

Space Shuttle Program

TRAINING DATA FILE

**Mission Operations Directorate
Training Division**

**Rev A
June 7, 1993**

NASA
National Aeronautics and
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**Lyndon B. Johnson Space Center
Houston, Texas**

MISSION OPERATIONS DIRECTORATE

TRAINING DATA FILE


REVISION A
June 7, 1993

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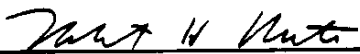
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TDF/REV A

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SECTION 1
INTRODUCTION

SECTION 1

INTRODUCTION

The Training Division has developed the Training Data File (TDF) to document procedures and techniques used in training flight crews which go beyond the scope of the Flight Data File (FDF). The TDF was developed to provide visibility of these additional procedures to all flight crews, flight controllers, and instructors. The TDF Management Plan, Appendix L of the Crew Procedures Management Plan, defines the purpose and management of the TDF. Guidelines and management procedures for documenting TDF procedures are also contained in the TDF Management Plan.

The two major roles for the TDF in flight crew training include:

- 1) an instructional document providing supplemental material such as comprehensive procedures and pilot techniques which are not included in FDF publications;
- 2) a reference document containing records of all non-FDF procedures which have been approved for flight crew training.

This document is divided into three sections and one appendix as shown in the CONTENTS. Each is briefly discussed below, followed by an additional introductory paragraph about SECTION 2:

- Section 1 - INTRODUCTION provides the overview of the TDF roles and contents.
- Section 2 - TDF PROCEDURES contain all approved and current TDF procedures.
- Section 3 - CROSS REFERENCE INDEX charts the procedures versus the discipline titles to show discipline involvement in all TDF procedures.
- Appendix - DT DISCIPLINE ASSIGNMENT LIST provides the list of DT (and one DF) instructors who have been assigned to the discipline subdivisions.

The TDF procedures are found in SECTION 2 and divided into the following 17 discipline titles:

APU/HYDRAULICS
COMMUNICATIONS
CREW SYSTEMS
CAUTION & WARNING
DATA PROCESSING SYSTEM
ENVIRONMENTAL CONTROL & LIFE SUPPORT
ELECTRICAL POWER SYSTEM
GUIDANCE, NAVIGATION & CONTROL
MECHANICAL
MAIN PROPULSION SYSTEM
ORBITAL MANEUVERING SYSTEM
PAYLOAD DEPLOYMENT & RETRIEVAL SYSTEM
PAYLOADS/CARRIERS
REACTION CONTROL SYSTEM
RENDEZVOUS
SPACELAB
OTHER DISCIPLINES

Each of these subdivisions will contain procedures involving that discipline. The subdivision entitled "OTHER DISCIPLINES" will contain procedures which do not fall into the other specific disciplines or cover more than four specific disciplines. Some procedures will involve more than one discipline. The multi-discipline involvement for these procedures will be indicated on each TDF procedure as well as the Cross Reference Index (SECTION 3), but will not be indicated in the CONTENTS since each procedure will be listed in only one discipline subdivision.

SECTION 2
TDF PROCEDURES

2.1 APU/HYDRAULICS

2.2 COMMUNICATIONS

COMM-1	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date George Witbeck / July, 1992		AFFECTED TDF DISCIPLINES(S)	
TITLE: BCE BYP KU		<input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input checked="" type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input checked="" type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	

PURPOSE:

There is no written procedure for a response to the DPS SM "BCE BYP KU" message. This message signifies that the interface is lost between the SM GPC and the Ku-Band system to follow SM GPC antenna pointing instructions and to display the antenna angles on the antenna display.

STEPS:

For the "BCE BYP KU" msg:

1. Try resetting the SM GPC to Ku-Band interface with an ITEM 8 EXEC on the antenna display
 2. Check MCC
- If this does not restore the interface or no COMM:
3. Perform the Manual Acquisition procedure in the ORBIT OPS checklist as required

COMM-2	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date George Witbeck / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input checked="" type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: MS and PLT ATU OFF - A/E			
<p>PURPOSE:</p> <p>If the PLT and MS ATU's are powered off at the same time, all voice communications to the ground are lost. This is due to a loss of the data control word for external COMM (A/G's and A/A) routing. This condition also effects all of the selections on the AIR Audio Center panel (e.g. Spacelab, docking ring, etc.). Cycling the ACCU power or restoring power to either the PLT or MS ATU will solve the problem.</p> <p>Note: This procedure is documented in the MAL PROC, COMM 2.1(b); however, for ascent and entry there is no documentation.</p> <p>STEPS:</p> <p>If both the MS and PLT ATU's power fail on ascent or entry:</p> <ol style="list-style-type: none"> 1. Make a voice check with MCC from working ATU 2. Cycle power on the ACCU's and try again 3. Continue steps 1 and 2 until voice is restored 			

COMM-3	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date G. Slusser & S. O'Roark / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input checked="" type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input checked="" type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: PCMMU I/O ERROR on BFS			
<p>PURPOSE:</p> <p>When BFS is active and PCMMU I/O ERROR occurs, check to see if problem involves whole PCMMU/MDM interface or single OI MDM failure. (Swapping PCMMU's for single OI MDM failure will cause loss of programmed TFL's, may cause loss of LDR TFL, and may not regain the OI MDM.)</p> <p>When switching PCMMU's, the crew should give the ground a "heads-up" call before actually flipping the switch. This advises the ground of the change, and alerts them about getting static data.</p> <p>STEPS:</p> <ol style="list-style-type: none"> 1. Check BFS SYS SUMM 1,2 2. When you come to a location which states: 'SWITCH TO ALT PCMMU (2)', give the ground a call to advise them of the change before switching. 3. Continue with the procedure unless the ground recommends an alternate path. 4. If all "M"s: switch to Alt PCMMU 2 (1) >> 5. If not all "M"s: check MCC, if available >> 6. If no COMM or ON MCC GO: OI PCMMU PWR - 2 (1) 			

COMM-4	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date George Witbeck / July, 1992	AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input checked="" type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS		
TITLE: KU-Band Stow Angles			
<p>PURPOSE:</p> <p>The crew is briefed where the Ku-Band LOS box will be located on the OPS 201 Antenna Display when the antenna is positioned to the stowed angles. This knowledge helps speed up the stowing process. The process is done in connection with ORBIT OPS - KU STOW procedure, after CABLE POSITIONING step.</p> <p>STEPS:</p> <ol style="list-style-type: none"> 1. Locate the Ku-Band LOS box on the SM OPS 201 Antenna Display 2. Manually position the Ku-Band to place the LOS box in the lower right section of the Antenna Display (just inside the payload bay door obscuration) 3. Manually adjust the antenna to the angles in KU STOW procedure 			

