STDN NO. 601/ALSEP/P&FS

NETWORK OPERATIONS SUPPORT PLAN FOR ALSEP/P&FS

REVISION 1

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GSFC — GODDARD SPACE FLIGHT CENTER
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NETWORK

OPERATIONS SUPPORT PLAN

for

ALSEP/P&FS

Revision 1

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PREFACE

The purpose of this Network Operations Support Plan (NOSP) is to provide operational configurations and procedures applicable to the Apollo Lunar Surface Experiments Packages (ALSEP) and the Particles and Fields Subsatellite (P&FS). The provisions of this document take precedence over procedures contained in other documents.

Changes to this document may be issued by Documentation Change Notice (DCN), printed page changes, or, when applicable, complete printed revision.

Questions from Network stations concerning information in this document should be transmitted to NOCC using standard procedures. Comments from other sources should be addressed to:

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Greenbelt, Md. 20771

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This revision includes all DCN's issued to the Network Operations Support Plan for ALSEP/P&FS, STDN No. 601/ALSEP/P&FS, dated September 1972, up to and including DCN 046. Changes other than those issued by DCN are marked by change bars.

This NOSP will be authorized for use by Instrumentation Support Instruction (ISI) after all supporting stations have acknowledged receipt in accordance with the Automated Documentation Receipt System, STDN No. 519.1 This document supersedes STDN No. 601/ALSEP/P&FS, dated September 1972, and all changes thereto.

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DCN CONTROL SHEET

Use this control sheet to record the DCN changes to this document.

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SECTION 1. MISSION OPERATIONS

1.1 MISSION DESCRIPTION

1.1.1 ALSEP

1.1.1.1 General

a. The Apollo Lunar Surface Experiments Package (ALSEP) consists of a number of experiments which were deployed on the lunar surface during Apollo lunar landings. These experiments are being used to investigate and determine the composition and structure of the lunar surface and interior, and to investigate the lunar environment.

b. Each ALSEP is a self-contained unit designed to transmit selenophysical information to earth via S-band frequencies for periods of 2 years or more. The unit consists of a power supply, central station, and various experiments.

1.1.1.2 ALSEP Experiments Description. Table 1-1 shows the experiments included in each ALSEP. The ALSEP experiments are:

a. Passive Seismic Experiment. The Passive Seismic Experiment (PSE) will measure the natural seismicity of the moon, the lunar free oscillations, and the tidal deformations. The data from this experiment will help determine the strain regime and energy of the moon's interior, the overall elastic properties, and the correlation between seismic sources and visible surface features.

b. Active Seismic Experiment. The Active Seismic Experiment (ASE) is used primarily to generate and monitor artificial seismic waves in the 3- to 250-Hz range in the lunar surface and near subsurface. The ASE can also be used to monitor natural seismic waves in the same frequency range. Data acquired from the ASE will aid in the determination of the physical properties of the lunar surface and near subsurface.

c. Lunar Surface Magnetometer Experiment. The Lunar Surface Magnetometer (LSM) experiment will measure the temporal variations of the local magnetic field vector. Data from this experiment will help determine whether or not the moon has a molten core.

d. Solar Wind Spectrometer. The Solar Wind Spectrometer (SWS) provides information on the following:

(1) The interaction between the moon and the solar wind.

(2) The moon's gross electrical conductivity.

(3) The presence of a lunar atmosphere.

(4) The effects of radiation on the surface through the mechanisms of sputtering and charging.

(5) The effect of the earth's magnetic field at 240,000 miles.

e. Suprathermal Ion Detector Experiment/Cold Cathode Gauge Experiment

(1) The Suprathermal Ion Detector Experiment (SIDE) is used to provide data pertaining to the density and temperature of the lunar ionosphere as it exists near the lunar surface.

(2) The Cold Cathode Gauge Experiment (CCGE) is used to determine the neutral particle density at the lunar surface and any variations in that density associated with solar activity. Specifically, the CCGE will be used to measure the pressure of the ambient lunar atmosphere.

f. Heat Flow Experiment. The Heat Flow Experiment (HFE) is designed to measure the subsurface vertical temperature gradients and brightness temperature in the lunar surface layer, and the absolute temperature and thermal conductivity of the lunar subsurface material to a depth of approximately 2.5 meters. The experiment includes two sensor probes which are placed in bore holes drilled with the Apollo Lunar Surface Drill (ALSD).

g. Charged Particle and Lunar Environment Experiment. The Charged Particle Lunar Environment Experiment (CPLEE) measures the energy distribution, time variation, and direction or proton and electron fluxes at the lunar surface. The results of these measurements will provide information on particle phenomena.

h. Dust, Thermal, and Radiation Engineering Measurement Package. The Dust, Thermal, and Radiation Engineering Measurement (DTREM) package measures the following:

(1) Radiation damage to three solar cells by monitoring the degradation in voltage output.

(2) Dust accumulation caused by the LM ascent or ASE motor activity.

(3) Reflected infrared energy, to obtain the lunar surface "brightness" temperature.

i. Lunar Ejecta and Meteorites Experiment. The Lunar Ejecta and Meteorites Experiment (LEAM) measures physical parameters of primary cosmic dust particle impacts on sensors in cislunar space, and of lunar ejecta emanating from the sites of meteorite impacts on the lunar surface. It will measure the direction, mass distribution, and speed of both the primary and secondary particles.

j. Lunar Seismic Profiling Experiment. The Lunar Seismic Profiling Experiment (LSP) is designed to obtain data on physical properties of the lunar surface and subsurface by generating and monitoring artificial seismic waves in the surface and near subsurface in the active mode, and by detecting moonquakes and meteorite impacts in the passive listening mode. The experiment electronics package and the four-geophone array was deployed in the ALSEP area during EVA-1. Transport modules with explosive charges were mounted on the LRV and deployed during the EVA traverses within 3.5 km of ALSEP. The eight charges were detonated remotely from earth subsequent to lunar liftoff.

k. Lunar Mass Spectrometer Experiment. The Lunar Mass Spectrometer Experiment (LMS) is designed to obtain data on composition of the lunar atmosphere in the 1 to 110 amu mass range at the lunar surface. A secondary goal is the detection of transient changes in composition due to emission of gasses from the surface of from man-made sources. The instrument is a magnetic sector field mass spectrometer with a Nier-type thermionic electronic bombardment ion source.

1. Lunar Surface Gravimeter. The Lunar Surface Gravimeter (LSG) is designed to gather the following information: absolute lunar gravity, tidal changes in local gravity due to the change in relative position of celestial bodies, low-level lunar gravity changes with periods between 10 seconds and 20 minutes due to natural oscillations of the moon excited by gravity waves, and vertical axis seismic activity. From this information conclusions may be drawn about the internal constitution of the moon, about associated seismic activity, and about the existence of gravity waves. The vertical component of gravity is measured in three different frequency ranges.

Table 1-1. ALSEP Experiments

Experiment	ALSEP Flight Article				
	1 AS-507 Array A Apollo 12	2 AS-510 Array A-2 Apollo 15	3 AS-511 Array D Apollo 16	4 AS-509 Array C Apollo 14	5 AS-512 Array E Apollo 17
PSE	EXP #1	EXP #1	EXP #1	EXP #1	
ASE			EXP #2	EXP #2	
LSM	EXP #2	EXP #2	EXP #3		
SWS	EXP #3	EXP #3			
SIDE/CCGE	EXP #4	EXP #4		EXP #3	
HFE		EXP #5	EXP #4		EXP #3
CPLEE				EXP #4	
DTREM	X	X		X	
LEAM					EXP #2
LSP					EXP #5
LMS					EXP #1
LSG					EXP #4

1.1.1.3 ALSEP Mission Support Description

a. Terminator Crossing. Continuous real-time CMD/TLM support may be required during each terminator (sunrise-sunset) crossing (approximately once each 15 days for a maximum of 60 hours) for the duration of the mission. (Refer to appendix A for Sunrise/sunset predictions.)

b. Daily R/T Support. Each ALSEP package requires four hours per day of continuous real-time CMD/TLM support. The specific period is not critical but the support must be continuous.

c. High Bit Rate (HBR) Support. High bit rate support of ALSEP 4 (ASE), ALSEP 3 (ASE), and ALSEP 5 (LSP) will be required as scheduled. Unscheduled support will utilize any station that is supporting ALSEP at the time.

d. Receive/Record Support. All ALSEP packages require continuous 24-hour per day receive/record support from at least one STDN station for the life of each ALSEP. In the event of a station contingency, a nominal downtime for repair (two hours) is acceptable except during a critical period. If a longer downtime is expected, a second station will be scheduled for coverage.

e. Station Initiated CMD Support. Station initiated CMD support will be scheduled as required.

f. ALSEP Contingency Support. In the event of an ALSEP contingency, real-time CMD/TLM support will be provided as required.

g. LSP Contingency Bit Rate (CBR) Support. The LSP will be commanded by MCC to CBR only in the event of a failure of the HBR downlink. The LSP can also downlink CBR as a result of a spurious command. Stations will only be required to record the CBR downlink.

h. Supporting Stations. Table 1-2 defines the STDN support of ALSEP.

1.1.2 PARTICLES AND FIELDS SUBSATELLITE

1.1.2.1 General

Note

The last contact with the satellite was on August 23, 1973. Support may be resumed in the future; the P&FS procedures are retained in this NOSP to provide that support.

a. The Particles and Fields Subsatellite (P&FS) provides the means of making measurements of energy particles and magnetic fields while in lunar orbit, utilizing the moon as a large absorber. The subsatellite also provides the capability of making precise phase-locked two-way Doppler measurements. Analysis of this data will permit mapping of the moon's gravitational field.

b. The P&FS was included in the experimental complement of the Service Module (SM) Scientific Instrumentation Module (SIM) on Apollo 15 and ejected into lunar orbit on August 4, 1971. The totally self-sufficient subsatellite was activated after LM ascent stage impact.

c. The P&FS is powered by solar cells and a battery. The satellite contains a Unified S-band (USB) transponder (using LM uplink and downlink frequencies), a data storage unit, and Apollo command system decoder, and associated electronic and power systems.

Table 1-2 ALSEP/P & FS Supporting Stations and Equipment Configuration

System / Facility	USB Antenna for TLM Update & Tracking			Telemetry Antenna		Voice (SCAMA)	TTY	RSDP (642 B Computer)	High-speed Tracking Data
	85' Dual	30'Single	30' Dual	85' Dish	40' Dish				
JSC						X	X		
NOCC						X	X	X	
ACN			X			X	X	X	X
AGO*		X			X	X	X	X	
BDA			X			X	X	X	X
BUR*					X	X	X		
CRO			X			X	X	X	X
CYI			X			X	X	X	X
ETC*		X			X	X	X	X	X
GDS	X	X			X	X	X	X	X
GWM			X			X	X	X	X
HAW			X			X	X	X	X
MIL			X			X	X	X	X
MAD	X					X	X	X	X
ORR*				X		X	X	#	
ROS*				X		X	X	#	
QUI*					X	X	X	#	
TAN*					X	X	X	#	
ULA*				X	X	X	X	#	
VAN			X			X	X	X	

*Receive and record telemetry, three-way tracking support only.
#642B Installation is scheduled for CY 1975.

1.1.2.2 P&FS Experiments Description. Experiments included in the P&FS flight article are described as follows:

a. S-173 Particle Measurement. The particle measurement will obtain data on the physics of the interaction region or the boundary layer while the P&FS is in a lunar orbit. The characteristics of the boundary layer are determined by the properties of the plasma as well as by the properties of the moon. Thus the study of the interaction region will yield information on the external plasma, the interior of the moon, the lunar surface, and the lunar ionosphere.

b. S-174 Magnetometer. This experiment will provide vector surveys to study bow shock and magnetosphere of the interplanetary medium, and the solar wind boundary layer over the moon. The experiment has been designed to study magnetic field interaction with the moon, measure particle flux near the plasma sheet, and to monitor solar flare electron events.

c. S-164 S-band Transponder. This S-band transponder will provide accurate S-band Doppler measurement of the subsatellite's natural lunar orbit position over periods of time allowing definition of a lunar mass model. Such a model when correlated with lunar shape information, enhances and supports future lunar activities by permitting greater altenate orbit determinations and will give the scientific community a basic model for such considerations as lunar origin and subsurface structure.

1.1.2.3 P&FS Mission Support Description

a. Daily Real-time Support. Two-station tracking support for one revolution twice per week (approximately three days separation) for the life of the spacecraft. Should an increase in orbital decay rate occur, an increase in P&FS tracking will be necessary.

b. Supplemental Real-time Support

(1) Two-station continuous track for two periods (minimum 14 days each) when the spacecraft perigee is approximately 60 km and 30 km from the surface and possibly a third period when the perigee of the spacecraft is approximately 30 km from the surface. Support is required every other revolution during these periods

(2) Approximately five days of continous support during each lunation when the moon crosses the earth's magnetosphere.

c. Daily Receive/record Support. One-station support each lunar revolution when data is downlinked in the automatic cycle mode, for the life of the spacecraft.

d. Station Initiated CMD Support. Station initiated command support will be scheduled as required.

e. P&FS Contingency Support. In the event of a P&FS contingency, real-time command/telemetry/tracking support will be provided as required.

f. Support Stations. Table 1-2 defines the STDN support of P&FS.

1.2 NETWORK OPERATIONS

1.2.1 NETWORK OPERATIONAL CONTROL

Network support has been subdivided into two phases for operational clarification.

1.2.1.1 Real-time Support Period (Phase II)

a. This phase is defined as real time and station-initiated command support as identified in the Network Operations Schedule. During this period, the following operational support guidelines will be in effect.

(1) MCC will exercise operational direction of the supporting station(s) through the ALSEP NC, as scheduled.

(2) All commands will be initiated from, or as directed by MCC.

(3) Real-time TLM will be transmitted to MCC except:

(a) During station-initiated command support periods.

(b) When supporting as a 3-way P&FS tracking station.

(4) USB carrier times will be at MCC direction.

(5) Real-time high-speed tracking data will be transmitted to MCC if specified in the Network Operations Schedule.

b. The basic operational interface during this period will be between the ALSEP NC and the ALSEP NOM. During scheduled activities, operational direction to supporting station(s) will be exercised through the ALSEP NC. Operational and configuration control will be exercised through the ALSEP NOM in accordance with the following criteria:

(1) The ALSEP NC will ensure that the MCC scheduling responsibilities outlined in section 16 of these supplements are met and coordinate late changes (HBR uplink configuration) with ALSEP NOM to ensure proper station configuration.

(2) The ALSEP NOM will utilize the Network Operations Schedule to request voice and data circuits necessary for support (refer to table 8-1). These circuits will be established no later than S-30 minutes. However, high-speed data (HSD) circuits will not be set into the GSFC Communications Processor (CP) until coordinated with Houston Comm Control.

(3) The ALSEP NC will be responsible for initiating command mode changes and informing the station Operations Supervisor (OPSR).

(4) Station transfer (data responsibility transferred from one station to another) will occur in accordance with the Network Operations Schedule.

