MISSION OPERATIONS
AND DATA SYSTEMS DIRECTORATE

STS-89 S/MM-08/ SPACEHAB-DM FLIGHT READINESS REVIEW

NETWORKS

AGENDA

- TDRSS CONSTELLATION
- SIGNIFICANT CHANGES
- NETWORK IP CONFIGURATION
- ASCENT PROFILE
- CONFIGURATION MANAGEMENT
- CRITICAL PERIODS
- READINESS CERTIFICATION

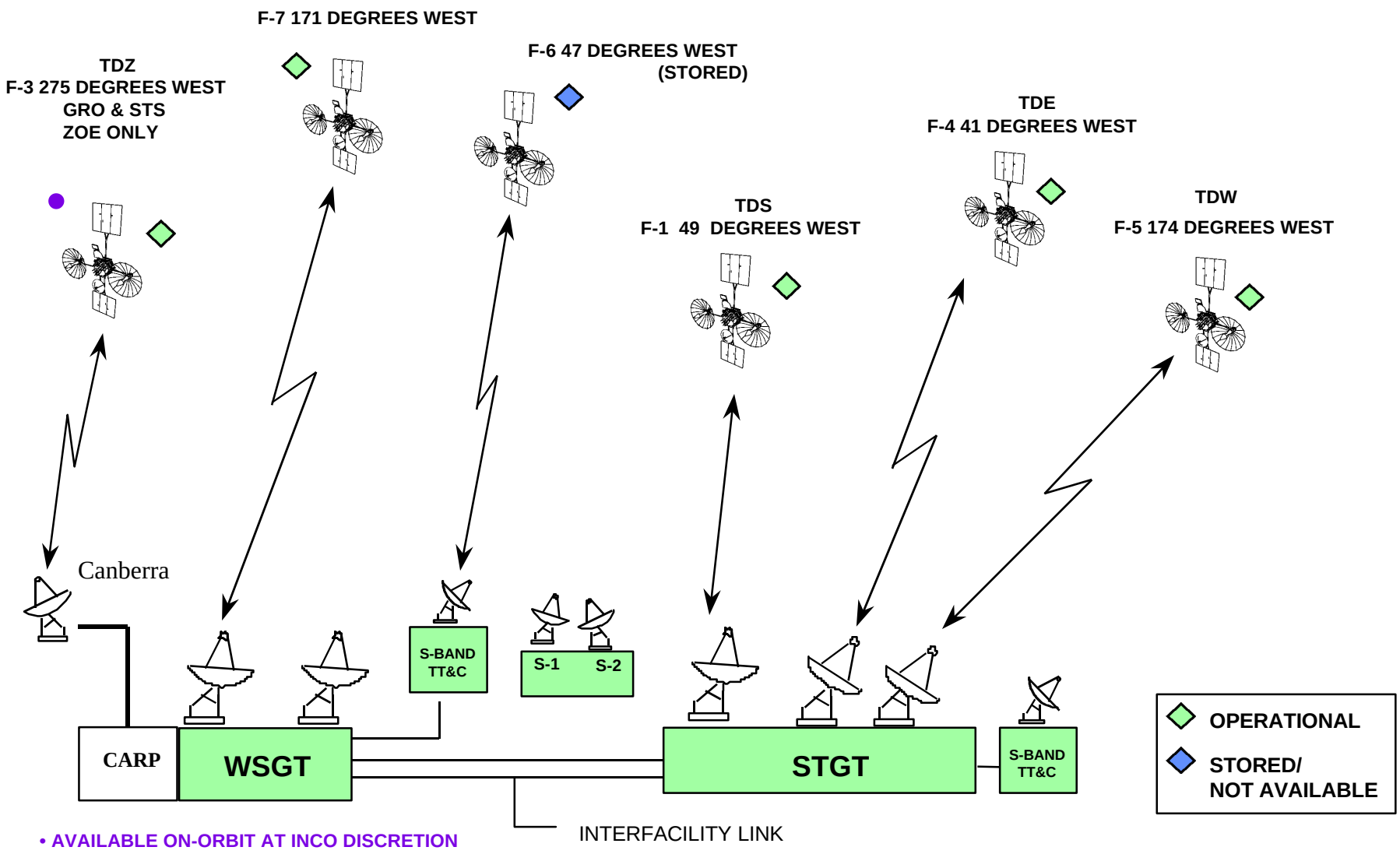
GARY A. MORSE
GSFC/NETWORKS
JANUARY 1998