COMM-5	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date James Shackleton / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input checked="" type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input checked="" type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: Headset Equip Handling/Adjust			
<p>PURPOSE:</p> <p>The lightweight headsets are easily damaged and broken. Three adjustments are available and crews are reminded not to "bend the boom". Power-off the CCU prior to connecting the headsets to prevent surges. The proper way to align the connector plug, to prevent damage, and to adjust the VOX sensitivity for proper headset sidetone is demonstrated.</p> <p>STEPS:</p> <ol style="list-style-type: none"> 1. CCU PWR - OFF 2. Connect headset <ul style="list-style-type: none"> * NOTE - check for proper connector alignment 3. Adjust headset for microphone close to mouth <ul style="list-style-type: none"> * NOTE - three possible adjustments available - do not "bend the boom" 4. CCU PWR - ON 5. XMIT/ICOM - PTT/VOX 6. VOX SENS - adjust as necessary for sidetone when talking in a normal voice 			

2.3 CREW SYSTEMS

2.4 CAUTION & WARNING

2.5 DATA PROCESSING SYSTEM

DPS-1	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date Stephen Messersmith / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input checked="" type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: Only FAULT SUMM Key/OPS XTION			
PURPOSE: To assure successful OPS transition and crew safety, MMU contentions are to be procedurally avoided as specified by CPDS SS-P-0002-170. With reference to Pass Program Note 15620, the crew must not move any switches during OPS transitions. However, in certain scenarios, the crew needs insight into the status of the MMU's. If for example, the crew gets one "MMU" fault message and other messages start stacking up, the crew has no insight into these other fault messages unless they can call up the FAULT SUMM page. The FAULT SUMM key is legal during OPS transition. STEPS: 1. Crew can call up FAULT SUMM page before transition 2. If OPS transition begins (i.e. pseudo OPS zero page appears) and fault messages start stacking up, the crew may call up the FAULT SUMM page			

DPS-2	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved 7-27
Initiator / Date Brenda Eliason / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input checked="" type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: CRT Power Fail Management			
PURPOSE: Certain power sources can take out 1 or 2 CRT/DEU's when the power sources fail. Flight Rule 7-27 states that the crew will maximize CRT coverage by GPC's. Therefore, when a CRT power-fails, the crew generally deassigns that CRT and assigns a good CRT. However, if a power source fails such that 2 CRT's lose all power, the crew does not gain a CRT by deassigning the power-failed CRT that was assigned. If both power-failed CRT's were assigned, the crew should deassign only 1 of them, but leave one assigned. The reason for leaving a CRT assigned is that MCC has the capability to uplink DEU equivalent commands "through" a power-failed CRT only if it is assigned.			
STEPS: If CRT is power-failed: 1. Deassign failed CRT 2. Assign previously deassigned CRT to PASS > > If 2 CRT's are power-failed: 3. Leave one of the power-failed CRT's assigned			

DPS-3	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date Brenda Eliason / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input checked="" type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: Recovery of PASS CRT I/F - A/E			
<p>PURPOSE:</p> <p>Total PASS CRT interface can be lost during the ASC/ENT time frame via several different failure combinations. BFS engage is the least desirable option for obtaining CRT interface with the software that is in control of the vehicle. Therefore, all other options should be exercised first and BFS engage should be the last alternative.</p> <p>One means of recovering PASS CRT interface involves taking a PASS GPC to STBY/RUN. If no PASS GPC is commanding a CRT, the PASS GPC being brought from STBY to RUN will take command of the forward three CRT's when that GPC joins the common set.</p> <p>NOTE: Failed CRT's are not considered deassigned in PASS unless the crew has deassigned them, or the GPC commanding it is taken down.</p> <p>STEPS:</p> <p>If PASS GPC X is assigned to a failed CRT and all other CRT's are deassigned:</p> <ol style="list-style-type: none"> 1. Mode GPC X to STBY/RUN >> <p>If NO PASS GPC's are assigned to any CRT's:</p> <ol style="list-style-type: none"> 2. Mode GPC with least impact to STBY/RUN 			

2.6 ENVIRONMENTAL CONTROL & LIFE SUPPORT

ECLS-1	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved 9-82 C
Initiator / Date Rena Haldiman / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input checked="" type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: NH3 Usage with Freon LP Degrade			
<p>PURPOSE:</p> <p>This procedure provides summarized steps, rationale and definitions related to using NH3 cooling with the condition of one freon coolant loop (FCL) being degraded.</p> <p>SUMMARIZED STEPS:</p> <ol style="list-style-type: none"> 1. If a FCL has degraded flow, use its associated NH3 System when NH3 cooling is required. 2. If a FCL is totally failed (no flow), use the NH3 System associated with the good flowing FCL when NH3 cooling is required. <p>Note: NH3 SYS A monitors FCL 1, NH3 SYS B monitors FCL 2.</p> <p>DEFINITIONS & RATIONALE:</p> <p>As a reminder, each NH3 System monitors the temperature of its associated FCL and sends spray quantities to regulate this temperature, regardless of the other FCL's temperature. In effect, each NH3 System is blind to its effect on the other FCL's status. The spray is directed onto both FCL's.</p> <p>A degraded flowing FCL is defined as the "slower" flowing FCL in comparison with the other FCL. The cause of the FCL's slower flow can range from real line blockage or pump problems to simply being in RAD flow when the other FCL is in BYP flow. (RAD flow is inherently slower than BYP flow.)</p> <p>Using the wrong NH3 System for cooling when a freon loop is degraded could result in an undertemp condition ($T < 32^\circ$), leading to freezing of the water in the H2O/FREON and PAYLOAD/FREON interchangers. This undertemp condition can be defined as follows: A degraded flowing FCL, when exposed to NH3 spray quantities meant for a normal flowing FCL, will receive too much cooling spray. This would result in a temperature in this FCL below the NH3 System's normal control point of around 34 deg, and possibly below the freezing point of water (32 deg).</p> <p>Water frozen in the interchangers due to the cold FCL could result in plumbing damage and subsequent loss of all freon and water cooling systems.</p> <p style="text-align: right;">Continued on Next Page...</p>			

DEFINITIONS & RATIONALE (Continued):

A totally failed FCL, one with no flowing freon, will not provide any real temperature readings to its associated NH3 System. This is why the other NH3 System on the good flowing loop should be selected, if NH3 cooling is required with this condition present.

In summary, if a degraded FCL condition exists at the same time that NH3 System cooling is required, select the NH3 System that monitors this slower flowing FCL to avoid an undertemp. As a result, expect to see EVAP OUT T's stabilizing at an elevated temperature (reflecting the average between the controlled 34 degrees on the slower flowing FCL and the hotter temperature on the faster FCL.)