1.2.1.2 Receive and Record Support Period (Phase III). This phase is defined as all receive and record support. During this period, the following operational guidelines will be in effect:

a. ALSEP NOM will exercise operational control of the support station(s).

b. The basic interface during this period will be between the ALSEP NOM and the supporting station OPSR. All operational direction and control will be exercised through the ALSEP NOM. Interface between the ALSEP NC and ALSEP NOM will be on an "as required" basis and may be initiated by either the NC or NOM.

1.2.2 INTERFACE TESTING

1.2.2.1 General. When supporting ALSEP/P&FS, testing will be in accordance with para 1.2.2.2 and para 1.2.2.3.

1.2.2.2 ALSEP/P&FS Support S-30 Count (Real-time)

Time	Position	Action
Prior to S-30 minutes	NOM Comm Mgr	NASCOM interface established. Comm Mgr report status to NOM on CCL-25.
S-30	NOM OPSR	NOM establish voice conference with station OPSR.
	NOM ALSEP NC	NOM establish voice coordination loop to ALSEP NC.
	NOM OPSR	OPSR pass verbal status report to NOM.
	NOM ALSEP NC	NOM brief NC on station status.
	Comm Mgr MCC Comm Controller	Comm Mgr (with MCC concurrence) set HSD into GSFC CP.
S-25	NOM Comm Mgr OPSR ALSEP NC	NOM places NC in voice conference with station OPSR (phase II only). NC briefs OPSR/NOM on current pass activities.
S-20	NOM ALSEP NC OPSR	Start MCC ALSEP/P&FS CMD, TLM (and tracking) interface test on Net 2.

Time	Position	Action
S-0	OPSR	Station transfer or support begin.
	NC NOM OPSR	NC advises NOM of ALSEP/ P&FS test results.

1.2.2.3 ALSEP/P&FS Support S-10 Count (Phase III)

Time	Position	Action
S-10	NOM OPSR	ALSEP NOM will establish voice conference with stations, obtain station status from the OPSR, and conduct verbal briefing as required.
S-3	NOM OPSR	To ensure overlap of recorded data between stations, the OPSR of the station scheduled to begin support will start recorders, advise ALSEP NOM of the recorder on time and signal strengths of the ALSEP packages being supported.
S-0	NOM OPSR	ALSEP NOM will obtain final signal strengths of the station scheduled to end support and will advise OPSR he may stop his recorder. ALSEP NOM will then conduct a debriefing, as required, and terminate voice conference.

1.2.2.4 ALSEP/P&FS Support S-10 Count (Station Initiated Commands)

Time	Position	Action
S-10	NOM OPSR ALSEP NC	NOM establish voice conference with station OPSR. NOM establish voice coordination circuit to ALSEP NC.
	NOM OPSR	OPSR pass verbal status report to NOM.
	NOM ALSEP NC	NOM brief ALSEP NC on station status.
S-5	NOM Comm Mgr OPSR ALSEP NC	NOM places ALSEP NC in voice conference with station OPSR (phase II only). NC brief OPSR and NOM on current pass activities (if required).
	NOM ALSEP NC OPSR	Start MCC tracking IF (if required).
S-0	ALSEP NC OPSR	Support begins.

1.2.2.5 ALSEP/P&FS Command Interface Test

a. General. Command interface testing will be performed at the time specified in the support S-30 count or at any other time specified by the ALSEP NC.

b. Nominal Testing Sequence

Position	Action
NOM, OPSR, ALSEP NC	Start MCC ALSEP CMD interface test on Net 2.
OPSR	ALSEP carrier or P&FS carrier and sub-carrier on radiating into dummy load. SAFE/OPERATE switch set to OPERATE.
ALSEP NC	Execute site status requests.
ALSEP NC	Execute RTC's 171, and 172, for appropriate ALSEP vehicle or RTC's 61 and 62, for P&FS.
OPSR	Remove modulation and carrier from dummy load. Execute low-speed history. When history is completed, enable critical groups requested by ALSEP NC.
ALSEP NC	Request ALSEP RTC inventory if critical groups were enabled.

1.2.2.6 ALSEP/P&FS Data Loss

a. Purpose. To define required action if there is an ALSEP/P&FS data loss

b. Participants. ALSEP NOM, ALSEP NC, and NESAC.

c. Procedure

(1) At the end of the GMT day when a 15-minute or more ALSEP/P&FS data loss has occurred, the ALSEP NOM will transmit a message to the ALSEP Network indicating that the loss occurred and the reason for this loss.

(2) The ALSEP/P&FS Data Loss Message is found in section 16 of this NOSP.

1.3 STATION OPERATING PROCEDURES

1.3.1 OPSR

1.3.1.1 Station Support Capability Reporting

a. Purpose. To keep GSFC and MCC aware of station status and configuration.

b. Participants. OPSR, NC, and NOM.

c. Procedures. The following procedures apply when a station is operationally manned. At other times, reporting will be done in accordance with STDN No. 502.16.

(1) When a mission-required equipment failure occurs that does not affect support capability and/or for which a backup capability exists, perform the following:

(a) Reconfigure, if required, to a backup mode as soon as possible to prevent loss of support capability.

(b) The OPSR will report the equipment failure, impact, and Estimated Time of Return to Operation (ETRO), by voice when time permits, to the NC (phase II) or to the NOM (phase III).

(c) When the problem is defined, the OPSR will transmit the appropriate status report in accordance with STDN No. 502.16 and section 16 of these supplements.

(2) When a mission-required station equipment failure occurs that affects support capability, perform the following:

(a) Reconfigure station equipment to provide the maximum possible support.

(b) The OPSR will immediately report the failure, impact, ETRO, and corrective action being taken to the NC (phase II) and to the NOM (phase III).

(c) When the problem is defined, the OPSR will transmit the appropriate status report in accordance with STDN No. 502.16 and section 16 of these NOSP.

1.3.1.2 Station Readiness Testing

a. Purpose. To ensure station readiness for pass-time support.

b. Participants. OPSR and NOM.

c. Procedure. The OPSR will perform the following:

(1) Conduct Station Readiness Tests (SRT's) prior to the Mission Prepass Support Counts or as directed by the Network Operations Schedule.

(2) Stations scheduled to support phase II real-time ALSEP and P&FS simultaneously will configure the USB uplink for ALSEP support. Stations will be advised of any changes to this configuration by the ALSEP NOM during their SRT. All other phases are per network schedule.

(3) An SRT Completion message will be submitted only when a problem occurred which affected readiness testing. If a problem report is submitted, the SRT Completion message will contain the Date/Time Group (DTG) of that message.

1.3.1.3 Frequency Synthesizer Reporting

a. Purpose. To advise the ALSEP NOM of a non-nominal frequency synthesizer setting.

b. Participants. ALSEP NOM, ALSEP NC, OPSR, and USB.

c. Procedures

(1) After successfully completing an uplink Radio Frequency (RF) acquisition, the USB supervisor will report the frequency synthesizer setting to the OPSR if it is other than nominal.

(2) Upon such notification, the OPSR will report the frequency synthesizer setting to the ALSEP NOM on the voice conference circuit.

(3) A TTY Operations Message (OPN) will be transmitted to GUNV/ALSEP NOM, INFO HANC/ALSEP NC, as soon as practical after the verbal report.

1.3.1.4 OPSR Announcements

a. Purpose. To define the required support announcements.

Note

P&FS AOS is defined as the first indication of spacecraft RF. ALSEP AOS is defined as the first indication of ALSEP RF or start of the station's scheduled period. Nominally, ALSEP AOS and LOS times will be the same as those reflected in the Networks Operation Schedule (phases II and III) and/or the SCM during manned mission periods.

b. Participants. OPSR, ALSEP NC

c. Procedures

(1) Acquisition of Signal (AOS). The following are AOS announcement conditions:

(a) P&FS AOS after emergence.

(b) AOS resulting from vehicle transmitter being turned "ON" by command or automatic cycle.

(c) P&FS subcarrier present when previous condition was acquisition of P&FS carrier only.

(d) AOS following return from a low signal strength LOS condition.

(e) The ALSEP NC will advise the OPSR during the prepass briefing if P&FS acquisition is anticipated at emergence, or later in the pass. Basically, there are four P&FS RF situations which may exist at emergence from lunar occultation. These are:

1. Uplink P&FS carrier "DOWN" and there is no downlink. Station tracks across the lunar front-side and at the prescribed time in the (P&FS) automatic cycle downlink carrier with subcarrier modulation is received for 11 minutes 46 seconds. The downlink carrier is then turned off by the (P&FS) on board automatic cycle.

2. P&FS carrier "UP" and vehicle is illuminated but there is no downlink. Following predicted emergence, commands are uplinked which result in a downlink carrier and subcarrier. Station then acquires two-way lock.

3. P&FS carrier "UP" and vehicle is illuminated but there is no downlink. Station tracks across the lunar front-side and at the prescribed time in the (P&FS) automatic cycle; downlink carrier with subcarrier modulation is received for approximately 11 minutes 46 seconds (the station is two-way for the duration of the downlink). The (P&FS) on-board automatic cycle then turns off the downlink carrier.

4. P&FS carriers "UP " which triggers the P&FS transponder and provides a downlink without subcarrier modulation. Subcarrier modulation can be applied if commanded or if "P&FS is in the automatic cycle mode" subcarrier modulation will appear during this period.

(2) Loss of Signal (LOS). Stations will announce P&FS LOS resulting from lunar occultation or low signal strength. The following are additional LOS announcement conditions:

(a) P&FS/ALSEP LOS resulting from vehicle transmitter being turned "OFF" by command, automatic cycle, or switchover.

(b) P&FS subcarrier loss when carrier only remains present and previous condition was acquisition of carrier with subcarrier modulation.

(c) Premature or unanticipated ALSEP/P&FS LOS.

(3) Announcements. The station OPSR will make announcements described in table 1-3 as applicable. AOS and LOS announcement conditions are further described in paragraphs 1.3.1.4 a through 1.3.1.4 c (2) (c).

Note

1. Command sequence announcements will be made using either "ALSEP" or "P&FS".

2. All announcements, other than command sequences, will use the following for voice identification of ALSEP/P&FS:

Vehicle	Voice ID
ALSEP 1	A-1
ALSEP 2	A-2
ALSEP 3	A-3
ALSEP 4	A-4
ALSEP 5	A-5
P&FS 1	P-1

(4) Acknowledgements. ALSEP NC will acknowledge all "AOS", "go for command" and "unable to command" announcements.

Table 1-3. OPSR Support Announcements

Seq	Conditions	Announcements
1	Upon acquisition of vehicle RF signal.	"(Station) AOS (ALSEP X/P&FS), signal strength minus XXX."
2	Upon decom lock on ALSEP/P&FS downlink.	"(Station) decom lock on (ALSEP X/P&FS." Announce ALSEP bit rate if other than NBR.
3	Upon bringing carrier up for ALSEP (OPSR will assure that carrier modulation is off).	"(Station) ALSEP carrier is up."
4	After turning command modulation on (upon direction from MCC) following ALSEP carrier turn on.	"(Station) go for command, ALSEP."
5	Upon bringing carrier up for P&FS (OPSR will assure that subcarrier and command modulation are off).	"(Station) P&FS carrier is up."
5A	After turning subcarrier and command modulation on (upon direction from MCC to apply modulation) following P&FS carrier turn on.	"(Station) go for command, P&FS."
6	If USB system is unable to command the vehicle.	"(Station) unable to command (ALSEP/P&FS)." Give brief reason why the station is unable to command.
7	When P&FS receiver appears to be locked to uplink subcarrier.	"(Station) has invalid P&FS lock, am reacquiring." "Unable to command P&FS" (if applicable).
8	When a station obtains P&FS valid USB lock after initiating another acquisition.	"(Station) has valid lock." "Go for command, P&FS" (if applicable).
9	Loss of ALSEP downlink.	"(Station) LOS ALSEP X due to ----------." (Give brief explanation for LOS.)
10	Upon presence of subcarrier when previous condition was acquisition of P&FS carrier only.	"(Station) P&FS subcarrier present."

Table 1-3. OPSR Support Announcements (cont)

Seq	Conditions	Announcements
11	Loss of P&FS downlink subcarrier (downlink carrier still present but subcarrier is turned off).	"(Station) Loss of P&FS subcarrier."
12	When P&FS RF is lost before occultation.	"(Station) LOS on P&FS."
13	When the vehicle RF is lost coincident with the end of a station's support period or pass.	"(Station) final LOS on (P&FS/ALSEP)."
14	Upon bringing ALSEP carrier down (OPSR will ensure that carrier modulation is off).	"(Station) ALSEP carrier is down."
15	Upon bringing P&FS carrier down.	"(Station) P&FS carrier is down."
16	Intermittent downlink receiver lock due to weak signal with no indication of uplink lock or with carrier down.	"(Station) intermittent P&FS downlink lock, signal strength minus XXX."
17	Downlink receiver lock with no indication of uplink lock or with carrier down.	"(Station) P&FS downlink lock only."
18	Intermittent uplink and downlink receiver lock due to weak signal.	"(Station) intermittent P&FS two-way lock, signal strength minus XXX."
19	No downlink signal detected from the P&FS.	"(Station) negative P&FS contact."

1.3.1.5 Station Data Playback

a. Purpose. To define the operational procedure to perform an ALSEP/P&FS data playback to MCC.

b. Participants. OPSR, Telemetry Tech, Recorder Tech, RSDP, ALSEP NC, and ALSEP NOM.

c. Procedures

(1) When MCC requests the OPSR to play back telemetry data received from ALSEP, he will give the following information:

(a) Vehicle (ALSEP No. or P&FS).

(b) Greenwich Mean Time (GMT) and date of recording.

(c) Bit rate.

(d) Playback bit (set or not set).

(e) Playback start time and duration.

(f) High-speed data formats and slot assignments.

(g) Real GMT or playback GMT.

(2) The OPSR will ensure that the station is configured for playback and notify the ALSEP NC.

(3) The Recorder Tech will start tape recorder on cue from the OPSR.

(4) The Telemetry Tech will confirm solid decom lock and solid time code translator lock and ensure that the time displayed on the translator is valid.

(5) The RSDP operator will assure the OPSR of proper data format selection.

(6) At completion of the playback, the ALSEP NC will notify the OPSR to reconfigure for real time or release the station to the ALSEP NOM.

(7) When MCC requests the OPSR to playback high-speed tracking data recorded during a P&FS tracking pass, ALSEP NC will give the following:

(a) Lunar orbit No.

(b) Greenwich Mean Time (GMT) and date of recording.

(c) Playback start time and duration.

1.3.1.6 OPSR Support Activities

a. Purpose. To define the required activities to support ALSEP/P&FS phase II.

b. Participants. OPSR and all station personnel.

c. Procedure

Note

Support time in table 1-4 is defined as the start of station's scheduled support period.