MO&DS DIRECTORATE

CODE 500

STS-89 S/MM-08/SPACEHAB-DM NETWORKS

TDRSS CONSTELLATION



SIGNIFICANT CHANGES

- GROUND NETWORK-MIL/PDL
  - THE FOLLOWING EQUIPMENT WILL BE RUN IN PARALLEL FOR TEST PURPOSES:
    - MILA
      - MONITOR AND CONTROL SUBSYSTEM (MCS) AND SERVER
      - RF SUBSYSTEM CONTROLLER
      - NEW RANGE SAFETY EQUIPMENT
      - NEW RANGE SAFETY BLOCKER/DEBLOCKER EQUIPMENT (PARALLEL OPERATIONS TO TCDT)
    - PDL
      - TRACKING ACQUISITION PROCESS AND SOFTWARE
      - REMOTE DATA GENERATOR

SIGNIFICANT CHANGES (CONT)

- WHITE SANDS COMPLEX
  - SOFTWARE - BASELINE 97005A
    - DELIVERY TO BOTH SITES COMPLETED DECEMBER 19, 1997
    - CORRECTS 49 DRS (NONE AFFECTING SHUTTLE SUPPORT)
  - FIRMWARE - 9702
    - DELIVERY TO BOTH SITES COMPLETED DECEMBER 22, 1997
      - CHANGES DATA TRANSITION DENSITY ALGORITHM IN THE MODULATOR DOPPLER PREDICTOR TO PREVENT UNWANTED FORWARD LINK FAILOVERS.

SIGNIFICANT CHANGES (CONT)

- C-BAND RADAR
  - ASTC SCHEDULED DOWN FOR RELOCATION JUNE 1997 TO JUNE 1998
  - WLPC SCHEDULED DOWN FOR SYSTEM UPGRADES JANUARY 1998 THROUGH JULY 1998
- MIR VHF SUPPORT
  - TESTED AND IMPLEMENTED PACKETIZED DATA CAPABILITY

NETWORK IP CONFIGURATION

- PRELAUNCH/LAUNCH
  - CONFIGURE SN ELEMENTS (NCC/FDF/JSC/WSC) IN IP MODE
  - ALL OTHER ELEMENTS ON LEGACY
- ON-ORBIT
  - NCC/FDF/JSC/WSC REMAIN ON IP FOR ON-ORBIT MISSION SUPPORT
  - SSME PLAYBACK DATA FLOW TO MSFC TO CHECKOUT IP CONFIGUATION
- LANDING
  - ALL SN ELEMENTS CONFIGURE IP AS PRIME FOR LANDING SUPPORT
  - OTHER ELEMENTS CONFIGURE TO LEGACY