2.7 ELECTRICAL POWER SYSTEM

EPS-1	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date Wyatt Smith / July, 1992		AFFECTED TDF DISCIPLINES(S)	
TITLE: Bus Tie Through the PL PRI Bus		<input type="checkbox"/> APU/HYD <input checked="" type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
PURPOSE:			
<p>It is possible to connect Main B to Main C through the primary payload bus. This connection may be necessary if a Bus tie (B-C) is required and the bus tie switches (B or C) are inoperable. The bus tie bar may also have a short which will require this procedure. To use this procedure, 2 failures are necessary: fuel cell 2 or 3 must be failing, and an inability to tie Main B or Main C must be present.</p>			
STEPS:			
(Ascent Pocket Time Frame)			
On MCC call:			
If inability to do normal bus tie:			
If Mn volts > 20:			
1. Payload Pri Mn C - ON (tb-ON)			
2. Payload Pri Mn B - ON (tb-ON) >>			
If Mn volts < 20:			
3. (Aff) AC Bus Sensor - OFF			
4. cb AC CONT (three) - CL			
5. INV/AC Bus - OFF (tb-OFF)			
6. INV PWR - OFF (tb-OFF)			
7. If MN B(C) dn, CAB FAN B(A) - OFF			
8. Payload Pri MN C - ON (tb-ON)			
9. Payload Pri MN B - ON (tb-ON)			
10. INV PWR - ON (tb-ON)			
11. INV/AC Bus - ON (tb-ON)			
12. cb AC CONT (three) - OP			
13. GNC I/O RESET EXEC			

2.8 GUIDANCE, NAVIGATION & CONTROL

GNC-1	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date Stephen Messersmith / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input checked="" type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input checked="" type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: Do Not Align Ref IMU, IMU/IMU			
<p>PURPOSE:</p> <p>The IMU Align procedure does not indicate whether the reference IMU should be aligned or deleted. The two non-reference IMU's should be aligned but not the reference. If the reference IMU is chosen to be aligned, the alignment will take longer to complete. First the non-reference IMU's will be aligned with the reference IMU, then the lowest numbered IMU will be used to align the other two IMU's. The two alignments will then take place. If the lowest numbered IMU has problems, the second alignment may cause all the IMU's to become misaligned.</p> <p>STEPS:</p> <p>1. Follow the ORB OPS C/L, IMU to IMU ALIGNMENT, with the following note:</p> <p style="padding-left: 40px;">Do not choose the reference IMU as one of the IMU's to be aligned</p>			

GNC-2	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date Robert Banfield / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input checked="" type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: PASS Probe Deploy Verification			
PURPOSE: For PASS, before the probes are deployed, there will be OFF flags on the AVVI and AMI when the air data switch is in either the Left or Right position. When a probe is considered deployed by PROBE RM, there will no longer be OFF flags for the corresponding switch position. STEPS: 1. Deploy both probes 2. After 30 seconds (single mtr time) select L, R on AIR DATA switch If AVVI OFF flags (probe not deployed): 3. Stow 4. Redeploy (time permitting)			

GNC-3	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE																		
Initiator / Date Robert Banfield / July, 1992	AFFECTED TDF DISCIPLINES(S) <table border="0"> <tr> <td><input type="checkbox"/> APU/HYD</td> <td><input type="checkbox"/> EPS</td> <td><input type="checkbox"/> PL/CARRIER</td> </tr> <tr> <td><input type="checkbox"/> COMM</td> <td><input checked="" type="checkbox"/> GNC</td> <td><input type="checkbox"/> RCS</td> </tr> <tr> <td><input type="checkbox"/> CREW SYS</td> <td><input type="checkbox"/> MECH</td> <td><input type="checkbox"/> RNDZ</td> </tr> <tr> <td><input type="checkbox"/> C&W</td> <td><input type="checkbox"/> MPS</td> <td><input type="checkbox"/> SL</td> </tr> <tr> <td><input type="checkbox"/> DPS</td> <td><input type="checkbox"/> OMS</td> <td><input type="checkbox"/> OTHER</td> </tr> <tr> <td><input type="checkbox"/> ECLS</td> <td><input type="checkbox"/> PDRS</td> <td></td> </tr> </table>			<input type="checkbox"/> APU/HYD	<input type="checkbox"/> EPS	<input type="checkbox"/> PL/CARRIER	<input type="checkbox"/> COMM	<input checked="" type="checkbox"/> GNC	<input type="checkbox"/> RCS	<input type="checkbox"/> CREW SYS	<input type="checkbox"/> MECH	<input type="checkbox"/> RNDZ	<input type="checkbox"/> C&W	<input type="checkbox"/> MPS	<input type="checkbox"/> SL	<input type="checkbox"/> DPS	<input type="checkbox"/> OMS	<input type="checkbox"/> OTHER	<input type="checkbox"/> ECLS	<input type="checkbox"/> PDRS	
<input type="checkbox"/> APU/HYD	<input type="checkbox"/> EPS	<input type="checkbox"/> PL/CARRIER																			
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<input type="checkbox"/> C&W	<input type="checkbox"/> MPS	<input type="checkbox"/> SL																			
<input type="checkbox"/> DPS	<input type="checkbox"/> OMS	<input type="checkbox"/> OTHER																			
<input type="checkbox"/> ECLS	<input type="checkbox"/> PDRS																				
TITLE: BFS Air Data Analysis																					
<p>PURPOSE:</p> <p>BFS GNC SPEC 51 does not display air data information so the tapes must be used. For the BFS, the left and right air data switch positions will both display the average of the lowest ADTA on the deployed probes. Therefore, the probes are deployed one at a time in order to isolate failures. First, the left probe is deployed and its data is compared on the tapes to NAV by cycling the air data switch from left (or right) to NAV. If the data is biased, it might be the probe or ADTA 1 so the crew can pull the ADTA 1 cb (time permitting) to display ADTA 3. If the left probe's data is good, the right probe is deployed. The tapes will display the average of ADTA's 1 & 2 (good data & unknown). If the tapes agree, both probes are good. If they do not agree, either the right probe or ADTA 2 is biased. If time permits, the ADTA 2 cb can be pulled.</p> <p>STEPS:</p> <ol style="list-style-type: none"> 1. Left probe - DEPLOY 2. Compare probe and NAV on tapes If data bad: <ol style="list-style-type: none"> 3. Left probe - STOW or 4. If time permits, ADTA 1 cb - pull, go to step 2 5. Right probe - DEPLOY 6. Compare NAV and probes on tapes If data bad: <ol style="list-style-type: none"> 7. Right probe - STOW or 8. If time permits, ADTA 2 cb - pull, go to step 6 9. Ensure air data has been incorporated to G&C by M=1.5 																					

GNC-4	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date Robert Banfield / July, 1992		AFFECTED TDF DISCIPLINES(S)	
TITLE: BFS RA Management		<input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input checked="" type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
PURPOSE: RA's have a history of sometimes locking on late or losing lock. If BFS is engaged, it will use the first RA to lock on. If RA1 locks on late and RA2 has a bias, BFS will display biased RA2 data. In this scenario, the crew would power RA1 off and still have biased RA2 data displayed. The correct action is to then power RA1 on and power RA2 off.			
STEPS: 1. Compare RA with NAV and visual If biased RA data: 2. RA1 - OFF If still biased RA date: 3. RA1 - ON 4. RA2 - OFF			

