OUTLINE

FOR

REFORMATTED 450-601-NOSP/SPACE SHUTTLE

Section 1. Mission Operations

1.4.1 Station Supervisor

1.4.1.1 Station Capability Reporting

1.4.1.2 Station Readiness Testing (R ref to SS for specifics)

1.4.1.3 Radio Frequency Interference (R)

Table 1-6. Launch Configuration

Table 1-7. Orbit Configuration (R old table 1-8)

Table 1-8. Landing Configuration (R old table 1-7)

1.4.1.4 Liftoff Time Reporting

1.4.1.5 Ground Station Reporting Following Launch Abort Initiation

1.4.1.6 S-band Pass Event Reporting (R intro & ref to SS)

Table 1-9. Tracking Pass Announcements (2 sheets)

(Table 1-10. MIL/PDL/DFRC/WPS Announcements for Loss of Carrier/Modulation – M SS)

(1.3.1.7 UHF Pass Event Reporting –M SS

(1.3.1.8 UL Carrier Handovers – M SS)

(1.3.1.9 Ascent Phase UL Carrier Handover – M SS)

(1.3.1.10 H Minus Time I/F Activity – M SS)

1.4.1.7 Typical Station Support Count – Intro & ref to SS (R old Pa 1.3.1.11)

(Table 1-11. MIL/PDL/DFRC/WPS Station H-35 Interface – M SS)

(Table 1-12. MIL/DFRC Station TV H-30 Interface – M SS)

(Table 1-13. C-band H-45 Interface and Pass Time Reporting–M SS)

(Table 1-14. MIL/PDL/DFRC/WPS Station Postpass Activities-M SS)

1.4.1.8 Reporting of Spacecraft Anomalies – Intro & ref to SS (R old Pa 1.3.1.12)

(1.3.1.13 Pre-launch/Ascent Contingency Procedures – M SS)

(Table 1-15. Nominal Prelaunch/Launch Configuration –M SS)

[Figure 1-8. MIL/PDL Pre-launch/Launch Configuration

(Simplified Block Diagram) (M SS)]

(New Pa JSC to DFRC UHF Communications Failure – N M SS)

1.4.1.9 GN Support in a Backup to TDRS Configuration (R old Pa 1.3.1.15)

1.4.1.10 TDRS/GN S-band H/Os (R old Pa 1.3.1.16)

1.4.2 Telemetry Destination Codes (R intro & ref to SS & Appen C)

1.4.3 Command (R intro & ref to SS)

(1.3.3.1 UL Data Rate Change via MIL\PDL M SS)

(1.3.3.2 CMD System SAFE/OPERATE Configuration M SS)

(1.3.3.3 CMD Circuit Restoration M SS)

[Shuttle Forward Link (32/72 kbps Commands) Data to KSC/RPS M SS)

1.4.4 Communications (R intro & ref to SS)

[1.3.4.1 Tone Keying Failure (UHF) M SS)]

(1.3.4.2 Postlanding Support from DFRC M SS)

(1.3.4.3 Contingency Landing Communications M SS)

1.4.5 Range Safety (R intro & ref to SS)

1.4.5.1 Purpose

1.4.5.2 Participants

1.4.5.3 Procedures (R)

Figure 1-8. Space Shuttle Range Safety Support (R simplify old Fig 1-9)

1.4.6 Meteorological Interactive Data Display System

(1.3.6.1 Pa number deleted)

[1.3.6.2 MIDDS Fault Isolation Procedure (Metosat Data) M SS]

1.5 Radio Frequency Interference (R ref to CSOC-WSC-PRO-002904 & Appen B)

1.6 Station Configurations (R intro & ref to SS)

(Figure 1-10. WFF MIDDS Data Flow M SS)

1.7 Space Shuttle Program Mission Contingencies (N)

Discuss mission emergencies briefly & ref to:

STDN Contingency Action Plan, 534-CAP-Space Shuttle

GSFC SSP Contingency Support Plan, 534-CAP-GSFC

SSP Emergency Mission Control Center Activation and Operations Procedures, 540-CAP-EMCC