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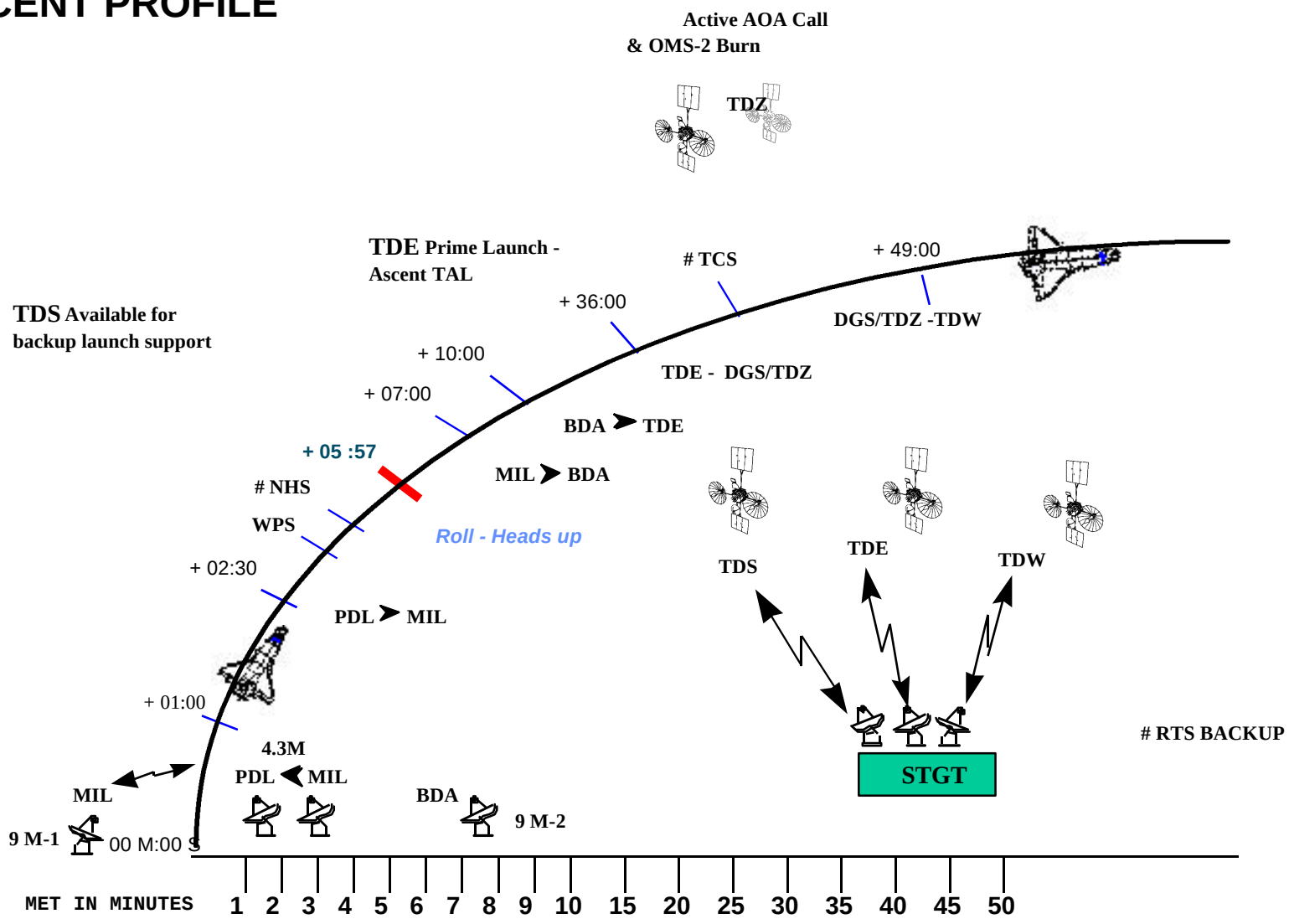
ASCENT PROFILE



CONFIGURATION MANAGEMENT

- HARDWARE/SOFTWARE FREEZE
  - INTEGRATED NETWORKS FREEZE WILL BE IMPOSED PRIOR TO THE SPACE NETWORK VER/VAL OR LAUNCH MINUS 7 DAYS, WHICHEVER COMES FIRST
  - EXEMPTIONS ARE APPROVED BY THE NETWORK DIRECTOR AND APPROPRIATE PROJECT HEADS
- CRITICAL PERIOD
  - CRITICAL PERIODS HAVE BEEN IDENTIFIED
  - MAINTENANCE AND TESTING RESTRICTIONS APPLY

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STS-89 S/MM-08/SPACEHAB-DM NETWORKS

