAL CRITICAL ITEMS

MDAC ID	ITEM	FAILURE MODE
4001	SWITCH, S4	FAILS TO SWITCH FROM OFF POSITION
4002	SWITCH, S4	CONTACTS SHORT TO GROUND WHILE RMS IS IN USE
4003	SWITCH, S4	FAILS TO SWITCH PRIMARY POWER ON
4004	SWITCH, S4	FAILS TO SWITCH BACKUP POWER ON
4005	SWITCH, S4	PRIMARY POWER FAILS WHILE ARM IS IN USE
4007	SWITCH, S1	FAILS TO SWITCH FROM OFF POSITION
4008	SWITCH, S1	CONTACTS SHORT TO GROUND WHILE RMS IS IN USE
4009	SWITCH, S1	FAILS OPEN WHILE EITHER ARM IS IN USE
4010	SWITCH, S8	FAILS OFF WHILE ARM IS IN USE
4011	SWITCH, S10	FAILS OFF WHILE ARM IS IN USE
4012	SWITCH, S8, S10	FAILS TO SWITCH FROM OFF TO AUTO
4013	SWITCH, S7	FAILS OFF WHILE ARM IS IN USE
4014	SWITCH, S9	FAILS OFF WHILE ARM IS IN USE
4015	SWITCH, S7, S9	FAILS TO SWITCH FROM OFF TO AUTO
4016	FUSE, F1	FAILS OPEN PRIOR TO DEPLOYMENT
4017	FUSE, F1	FAILS OPEN WHILE ARM IS IS USE
4018	FUSE, F2	FAILS OPEN PRIOR TO DEPLOYMENT
4019	FUSE, F2	FAILS OPEN WHILE ARM IS IN USE
4028	CKT BREAKER, CB17	FAILS OPEN PRIOR TO DEPLOYMENT
4029	CKT BREAKER, CB17	FAILS OPEN WHILE ARM IS IN USE
4031	CKT BREAKER, CB19	FAILS OPEN PRIOR TO DEPLOYMENT
4032	CKT BREAKER, CB19	FAILS OPEN WHILE ARM IS IN USE
4034	RELAY, K1	FAILS OPEN PRIOR TO DEPLOYMENT
4035	RELAY, K1	FAILS OPEN WHILE ARM IS IN USE
4037	RELAY, K2	FAILS OPEN PRIOR TO DEPLOYMENT

POTENTIAL CRITICAL ITEMS (CONT'D)

MDAC ID	ITEM	FAILURE MODE
4038	RELAY, K2	FAILS OPEN WHILE ARM IS IN USE
4040	FUSE, F26	FAILS OPEN
4041	FUSE, F27	FAILS OPEN
4044	REMOTE PWR CONTRLR, RPC 4	OPEN, FAILS TO CLOSE
4045	REMOTE PWR CONTRLR, ROC 31	FAILS TO CLOSE
4046	REMOTE PWR CONTRLR, RPC 30	OPEN, FAILS TO CLOSE
4101	SWITCH, S1	OPENS, FAILS TO CLOSE
4103	SWITCH, S2	OPENS, FAILS TO CLOSE
4105	SWITCH, S5	OPEN, FAILS TO CLOSE TO EITHER DEPLOY OR STOW
4106	SWITCH, S5	FAILS CLOSED, APPLIES UNTIMELY POWER
4107	SWITCH, S2	OPEN, FAILS TO CLOSE TO EITHER DEPLOY OR STOW
4108	SWITCH, S2	FAILS CLOSED, APPLIES UNTIMELY POWER
4114	HYBRID RELAY, K72	FAILS CLOSED, APPLIES UNTIMELY POWER
4116	HYBRID RELAY, K49	FAILS CLOSED, APPLIES UNTIMELY POWER
4118	HYBRID RELAY, K60	FAILS CLOSED, APPLIES UNTIMELY POWER
4120	HYBRID RELAY, K51	FAILS CLOSED, APPLIES UNTIMELY POWER
4122	HYBRID RELAY, K22	FAILS CLOSED, APPLIES UNTIMELY POWER
4124	HYBRID RELAY, K62	FAILS CLOSED, APPLIES UNTIMELY POWER
4126	HYBRID RELAY, K24	FAILS CLOSED, APPLIES UNTIMELY POWER
4128	HYBRID RELAY, K50	FAILS CLOSED, APPLIES UNTIMELY POWER
4501	SWITCH, S21	FAILS LOCKED IN SAFE (CENTER) POSITION
4502	SWITCH, S21	FAILS CLOSED, APPLIES UNTIMELY POWER
4503	SWITCH, S28	FAILS LOCKED IN SAFE (CENTER) POSITION
4504	SWITCH, S28	FAILS CLOSED, APPLIES UNTIMELY POWER

POTENTIAL CRITICAL ITEMS (CONT'D)