Table 1-4. OPSR Activities

Support Time	ALSEP/P&FS	Activity
S-30	Both	Confirm that prepass console checklist is complete. Start voice recorders.
	Both	Confirm that station is configured according to the Network Operations Schedule and these supplements.
	ALSEP	Set horizon clocks to scheduled AOS.
	Both	Request parameter listing and verify computer mode 2/FC. Confirm computer constants. Check each system for "go" indication. Log all "red" items. Give "Go/No Go" voice status to ALSEP NOM. Confirm that no HS telemetry or tracking data is being output from station.
S-28	Both	Verify that tracking system can autotrack collimation tower.
S-20	Both	Start MCC CMD/TLM/TRACKING interface test. Confirm RSDP HS TLM destination code initialized for MCC only (unless otherwise directed by MCC).
S-15	Both	Confirm system status; verify that recorders are loaded; prepass cals and prepass checklists are completed. Confirm that APP is loaded with acquisition tape.
S-10	Both	Confirm via negative reporting from systems, that all local signal sources of RFI are off and no outside interference is present. Clear operating area of all nonoperational personnel.
	ALSEP	Confirm that M&O SAFE/OPERATE switch is set to SAFE.

Table 1-4. OPSR Activities (cont)

Support Time	ALSEP/P&FS	Activity
S-8	Both	Confirm that antenna is pointing to Initial Point (IP).
S-5	Both	Receive P&FS emergence and occultation times of lunar orbits to be supported and support briefing.
S-3	Both	Reconfirm with GCC that data links are configured.
	P&FS	Place M&O SAFE/OPERATE switch to OPERATE.
S-2	Both	On paging system announce: "Support start time in two minutes. All data recorders on."
S-0	ALSEP	Make AOS announcements on Net 2. Log start time.
	Both	Confirm with GCC that data is online to MCC per ALSEP NC direction.
S-Plus	P&FS	When requested by ALSEP NC to bring up the P&FS carrier, announce to systems: "P&FS carrier up"; verify that status displays show system is radiating (with sub-carrier and command modulation off). Confirm high-speed tracking data online (if required).
	P&FS ("AOS")	Make appropriate AOS announcements.
	Both	Report frequency synthesizer setting to ALSEP NC when other than nominal. Report to ALSEP NC on Net 2 any time during a tracking period when the station has a signal loss or gain greater than 1 dBm.
	ALSEP	When requested by ALSEP NC to bring up the ALSEP carrier, announce to systems "ALSEP carrier up" and verify that status display shows system is radiating (no command modulation) announce "ALSEP carrier on," on Net 2.
	ALSEP	When requested by ALSEP NC to apply modulation, set M&O SAFE/OPERATE switch to OPERATE. Announce "go for command ALSEP" on Net 2.
	ALSEP	Hand over (as applicable), set SAFE/OPERATE switch to SAFE. On OPSR loop, announce "carrier down."

Table 1-4. OPSR Activities (cont)

Support Time	ALSEP/P&FS	Activity
S-Plus	P&FS	When requested by ALSEP NC to apply modulation, turn normal modulation on and set M&O SAFE/OPERATE switch to OPERATE. Announce: "Go for command P&FS" on Net 2.
	P&FS	Hand over (as applicable). On OPSR loop announce: "Stand by for P&FS on Net 2." (para 1.3.3.5).
	ALSEP (Premature LOS carrier up)	Set M&O SAFE/OPERATE switch to SAFE position and attempt to reacquire the ALSEP downlink. Announce: "USB has invalid ALSEP(s) lock, am reacquiring; unable to command ALSEP."
	P&FS (Premature LOS)	Attempt to reacquire the P&FS downlink. Announce: "USB has invalid P&FS lock, an reacquiring; unable to command P&FS" (if applicable).
	ALSEP (Premature LOS carrier down)	Announce: "Am reacquiring ALSEP" on Net 2.
	ALSEP (Premature LOS reacquisition, carrier down)	Announce: "USB has valid lock ALSEP" on Net 2.
	ALSEP (Premature LOS reacquisition, carrier up)	When directed by ALSEP NC to apply modulation reset the SAFE/OPERATE switch to OPERATE. Announce: "Go for command ALSEP" on Net 2.
	P&FS (Premature LOS reacquisition)	Announce: "USB has valid P&FS lock. Go for command P&FS" (if applicable).
	P&FS (Occultation)	Make appropriate LOS announcements on Net 2 if P&FS downlink was present at occultation time.
	P&FS	When directed by the NC or occultation plus two minutes announce to systems: "P&FS carrier down" and verify that status display shows system is not radiating.

Table 1-4. OPSR Activities (cont)

Support Time	ALSEP/P&FS	Activity
S-Plus	P&FS	Announce:"P&FS carrier down" on Net 2. Inhibit HS tracking data (if applicable).
	Both (Uplink support minus X min)	When directed by ALSEP NC, reconfigure the USB system for ALSEP/P&FS carrier support.
	Both (Uplink support plus X min)	Announce: "Station reconfigured for ALSEP/P&FS carrier support" on Net 2.
	Completed Both	At end of scheduled support period log GMT. Obtain system status from system supervisors on OPSR loop. Announce to data recorders: "Data recorders off."
	Completed Both	Ensure that LOS-T is typed in. Verify HS TLM/TRACK data terminated.
	Both	Voice recorders off, lift station security.
	Both	Execute appropriate CMD histories.

Note

Within 45 minutes after final LOS for the day's activity, the OPSR will transmit the Pass Summary Report (PASSUM) in accordance with section 16.

1.3.1.7 Reporting of ALSEP/P&FS Anomalies

a. Purpose. To inform ALSEP NC/ALSEP NOM of anomalies.

b. Participants. ALSEP, NOM, ALSEP NC, OPSR, and system supervisors.

c. Procedures

(1) Each system supervisor will inform the OPSR of any ALSEP/P&FS anomalies observed from his area.

(2) The OPSR will verbally report the anomaly in real time to the ALSEP NC or ALSEP NOM.

(3) The OPSR will then report the anomaly by Spacecraft/Vehicle Anomaly Report to the ALSEP NOM and ALSEP NC as soon as possible.

(4) The ALSEP/P&FS RSDP can process up to four PCM inputs simultaneously. During real-time support, all ALSEP/P&FS decom outputs should be enabled to the RSDP. This will enable the OPSR to monitor the input channel sync status of all ALSEP/P&FS vehicles being received. Any input channel sync losses will be reported to the ALSEP NC.

1.3.2 TELEMETRY

1.3.2.1 PCM Bit Rate Change

a. Purpose. To provide the station with the operational procedure for an ALSEP bit rate change.

b. Participants. OPSR, USB, and PCM Tech.

c. Procedures

(1) When MCC generates a command to change bit rate, and uplink is noted on station, OPSR will announce on the OPSR loop: "NBR (normal bit rate) on," "CBR (contingency bit rate) on," "HBR (high bit rate) on."

(2) The PCM Tech should switch formats and bit synchronizer rate to the proper bit rate.

(3) The USB Receiver Tech will ensure proper receiver TLM bandwidth selection for bit rate change and rephase the TLM phase shifter.

(4) RSDP Tech should initiate a format change when the command is uplinked.

(5) MCC may announce a bit rate change as it is initiated.

(6) The Microdyne receiver will not be used to support "HBR." If an ALSEP being processed by the Microdyne receiver should change to "HBR", reconfiguration to a USB receiver will be necessary.

1.3.2.2 Decom Format Change From P&FS to ALSEP

a. Purpose. To provide operational procedure when changing decom formats from P&FS to ALSEP.

b. Participants. OPSR, PCM Tech, and RSDP Tech.

c. Procedures

(1) OPSR directs PCM and RSDP Techs to change decom format from P&FS to ALSEP.

(2) PCM Tech inhibits computer buffer, resets decom, changes input to signal conditioner, selects appropriate ALSEP format, and initiates format select.

(3) RSDP Tech confirms loss of sync printouts of P&FS data on HSP 1232 I/O console.

(4) RSDP Tech confirms decom printout of ALSEP data on HSP and 1232 I/O console.

1.3.2.3 PCM Parameter Verification

a. Purpose. To define the types of readouts which can be requested and the station/MCC interfacing procedures.

b. Participants. OPSR, PCM Tech, and ALSEP NC.

c. Procedures

(1) TLM Readouts

(a) When requesting a TLM parameter readout, MCC will give the measurement number and vehicle identification. ALSEP/P&FS readouts will be given in decimal unless otherwise specified by MCC.

(b) The OPSR will direct the PCM Tech to dial up the requested parameter at the TLM station, convert it, and read it back. The OPSR will pass the readout to MCC.

(c) Readouts will be 8 bits in length for P&FS and 10 bits in length for ALSEP.

(2) ALSEP ASE Readouts

(a) When a station is requested to read out an ASE parameter MCC will give the downlink word number (1-32) and vehicle identification.

(b) ASE words consist of 20 bits (four 5-bit parameters). When an ASE readout is requested the PCM Tech will dial up the 20-bit word and read it in two 10-bit octal syllables.

(3) ALSEP NBR/LBR Readout Capability

(a) Housekeeping. All 90 parameters in A-G word 33 can be read.

(b) PSE. All PSE parameters can be read out.

(c) CPLEE. No CPLEE parameters can be read out.

(d) HFE. No HFE parameters can be read out.

(e) LSM. Only LSM scientific parameters can be read out.

(f) SIDE. No SIDE parameters can be read out.

(g) SWS. No SWS parameters can be read out.

(h) LMS. No LMS parameters can be read out.

(i) LSG. No LSG parameters can be read out.

(j) LEAM. No LEAM parameters can be read out.

(4) P&FS Readout Capability. All P&FS parameters can be read out.

(5) ALSEP LSP Readout Capability

(a) When a station is requested to read out an LSP parameter, MCC will give the measurement number and the decom to select for the readout.

(b) Station will select the LSP display format in the decom called out by MCC.

(c) LSP readouts will be given in octal and all syllables should be read out unless otherwise directed by MCC. (Refer to section 2 for LSP alphanumeric listing.)

1.3.2.4 ALSEP and P&FS Downlink and Parameter Monitoring

a. Purpose. To define downlink and parameter monitoring and reporting requirements.

b. Participants. OPSR, PCM Tech, ALSEP NOM.

c. Procedure

(1) Stations are required to monitor certain ALSEP parameters only during support periods when RSDP real-time data is not being transmitted to MCC from any station. ALSEP parameter monitoring is specified in tables 2-9 through 2-13.

(2) Except for the CVW's, the ALSEP parameters will be monitored on the PCM decom. The parameters will be read out once every 2 hours. If a parameter is out of limits, it will be monitored for 5 minutes. If it remains out of limits for the 5 minute period, the station will voice report it to the ALSEP NOM, and will report it in the ALSEP PASSUM. The station will report the AOS and LOS octal value of each parameter in the PASSUM.

(3) The ALSEP CVW's will be monitored on either a recorder or from the OPSR high-speed printer. Only a CVW that has bit 10 set and contains in bits 3-9 a valid RTC for the vehicle from which it was monitored, as listed in section 5, will be reported in the ALSEP PASSUM. A bit 10 set CVW for a RTC listed in table 2-14 will be voice reported to the ALSEP NOM if it was monitored from a vehicle listed for the RTC.

Note

HSP CVW printout: AX CY CVW ZZZ M AAAA, indicates a CVW has been detected from ALSEP X. CY equals the input channel; ZZZ equals the RTC detected; M equals the MAP bit (10) where 1 equals a good MAP; and AAAA equals the number of frames in which the CVW occurred.

(4) ALSEP parameter monitoring locations for MSFTP-1, MSFTP-2, and MSFTP-3 are found intable 2-8.

(5) During all support periods, the station will be continuously configured to monitor the ALSEP downlinks assigned to the station. If the station has a significant change in an ALSEP downlink, it will be voice reported to the ALSEP NOM and will be reported in the ALSEP PASSUM.

(6) Monitoring of the P&FS downlink will be as scheduled and directed (support briefing) by the ALSEP NC or NOM. Since P&FS does not require parameter monitoring, a decom is required for P&FS only during real-time and station-initiated command support.

(7) When a station supports more downlinks than decoms available, the decoms will be configured to the highest priority ALSEP(s) per the one station decom priority list (refer to table 2-6). The lowest priority ALSEP(s) which are not configured to a decom require the following support:

(a) Once every two hours the lowest priority decom will be configured to the ALSEP(s) not monitored in realtime long enough to obtain the required parameter readouts. Playback of data for CVW monitoring for the ALSEP from which the decom was reconfigured is not required for the period the decom was on the lower priority ALSEP(s).

(b) A station supporting all ALSEP's is not required to monitor ALSEP 3 and ALSEP 5 for CVW's.

(c) If a contingency arises during support where less than three decoms are available a playback of the ALSEP(s) (1, 2, and 4) data for CVW monitoring will be made at the end of the active scheduled support period.

1.3.2.5 RSDP, DECOM, Simulator Programs and Constants

a. Purpose. To identify the mission programs and initialization constants.

b. Participants. OPSR, RSDP Tech, PCM Tech.

c. Procedure

(1) RSDP Program

(a) Program: 781-03

(b) Errata: per latest ISI

(c) Sta: (own ID)

(d) ALSEP MWP: 5000 msec

(e) P&FS MWP: 13,000 msec

(f) GMT: Current

(g) P&FS 1 subbit code: "C"

(h) Station: FMT 1; 3A, 5B

Note

Changes may be made by MCC during the interface test.

(2) MSFTP-2 Decom Program

(a) Program: 1048D

(b) Errata: per latest ISI

(3) MSFTP-3 Decom Program

(a) Program: 1057MS

(b) Errata: per latest ISI

(4) Simulator Program

(a) Program: 1049S

(b) Errata: per latest ISI

1.3.3 COMMAND

1.3.3.1 Computer Address Matrix Operation

a. Purpose. To provide a script giving an example of the sequence of events that will occur between the station OPSR and MCC if the station is directed to switch to computer mode 1 and uplink commands.

b. Participants. ALSEP NC and OPSR.

c. Procedures

(1) Typical OPSR Computer Address Matrix (CAM) operation announcements are shown in table 1-5.

Table 1-5. Typical OPSR CAM Operation Announcements

Sequence	Position	Action and Remarks
1	MCC	"(Station), (MCC) configure the computer for mode 1 commanding with MAP override (on/off)."
2	(Station)	"(MCC) (Station) Roger computer in mode 1 MAP override (on/off)."
3	MCC	"(Station) (MCC) request RTC XXX for ALSEP X decoder X/P&FS."
4	(Station)	"(Station), Wilco."
5	(Station)	"(MCC), (Station) RTC XXX for ALSEP X/decoder P&FS requested."
6	MCC	"(Station), (MCC), uplink RTC XXX."
7	(Station)	"(Station), uplinking RTC XXX."
8	(Station)	"(MCC), (Station), RTC XXX CMD (verified, SC reject, ground reject)."
9	MCC	(If applicable.) "(Station), (MCC) go to MAP override off,computer mode 2."
10	(Station)	"(MCC), (Station), Roger, MAP override off,in computer mode 2."

(2) The CAM uplink procedure will be immediately terminated if a ground or spacecraft reject should occur, or if the vehicle telemetry link is lost. No further CAM requests should be made until directed by MCC.