SPACE SHUTTLE CRITICAL PERIODS

EVENT	*START*	*STOP*
LAUNCH RENDEZVOUS MISSION	LAUNCH -4 HOURS	LAST RENDEZVOUS BURN ON FD1
LAUNCH NON-RENDEZVOUS MISSION	LAUNCH -4 HOURS	"GO FOR ORBIT OPS"
PAYLOAD DEPLOY	DEPLOY -3 HOURS	FINAL SEP BURN (+1 ORBIT DELAY)
RENDEZVOUS/DOCKING	2 HOURS PRIOR TO FIRST DAY OF RENDEZVOUS BURN (~CREW WAKEUP)	HATCH OPENING (+1 ORBIT DELAY FOR CONTINGENCY)
RENDEZVOUS GRAPPLE/RETRIEVE	2 HOURS PRIOR TO FIRST DAY OF RENDEZVOUS BURN (~CREW WAKEUP)	PAYLOAD BERTHING (+1 ORBIT DELAY FOR CONTINGENCY)
UNDOCKING	UNDOCKING - 3 HOURS	FINAL SEP BURN (+1 ORBIT DELAY)
EVA	EVA EGRESS - 1 HOUR	EVA INGRESS + 1 HOUR
LANDING	TD - 5 HOURS	WOW

GODDARD SPACE FLIGHT CENTER

CERTIFICATE OF MISSION OPERATIONS AND DATA SYSTEMS DIRECTORATE (MO&DSD) NETWORKS READINESS

THIS IS TO CERTIFY THAT WITH SUCCESSFUL COMPLETION OF FLIGHT READINESS PREPARATIONS AND CLOSURE OF ASSOCIATED ACTION ITEMS, ALL MO&DSD ELEMENTS AND INTEGRATED NETWORKS ARE READY TO SUPPORT THE STS-89 S/MM-08/SPACEHAB-DM MISSION.

12/12/97	12/12/97	R. D. Caldwell 12/12/97
G. A. MORSE/NASA DATE	W. WATSON/NASA DATE	for W. FRIEDMAN/ATSC DATE
SPACE SHUTTLE NETWORK DIRECTOR	ASSISTANT CHIEF NETWORKS DIVISION	VICE PRESIDENT GSFC PROGRAMS
12/12/97	12/12/97	12/12/97
JON Z. WALKER/NASA DATE	W. MACK/NASA DATE	T. SOBCHAK/NASA DATE
HEAD, INTEGRATION AND OPERATIONS MANAGEMENT	OFFICE OF FLIGHT ASSURANCE	SPACE SHUTTLE NETWORKS TEST MANAGER

STS-89 S/MM-08/SPACEHAB-DM NETWORKS

BACKUP

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STS-89 S/MM-08/SPACEHAB-DM NETWORKS

MIR COMMUNICATIONS OVERVIEW

	MIR VHF-1	SOYUZ VHF-2
	139.208 Mhz up	130.167 Mhz up
	143.625Mhz down	121.750 Mhz down
	Full duplex w doppler comp - All stations	Full duplex -All stations
	VMR-500 voice recognition on transmit	
→	**(Bypassed for mixed voice/packet data uplink)**	
DFRC	Quad Yagi (Two arrays for prime/backup)	Quad Yagi (No backup)
	ICOM 820 (2) receive w 30 Khz B/W	ICOM R-9000 receive w 15 Khz B/W prime
	ICOM-820 (2) transmit; constant key	HP-8657 w FM Modulator for transmit
	Power Amp TE-1512G	Power Amp TE-1212GS
	10 KHz deviation;150 watts	10 KHz deviation; 150 watts
	Antenna Controller/Nova S/W	Antenna Controller/Nova S/W
WSC	Quad Yagi (Single array; no backup)	Single Yagi (No backup)
	Dual transmit/receive strings w RF switch	Single transmit/receive string
→	ICOM-821 (2) receive w **30 Khz B/W**	ICOM R-9000 receive w 15 Khz B/W
	ICOM-821 (2) transmit	HP-8920 w FM modulator transmit
	Power Amp TE-1510G	Power Amp TE1209G
	10 KHz deviation; 150 watts	10 Khz deviation; 150 watts
	Antenna controller/FOD Track S/W	Antenna Controller/FOD Track S/W
WPS	Quad Yagi prime (Single array)	Single Yagi - Collocated with VHF-1 Single Yagi
	Single transmit/receive string	No Backup
	Single Yagi backup (Original system)	ICOM 9001 Receive w 15 Khz B/W
→	ICOM 821 Prime/820 B/U receive w **30 Khz B/W**	HP-8660 w FM modulator for transmit
	ICOM-821 Prime/820 B/U transmit; constant key;	Power Amp TE-1212GS
	Power Amps TE1510G/1512G	10 Khz deviation; 150 watts
	10 KHz deviation; 150 watts	STPS/INP's (Dish rim mount)
	Antenna controller prime/FOD Track S/W	
	STPS Backup/INP's (Dish rim mount)	