1.8 References (N)

1.8.1 Referenced Abbreviations and Acronyms (N intro to Appen A)

1.8.2 Supporting Documents and Related Web Sites (N intro to Appen B)

1.8.3 Data Stream Assignments (N intro to Appen C)

(Move Figures 1-11 thru 1-19 to SS)

Section 2. Dryden

(Typical Station Section N - Combined old sections 1, 4, 5, 6, 12, 14, & 26)

2.1 Introduction

2.2 Telemetry

2.2.1 General

2.2.2 Launch and Landing Support

2.2.2.1 Station Support Requirements/Configurations

2.2.2.2 Link Description

Table 2.2-1. Launch Support Requirements

Table 2.2-2. Landing and Postlanding Requirements

Table 2.2-3. FM DL, 2250.0-MHz Real-time DL Characteristics

Table 2.2-4. FM DL, 2250.0-MHz Dump Configuration

2.2.2.3 Data Systems Configuration

Table 2.2-5. Nominal Launch and DL Configuration

2.2.2.4 Data Conditioning Subsystem

2.2.2.4.1 General

2.2.2.4.2 Bit Synchronizers

Table 2.2-6. OD DL (2217.5/2287.5 MHz) Bit Synchronizer Setup

Table 2.2-7. FM DL (2250.0 MHz) Bit Synchronizer Setup

2.2.2.4.3 PSK Demodulators

Table 2.2-8. PSK Demodulator Setup for Launch

2.2.2.4.4 Launch bit Sync Assignments

2.2.2.4.5 SSME Data Flow

2.2.2.5 Bit Synchronizers, Launch Phase

Figure 2.2-1. SSME Data Flow

2.2.2.6 Phase Shift Key Demodulator FM DL

Table 2.2-9. FM DL SSME Bit Sync/Frame Sync Setup

Table 2.2-10. CCX Launch Configuration

Figure 2.2-8. UHF/VHF Configuration (M old Fig 1-17)