(3) Certain Real-time Commands (RTC's) are disabled upon ALSEP program initialization.

(a) The ALSEP NC will advise the station OPSR which group(s) of critical RTC's will be used.

(b) The ALSEP NC will instruct the station OPSR to safe the command system (if carrier is up), then go to mode 1, M&O mode, to enable or disable required critical RTC's.

(c) The OPSR should execute a status request after enabling or disabling critical RTC groups.

(d) The ALSEP NC will take or request from the OPSR an RTC inventory after critical RTC groups are enabled or disabled.

1.3.3.2 USB Status Command Analysis Patterns

a. Purpose. To define the conditions which require the OPSR to transmit a status Command Analysis Pattern (CAP) to MSC.

b. Participant. OPSR.

c. Procedures

(1) After the OPSR announces: "Go for command," he will initiate a request for USB loop test (CAM 988).

(2) If the USB uplink is lost or terminated, or command capability is lost, the OPSR will initiate a request for USB loop test.

(3) After enabling or disabling critical RTC group(s) the OPSR will initiate a request for a USB loop test.

1.3.3.3 Command Histories

a. Purpose. To obtain a history of commands uplinked to the ALSEP/P&FS.

b. Participant. RSDP.

c. Procedures

(1) End-of-File

(a) At completion of MCC Command (CMD)/TLM interface testing an End-of-File (EOF) will be placed on the command history tape.

(b) The EOF should be the last item placed on the history tape before a station comes up for ALSEP/P&FS support.

(c) An EOF will be placed on the command history tape each time the USB carrier is brought down.

(2) Off-line Command Histories

(a) The station will take a low-speed history following the station support period if commands were uplinked; use the Real-time Off-line ALSEP Command History (ROACH) off-line operating procedure as defined in the Software Catalog for the Apollo Network (SCAN) (refer to SCAN control No. 6-750).

(b) High-speed printer histories are not required after a support period, unless otherwise requested by MCC.

(3) Disposition of Command History Tape

(a) A new command history tape will be mounted on the Magnetic Tape Unit (MTU) for each 24-hour support period.

(b) Refer to STDN Network Operations Procedures for Data Identification and Disposition, STDN No. 502.11 for instructions on identification and disposition of magnetic tape.

Note

The 24-hour support period begins with the SRT activities in preparation for ALSEP/P&FS support. This means that a station could have more than one block of support (CMD) data on the new command history tape. A new command history tape will be mounted the following day before performing the SRT.

1.3.3.4 ALSEP Command Handover

a. Purpose. This procedure provides transfer of ALSEP command capability from one station to another.

b. Participants. ALSEP NC, OPSR, and USB.

c. Procedures

(1) Station command handover will be conducted by the ALSEP NC, and will be accomplished with a 1-minute separation between the respective stations' carrier on and off.

(2) No modulation will be applied to the USB carriers while they are being turned on or off. Modulation will be turned on at the direction of the ALSEP NC only.

(3) A station directed to bring its carrier down will "safe" the command system, bring its carrier down, and report "carrier down" to the ALSEP NC.

(4) Prior to bringing up its carrier, a station directed to bring its carrier up will ensure that the M&O SAFE/OPERATE switch is set to SAFE.

(5) When ALSEP NC instructs the station to turn on command modulation, the OPSR will set the SAFE/OPERATE switch to OPERATE.

d. Information. It has been determined that if the ALSEP receiver is acquired with uplink modulation or by two modulated carriers simultaneously, the idle 1's pattern that is uplinked will result in random command executions by the ALSEP receiver/decoder.

1.3.3.5 P&FS Carrier Handover

a. Purpose. To define the P&FS carrier handover and interfacing procedure.

b. Participants. OPSR, USB Tech, and ALSEP NC.

c. Procedures

(1) General

(a) In these procedures the term "outgoing station refers to the current radiating station and the term "incoming station" refers to the non-radiating station receiving the handover.

(b) All unscheduled handovers will be conducted by ALSEP NC count. Station will not handover unless ALSEP NC count is received.

(c) All scheduled handovers will be conducted upon direction from ALSEP NC, and will be nominally planned for periods of lunar occultation.

(d) When doing an unscheduled handover USB Tech will utilize the normal handover procedure in section 4 of this NOSP.

(e) A station bringing the P&FS carrier up will ensure that subcarrier and command modulation are off.

(f) The M&O SAFE/OPERATE switch will be placed in the OPERATE position when a station is configured for P&FS uplink support. The OPSR will turn the station subcarrier on when the ALSEP NC instructs the station to apply modulation.

(g) Information: It has been determined that if the P&FS receiver is acquired with uplink subcarrier the receiver could possibly lock on the subcarrier. The P&FS carrier only is brought up to prevent this. Any reacquisition of the P&FS will be accomplished per normal USB procedures. For P&FS the term "apply modulation" means apply subcarrier and command modulation to the P&FS uplink.

(2) Scheduled Handovers

(a) ALSEP NC announces: "(Outgoing station) Bring the P&FS carrier down."

(b) Outgoing station announces: "P&FS carrier is down."

(c) ALSEP NC announces: "(Incoming station) Bring the P&FS carrier up."

(d) Incoming station announces: "P&FS carrier is up."

(e) Upon direction from ALSEP NC, incoming station applies modulation and announces: "Go for command P&FS."

(3) Unscheduled Handovers

(a) ALSEP NC announces: "(Outgoing station); (Incoming station) Standby for P&FS handover as soon as possible. Confirm when you are ready for handover."

(b) Both stations confirm when they are ready for handover.

(c) ALSEP NC announces: "Handover on my mark: 5...4...3...2...1... mark." (ALSEP NC will count down to a mark for the handover.)

(d) Incoming station announces: "(Incoming station) Go for command P&FS."

1.3.3.6 Dump and Reload the System (DARTS)

a. Purpose. To reload the operational program after a computer fault.

b. Participants. ALSEP NC, OPSR, and computer operator.

c. Procedures

(1) Operating Instructions. Refer to SCAN for DARTS operating instructions.

(2) DARTS Reloads

(a) If the computer faults and DARTS instantly reloads the operational program, the operator will immediately perform computer recovery.

(b) The OPSR will then verify the parameter list, and report by voice to the ALSEP NC.

(3) DARTS Will Not Reload

(a) If the computer faults and DARTS or the recovery tape does not reload, the operator will immediately attempt to manually reload DARTS three times.

(b) The OPSR will immediately notify ALSEP NC whether or not the attempt was successful.

(c) If unsuccessful, the computer operator will immediately begin to reload the ALSEP program from the systems tape and the OPSR informs the ALSEP NC that the ALSEP computer is being reloaded.

Note

Critical RTC's are not retained in the uplink storage area after a DARTS.

1.3.3.7 Computer Operating Procedures

a. Purpose. To define the normal computer operations during an ALSEP/P&FS pass.

b. Participants. OPSR and RSDP Tech

c. Procedures

(1) ALSEP/P&FS System Constants

(a) Command Constants. The OPSR will direct the computer operator to insert specific constants during initialization. When initialization is complete, the program will automatically print an ALSEP/P&FS parameter listing. The OPSR should verify that the constants are correct.

(b) Telemetry Constants. MCC will advise the station of any change to the initialization constants listed in this section.

(2) Command Program

(a) General. Command executes for RTC's will be initiated by MCC in mode 2. Under no circumstances will the OPSR switch to mode 1 to initiate a command uplink unless so directed by MCC.

(b) Processing Command Loads. Command load processing is not required for ALSEP support.

(c) Flight Controller/M&O Mode. The computer will be operated in the Flight Controller (FC) mode unless required to go to the M&O mode to perform an MCC-requested function.

(d) Message Acceptance Pulse Override. If requested by MCC, the Message Acceptance Pulse (MAP) override function will be initiated when command uplinks are to be initialized without having the computer search for valid MAP's.

(3) Telemetry Program

(a) High-speed TLM Initiation. The OPSR will ensure that ROS T is typed into the computer and High-speed (HS) TLM output is on line as directed by the ALSEP NC. The on-station HS printer will indicate this activity and the OPSR should verify by negative reporting that HS data is leaving the station. The OPSR will ensure that LOS T is typed into the computer at end of support period.

(b) Telemetry Manual Input/Output Routines. The 1232 typewriter will input system initialization constants and will access the program for performing manual Input/Output (I/O) routines.

(c) TLM HSD Formats. The computer can output three different HS TLM formats. OPSR will direct the computer operator to change formats via the 1232 at the direction of MCC. HS TLM data output will be on Net 4 or Net 6 upon direction of MCC.

(d) TLM Destination Codes. The computer can output three different HS TLM Destination Codes. MCC will advise the station regarding the HS Destination Codes to be initialized. When transmitting data to MCC, the RSDP will be initialized for MCC unless otherwise directed by MCC.

1.3.3.8 Network Safe

a. Purpose. To ensure that no commands are transmitted to the ALSEP/P&FS.

b. Participants. ALSEP NC and OPSR.

c. Procedures

(1) The M&O SAFE/OPERATE switch will be in the SAFE position under the following conditions:

(a) When the command modulation is not required.

(b) When requested to safe the command system.

(c) When instructed to remove command modulation.

(2) The switch will remain in the SAFE position when the station is configured for ALSEP uplink support until directed by ALSEP NC to apply modulation to the ALSEP carrier.

(3) The switch will be placed in the OPERATE position when a station is configured for P&FS uplink support. Stations will turn normal modulation "ON" when directed by ALSEP NC to apply modulation.

1.3.4 TRACKING

1.3.4.1 ALSEP/P&FS Antenna Positioning Procedure

a. Purpose. To provide the station with procedures for positioning the USB antenna.

b. Participants. OPSR, 1218 operator, USB.

c. Procedures

(1) 85-foot Antenna Stations

(a) ALSEP Only Support

1. If A5 is not being supported, antenna pointing may be accomplished either by autotrack of A1, A2, A3, or A4, or program track (X equals 2) with RSVP at station option.

2. When supporting A5, antenna pointing may be accomplished either by autotrack of A2 or A3, or program track (X equals 2) with RSVP at station option. Antenna pointing will not be accomplished by autotrack of A5.

(b) P&FS Only Support

1. The USB system will be configured for program track (computer). The USB receiver will be phased for autotrack of the P&FS. The 1218 will have RSVP loaded.

2. The 1218 operator will designate the antenna to one of five equational points (X equals 3, 9, 2, 8, or 1), according to where start of P&FS support is occurring.

3. USB will program track until AOS and autotrack from AOS to LOS.

4. The 1218 operator will redesignate the antennas as follows (even during autotrack support):

a. Emergence plus 20 minutes: X equals 2.

b. Emergence plus 50 minutes: X equals 1.

(c) Simultaneous ALSEP/P&FS Support

1. The USB system will be configured for program track (computer). The USB receivers will be phased for ALSEP autotrack. The 1218 will have RSVP loaded.

2. The 1218 operator will designate the antenna to X equals 9, X equals 2, or X equals 8, according to where start of P&FS support is occuring.

3. The 1218 operator will redesignate the antenna as follows:

a. Emergence plus 30 minutes: X equals 2.

b. Emergence plus 50 minutes: X equals 8.

4. At completion of P&FS support, station will revert to para 1.3.4.1c(1)(a).

(2) 30-foot Antenna Stations

(a) ALSEP Only Support. Antenna pointing may be accomplished by autotrack of any ALSEP or program track (X equals 2) with RSVP (if available) at station option.

(b) P&FS Only Support

1. The USB system will be configured for program track (computer). The USB receivers will be phased for autotrack of the P&FS. The 1218 will have RSVP loaded.

2. The 1218 operator will designate the antenna to X equals 2.

3. USB will program track until AOS, and will autotrack from AOS to LOS.

(c) Simultaneous ALSEP/P&FS Support

1. The USB receiver will be phased for ALSEP autotrack. The 1218 will have RSVP loaded. Antenna positioning may be accomplished either by autotrack or program track, at station option.

2. The 1218 operator will designate the antenna to X equals 2, X equals 8, or X equals 9, according to where start of P&FS support is occurring.

3. The 1218 operator will redesignate the antenna even during autotrack support as follows (also refer to Note 2):

a. Emergence plus 30 minutes: X equals 2.

b. Emergence plus 50 minutes: X equals 8.

4. At the completion of P&FS support, stations will revert to para 1.3.4.1c(2)(a).

Note

1. The station will generate a nominal APP tape in accordance with para 1.3.4.2.

2. When the USB antenna is in program track, the 1218 operator prior to redesignating the antenna should notify the USB servo operator so he can monitor antenna performance during redesignate.

3. RSVP equatorial points are defined for P&FS as follows:

a. Emergence: X equals 3.

b. Midpoint between emergence and center of moon: X equals 9.

c. Center of moon: X equals 2.

d. Midpoint between occultation and center of moon: X equals 8.

e. Occultation: X equals 1.

1.3.4.2 ALSEP/P&FS Acquisition Messages

a. Purpose. To define the acquisition data generation procedures available in providing ALSEP/P&FS pointing data.

b. Participants. OPSR, 1218 operator, ALSEP NOM, and ALSEP NC.

c. Procedure. All supporting stations will generate a nominal APP drive tape for moon center (X equals 2) at a sample rate (selected at station option) of 1 sample/10 seconds minimum to 1 sample/90 seconds maximum, using the RSVP program. The pointing data will be generated for all scheduled support as soon as practical after notification of scheduled support.

1.3.4.3 P&FS High-speed Doppler Tracking Data

a. Purpose. To outline the high-speed tracking data that is to be transmitted to MCC.

b. Participants. OPSR, USB Tech, TDP Tech.

c. Procedure

(1) A station scheduled to support a P&FS tracking pass should configure to provide 2-way or 3-way Doppler tracking data.

(2) The Comm Mgr should set the designated station into the GSFC-CP with a 160 octal designation.

(3) The tracking data will be turned on or off per ALSEP NC direction.

(4) When high-speed data is transmitted to MCC, the stations are requested to record low-speed data (1 smp/min) and transmit postpass to GSFC. When transmitting low-speed data to GSFC, one message may not exceed 120 lines without a new header (refer to section 16).

1.3.4.4 P&FS Auto Cycle Operations

a. Purpose. To provide the data for determining the P&FS auto cycle AOS/LOS times.

b. Participants. OPSR, ALSEP NOM, ALSEP NC.

c. Procedure

(1) The ALSEP NC will provide the ALSEP NOM with the current vector to be used in generating ephemeris for determining the emergence/occulation times for Network scheduling.

(2) The ALSEP NC will provide the ALSEP NOM with the GMT of LOS for the last revolution preceding start of any station's phase III support. The ALSEP NOM will use the LOS GMT to calculate the P&FS predicted AOS/LOS using the following formula:

Example:	Rev. 460	LOS Equals	21:55:05
	Add Constant	Plus	01:46:38
	AOS Rev. 461	Equals	23:41:43
	Add Constant	Plus	00:11:46
	LOS Rev. 461	Equals	23:53:29
	Add Constant	Plus	01:46:38
	AOS Rev. 462	Equals	01:40:07
	Add Constant	Plus	00:11:46
	LOS Rev. 462	Plus	01:51:53

(3) The ALSEP NOM is responsible for providing the station(s) with the following P&FS data during phase III support.