→ **Changes since STS-86 in Bold**

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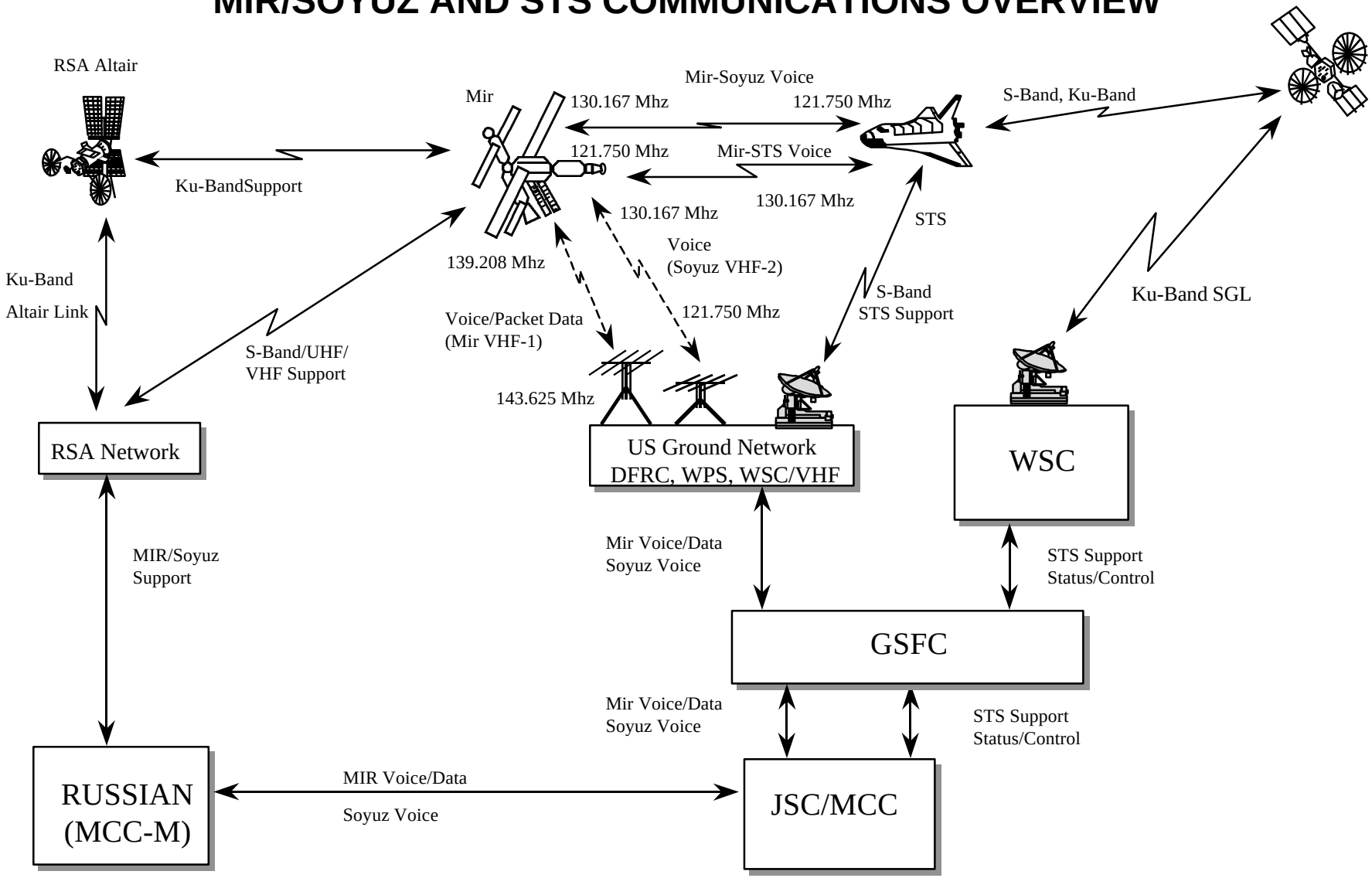
MIR/SOYUZ AND STS COMMUNICATIONS OVERVIEW