GNC-5	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date Robert Banfield / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input checked="" type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: BFS Air Data Probe Deploy Ver			
<p>PURPOSE:</p> <p>Crews normally look for OFF flags on their AVVI and AMI to see if the probes are deployed. However, the BFS does not display OFF flags before the probes are out. When the left probe is deployed (and deploy discrettes are set), residuals and ratios for air data will appear on GNC SPEC 50 to verify that the left probe is out. When the right probe is deployed, there is no simple onboard method of verifying it is out. The crew might see the tapes jump, but this is not a definite indication (BFS displays the average of lowest ADTA on the probes that are deployed). MCC sees data good flags on ADTA's 2 & 4 when the right probe is deployed so the crew depends on MCC to call in case the right probe does not go out. If MCC does not have data, the crew can coordinate with the ground and verify the right probe is out by pulling the ADTA 4 cb. The crew will get a "BCE STRG 4 ADTA" msg since the ADTA is commfaulted. If the right probe is deployed, however, they will also get a "RM FAIL ADTA" msg.</p> <p>IMPACT: If the right probe is only partially deployed, the crew will take air data to G&C without evaluating the right probe's data. If the right probe subsequently becomes completely deployed and either the right probe or ADTA 2 is biased, the vehicle may go out of control.</p> <p>STEPS:</p> <ol style="list-style-type: none"> 1. Left probe - DEPLOY: 2. Look for resid/ratios 3. Evaluate air data for that probe below M=3.5 4. Right probe - DEPLOY (MCC verifies deploy) <p>If no COMM:</p> <ol style="list-style-type: none"> 5. ADTA 4 cb - pull If no "RM FAIL ADTA": 6. Right probe - STOW > > 7. ADTA 4 cb - push 8. I/O RESET EXEC 			

GNC-6	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date Robert Banfield / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input checked="" type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: MLS Dilemma			
PURPOSE: To identify which MLS is bad, it is quickest to identify the parameter in dilemma and then use the HSI to compare that parameter for each MLS with NAV. To identify the parameter, you must know 4 facts of MLS processing. First, FDIR will start independently for each parameter when the data good flag for each parameter goes good. The range data good flag is set if range is less than 15 nmi, so range FDIR starts as the Orbiter goes around the HAC (this is when a range DLMA is annunciated). Second, for Azimuth and Elevation, there are some limit checks but the important one is that the Orbiter's heading with respect to the runway must be less than 40 degrees. Therefore, an Azimuth or Elevation DLMA will be annunciated when the Orbiter lines up with the runway. Third, NAV will use MLS only if both the Range and Azimuth data good flags are set. Therefore, if an MLS dilemma is annunciated when the Orbiter is lined up with the runway but NAV continues to use MLS (resid/ratios blank), it is an Elevation DLMA. Fourth, if the Orbiter is lined up with the runway, MLS comes in, a DLMA is annunciated, and the resid/ratios reappear, it is most likely an Azimuth DLMA. However, it could be a Range DLMA if the MLS Range had just become biased. Azimuth is indicated on the Course Deviation Indicator (CDI) and Elevation is on the Glide Slope Indicator (GSI). Since the MCC can compare the MLS outputs with ground radar sources, they should first be consulted before any action is taken. NOTE: Abort sites have no ground radar with which to compare MLS.			
STEPS: 1. ✓MCC 2. Identify DLMA - RNG annunciated around HAC - EL annunciated on final, Resid/Ratios blank - AZ or RNG annunciated on final, Resid/Ratios remain or return 3. Resolve - compare with NAV - RNG on range counters - AZ on Course Deviation Indicator (CDI) - AL on Glide Slope Indicator (GSI)			

GNC-7	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved 8-56 D
Initiator / Date William Lane / September, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input checked="" type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: Theta Limits			
<p>PURPOSE:</p> <p>If air data is not incorporated into G&C, flight control defaults to a fixed value of alpha (7.5 degrees). Q-bar is derived from an I-loaded table as a function of navigation ground relative velocity (V_{rel}). Since guidance no longer limits alpha by protecting the low Q-bar boundary, it is necessary for the crew to follow theta limits on the vertical situation display. In this situation, the displayed alpha is not reliable.</p> <p>Keeping theta between the NOSE HI and NOSE LO region will ensure that the vehicle alpha is within acceptable limits. Allowing theta to exceed NOSE HI increases the chances of stall while allowing theta to fall below NOSE LO could cause Q-bar to increase to unacceptable limits. Keeping theta within limits also reduces energy dispersions.</p> <p>The NOSE HI and NOSE LO limits cross at a bank (Φ) of 57° which may stall or exceed Q-bar on the vehicle. Therefore, the crew is not to exceed a bank of 50° to avoid this point. The crew will also have to take the speedbrake to manual mode by 5000 feet and command the speedbrake to a predetermined position (found on the DEL PAD). If air data was incorporated into G&C, then the speedbrake position will be automatically set according to equivalent air speed (EAS) as derived by the air data system.</p> <p>STEPS:</p> <p>From ENTRY MANEUVERS CUE CARD:</p> <p>M=2.0 Ensure ADTA to G&C (CIL) Else: Fly θ limits Φ max = 50°</p>			

GNC-8	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved 8-52
Initiator / Date David Marquette / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input checked="" type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: FCS Channel Actions			
PURPOSE: FCS Channel Actions: If a channel fails but does not bypass, the other 3 channels must be placed in override to ensure they are not bypassed (only crew-visible case is a bypass and subsequent electrical bus failure resulting in loss of isolation). If a channel in override has sustained a previous bypass, a manual bypass on SPEC 53 must be performed. When multiple channel switches must be moved, 2 seconds must elapse between each switch throw. If 2 ports bypass on the same main engine actuator, one of the affected channels must be turned off before engine shutdown. After flight configuration changes (SRB Sep & MECO), FCS channel switch configuration should be re-assessed (channels in override can be moved to auto if failed channels regained or affected actuator no longer controls vehicle). STEPS: For "FCS CH 1 (2,3,4)": 1. ✓MCC/SPEC 53 If aerosurface: 2. Man BYPASS: ITEM 8 + XX EXEC If 2 '↓' on any actuator or no insight/comm: 3. One good FCS CH - OVRD ... Wait 2 sec ... 4. Other good FCS CH - OVRD If SSME P/Y fails and pre-MECO: 5. One bad FCS CH - OFF If no SPEC 53 '↓' (SRB fails): 6. Post-SRB sep: FCS CH (four) - AUTO >> If SSME P/Y fails and RTLS/TAL: 7. Post-MECO: FCS CH (four) - AUTO			

GNC-9	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date David Marquette / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input checked="" type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: Auto/CSS Pb			
<p>PURPOSE:</p> <p>If the Pitch and/or Roll/Yaw CSS pushbutton(s) fails to AUTO, the crew must depress the affected pushbutton(s) and hold to maintain CSS flight control. Similarly, if CSS is selected pre-MECO and AUTO is subsequently desired but the CSS pbi is failed ON, the AUTO pbi must be continuously depressed.</p> <p>STEPS:</p> <ol style="list-style-type: none"> 1. P, R/Y - CSS as reqd at M=0.9 (from ENTRY MANEUVERS CUE CARD) If no joy: 2. P (R/Y) - CSS and hold 			