MDAC ID	ITEM	FAILURE MODE
4505	SWITCH, S25	FAILS LOCKED IN SAFE (CENTER) POSITION
4506	SWITCH, S25	FAILS CLOSED, APPLIES UNTIMELY POWER
4507	SWITCH, S32	FAILS LOCKED IN SAFE (CENTER) POSITION
4508	SWITCH, S32	FAILS CLOSED, APPLIES UNTIMELY POWER
4509	SWITCH, S24	FAILS LOCKED IN SAFE (CENTER) POSITION
4510	SWITCH, S24	FAILS CLOSED, APPLIES UNTIMELY POWER
4511	SWITCH, S31	FAILS LOCKED IN SAFE (CENTER) POSITION
4512	SWITCH, S31	FAILS CLOSED, APPLIES UNTIMELY POWER
4513	SWITCH, S23	FAILS LOCKED IN SAFE (CENTER) POSITION
4514	SWITCH, S23	FAILS CLOSED, APPLIES UNTIMELY POWER
4515	SWITCH, S30	FAILS LOCKED IN SAFE (CENTER) POSITION
4516	SWITCH, S30	FAILS CLOSED, APPLIES UNTIMELY POWER
4517	SWITCH, S22	FAILS LOCKED IN SAFE (CENTER) POSITION
4518	SWITCH, S22	FAILS CLOSED, APPLIES UNTIMELY POWER
4519	SWITCH, S29	FAILS LOCKED IN SAFE (CENTER) POSITION
4520	SWITCH, S29	FAILS CLOSED, APPLIES UNTIMELY POWER
4524	CKT BREAKER, CB27	FAILS OPEN, WILL NOT CLOSE
4526	CKT BREAKER, CB29	FAILS OPEN, WILL NOT CLOSE
4528	CKT BREAKER, CB33	FAILS OPEN, WILL NOT CLOSE
4530	CKT BREAKER, CB32	FAILS OPEN, WILL NOT CLOSE
4532	PIC 1	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4533	PIC 1	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4534	PIC 12	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4535	PIC 12	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)

POTENTIAL CRITICAL ITEMS (CONT'D)

MDAC ID	ITEM	FAILURE MODE
4536	PIC 1, 12	EITHER PIC 1 OR 12 ARMS/FIRES PREMATURELY
4537	PIC 1, 12	EITHER PIC 1 OR 12 ARMS/FIRES PREMATURELY
4538	PIC 6	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4539	PIC 6	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4540	PIC 17	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4541	PIC 17	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4542	PIC 6, 17	EITHER PIC 1 OR 12 ARMS/FIRES PREMATURELY
4543	PIC 6, 17	EITHER PIC 1 OR 12 ARMS/FIRES PREMATURELY
4544	PIC 8	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4545	PIC 8	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4546	PIC 19	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4547	PIC 19	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4548	PIC 8, 19	EITHER PIC 8 OR 19 ARMS/FIRES PREMATURELY
4549	PIC 8, 19	EITHER PIC 8 OR 19 ARMS/FIRES PREMATURELY
4550	PIC 10	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4551	PIC 10	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4552	PIC 21	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4553	PIC 21	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4554	PIC 10, 21	EITHER PIC 10 OR 21 ARMS/FIRES PREMATURELY
4555	PIC 10, 21	EITHER PIC 10 OR 21 ARMS/FIRES PREMATURELY
4556	PIC 2	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4557	PIC 2	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4558	PIC 13	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4559	PIC 13	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)

POTENTIAL CRITICAL ITEMS (CONT'D)

MDAC ID	ITEM	FAILURE MODE
4560	PIC 2, 13	EITHER PIC 2 OR 13 ARMS/FIRES PREMATURELY
4561	PIC 2, 13	EITHER PIC 2 OR 13 ARMS/FIRES PREMATURELY
4562	PIC 7	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4563	PIC 7	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4564	PIC 18	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4565	PIC 18	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4566	PIC 7, 18	EITHER PIC 7 OR 18 ARMS/FIRES PREMATURELY
4567	PIC 7, 18	EITHER PIC 7 OR 18 ARMS/FIRES PREMATURELY
4568	PIC 9	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4569	PIC 9	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4570	PIC 20	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4571	PIC 20	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4572	PIC 9, 20	EITHER PIC 9 OR 20 ARMS/FIRES PREMATURELY
4573	PIC 9, 20	EITHER PIC 9 OR 20 ARMS/FIRES PREMATURELY
4574	PIC 11	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4575	PIC 11	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4576	PIC 22	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4577	PIC 22	FAILS TO ARM AND/FAILS TO FIRE (EITHER/BOTH)
4578	PIC 11, 22	EITHER PIC 11 OR 22 ARMS/FIRES PREMATURELY
4579	PIC 11, 22	EITHER PIC 11 OR 22 ARMS/FIRES PREMATURELY