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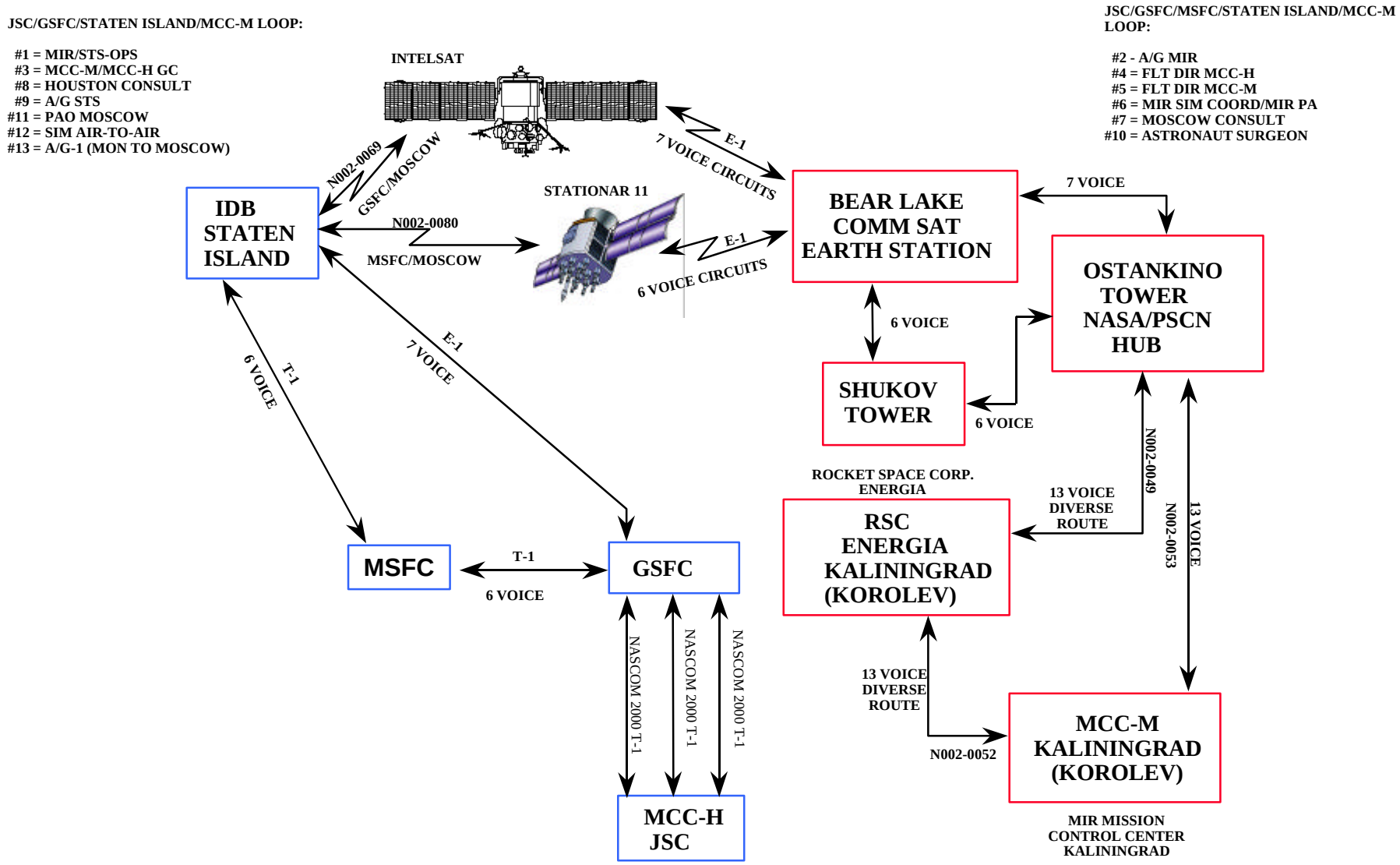
JSC - KOROLEV (KALININGRAD) VOICE CIRCUITS