GNC-10	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved 2-92																		
Initiator / Date David Marquette / July, 1992		AFFECTED TDF DISCIPLINES(S) <table border="0"> <tr> <td><input type="checkbox"/> APU/HYD</td> <td><input type="checkbox"/> EPS</td> <td><input type="checkbox"/> PL/CARRIER</td> </tr> <tr> <td><input type="checkbox"/> COMM</td> <td><input checked="" type="checkbox"/> GNC</td> <td><input type="checkbox"/> RCS</td> </tr> <tr> <td><input type="checkbox"/> CREW SYS</td> <td><input type="checkbox"/> MECH</td> <td><input type="checkbox"/> RNDZ</td> </tr> <tr> <td><input type="checkbox"/> C&W</td> <td><input type="checkbox"/> MPS</td> <td><input type="checkbox"/> SL</td> </tr> <tr> <td><input checked="" type="checkbox"/> DPS</td> <td><input type="checkbox"/> OMS</td> <td><input type="checkbox"/> OTHER</td> </tr> <tr> <td><input type="checkbox"/> ECLS</td> <td><input type="checkbox"/> PDRS</td> <td></td> </tr> </table>		<input type="checkbox"/> APU/HYD	<input type="checkbox"/> EPS	<input type="checkbox"/> PL/CARRIER	<input type="checkbox"/> COMM	<input checked="" type="checkbox"/> GNC	<input type="checkbox"/> RCS	<input type="checkbox"/> CREW SYS	<input type="checkbox"/> MECH	<input type="checkbox"/> RNDZ	<input type="checkbox"/> C&W	<input type="checkbox"/> MPS	<input type="checkbox"/> SL	<input checked="" type="checkbox"/> DPS	<input type="checkbox"/> OMS	<input type="checkbox"/> OTHER	<input type="checkbox"/> ECLS	<input type="checkbox"/> PDRS	
<input type="checkbox"/> APU/HYD	<input type="checkbox"/> EPS	<input type="checkbox"/> PL/CARRIER																			
<input type="checkbox"/> COMM	<input checked="" type="checkbox"/> GNC	<input type="checkbox"/> RCS																			
<input type="checkbox"/> CREW SYS	<input type="checkbox"/> MECH	<input type="checkbox"/> RNDZ																			
<input type="checkbox"/> C&W	<input type="checkbox"/> MPS	<input type="checkbox"/> SL																			
<input checked="" type="checkbox"/> DPS	<input type="checkbox"/> OMS	<input type="checkbox"/> OTHER																			
<input type="checkbox"/> ECLS	<input type="checkbox"/> PDRS																				
TITLE: DPS Restrng for ASA Commands																					
PURPOSE: A DPS restrng will be performed to maintain 2 ASA commands on each aerosurface during entry (Flight Rule 2-92 C2). STEPS: <table border="0"> <tr> <td>For PASS GPC FAIL</td> <td>ENTRY,</td> </tr> <tr> <td>FA MDM I/O ERROR</td> <td>ENTRY,</td> </tr> <tr> <td>FA MDM OUTPUT</td> <td>ENTRY:</td> </tr> </table> If 3 GPC/FA/FCS CH '↓', on MCC go: DPS Restrng				For PASS GPC FAIL	ENTRY,	FA MDM I/O ERROR	ENTRY,	FA MDM OUTPUT	ENTRY:												
For PASS GPC FAIL	ENTRY,																				
FA MDM I/O ERROR	ENTRY,																				
FA MDM OUTPUT	ENTRY:																				

GNC-11	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date David Marquette / July, 1992		AFFECTED TDF DISCIPLINES(S)	
TITLE: OMS and RCS Manual Burn Cues		<input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input checked="" type="checkbox"/> GNC <input checked="" type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input checked="" type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	

PURPOSE:

As a crosscheck on guidance, the following VGO ratios should exist during a burn (this is especially important if ADI's are failed, or guidance cannot downmode, etc.).

Fraction of $\Delta VTOT$

	<u>2 OME's</u>	<u>1 OME</u>	<u>+X RCS</u>	<u>-X RCS</u>
VGO X	+1	+1	+1	-1
VGO Y	0	$\pm 1/5$	0	0
VGO Z	+1/4	+1/4	+1/6	+1/4*

These are rules of thumb only. Variations within the attitude deadband of 3° are acceptable.

* This is the initial ratio. After -X thrusting begins, the vehicle will pitch down through the deadband, where VGO Z will be closer to 1/3 $\Delta VTOT$. No manual adjustment is necessary.

2.9 MECHANICAL

2.10 MAIN PROPULSION SYSTEM

MPS-1	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date David Marquette / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input checked="" type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: MECO Confirmed Flag			
<p>PURPOSE:</p> <p>If the MECO confirmed flag is not set automatically, or manually via the 3 main engine shutdown pushbuttons, it can be set manually with an "OPS 104 PRO" (in OPS 1) or a fast separation command (in OPS 6). A fast separation is commanded by moving the ET Sep switch to manual and depressing the "sep" pushbutton.</p> <p>STEPS:</p> <p>For "MPS DATA":</p> <p>If multi (no MECO CONFIRM):</p> <ol style="list-style-type: none"> 1. MN ENG SHUTDN pb (three) - push (simo) <p>If no joy and OPS 1:</p> <ol style="list-style-type: none"> 2. OPS 104 PRO > > <p>If no joy and OPS 6:</p> <ol style="list-style-type: none"> 3. ET SEP - MAN 4. ET SEP pb - push 			

MPS-2	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved 5-30
Initiator / Date David Marquette / July, 1992	AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input checked="" type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS		
TITLE: SSME Shutdown			
PURPOSE: If a main engine fails with limit shutdown inhibited and one of its two shutdown pushbutton contacts failed: <ul style="list-style-type: none"> • the AC power switches must be turned off and the pbi depressed if the bad pbi contact is commfaulted • the AC power switches must be turned off and the corresponding FF MDM power cycled if the bad pbi contact is power failed and then the pbi depressed STEPS: For MN ENG FAIL/SHUTDN: <ul style="list-style-type: none"> If "MPS DATA": <ol style="list-style-type: none"> 1. Aff MN ENG SHUTDN pb - push If LIMIT SHUTDN INH: <ol style="list-style-type: none"> 2. Aff MPS PWR (two) - OFF 3. Aff MN ENG SHUTDN pb - push If "ME SHDN SW": <ol style="list-style-type: none"> 4. Assoc FF MDM - OFF, ON 5. Aff MN ENG SHUTDN pb - push 6. I/O RESET EXEC 			

MPS-3	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date David Marquette / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input checked="" type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: SSME He Leak			
<p>PURPOSE:</p> <p>If a main engine is near failure due to helium loss (and limits are inhibited), limit shutdown must be re-enabled prior to failure to avoid catastrophic engine shutdown.</p> <p>STEPS:</p> <p>For MPS HE P (PRE MECO):</p> <p>If MPS He P < 1150 and LIMIT SHUTDN INH:</p> <ol style="list-style-type: none"> 1. MN ENG LIMIT SHUTDN - ENA (ASAP) 			