(a) P&FS revolution number.

(b) GMT of emergence.

(c) GMT of AOS.

(d) GMT of LOS.

(e) GMT of occultation.

Note

P&FS orbital period is 01:59:21.

1.3.5 OPERATIONAL SCHEDULING

1.3.5.1 Two Station P&FS Tracking Selection for Phase II

a. Purpose. To provide the criteria for selection of Network stations in support of P&FS high-speed tracking requirements.

b. Participants. NESAF, NESAC, ALSEP NC, NOM, FOSO.

c. Procedure

(1) The selection of the two stations to track the P&FS for any given revolution should be such that the maximum obtainable geometric separation (north-south and east-west) is provided. This is required to obtain acceptable orbit determination for maintaining the P&FS ephemeris accuracy requirements.

(2) The station scheduling criteria for two-station tracking is shown in table 1-6.

(3) If the above stated criteria cannot be met due to station coverage, station downtime, or station scheduled to support other projects, GSFC Scheduling will coordinate a change of tracking pass with the Flight Operations Scheduling Office (FOSO).

Note

An 85-foot station will not be scheduled to support A5 and P1 simultaneously.

Table 1-6. Station Scheduling Criteria for Two Station Tracking

Station	ACN	BDA	CRO	CYI	GDS	GWM	HAW	MAD	MIL
ACN	2	3	3*	X	3	3	3	3*	3
BDA	3	2	3	3*	3*	3*	3*	3*	X
CRO	3*	3	2	3	3	3	3	3	3
CYI	X	3*	3	2	3*	3*	3*	X	3*
GDS	3	3*	3	3*	2	3*	3*	3	3*
GWM	3	3*	3	3*	3*	2	3*	3*	3*
HAW	3	3*	3	3*	3*	3*	2	3*	3*
MAD	3*	3*	3	X	3	3*	3*	2	3*
MIL	3	X	3	3*	3*	3*	3*	3*	2

Legend

2 - Indicated the 2-way station.

The following criteria will be used in scheduling the 3-way station in combination with a specific 2-way station.

3 - Indicates a preferable 3-way station.

3* - Indicates an acceptable 3-way station.

X - Indicates an unacceptable 3-way station.

1.3.5.2 ALSEP/P&FS Scheduling

a. Purpose. To define the criteria and configuration for scheduling ALSEP/P&FS support.

b. Participants. NESAF, NESAC, FOSO, ALSEP NC, ALSEP NOM.

c. Procedures

(1) The applicable portions of STDN No. 502.16, along with this procedure, will be used to schedule ALSEP/P&FS support.

(2) Each Tuesday, no later than 1800Z, FOSO will provide NOCC with an ALSEP/P&FS schedule request containing phase II support for the upcoming schedule week (Monday through Sunday). The request will also contain tentative phase II support for the following schedule week.

(3) GSFC (NESAF) will determine the stations for all ALSEP/P&FS support. An 85-foot station will not be scheduled to support A5 and P1 simultaneously. VAN will not be scheduled to support more than four downlinks. Five downlink support at 85-foot stations will be scheduled only when there are no other stations available to provide split support of the ALSEP packages.

(4) When a station is scheduled to support all downlinks simultaneously, the following criteria will apply:

(a) One station will be scheduled for all phase II and phase III support. The station will initially configure the uplink per the Network Operations Schedule.

(b) Two stations will be scheduled for the P&FS tracking revolutions. The second station will be scheduled for two-way (P&FS) and will be required to remote P&FS telemetry in addition to high-speed tracking data. The station supporting all ALSEP's will be required to remote P&FS high-speed tracking data only in addition to ALSEP real-time data.

(5) If equipment availability requires that two stations be scheduled to support ALSEP/P&FS, the downlinks will be distributed between the two stations. Uplink assignments and tracking modes will be per the Network Operations Schedule.

(6) The scheduled support is always telemetry receive and record and additional support will be indicated in the Network Operations Schedule. The following SUPIDEN numbers are assigned to the ALSEP and P&FS vehicle:

(a) 0781 - ALSEP-1 (A1)

(b) 0782 - ALSEP-2 (A2)

(c) 0783 - ALSEP-3 (A3)

(d) 0784 - ALSEP-4 (A4)

(e) 0785 - ALSEP-5 (A5)

(f) 0791 - P&FS-1 (P1)

(7) When STDN resources are such that all downlinks cannot be supported, the downlinks will be scheduled in accordance with the current ALSEP priority list (refer to table 2-5).

(8) The Confirmation Schedule Request Message (CSRM) will be transmitted to MCC each Thursday. The CSRM will be sectionalized on a daily basis, and will contain all the ALSEP and P&FS support, as well as other JSC support.

(9) Examples of the FOSO phase II schedule request message and the NESAF CSRM are presented in section 16 of this NOSP.

SECTION 2. TELEMETRY

2.1 GENERAL

STDN stations will provide the following telemetry support for ALSEP and P&FS:

a. Recording up to four TLM links (two-station support).

b. Recording up to six TLM links (single-station support).

c. Decommutating up to four TLM links simultaneously and transmitting:

(1) Two ALSEP's and one P&FS in any live or playback combination.

(2) One live or one playback ALSEP HBR (ASE or LSP) format plus one live or one playback P&FS.

2.1.1 BASIC TELEMETRY FORMAT DESCRIPTION FOR ALSEP

Each ALSEP can transmit PCM telemetry in a normal or contingency bit rate mode. In addition, the ASE and the LSP are capable of transmitting in a high bit rate mode. The basic characteristics of the ALSEP PCM telemetry formats are:

Normal Bit Rate	Contingency Bit Rate	ASE High Bit Rate	LSP High Bit Rate	LSP Contingency Bit Rate
1060 b/sec	530 b/sec	10,600 b/sec	3,5331/3 b/sec	1060 b/sec
10 b/wd	10 b/wd	20 b/wd	30 b/wd	30 b/wd
64 wd/frm	64 wd/frm	32 wd/frm	20 wd/subfrm	20 wd/subfrm
640 b/frm	640 b/frm	640 b/frm	1800 b/frm	1800 b/frm
603.733 msec/frm	1.21 sec/frm	60.37 msec/frm	509.43 msec/frm	1.698 sec/frm
			3 subfrm/frm	3 subfrm/frm

Note

1. Data is transmitted Most Significant Bit (MSB) first.

2. The 90:1 subframe uses the ID count located in word 3 for reference.

3. All ALSEP telemetry is PCM/Phase Modulation (PM) Split Phase (SØ).

Note (cont)

4. Frequency assignments for ALSEP are as follows:

ALSEP 1: 2278.5 MHz

ALSEP 2: 2278.0 MHz

ALSEP 3: 2276.0 MHz

ALSEP 4: 2279.5 MHz

ALSEP 5: 2275.5 MHz

2.1.2 BASIC TELEMETRY FORMAT DESCRIPTION FOR P&FS

The P&FS downlink will be PCM/PSK/PM at a data rate of 128 b/sec. Data can be downlinked in either the real-time or MEMORY READOUT (MRO) format. The basic characteristics of the P&FS PCM telemetry formats are:

a. 128 b/sec NRZM.

b. 8 b/wd.

c. 32 wd/frm.

d. 1 frm/2 sec.

e. 8 frm/data cycle.

f. 1 data cycle/16 sec.

Note

1. Downlink frequency: 2282.5 MHz

2. PCM/PSK/PM

3. Telemetry data subcarrier frequency: 32.768 kHz.

2.2 SINGLE-STATION SUPPORT

When scheduled for single-station support, stations will configure two (Microdyne 2200) VHF receivers for the additional downlinks after being downconverted from S-band to VHF.

2.2.1 RECEIVER CONFIGURATION

2.2.1.1 Microdyne 2200

a. Tuner	215-320 MHz (with appropriate crystal)
b. Crystal-select	crystal position
c. 1st L.O.	crystal

d. 2nd L.O. PM

e. Video Bandwidth 6.25 kHz

f. Video Coupling DC

g. AGC T/C 10.0 msec

h. IF Bandwidth 30 kHz

2.2.1.2 PM Demod (PMD 1151D)

a. IF Bandwidth 30 kHz

b. Loop Bandwidth 100 Hz

2.2.2 MIXER CONFIGURATION

The TLM mixer will be configured as follows:

Source	IRIG	Station
Microdyne No. 5	12	HAW, BDA
Microdyne No. 6	13	HAW, BDA
USB Mixer	EXT INPUT 1	
Microdyne No. 5	12	ACN, CRO, CYI, GWM, MIL
Microdyne No. 6	13	ACN, CRO, CYI, GWM, MIL
USB Mixer	EXT INPUT 1	

Note

The output of the TLM mixer will be patched to track 1 of the magnetic tape recorder.

2.2.3 CALIBRATIONS PROCEDURES

Prepass and postpass calibrations will be performed in conjunction with USB calibrations (refer to STDN No. 502.4).

2.3 MAGNETIC TAPE RECORDING INSTRUCTIONS

Recording speed will be 3-3/4 in./sec for the wideband recorder except during ASE high bit rate mode when the tape recorder will be run at 7-1/2 in./sec. If a station requires more than one tape during a view period, recorders No. 1 and 2 will be operated in series with recorder No. 2 being turned on 1-minute before recorder No. 1 runs out of tape. USB TDP data modem output (AC) will be played back to MCC upon request direct via Net 5. TPD data modem output is required only during

P&FS tracking orbits. Stations will ensure that clear annotation is made on the tape label so that no possible confusion could exist during analysis by the data users. The tape length will be determined by the station for the support required. The tape thickness is 1 or 1-1/2 mm and the real size is 10.5 or 14 in.

2.4 MAGNETIC TAPE RECORDER ASSIGNMENTS

Tape recorder assignments are contained in table 2-1. During Phase III support tracks 10 and 14 will be deleted from recording requirements. Additional recordings or redundant recordings of data may be made on spare tracks with labels properly annotated.

2.5 TIME CODE TRANSLATOR AND DATA PLAYBACK

2.5.1 TIME CODE TRANSLATOR

The output of the wideband magnetic tape recorder track No. 13 will be patched to the Time Code Translator. During recording, the front panel indicator on the translator should be checked periodically to ensure that it is updating every second and that the time indicated is the actual GMT (minus record/reproduce time). When MCC requests data playback, the appropriate magnetic tape track No. 13 will be patched to the Time Code Translator.

2.5.2 DATA PLAYBACK

When data playback is required from the tape being recorded the following will apply:

a. Recorders Operated in Parallel

(1) The backup tape recorder will be used for playback and the primary recorder will continue to record data.

(2) When tape playback is completed the recorders will be operated in the normal manner.

b. Recorders Operated in Series

(1) When notified that a tape playback is required the recorder not in use will be started and the other recorder will be configured for playback.

(2) When tape playback is completed a clean tape will be put on the recorder used for the playback. The recorder will then be operated in the normal manner.

c. Previous Support Playback. When a tape playback of previous support is required during real-time support, the backup recorder or recorder not in use will be used for playback.

2.6 PULSE CODE DECOMMUTATION

All stations will use the applicable formats and programs referred to in tables 2-2 and 2-3. A log for transmitted program errata is provided in table 2-4. TLM links will be processed as stated by the Network Operations Schedule or as otherwise directed by MCC during phase II. The ALSEP/P&FS link priorities are shown in tables 2-5 and 2-6. Stations with Manned Flight Telemetry Processor (MSFTP)-1 decommutators will be required to patch a set of ALSEP normal and high acquisition and distribution patchboards for each decom on station. Also patch one set of acquisition and distribution patchboards for P&FS.

Table 2-1. ALSEP and P&FS Recorder Assignment

TRK	Recorder No. 1	Mode	TRK	Recorder No. 2	Mode
1	USB mixer #1	Dir	1		
2	Servo Ref or 17kHz speed lock	Dir	2		
3	USB mixer #2	Dir	3	Patch redundant to	
4	Video-2278.5 MHz-ALSEP No. 1	FM	4	Recorder No. 1	
5	Video-2278.0 MHz-ALSEP No. 2	FM	5	(refer to para 2.3)	
6	Video-2276.0 MHz-ALSEP No. 3	FM	6		
7	Video-2279.5 MHz-ALSEP No. 4	FM	7		
8	Video-2275.5 MHz-ALSEP No. 5	FM	8		
9	36-bit BCD time code on 1 kHz (code 1)	FM	9		
10	Video-USB verification RCVR	FM	10		
11	Voice annotation	Dir	11		
12	Blank	Dir	12		
13	36-bit BCD time Code/1 kHz	Dir	13		
14	USB TDP-2.4 kb AC data	Dir	14		
TRK	Recorder No. 3	Mode	TRK	Recorder No. 4	Mode
1			1		
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		

Table 2-2. MSFTP-2 Decom/Simulator Formats and Programs

Seq. No.	Description	Format	Bit Configuration Format ID (Octal)	Vehicle ID
1048D	PSE - A1	1	10110 (26)	A1 - 010
	A2			A2 - 011
	A3			A3 - 001
	PSE - A4	2	10110 (26)	A4 - 110
	PSE - A5	3	10110 (26)	A5 - 100
	ASE HBR	4	10111 (27)	
	P&FS	5	11000 (30)	
	LSP CMPTR XFER	6	11001 (31)	
	LSP Dsply Mon.	7	11001 (31)	
1049S	PSE-A1, A2, A3	1		
	PSE - A4	2		
	PSE - A5	3		
	ASE HBR	4		
	P&FS	5		
	LSP HBR	6		

Table 2-2 A. Dynatronic DHS and Radiation DHE Decom/Simulator Formats and Programs

Seq. No.	Description	Format
454DS	PSE - All vehicles (mod.)	1
455RS	PSE - All vehicles (mod.)	1
454DD	PSE - All vehicles (mod.)	1
455RD	PSE - All vehicles (mod.)	1

Table 2-3. MSFTP-3 Decom Formats and Programs

Seq No.	Description	Format	Format ID	Vehicle ID
1057 MD	PSE A1	26	26	010
	A2			011
	A3			001
	A4			110
	A5			100
	ASE	27	27	
	P&FS	30	30	
	LSP CMPTR XFR	31	31	
	LSP DISPLAY	32	N/A	

Table 2-4. Log for Transmitted Program Errata

Seq No.	Errata	Date	Description	Station
1048D	A	10-25-72	Deletes DAC 45 from frame	All
1048D	B	11-09-72	Reprograms LSP FMT 6 FSUI's 11 & 12 to prevent EI generation in FS mode II	All
455RD	A	5-15-73	Makes bit rate 1060 b/sec.	All
1057MD	A	12-21-73	Enables MSFTP-3 CVW computer transfer	All

Table 2-5. Decom Link and A-G Restoration Priorities for Dual Station Support

Mission Support Period	Priorities					
A1, A2, A3, A4, A5, P1 to end of mission	A5	A3	A2	A4	A1	P1

Table 2-6. Decom Link Priorities for Single Station Support

Mission Support Period	Priorities				
A1, A2, A3, A4, A5 to end of mission	A2	A4	A1	A3	A5

2.7 MSFTP-1 SETUP INSTRUCTIONS FOR ALSEP, P&FS, AND LSP

See figures 2-1 through 2-5 for MSFTP-1 patching instructions.