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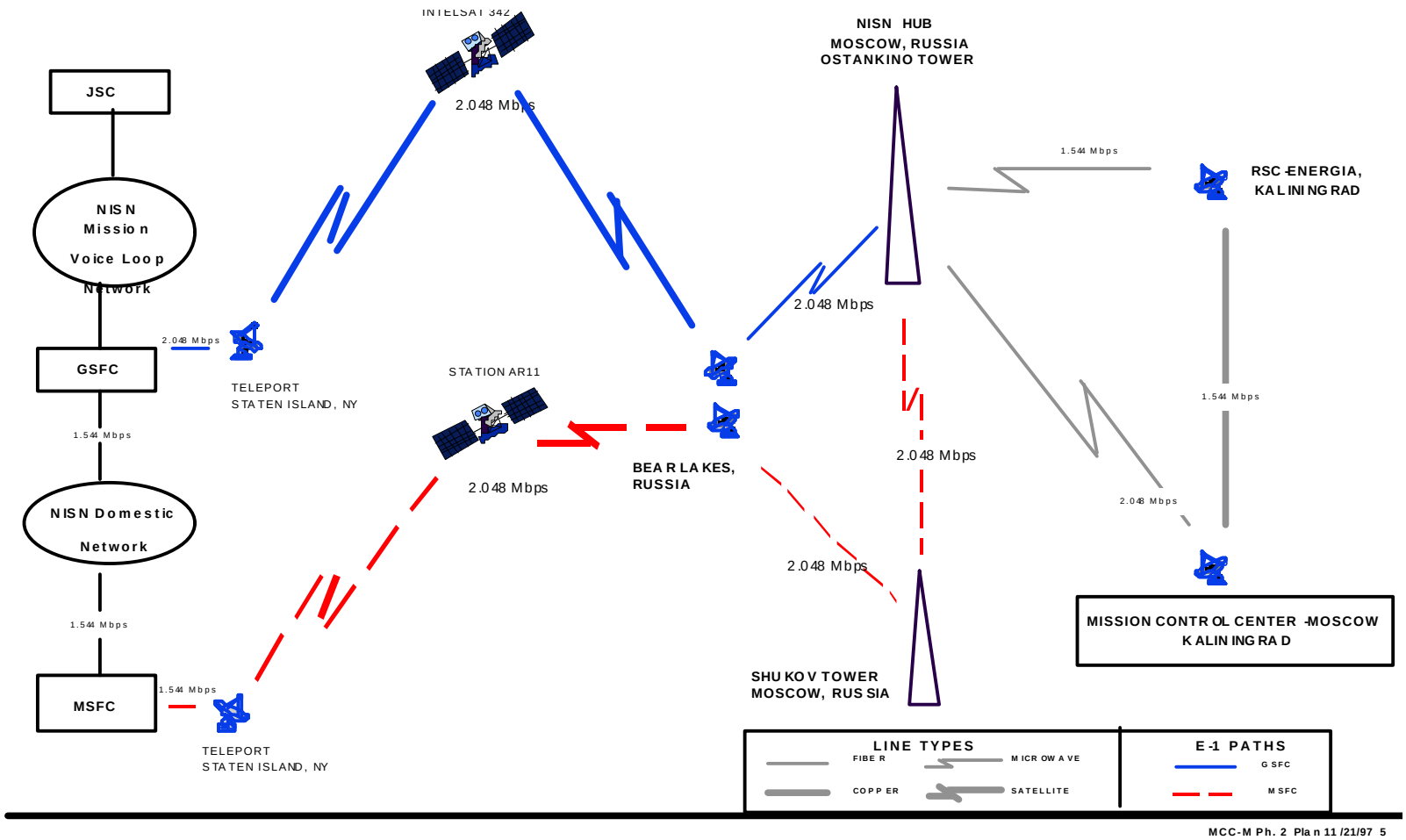
NISN ISS PHASE 1 MISSION VOICE SUPPORT