MPS-4	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved 5-34 & 8-41
Initiator / Date David Marquette / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input checked="" type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: Two Stuck Throttle Aborts			
PURPOSE: For two stuck throttles, manual throttles must be taken to 104% (for a TAL) or 67% (for a RTLS) for guidance to converge on a proper MECO solution. STEPS: <div style="text-align: center;">TAL PLT</div> <ul style="list-style-type: none"> * If 2 stuck throttles: * * MAN THROT to 104% * * Abort TAL * * AUTO THROT * <div style="text-align: center; margin-top: 20px;">RTLS PLT</div> <ul style="list-style-type: none"> * If 2 stuck throttles: * * MAN THROT to 67% * * AUTO THROT * * After 10 sec, Abort RTLS * 			

2.11 ORBITAL MANEUVERING SYSTEM

OMS-1	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE									
Initiator / Date David Marquette / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input checked="" type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input checked="" type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS										
TITLE: OMS TVC Gimbal Motors												
PURPOSE: If the OMS engines are not in the stow position prior to the MM 303 powerdown, secondary gimbals must first be selected to move the engines to the stow position. STEPS: For OMS GMBL PWRDN (PASS ONLY): Verify GMBL positions: <table style="margin-left: 40px;"> <tr> <td></td> <td style="text-align: center;"><u>L</u></td> <td style="text-align: center;"><u>R</u></td> </tr> <tr> <td>P</td> <td style="text-align: center;">+5.9</td> <td style="text-align: center;">+5.9</td> </tr> <tr> <td>Y</td> <td style="text-align: center;">+6.4</td> <td style="text-align: center;">-6.4</td> </tr> </table> * If not in position $\pm 0.4^\circ$: * * Sel SEC GMBL - ITEM 30(31) EXEC * GMBL OFF - ITEM 32 EXEC ITEM 33 EXEC					<u>L</u>	<u>R</u>	P	+5.9	+5.9	Y	+6.4	-6.4
	<u>L</u>	<u>R</u>										
P	+5.9	+5.9										
Y	+6.4	-6.4										

2.12 PAYLOAD DEPLOYMENT & RETRIEVAL SYSTEM

PDRS-1	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date Shannon O'Roark / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input checked="" type="checkbox"/> PDRS	
TITLE: General RMS THC Use			
PURPOSE: The RMS THC needs to be held in such a way that all-axis, all-direction motion can be initiated and maintained without having to stop and rearrange the grip. This is critical during track and captures/payload retrievals/unberthings and berthings. There are no actual steps. It is recommended that the thumb and first two fingers be placed on opposing sides of the THC (do not wrap around THC, but hold on to sides) and that the remaining two fingers be put on the THC guard for stability.			

PDRS-2	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE																		
Initiator / Date Shannon O'Roark / July, 1992	AFFECTED TDF DISCIPLINES(S) <table border="0"> <tr> <td><input type="checkbox"/> APU/HYD</td> <td><input type="checkbox"/> EPS</td> <td><input type="checkbox"/> PL/CARRIER</td> </tr> <tr> <td><input type="checkbox"/> COMM</td> <td><input type="checkbox"/> GNC</td> <td><input type="checkbox"/> RCS</td> </tr> <tr> <td><input type="checkbox"/> CREW SYS</td> <td><input type="checkbox"/> MECH</td> <td><input type="checkbox"/> RNDZ</td> </tr> <tr> <td><input type="checkbox"/> C&W</td> <td><input type="checkbox"/> MPS</td> <td><input type="checkbox"/> SL</td> </tr> <tr> <td><input type="checkbox"/> DPS</td> <td><input type="checkbox"/> OMS</td> <td><input type="checkbox"/> OTHER</td> </tr> <tr> <td><input type="checkbox"/> ECLS</td> <td><input checked="" type="checkbox"/> PDRS</td> <td></td> </tr> </table>			<input type="checkbox"/> APU/HYD	<input type="checkbox"/> EPS	<input type="checkbox"/> PL/CARRIER	<input type="checkbox"/> COMM	<input type="checkbox"/> GNC	<input type="checkbox"/> RCS	<input type="checkbox"/> CREW SYS	<input type="checkbox"/> MECH	<input type="checkbox"/> RNDZ	<input type="checkbox"/> C&W	<input type="checkbox"/> MPS	<input type="checkbox"/> SL	<input type="checkbox"/> DPS	<input type="checkbox"/> OMS	<input type="checkbox"/> OTHER	<input type="checkbox"/> ECLS	<input checked="" type="checkbox"/> PDRS	
<input type="checkbox"/> APU/HYD	<input type="checkbox"/> EPS	<input type="checkbox"/> PL/CARRIER																			
<input type="checkbox"/> COMM	<input type="checkbox"/> GNC	<input type="checkbox"/> RCS																			
<input type="checkbox"/> CREW SYS	<input type="checkbox"/> MECH	<input type="checkbox"/> RNDZ																			
<input type="checkbox"/> C&W	<input type="checkbox"/> MPS	<input type="checkbox"/> SL																			
<input type="checkbox"/> DPS	<input type="checkbox"/> OMS	<input type="checkbox"/> OTHER																			
<input type="checkbox"/> ECLS	<input checked="" type="checkbox"/> PDRS																				
TITLE: Auto Capture Verification	PURPOSE: To avoid interrupting an RMS auto capture for a possible capture or close talkback (tb) failure, watch the extend tb as well. If auto capture proceeds (as seen by the extend tb going bp immediately after the snares close), the bp close or bp capture tb is truly a tb-only failure. If the auto sequence stops, the failure is a microswitch failure.																				

PDRS-3	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date Ruben Veloz / October, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input checked="" type="checkbox"/> PDRS	
TITLE: Exiting Backup Mode			

STEPS:

In order to exit Backup mode (either nominally or for contingency situations), the RMS Select switch should be taken to the OFF position. If the switch is inoperative, the RMS Power switch should be taken to OFF.

PURPOSE:

When the RMS Power switch is taken to the BACKUP position and the Port arm is selected, Backup mode is entered. Therefore, to exit Backup mode you should take the RMS Select switch to the OFF position which will leave the brakes engaged (or engage the brakes for certain failure scenarios). If a failure has caused the Select switch to malfunction, the next immediate course of action should be to terminate backup power by taking the RMS Power switch to OFF.

The RMS Select switch was chosen over the RMS Power switch as the primary step since backup edge lighting would remain on panel A8U&L and because the Select switch has no switch cover guard (this allows for a quicker response) as opposed to the Power switch which does.

PDRS-4	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date Ruben Veloz / October, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input type="checkbox"/> GNC <input type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input checked="" type="checkbox"/> PDRS	
TITLE: Rotating Mode Sw Thru Direct			
STEPS: The Mode switch should not be rotated through the DIRECT position with the brakes on. PURPOSE: This switch configuration will momentarily place the RMS in Direct mode. Certain failures could cause the RMS to inadvertently drive while in Direct mode.			