2.7.1 SYNC ALLOWABLE ERRORS

Frame and Subframe	Search		Check		Lock
		Err	Frame	Err	Frame
	1 err	0	1	0	1

2.7.2 DIGITAL-TO-ANALOG CONVERTERS

DAC	Word	Frame
45	31	22
47	31	52
49	31	67

2.7.3 DAC CARD LOCATION

The Digital-to-Analog Converter (DAC) card location will be changed as follows:

DAC 45 from 10A8J13 to 10A8J0

DAC 47 from 10A8J7 to 10A9J0

DAC 49 from 10A8J5 to 10A10J0

2.8 MSFTP-2 PCM SETUP FOR ALSEP AND P&FS

2.8.1 WIDEBAND SIGNAL CONDITIONERS

Unit/Function	ALSEP Indication/Setting	P&FS Indication/Setting
BIT-RATE SELECTOR switch	2.120 kb/sec (NBR&LSP CBR) 1.060 kb/sec (CBR) 21.200 kb/sec (ASE HBR) 7.066 kb/sec (LSP HBR)	128 b/sec
CODE TYPE switch	SØ	NRZM

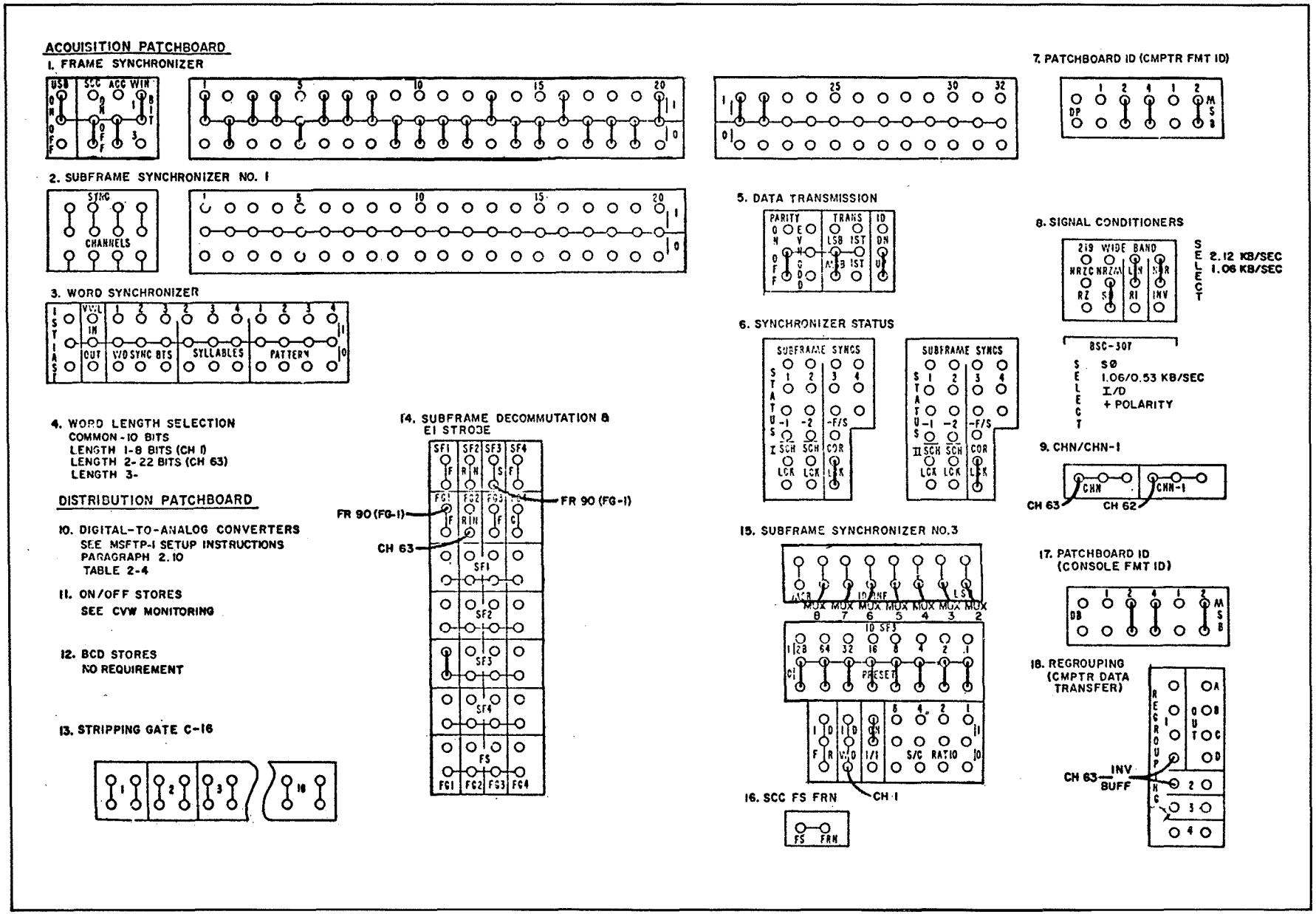

Figure 2-1. MSFTP-1 Patching Instructions for ALSEP (Normal Contingency Bit Rates)

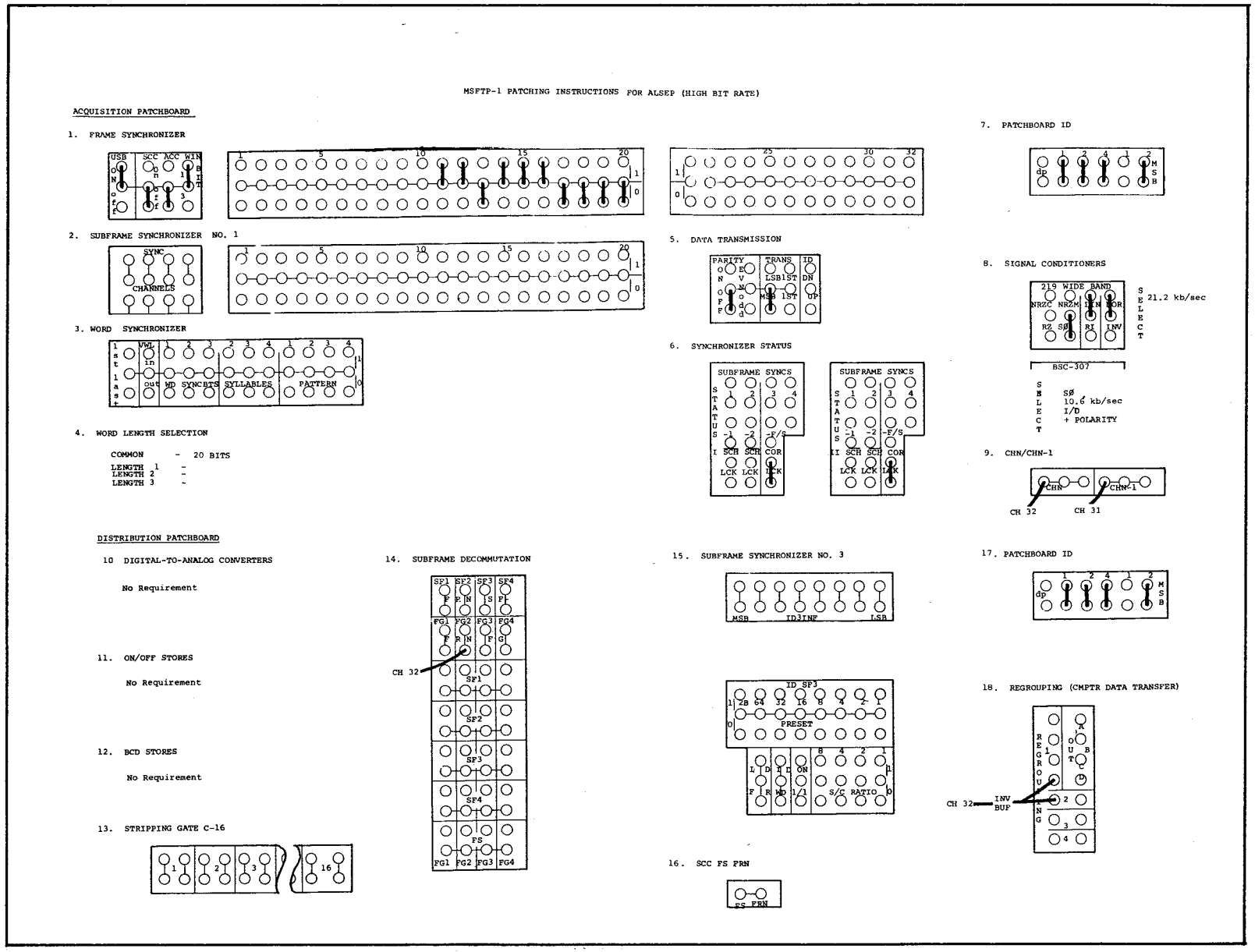

Figure 2-2. MSFTP-1 Patching Instructions for ALSEP (High Bit Rate)

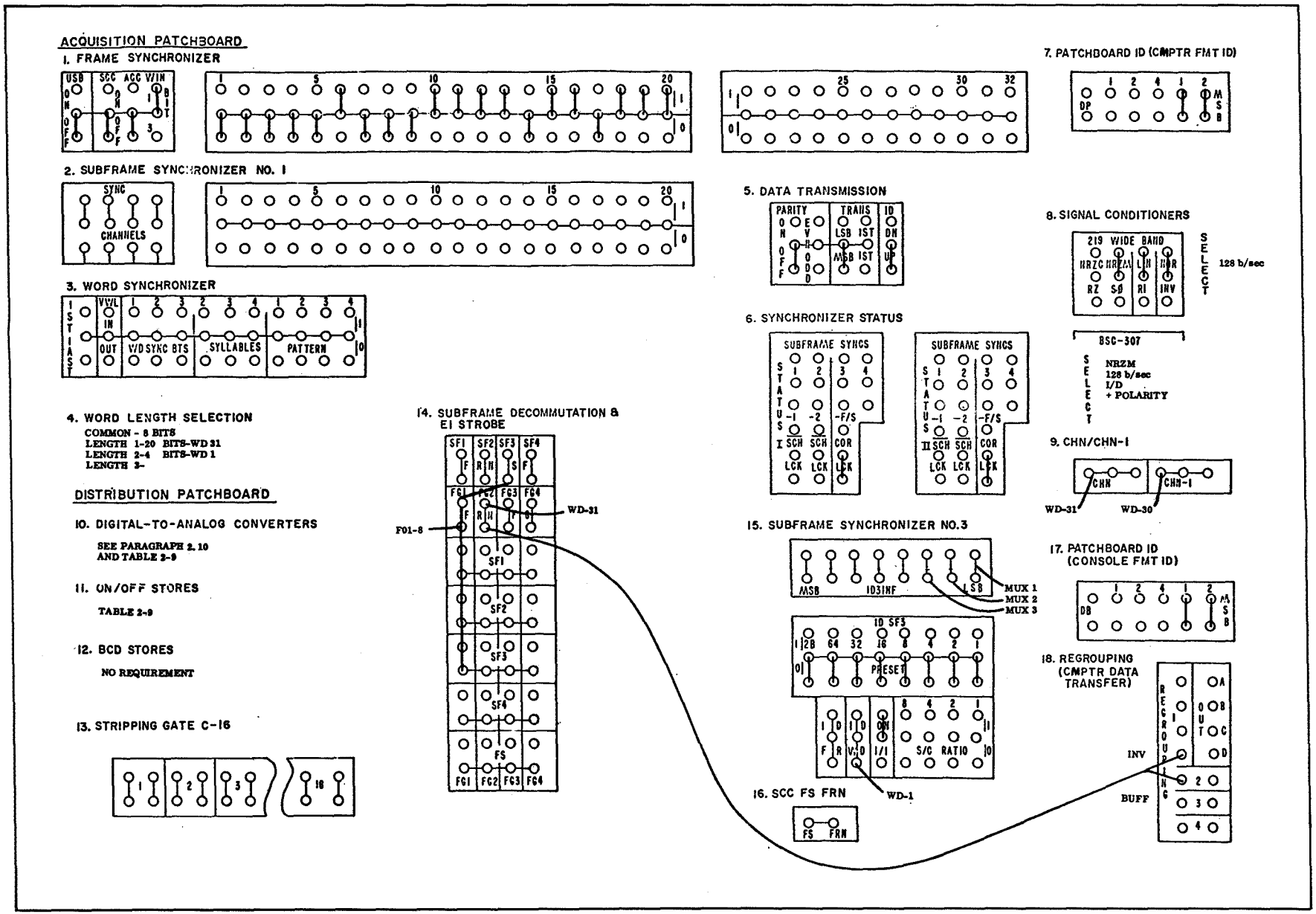

Figure 2-3. MSFTP-1 Patching Instructions for P&FS

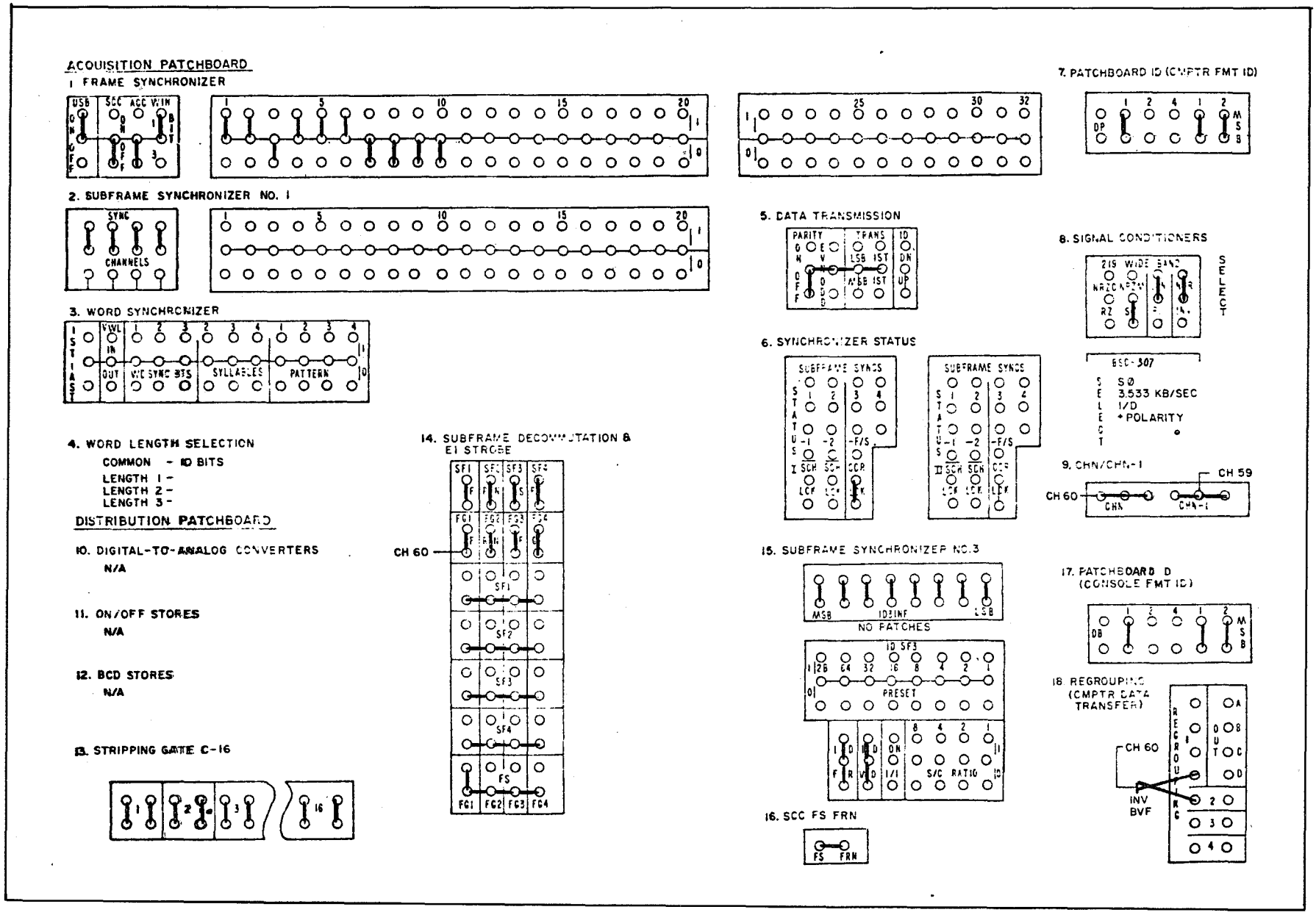

Figure 2-4. LSP MSFTP-1 Patching Instructions (Computer)