2.2.3.3 Receiver Configuration

2.2.3.3.1 Multifunction Receiver

2.2.3.3.2 Microdyne Receiver

2.2.3.4 Data Systems Configuration

2.2.3.4.1 General

2.2.3.4.2 Bit Synchronizers

2.2.3.4.3 403 Frame Sync

2.2.3.4.4 403 Frame Sync, Dump Monitoring

Table 2.2-33. Orbital Throughput Support

Table 2.2-34. Bit Synchronizer Setup for Orbit Phase

Table 2.2-35. 403 Frame Sync Dump Monitor Program

2.2.3.4.5 FM Dump Data Monitoring

2.2.3.4.6 Operations 2 Recorder Dump Playback Coordination

2.2.3.4.7 Orbit Super Group Setup for DCS

2.2.3.4.8 FM Dump Data Flow

Figure 2.2-9. MIL FM Dumps Data Flow Configuration

2.2.3.5 Delta Modulation System

2.2.3.6 Magnetic Tape Recorder Configuration

2.2.3.6.1 General

2.2.3.6.2 Orbital Record Requirements

Table 2.2-36. Orbit Phase Support MTR Track Assignments

2.2.3.7 High-Speed Data Transmission

2.2.3.7.1 Station

2.2.3.7.2 JSC-GSFC

2.2.4 Station Playback Procedures

2.2.4.1 General

2.2.4.2 Playback Requests

2.2.4.3 Station Playback Procedures

2.2.4.4 Station Playback Recorder Configuration

2.3 S-band (M old section 4)

2.4 Computer Systems (M old section 5)

2.5 Command (M old section 6)

2.6 Station Communications Support (M old section 12)

2.6.1 General

2.6.2 Operating Procedures

2.6.2.1 General

2.6.2.2 Voice Recorder Configuration

Table 2.6-1. Digital Voice Recorders Configuration

2.6.2.3 Postlanding Support from DFRC (M old Pa 1.3.4.2)

2.6.2.4 Contingency Landing Communications (M old Pa 1.3.4.3)

2.7 Air-to-Ground Communications (M old section 14)

2.7.1 General

2.7.2 Voice Communication Modes

2.7.2.1 Space Shuttle Definition

2.7.2.2 S-band

Table 2.7-1. Station A-G Equipment Allocations

Table 2.7-2. Shuttle Communications Modes

2.7.2.3 UHF

2.7.2.4 Technical Characteristics

2.7.3 Operations Procedures and Configurations

2.7.3.1 Procedures

2.7.3.2 Equipment Configurations

2.7.3.3 A-G Configurations

2.7.3.3.1 ALPHA; Pre-launch (Throughput) Until SRB Ignition

2.7.3.3.2 BRAVO;Ascent Throughput A-G

2.7.3.3.3 CHARLIE; Flight Operations (Orbit) UHF

2.7.3.3.4 DELTA; Flight Operations, Orbit (Throughput)

2.8 Testing and Simulations (M old section 26)

2.8.1 General

2.8.2 Mission Readiness Test

2.8.3 Prelaunch Simulations

2.8.3.1 Network Simulations

2.8.3.2 GSFC Simulations

2.8.4 Timeline for MRT for Space Shuttle

2.8.4.1 General

2.8.4.2 Events

2.8.5 MIDDS Fault Isolation Procedure (Metosat Data) (M old Pa 1.3.6.2)

Figure 2.8-1. WFF MIDDS Data Flow (M old Fig 1-10)

Section 3. Meritt Island/Ponce De Leon

(USE SAME PARA, TABLES AND FIGURES AS IN SECTION 2 – DRYDEN)