PDRS-5	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE																		
Initiator / Date Ruben Veloz / October, 1992		AFFECTED TDF DISCIPLINES(S) <table border="0"> <tr> <td><input type="checkbox"/> APU/HYD</td> <td><input type="checkbox"/> EPS</td> <td><input type="checkbox"/> PL/CARRIER</td> </tr> <tr> <td><input type="checkbox"/> COMM</td> <td><input type="checkbox"/> GNC</td> <td><input type="checkbox"/> RCS</td> </tr> <tr> <td><input type="checkbox"/> CREW SYS</td> <td><input type="checkbox"/> MECH</td> <td><input type="checkbox"/> RNDZ</td> </tr> <tr> <td><input type="checkbox"/> C&W</td> <td><input type="checkbox"/> MPS</td> <td><input type="checkbox"/> SL</td> </tr> <tr> <td><input type="checkbox"/> DPS</td> <td><input type="checkbox"/> OMS</td> <td><input type="checkbox"/> OTHER</td> </tr> <tr> <td><input type="checkbox"/> ECLS</td> <td><input checked="" type="checkbox"/> PDRS</td> <td></td> </tr> </table>		<input type="checkbox"/> APU/HYD	<input type="checkbox"/> EPS	<input type="checkbox"/> PL/CARRIER	<input type="checkbox"/> COMM	<input type="checkbox"/> GNC	<input type="checkbox"/> RCS	<input type="checkbox"/> CREW SYS	<input type="checkbox"/> MECH	<input type="checkbox"/> RNDZ	<input type="checkbox"/> C&W	<input type="checkbox"/> MPS	<input type="checkbox"/> SL	<input type="checkbox"/> DPS	<input type="checkbox"/> OMS	<input type="checkbox"/> OTHER	<input type="checkbox"/> ECLS	<input checked="" type="checkbox"/> PDRS	
<input type="checkbox"/> APU/HYD	<input type="checkbox"/> EPS	<input type="checkbox"/> PL/CARRIER																			
<input type="checkbox"/> COMM	<input type="checkbox"/> GNC	<input type="checkbox"/> RCS																			
<input type="checkbox"/> CREW SYS	<input type="checkbox"/> MECH	<input type="checkbox"/> RNDZ																			
<input type="checkbox"/> C&W	<input type="checkbox"/> MPS	<input type="checkbox"/> SL																			
<input type="checkbox"/> DPS	<input type="checkbox"/> OMS	<input type="checkbox"/> OTHER																			
<input type="checkbox"/> ECLS	<input checked="" type="checkbox"/> PDRS																				
TITLE: Exiting Direct Mode																					
<p>STEPS:</p> <p>In order to exit Direct mode (either nominally or for contingency situations), the Mode switch should be taken out of the DIRECT position. If the Mode switch is inoperative, the RMS Power switch should be taken to OFF.</p> <p>PURPOSE:</p> <p>While in Direct mode, the Brake switch is in the ON position. When the mode switch is taken out of the DIRECT position, Direct mode is exited. This action will leave the brakes engaged (or engage for certain failure scenarios). If a failure has caused the Mode switch to malfunction, the next immediate course of action should be to terminate primary power by taking the RMS Power switch to OFF.</p>																					

PDRS-6	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE																		
Initiator / Date Ruben Veloz / October, 1992		AFFECTED TDF DISCIPLINES(S) <table border="0"> <tr> <td><input type="checkbox"/> APU/HYD</td> <td><input type="checkbox"/> EPS</td> <td><input type="checkbox"/> PL/CARRIER</td> </tr> <tr> <td><input type="checkbox"/> COMM</td> <td><input type="checkbox"/> GNC</td> <td><input type="checkbox"/> RCS</td> </tr> <tr> <td><input type="checkbox"/> CREW SYS</td> <td><input type="checkbox"/> MECH</td> <td><input type="checkbox"/> RNDZ</td> </tr> <tr> <td><input type="checkbox"/> C&W</td> <td><input type="checkbox"/> MPS</td> <td><input type="checkbox"/> SL</td> </tr> <tr> <td><input type="checkbox"/> DPS</td> <td><input type="checkbox"/> OMS</td> <td><input type="checkbox"/> OTHER</td> </tr> <tr> <td><input type="checkbox"/> ECLS</td> <td><input checked="" type="checkbox"/> PDRS</td> <td></td> </tr> </table>		<input type="checkbox"/> APU/HYD	<input type="checkbox"/> EPS	<input type="checkbox"/> PL/CARRIER	<input type="checkbox"/> COMM	<input type="checkbox"/> GNC	<input type="checkbox"/> RCS	<input type="checkbox"/> CREW SYS	<input type="checkbox"/> MECH	<input type="checkbox"/> RNDZ	<input type="checkbox"/> C&W	<input type="checkbox"/> MPS	<input type="checkbox"/> SL	<input type="checkbox"/> DPS	<input type="checkbox"/> OMS	<input type="checkbox"/> OTHER	<input type="checkbox"/> ECLS	<input checked="" type="checkbox"/> PDRS	
<input type="checkbox"/> APU/HYD	<input type="checkbox"/> EPS	<input type="checkbox"/> PL/CARRIER																			
<input type="checkbox"/> COMM	<input type="checkbox"/> GNC	<input type="checkbox"/> RCS																			
<input type="checkbox"/> CREW SYS	<input type="checkbox"/> MECH	<input type="checkbox"/> RNDZ																			
<input type="checkbox"/> C&W	<input type="checkbox"/> MPS	<input type="checkbox"/> SL																			
<input type="checkbox"/> DPS	<input type="checkbox"/> OMS	<input type="checkbox"/> OTHER																			
<input type="checkbox"/> ECLS	<input checked="" type="checkbox"/> PDRS																				
TITLE: Minimize Startup X-Coupling																					
STEPS: While maneuvering payloads near structure, the RMS operator should avoid unnecessary stopping and starting maneuvers. PURPOSE: This is required in order to minimize startup transients which result from joints achieving their commanded rates at different times. Note that this type of unwanted motion combined with tach bias cross coupling would make the unberthing and berthing tasks much more difficult if you stopped while in the V-guides. This technique assumes that no failure has occurred during this timeframe which may require RMS operations to cease or that you are not in a single joint mode of operation.																					

2.13 PAYLOAD/CARRIERS

2.14 REACTION CONTROL SYSTEM

RCS-1	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date David Marquette / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input type="checkbox"/> GNC <input checked="" type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: Control Bus Fail RCS Secure			
<p>PURPOSE:</p> <p>While in OPS 1 or 3, the Master RCS Crossfeed switch (and the software it activates) can be used to close valves that will not manually close due to control bus (switch power) failures. This is particularly useful when isolating RCS leaks. Also, if a manifold valve does not close, its status must be overridden to "closed" via SPEC 23 before closing the associated tank isolation valve(s). These items are not to be performed in dynamic flight phases (pre-ET Sep and post-EI).</p> <p>STEPS:</p> <p>For RCS SECURE:</p> <ol style="list-style-type: none"> 1. RCS MANF ISOL - CL (tb-CL) If no joy (bus fail): 2. SPEC 23: Aff MANF STAT OVRD - CL 3. Aff RCS TK ISOL - CL (tb-CL) If no joy and Aft leak: 4. RCS XFEED (four) - CL 5. MSTR RCS XFEED - FEED FROM good side <p>For AFT RCS LK (GRTLS/304/305):</p> <ol style="list-style-type: none"> 5. Secure 3/4/5 MANF's & TK ISOL's If no joy and $\bar{q} > 20$: 5a. ENTRY MODE - NO Y JET 5b. Perform aff RCS SECURE 			