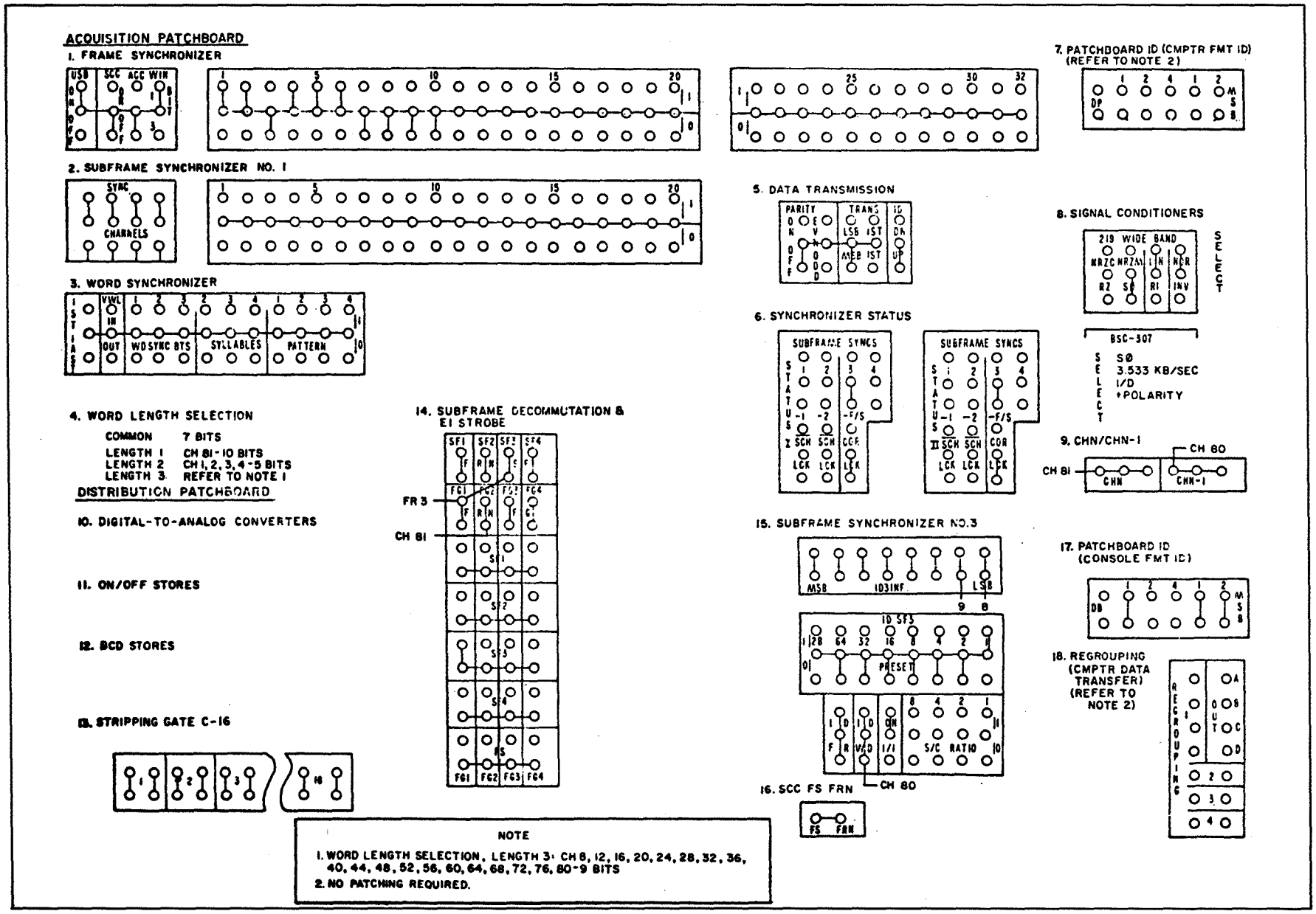

Figure 2-5. LSP MSFTP-1 Patching Instructions (Display)

Unit/Function	ALSEP Indication/Setting	P&FS Indication/Setting
Input voltage P-P switch	1-15	1-15
Loop BW switch	MED	MED
DETECTOR switch	I/D	I/D
MODE SELECT switch	LOCAL	LOCAL
DC restoration switch	IN	OUT
POLARITY	POS	POS

2.8.2 NARROWBAND SIGNAL CONDITIONERS

Unit/Function	ALSEP Indication/Setting
CODE TYPE switch	SØ
Input Voltage	1-15
Loop BW switch	MED
DETECTOR switch	I/D
MODE SELECT switch	PROGRAM*
DC restoration switch	IN
POLARITY	POS

*Local when in contingency

2.8.3 DECOMMUTATOR CONTROL FOR ALSEP AND P&FS

2.8.3.1 FS III Error: 1

2.8.3.2 Sync Allowable Errors for Data Downlink

Frame	I		II		III	
	01	02	Patt	Err	Patt	Err
	1	0	1	0	2	0

Note

ID Pattern Errors: PSE and P&FS - 2
LSP - 1

2.8.3.3 DAC Offset: None

2.8.3.4 Comp Det: Program

2.8.4 MSFTP-3 PCM SETUP

2.8.4.1 Signal Conditioners. The MSFTP-3 signal conditioners will be controlled by the decom program. Refer to table 2-7 for setup and indications.

2.8.4.2 MSFTP-3 Decommutator Control

a. Synchronizer and I/O Control Panel

Unit/Function	Indication/Setting
(a) SYNC BYPASS	NORMAL
(b) AUTO DATA INVERSION	PROGRAM
(c) DAC INHIBIT	OFF
(d) FORMAT CHANGE	OFF
(e) BINARY STORES	OFF
(f) DIGITAL STORES	NA
(g) COMP BUFF 1 INHIBIT	OFF
(h) COMP BUFF 2 INHIBIT	OFF
(i) COMP BUFF 1 PLAYBACK bit	Down
(j) COMP BUFF 2 PLAYBACK bit	Down

b. Central Control Unit

Unit/Function	Indication/Setting
(a) FORMAT SELECT	As required
(b) SENSE-1	As required
(c) SENSE-2	As required
(d) MODE	NORMAL

2.8.5 MSFTP-3 SENSE SWITCH OPTIONS

Sense switch options are as follows:

SENSE 1	SENSE 2	Option
OFF	OFF	ALSEP 1, 2, and 3 PSE processing
ON	OFF	ALSEP 4 PSE processing
OFF	ON	ALSEP 5 PSE processing

Table 2-7. Model 317 Signal Conditioner Configuration

Unit/Function	PSE		ASE		LSP		P&FS
	Normal Bit Rate	Contingency Bit Rate	High Bit Rate	Contingency Bit Rate	High Bit Rate	Contingency Bit Rate	High Bit Rate
DET POL	I/D	I/D	I/D	I/D	I/D	I/D	I/D
CODE TYPE	BIØ-L	BIØ-L	BIØ-L	BIØ-L	BIØ-L	BIØ-L	NRZ-M
LOOP BW	2	2	2	2	2	2	2
BIT RATE	1.060×10^3	5.30×10^2	10.60×10^4	1.060×10^3	3.533×10^3	1.060×10^3	1.28×10^2
MAN/PROG	PROG	PROG	PROG	PROG	PROG	PROG	PROG
SOURCE	1	1	1	1	1	1	1

Note

The Model 317 signal conditioner is controlled by the decom program. The settings are provided for station information.

Note

SENSE 1 and SENSE 2 switches must be properly set for the specific vehicle being processed. Improper combinations of these settings will provide erroneous printer, digital store and DAC outputs (wrong words).

2.9 MONITOR MODEL 329 PSK DEMOD SETUP

a. Loop bandwidth: 1

b. Source: as desired

c. Tracking: 10%

d. Filter: Internal

e. Bandwidth: 3.84×10^2

f. Subcarrier: 3.2768×10^4

2.10 COMPUTER BUFFER PATCHING FOR ALSEP AND P&FS

Refer to Network Operations Procedures for Telemetry Systems, STDN No. 502.2, Section 6 for MSFTP-1, 2, and 3 computer buffer patching.

2.11 EXCITER CONSOLE PATCHING FOR ALSEP

The following ALSEP measurements will be patched to the system monitor on exciter consoles in the USB area:

	MSFTP-1 and 2	MSFTP-3
a. Receiver AGC		
(1) ALSEP 1, 2 & 4 RCVR AGC prelimit level (AE-13 from	DAC 43	DAC 17
(2) ALSEP 3 & 5 (AE-19) RCVR A input signal level from	DAC 43	DAC 17
or		
(AE-20) RCVR B input signal level from	DAC 42	DAC 18
b. Transmitter Power		
ALSEP 1, 2, 3, & 4 (AE-15) Transmitter A RF power	DAC 45	DAC 19
or		
(AE-16) Transmitter B RF power	DAC 45	DAC 20

2.12 ALSEP/P&FS PARAMETER RECORDING/MONITORING

Refer to table 2-8 for ALSEP parameter monitoring locations, tables 2-9 through 2-13 for ALSEP parameters to be monitored, and table 2-14 for CVW voice reporting. Except for CVW's, recording of parameters listed in tables 2-9 through 2-13 is required only during playback to establish the time of a parameter change. CVW monitoring will be in accordance with para 1.3.2.4c(3). If recording of more than eight parameters is required, a second function/event recorder (DSS 559) will be used.

Table 2-8. ALSEP Parameter Monitoring Locations

Item No.	Vehicle No.	Para No.	Downlink			MSFTP-2			MSFTP-1				MSFTP-3		
			WD	FR	Bit	ADD	DS	DAC	WD	FR	DS	DAC	WD/FR	DS	DAC
1	1/2/3	CVW	46	All	3		1		44	All	1		FMT 26	8	
	Array				4		2				2		46	7	
	A/A2/D				5	FMT1	3				3			6	
					6		4				4			5	
					7	431	5				5			4	
					8		6				6			3	
					9		7				7			2	
					10		8				8			1	
2	4	CVW	5	All	3		1		3	All	1			8	
	Array				4		2				2		FMT 26	7	
	C				5		3				3		5	6	
					6	FMT 2	4				4			5	
					7	431	5				5			4	
					8		6				6			3	
					9		7				7			2	
					10		8				8			1	
3	5	CVW	7	All	3		1		5	All	1		FMT 26	8	
	Array				4		2				2		7	7	
	E				5		3				3			6	
					6	FMT 3	4				4			5	
					7	431	5				5			4	
					8		6				6			3	
					9		7				7			2	
					10		8				8			1	
4	All	AB04	33	12	3-10	FMT 1-300		12	31	13			FMT 26		12
						FMT 2-577		12				12	33/12		
						FMT 3-1050		12							
5	All	AB05	33	14	3-10	FMT 1-302		13	31	15			FMT 26		13
						FMT 2-601		13				13	33/14		
						FMT 3-1052		13							
	A1/2/3/4					FMT 1-314		14				14	FMT 26		14
6	Array	AL05	33	24	3-10				31	25			33/14		
	A/A2/ C/D					FMT 2-613									
	A5					FMT 3	1145	15				14	FMT 26		15
7	Array E	AB-11	33	73	3-10				31	74			33/73		
	A5					FMT 3	1150	16				16	FMT 26		16
8	Array	AB-13	33	76	3-10				31	77			33/76		

Note

Recorder speed is 2 mm/sec. Recorder timing is SDT with 1 minute frame rate from slow-code generator.

Table 2-9. ALSEP 1 Parameter Monitoring

Item	Parameter	When Required	Out of Limits Condition
1	AB04	All support periods.	Greater than 0002 octal.
2	AB05	All support periods.	Greater than 0002 octal.
3	AL05	Lunar night support periods.	Greater than 0030 octal.
4	CVW	All support periods.	NA

Table 2-10. ALSEP 2 Parameter Monitoring

Item	Parameter	When Required	Out of Limits Condition
1	AB04	All support periods.	Greater than 0002 octal.
2	AB05	SIDE on.	Greater than 0007 octal.
2A	AB05	SIDE standby.	Less than 0073 or greater than 0117 octal.
3	CVW	All support periods.	NA

Table 2-11. ALSEP 3 Parameter Monitoring

Item	Parameter	When Required	Out of Limits Condition
1	AB04	All support periods.	Greater than 0002 octal.
2	AB05	All support periods.	Greater than 0002 octal.
3	CVW	All support periods.	NA

Table 2-12. ALSEP 4 Parameter Monitoring

Item	Parameter	When Required	Out of Limits Condition
1	AB04	All support periods.	Less than 0171 or greater than 0215 octal.
1A	Word 15	SIDE on.	Static.
2	AB05	All support periods with CPLEE standby and SIDE on, off or standby.	Less than 0073 or greater than 0117 octal.
3	AB05	All support periods with CPLEE on and SIDE on, off, or standby.	Greater than 0005 octal.
4	CVW	All support periods	NA

Table 2-13. ALSEP 5 Parameter Monitoring

Item	Parameter	When Required	Out of Limits Condition
1	AB04	All support periods with:	
		LMS on and LEAM on.	Less than 221 or greater than 237 octal.
		LMS off and LEAM off.	Less than 000 or greater than 004 octal.
		LMS standby and LEAM standby.	Less than 110 or greater than 123 octal.
		LMS on and LEAM off.	Less than 032 or greater than 043 octal.
		LMS off and LEAM on.	Less than 164 or greater than 203 octal.
		LMS standby and LEAM off.	Less than 013 or greater than 023 octal.
		LMS off and LEAM standby.	Less than 073 or greater than 107 octal.