3.1 Introduction

3.2 Telemetry

3.2.1 General

3.2.2 Launch and Landing Support

3.2.2.1 Station Support Requirements/Configurations

3.2.2.2 Link Description

Table 3.2-1. Launch Support Requirements

Table 3.2-2. Landing and Postlanding Requirements

Table 3.2-3. FM DL, 2250.0-MHz Real-time DL Characteristics

Table 3.2-4. FM DL, 2250.0-MHz Dump Configuration

3.2.2.3 Data Systems Configuration

Table 3.2-5. Nominal Launch and DL Configuration

3.2.2.4 Data Conditioning Subsystem

3.2.2.4.1 General

3.2.2.4.2 Bit Synchronizers

Table 3.2-6. OD DL (2217.5/2287.5 MHz) Bit Synchronizer Setup

Table 3.2-7. FM DL (2250.0 MHz) Bit Synchronizer Setup

3.2.2.4.3 PSK Demodulators

Table 3.2-8. PSK Demodulator Setup for Launch

3.2.2.4.4 Launch bit Sync Assignments

3.2.2.4.5 SSME Data Flow

3.2.2.5 Bit Synchronizers, Launch Phase

Figure 3.2-1. SSME Data Flow

3.2.2.6 Phase Shift Key Demodulator FM DL

Table 3.2-9. FM DL SSME Bit Sync/Frame Sync Setup

Table 3.2-10. CCX Launch Configuration

2.3 S-band (M old section 4)

3.4 Computer Systems (M old section 5)

3.5 Command (M old section 6)

3.6.2 Operating Procedures

3.6.2.1 General

3.6.2.2 Voice Recorder Configuration

Table 3.6-1. Digital Voice Recorders Configuration

3.6.2.3 Postlanding Support from DFRC (M old Pa 1.3.4.2)

3.6.2.4 Contingency Landing Communications (M old Pa 1.3.4.3)

3.7 Air-to-Ground Communications (M old section 14)

3.7.1 General

3.7.2 Voice Communication Modes

3.7.2.1 Space Shuttle Definition

3.7.2.2 S-band

Table 3.7-1. Station A-G Equipment Allocations

Table 3.7-2. Shuttle Communications Modes

3.7.2.3 UHF

3.7.2.4 Technical Characteristics

3.7.3 Operations Procedures and Configurations

3.7.3.1 Procedures

3.7.3.2 Equipment Configurations

3.7.3.3 A-G Configurations

3.7.3.3.1 ALPHA; Pre-launch (Throughput) Until SRB Ignition

3.7.3.3.2 BRAVO;Ascent Throughput A-G

3.7.3.3.3 CHARLIE; Flight Operations (Orbit) UHF

3.7.3.3.4 DELTA; Flight Operations, Orbit (Throughput)

3.7.3.3.5 FOXTROT; FlightOperations, EVA

3.7.3.3.6 GOLF; GN EVA/EMU (Throughput)

3.7.3.3.7 HOTEL; Landing

3.8 Testing and Simulations (M old section 26)

Section 4. Wallops

(USE SAME PARA, TABLES AND FIGURES AS **INSECTION 2 – DRYDEN)**

4.1 Introduction

4.2 Telemetry

4.2.1 General

4.2.2 Launch and Landing Support

4.2.2.1 Station Support Requirements/Configurations

4.2.2.2 Link Description

Table 4.2-1. Launch Support Requirements

Table 4.2-2. Landing and Postlanding Requirements

Table 4.2-3. FM DL, 2250.0-MHz Real-time DL Characteristics

Table 4.2-4. FM DL, 2250.0-MHz Dump Configuration

4.2.2.3 Data Systems Configuration

Table 4.2-5. Nominal Launch and DL Configuration

4.2.2.4 Data Conditioning Subsystem

4.2.2.4.1 General

4.2.2.4.2 Bit Synchronizers

Table 4.2-6. OD DL (2217.5/2287.5 MHz) Bit Synchronizer Setup

Table 4.2-7. FM DL (2250.0 MHz) Bit Synchronizer Setup

4.2.2.4.3 PSK Demodulators

Table 4.2-8. PSK Demodulator Setup for Launch

4.2.2.4.3 Launch bit Sync Assignments

4.2.2.4.4 SSME Data Flow

4.2.2.5 Bit Synchronizers, Launch Phase

Figure 4.2-1. SSME Data Flow

4.2.2.6 Phase Shift Key Demodulator FM DL

Table 4.2-9. FM DL SSME Bit Sync/Frame Sync Setup

Table 4.2-10. CCX Launch Configuration

4.2.2.7 Data Communications Switch

4.3 S-band (M old section 4)

4.4 Computer Systems (M old section 5)

4.5 Command (M old section 6)

4.7 Air-to-Ground Communications (M old section 14)

4.8 Testing and Simulations (M old section 26)

Section 5. White Sands Space Harbor

(USE SAME PARA, TABLES AND FIGURES AS IN SECTION 2 – DRYDEN)

5.1 Introduction

5.2 Telemetry

5.2.1 General

5.2.2 Launch and Landing Support

5.2.2.1 Station Support Requirements/Configurations

5.2.2.2 Link Description

Table 5.2-1. Launch Support Requirements

Table 5.2-2. Landing and Postlanding Requirements

Table 5.2-3. FM DL, 2250.0-MHz Real-time DL Characteristics

Table 5.2-4. FM DL, 2250.0-MHz Dump Configuration

5.2.2.3 Data Systems Configuration

Table 5.2-5. Nominal Launch and DL Configuration

5.2.2.4 Data Conditioning Subsystem

5.2.2.4.1 General

5.2.2.4.2 Bit Synchronizers

Table 5.2-6. OD DL (2217.5/2287.5 MHz) Bit Synchronizer Setup

Table 5.2-7. FM DL (2250.0 MHz) Bit Synchronizer Setup

5.2.2.4.3 PSK Demodulators

Table 5.2-8. PSK Demodulator Setup for Launch

5.2.2.4.4 Launch bit Sync Assignments

5.2.2.4.5 SSME Data Flow

5.2.2.5 Bit Synchronizers, Launch Phase

Figure 5.2-1. SSME Data Flow

5.2.2.6 Phase Shift Key Demodulator FM DL

Table 5.2-9. FM DL SSME Bit Sync/Frame Sync Setup

Table 5.2-10. CCX Launch Configuration

5.3 S-band (M old section 4)

5.4 Computer Systems (M old section 5)

5.5 Command (M old section 6)

5.7 Air-to-Ground Communications (M old section 14)

5.8 Testing and Simulations (M old section 26)

5.8.4.2 Events

5.8.5 MIDDS Fault Isolation Procedure (Metosat Data) (M old Pa 1.3.6.2)

Figure 5.8-1. WFF MIDDS Data Flow (M old Fig 1-10)