RCS-2	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date David Marquette / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input type="checkbox"/> GNC <input checked="" type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: RCS Leaks While in Crossfeed			
PURPOSE: If a leak occurs in the RCS and a crossfeed is open, isolation principles must be remembered: the manifold valves must be closed first, followed by closure of the crossfeed valves and then the tank isolation valves. This procedure does not exist in the AESP. STEPS: For AFT RCS LK (GRTLS/304/305): If in crossfeed: 1. MANF ISOL 3,4,5 (three) - CL 2. XFEED 3/4/5 - CL 3. TK ISOL 3/4/5 (two) - CL			

RCS-3	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date David Marquette / July, 1992		AFFECTED TDF DISCIPLINES(S)	
TITLE: BFS RCS Jet Deselection		<input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input type="checkbox"/> GNC <input checked="" type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
PURPOSE:			
If the BFS is engaged and a second failed RCS jet needs to be deselected, closing the manifold will do so.			
STEPS:			
For RCS JET FAIL (OFF):			
If BFS control problems and another jet/pod/dir failed OFF:			
<ol style="list-style-type: none"> 1. 2nd failure MANF ISOL - CL (tb-CL) 			

RCS-4	Flight(s) ALL	Vehicle(s) ALL	Flight Rule(s) Involved NONE
Initiator / Date David Marquette / July, 1992		AFFECTED TDF DISCIPLINES(S) <input type="checkbox"/> APU/HYD <input type="checkbox"/> EPS <input type="checkbox"/> PL/CARRIER <input type="checkbox"/> COMM <input type="checkbox"/> GNC <input checked="" type="checkbox"/> RCS <input type="checkbox"/> CREW SYS <input type="checkbox"/> MECH <input type="checkbox"/> RNDZ <input type="checkbox"/> C&W <input type="checkbox"/> MPS <input type="checkbox"/> SL <input type="checkbox"/> DPS <input type="checkbox"/> OMS <input type="checkbox"/> OTHER <input type="checkbox"/> ECLS <input type="checkbox"/> PDRS	
TITLE: Failed "ON" RCS Jet			
PURPOSE: If an RCS jet fails ON, its propellant supply must be disconnected. If the manifold valves will not close, the other manifold valve(s) on that leg must be closed, the tank isolation valve must be closed, and the manifold status that has the jet failed ON must be overridden closed. This prevents evacuation of the good manifold and informs the DAP that the jets on the bad manifold are not available. STEPS: For RCS JET FAIL (ON): 1. Aff MANF ISOL - CL If no joy: 2. Same leg MANF ISOL(s) - CL 3. Aff TK ISOL(s) - CL 4. SPEC 23, Aff MANF STAT OVRD - CL			

2.15 RENDEZVOUS

2.16 SPACELAB

2.17 OTHER DISCIPLINES

SECTION 3

CROSS REFERENCE INDEX

SECTION 3

CROSS REFERENCE INDEX

The following index lists all TDF procedures according to discipline and charts the discipline involvement with each.

CNTL #	TITLE	TDF DISCIPLINE TITLES																
		APU/ HYD	COMM	CREW SYS	C&W	DPS	ECLS	EPS	GNC	MECH	MPS	OMS	PDRS	PL/ CAR	RCS	RNDZ	SL	OTHER
COMM-1	BCE BYP KU		X			X												
COMM-2	MS and PLT ATU OFF - A/E		X															
COMM-3	PCMMU I/O ERROR on BFS		X			X												
COMM-4	KU-Band Stow Angles		X															
COMM-5	Headset Equip Handling/Adjust		X	X														
DPS-1	Only FAULT SUMM Key/OPS XTION					X												
DPS-2	CRT Power Fail Management					X												
DPS-3	Recovery of PASS CRT I/F - A/E					X												
ECLS-1	NH3 Usage with Freon LP Degrade						X											
EPS-1	Bus Tie Through the PL PRI Bus							X										
GNC-1	Do Not Align Ref IMU, IMU/IMU					X			X									
GNC-2	PASS Probe Deploy Verification								X									
GNC-3	BFS Air Data Analysis								X									
GNC-4	BFS RA Management								X									
GNC-5	BFS Air Data Probe Deploy Ver								X									

CROSS REFERENCE INDEX (Continued)

CNTL #	TITLE	TDF DISCIPLINE TITLES																
		APU/ HYD	COMM	CREW SYS	C&W	DPS	ECLS	EPS	GNC	MECH	MPS	OMS	PDRS	PL/ CAR	RCS	RNDZ	SL	OTHER
GNC-6	MLS Dilemma								X									
GNC-7	Theta Limits								X									
GNC-8	FCS Channel Actions								X									
GNC-9	Auto/CSS Pb								X									
GNC-10	DPS Restring for ASA Commands					X			X									
GNC-11	OMS and RCS Manual Burn Cues								X			X			X			
MPS-1	MECO Confirmed Flag										X							
MPS-2	SSME Shutdown										X							
MPS-3	SSME He Leak										X							
MPS-4	Two Stuck Throttle Aborts										X							
OMS-1	OMS TVC Gimbal Motors								X			X						
PDRS-1	General RMS THC Use												X					
PDRS-2	Auto Capture Verification												X					
PDRS-3	Exiting Backup Mode												X					
PDRS-4	Rotating Mode Sw Thru Direct												X					
PDRS-5	Exiting Direct Mode												X					
PDRS-6	Minimize Startup X-Coupling												X					

CROSS REFERENCE INDEX (Concluded)

CNTL #	TITLE	TDF DISCIPLINE TITLES																
		APU/ HYD	COMM	CREW SYS	C&W	DPS	ECLS	EPS	GNC	MECH	MPS	OMS	PDRS	PL/ CAR	RCS	RNDZ	SL	OTHER
RCS-1	Control Bus Fail RCS Secure														X			
RCS-2	RCS Leaks While in Crossfeed														X			
RCS-3	BFS RCS Jet Dealection														X			
RCS-4	Failed "ON" RCS Jet														X			

APPENDIX
DT DISCIPLINE ASSIGNMENT LIST

APPENDIX

DT DISCIPLINE ASSIGNMENT LIST

<u>SUBDIVISION</u>	<u>DG DISCIPLINE REPRESENTATIVE</u>
APU/HYD	DT48/Rena H. Haldiman
COMM	DT33/Laura D. Vincent
CREW SYS	DF42/Sharon P. Jones
C&W	DT48/Rena H. Haldiman
DPS	DT23/Richard M. Davis
ECLS	DT48/Rena H. Haldiman
EPS	DT48/Rena H. Haldiman
GNC	DT23/Richard M. Davis
GNC	DT66/David R. Marquette
MECH	DT48/Rena H. Haldiman
MPS	DT66/David R. Marquette
OMS	DT66/David R. Marquette
PDRS	DT67/Ruben D. Veloz
PL/CARRIERS	DT35/William M. Preston
RCS	DT66/David R. Marquette
RNDZ	DT67/Ruben D. Veloz
SL	DT45/Lydia Y. Bowers
OTHER	DT/TDF Book Manager