Section 6. Flight Dynamics Facility (M old section 7)

6.1 Introduction

6.2 Operational Communications

6.2.1 Introduction

6.2.2 Operational Systems

6.3 Mission Participation

6.3.1 Planning Phase

6.3.2 Planning Data

6.3.3 Terminal Count Support

6.3.4 Displays

6.3.5 Data Validation

6.3.6 Fault Isolation

6.4 Acquisition Data

6.4.1 General

6.4.1.1 Space Shuttle Flights

6.4.1.2 Acquisition Data Responsibilities

6.4.2 Pre-mission Phase

6.4.2.1 Nominal Acquisition Data

6.4.2.2 Contingency Acquisition Data

6.4.3 Mission Phase Acquisition Data

6.4.3.1 General

6.4.3.2 Onorbit Phase

6.4.3.3 Maneuvers

6.4.3.4 Entry/Landing Phase

6.4.3.5 Retransmission of Acquisition Data

6.5 C-Band and S-Band Station Antenna Identification

Figure 6-1. Space Shuttle PDL Station Communications (M old Fig 8-1)

6.6 GSFC Bypass Acquisition Data Plan

Section 7. Communications – NISN (M old section 8)

Section 8. NIC/Station Interface (M old section 16)

8.1 NIC/Network Standard Operating Procedures

8.2 Documentation, Scheduling, and Reporting Standard Operating Procedures

8.3 Message Formats and Method of Delivery

8.3.1 General

8.3.2 Four-Letter Designators

8.3.3 Interim Support Instruction (ISI) Message

8.3.4 Request for Information or Clarification (RIC)

8.3.5 Documentation Change Notice (DCN) General Header Format

8.3.6 Operations (OPN) Message

[Station Equipment Status Report (ESR) …deleted]

[Problem Report (PRT) Message ….deleted]

(Computer Software, Hardware Anomaly Message ….deleted)

8.3.7 Radio Frequency Interference (RFI) Report Message

8.3.8 Spacecraft/Vehicle Anomaly (SVA) Report

8.3.9 Space Shuttle Contingency Plan (SCP) (Sample)

(Data Shipment Advisory Message …deleted)

8.3.10 Support Request Message

8.3.11 Briefing Message Request

8.3.12 Tracking Summary Message (Teletype) - C-band Message Format

8.3.13 MIL-originated S-band CRF Message (Non-nominal) (Teletype)

8.3.14 Space Shuttle Launch Count Status

8.3.15 Space Shuttle Liftoff Time

8.3.16 DOD Weather Report

8.3.17 Station Postmission Reporting Message

8.3.17.1 General

8.3.17.2 Message Format

Section 9. Radar (M old section 3)

9.6.6 Data Disposition

9.7 Wallops Island Support Procedures

9.7.1 Documentation

9.7.2 Requirements

9.7.3 Tracking Data

9.7.3.1 Launch Support

9.7.3.2 Launch/Ascent Radar Requirements and Preferences

9.7.3.3 Wallops Island Launch/Ascent Contingency Main Engine Failure Support

9.7.3.4 Orbital Support

9.7.4 Acquisition Data

9.7.5 Support Configuration

9.7.5.1 C-band Support

9.7.5.2 PRF

9.7.6 Low-Speed Data Header

9.7.7 C-Band Acquisition Procedures

9.7.8 System Recorders

9.7.9 Data Disposition

9.7.10 Phasing

9.7.11 Atmospheric Refraction Correction

9.7.12 Reporting

9.8 United States Space Command ET Support

9.8.1 Launch Phase Support

9.8.2 Orbital Support

Section 10. Data Management

Section 11. Television (M old section 25)

Section 12. Equipment Modifications (M old section 17)

12.1 General

12.2 STDN Implementation Schedule

12.2.1 General

12.2.2 Configuration Freeze

12.2.3 Exemptions

12.3 Engineering Changes

12.4 Request for Modification

12.5 Other Equipment Modifications

12.6 Status Reports

Appendix A – Referenced Abbreviations and Acronyms (R)

Appendix B – Supporting Documents and Related Web Sites (N)

Appendix C – Data Stream Assignments (N)