Table 2-13. ALSEP 5 Parameter Monitoring (cont)

Item	Parameter	When Required	Out of Limits Condition
1 (cont)	AB04	All support periods with:	
		LMS on and LEAM standby.	Less than 124 or greater than 140 octal.
		LMS standby and LEAM on.	Less than 204 or greater than 220 octal.
2	AB05	All support periods.	Less than 0220 or greater than 0257 octal.
3	AB11	All support periods.	Less than 00400 greater than 036 octal.
4	AB13	All support periods.	Less than 0330 or greater than 0377 octal.
5	CVW	All support periods.	NA
6	AG04	Lunar day.	Above 174 octal.

Table 2-14. ALSEP CVW Voice Reporting

RTC	Vehicle No.
017	1, 2, 3, 4, 5
022	1, 2, 3, 4, 5
063	1, 2, 3, 4
064	1, 2, 3, 4, 5
067	2, 3, 4
070	1, 2, 3, 4
071	1, 2, 3, 4
072	1, 2, 3, 4

Table 2-14. ALSEP CVW Voice Reporting (cont)

RTC	Vehicle No.
076	1, 2, 3, 4
101	1, 4
113	5
117	5
123	3
134	3
140	2, 5
152	2, 5

2.13 ALPHANUMERIC LISTING FOR LSP READOUTS

2.13.1 GENERAL

The alphanumeric listing for LSP readouts is shown in table 2-15.

2.13.2 HOUSEKEEPING PARAMETERS

a. The analog housekeeping parameters will be read out, when requested by MCC, in octal. Construction of the octal word (8 bits) is shown below. All syllables will be read out unless otherwise specified by MCC.

Syllable 1		Syllable 2		Syllable 3		Syllable 4	
2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
Octal digit 1		Octal digit 2		Octal digit 3			

b. The analog housekeeping parameters are AB-4, AB-5, AE-3, AE-4, AE-24 AT-16, DP-2, DP-3, DP-5, DP-10, and DP-14.

2.13.3 STATUS PARAMETERS

a. Parameters DP-18 and DP-19 will be read out as a "1" or a "0".

b. Parameter DP-20 will be read out as two binary digits, i.e., "10".

Table 2-15. Alphanumeric Listing for LSP Readouts

Measurement No.	MSFTP-1 Decom WD	FR	Sc	MSFTP-1 Decom Bit No.	MSFTP-2 (Display Program) Address	MSFTP-2 Bit No.	MSFTP-2 Sim Address	MSFTP-3 Display Word	Remarks
AB-4	16	2	1	8 & 9	2047	1 & 2	1566	116	Bits 2^7 & 2^6
	20	2	1	8 & 9	2053	1 & 2	1567	116	Bits 2^5 & 2^4
	24	2	1	8 & 9	2057	1 & 2	1570	116	Bits 2^3 & 2^2
	28	2	1	8 & 9	2063	1 & 2	1571	116	Bits 2^1 & 2^0
AB-5	64	2	1	8 & 9	2127	1 & 2	1602	118	Bits 2^7 & 2^6
	68	2	1	8 & 9	2133	1 & 2	1603	118	Bits 2^5 & 2^4
	72	2	1	8 & 9	2137	1 & 2	1604	118	Bits 2^3 & 2^2
	76	2	1	8 & 9	2143	1 & 2	1605	118	Bits 2^1 & 2^0
AE-3	16	1	1	8 & 9	2051	1 & 2	1543	112	Bits 2^7 & 2^6
	20	1	1	8 & 9	2055	1 & 2	1544	112	Bits 2^5 & 2^4
	24	1	1	8 & 9	2061	1 & 2	1545	112	Bits 2^3 & 2^2
	28	1	1	8 & 9	2065	1 & 2	1546	112	Bits 2^1 & 2^0
AE-4	64	1	1	8 & 9	2131	1 & 2	1557	115	Bits 2^7 & 2^6
	68	1	1	8 & 9	2135	1 & 2	1560	115	Bits 2^5 & 2^4
	72	1	1	8 & 9	2141	1 & 2	1561	115	Bits 2^3 & 2^2
	76	1	1	8 & 9	2145	1 & 2	1562	115	Bits 2^1 & 2^0
AE-24	48	3	1	8 & 9	2110	1 & 2	1530	129	Bits 2^7 & 2^6
	52	3	1	8 & 9	2114	1 & 2	1531	129	Bits 2^5 & 2^4
	56	3	1	8 & 9	2120	1 & 2	1532	129	Bits 2^3 & 2^2
	60	3	1	8 & 9	2124	1 & 2	1533	129	Bits 2^1 & 2^0
AT-16	32	1	1	8 & 9	2071	1 & 2	1547	113	Bits 2^7 & 2^6
	36	1	1	8 & 9	2075	1 & 2	1550	113	Bits 2^5 & 2^4
	40	1	1	8 & 9	2101	1 & 2	1551	113	Bits 2^3 & 2^2
	44	1	1	8 & 9	2105	1 & 2	1552	113	Bits 2^1 & 2^0
DP-1	1	0	2	1 to 5	2005	1 to 5	1506	101	5 MSB of geophone 1
	Supercommed words 5, 9, 13 and every 4th word thru word 77-0-2			1 to 7	2012	1 to 7	1512	101	7 LSB of geophone 1
DP-2	16	3	1	8 & 9	2050	1 & 2	1520	107	Bits 2^7 & 2^6
	20	3	1	8 & 9	2054	1 & 2	1521	107	Bits 2^5 & 2^4
	24	3	1	8 & 9	2060	1 & 2	1522	107	Bits 2^3 & 2^2
	28	3	1	8 & 9	2064	1 & 2	1523	107	Bits 2^1 & 2^0
DP-3	32	3	1	8 & 9	2070	1 & 2	1524	108	Bits 2^7 & 2^6
	36	3	1	8 & 9	2074	1 & 2	1525	108	Bits 2^5 & 2^4
	40	3	1	8 & 9	2100	1 & 2	1526	108	Bits 2^3 & 2^2
	44	3	1	8 & 9	2104	1 & 2	1527	108	Bits 2^1 & 2^0

Table 2-15. Alphanumeric Listing for LSP Readouts (cont)

Measurement No.	MSFTP-1 Decom WD	FR	Sc	MSFTP-1 Decom Bit No.	MSFTP-2 (Display Program) Address	MSFTP-2 Bit No.	MSFTP-2 Sim Address	MSFTP-3 Display Word	Remarks
DP-5	64	3	1	8 & 9	2130	1 & 2	1534	110	Bits 2^7 & 2^6
	68	3	1	8 & 9	2134	1 & 2	1535	110	Bits 2^5 & 2^4
	72	3	1	8 & 9	2140	1 & 2	1536	110	Bits 2^3 & 2^2
	76	3	1	8 & 9	2144	1 & 2	1537	110	Bits 2^1 & 2^0
DP-6	2	0	2	1 to 5	2007	1 to 5	1507	102	5 MSB of geophone 2
	Supercommed word 6, 10, 14 and every 4th word thru word 78-0-2			1 to 7	2013	1 to 7	1513	102	7 LSB of geophone 2
DP-10	48	1	1	8 & 9	2111	1 & 2	1553	114	Bits 2^7 & 2^6
	52	1	1	8 & 9	2115	1 & 2	1554	114	Bits 2^5 & 2^4
	56	1	1	8 & 9	2121	1 & 2	1555	114	Bits 2^3 & 2^2
	60	1	1	8 & 9	2025	1 & 2	1556	114	Bits 2^1 & 2^0
DP-11	3	0	2	1 to 5	2010	1 to 5	1510	103	5 MSB of geophone 3
	Supercommed word 7, 11, 15 and every 4th word thru word 79-0-2			1 to 7	2014	1 to 7	1514	103	7 LSB of geophone 3
DP-14	32	2	1	8 & 9	2067	1 & 2	1572	117	Bits 2^7 & 2^6
	36	2	1	8 & 9	2073	1 & 2	1573	117	Bits 2^5 & 2^4
	40	2	1	8 & 9	2077	1 & 2	1574	117	Bits 2^3 & 2^2
	44	2	1	8 & 9	2103	1 & 2	1575	117	Bits 2^1 & 2^0
DP-16	4	0	2	1 to 5	2011	1 to 5	1511	104	5 MSB of geophone 4
	Supercommed word 8, 12, 16 and every 4th word thru word 80-0-2			1 to 7	2015	1 to 7	1515	104	7 LSB of geophone 4
DP-17	81	0	2	1 to 10	2004	1 to 10	1505	001	Frame sync
DP-18	8	0	2	8	2016	1	1516-SF1 1564-SF3 1541-SF2	105	
DP-19	8	0	2	9	2016	2	1516-SF1 1564-SF3 1541-SF2	105	
DP-20	12	3	1	8 & 9	2044	1 & 2	1517	106	
DP-21	80	0	2	8 & 9	2047-2151	1 & 2	1540-SF1 1606-SF3 1563-SF2	111	Subframe ID

2.13.4 GEOPHONE PARAMETERS

The geophone parameters DP-1, DP-6, DP-11, and DP-16 will be read out in octal (12 bits). Both syllables will be read out unless otherwise specified by MCC. Construction of the octal word is shown below.

Syllable 1					Syllable 2						
5 MSB					7 LSB						
1	2	3	4	5	1	2	3	4	5	6	7
Octal digit 1			Octal digit 2		Octal digit 3				Octal digit 3		

2.14 SPECIAL ALSEP AND P&FS FM/FM PARAMETER REMOTING

2.14.1 Selected stations may be required to configure a MSFTP-2 decom and VCO's EMR 4900 mixer to remote MSFTP-2 DAC outputs on requested designated VCO's to MCC.

2.14.2 On request from ALSEP NC, perform the following calibration procedure using the MSFTP-2 D-A calibration controls and decom errata.

a. Load Errata (to be determined).

b. Set D-A switch 1-24 to CAL.

c. Set CAL DATA SELECT switch to 0%.

d. Using NORMAL-INVERTED SELECTION switch, invert DAC requested 1, 2, 3, etc.

e. Return D-A DATA CAL switch back to DATA on MSFTP-2.

f. On EMR 4900 set VCO's requested 1, 2, 3, etc., to mixer 1 output and proceed with 5 step cal 0, 25, 50, 75, 100 using EMR 4900 internal cal voltage switch until told to terminate by Houston TLM.

g. On completion of special remoting, load the second portion of the errata to restore the original program.

2.14.3 A set of discriminators and a stripchart recorder will be configured to monitor the EMR 4900 mixer output on station. Recorder speed is station option.

2.15 IOCC PATCHING

2.15.1 GENERAL

This paragraph details the mandatory patching for station status words and station patching for the IOCC. Where noted, console event location is at the discretion of the station.

Note

Refer to STDN No. 502.25, Section 8, for logic figures and patching instructions.

2.15.2 IOCC DECODER OUTPUT PATCHING

ALSEP/P&FS decoder output patching instructions are given in table 2-16.

Table 2-16. ALSEP/P&FS Decoder Output Patching

Format	Format ID		Decoder Taper Pin	Decoder Patch Coord*			
	Binary	Octal		1	2	3	4
ALSEP	01000	10	C-2	C22Y	C10DD	C30CC	C24CC
P&FS	11000	30	H-3	C25Y	C14CC	C20CC	C27CC
* Indicator selections is at station discretion.							

2.15.3 COMMAND MODE STATUS

Command mode status IOCC patching for ALSEP/P&FS are given in table 2-17.

Table 2-17. ALSEP/P&FS Command Mode Status

Signal	Patch From	Patch To*
Mode II F/C	C16V	
Mode I F/C	C16T	
Mode I M&O	C18V	
MAP Overide ON	C18T	
MQP Overide OFF	C20V	
ALSEP (1) **	C20T	
ALSEP (2) **	C21T	
ALSEP (3) **	C21V	
ALSEP (4) **	C23T	
ALSEP (5) **	C23V	
ALSEP (6) **	C10U	
* Console event location is at station discretion. ** ( ) Indicates critical group number.		

Table 2-17. ALSEP/P&FS Command Mode Status (cont)

Signal	Patch From	Patch To*
ALSEP SYS TSTD	C9V	
ALSEP P&FS SYS TSTD	C10V	
Sys Good	C12U	
Sys Bad	C12V	

* Console event location is at station discretion.

** ( ) Indicates critical group number.

2.15.4 USB STATION STATUS

USB station status words for ALSEP/P&FS are given in table 2-18.

Table 2-18. USB Station Status Word for ALSEP/P&FS

ISA Status Bit	Indication
2^5	SLV PM receiver lock
2^{12}	CSM PM receiver lock
2^{18}	P&FS subc 32.768 kHz

SECTION 4. UNIFIED S-BAND

4.1 GENERAL

4.1.1 ALSEP SUPPORT

USB system support for ALSEP will be provided by ACN, BDA, CRO, CYI, ETC, GDS, GWM, HAW, MAD, MIL, and VAN. Station support will consist of transmitting commands (except ETC) and providing telemetry data to other on-station systems.

4.1.2 P&FS SUPPORT

a. USB system support for P&FS will be provided by ACN, BDA, CRO, CYI, ETC, GDS, GWM, HAW, MAD, MIL, and VAN. Station support will consist of transmitting commands (except ETC), providing tracking data (except VAN), and providing telemetry data to other on-station systems.

b. High-and low-speed tracking data will be recorded during tracking orbits only. During support of tracking passes, MCC will require high-speed tracking data in real time, unless otherwise specified in the Network Operations Schedule.

c. Recorded low-speed data (1 s/min) will be transmitted postpass to GSFC. One message may not exceed 120 lines without a new heading (see section 16 of this NOSP.)

4.2 PREDICTED COVERAGE

ALSEP and P&FS support coverage descriptions are provided in section 1 of this NOSP.

4.3 LINK DESCRIPTION

4.3.1 ALSEP, P&FS FREQUENCIES AND MODES

Table 4-1 gives the uplink and downlink frequencies for ALSEP and P&FS; table 4-2 the uplink modes; table 4-3 the ALSEP downlink modes; and table 4-4 P&FS downlink modes.

4.3.2 ALSEP UPLINK MODULATION INDEX

Using the wave analyzer and digital voltmeter, adjust the uplink modulation level for a 0.169 reading on the Digital Vacuum Tube Voltmeter (VTVM). This corresponds to 3-rad deviation. When making this adjustment, the receiver loop filter must be in NARROW.

4.3.3 UPLINK POWER

Uplink power for ALSEP and P&FS support will be as follows:

a. 30 ft. stations: 10 kW.

b. 85 ft. stations: 2 kW.

Table 4-1. S-band Uplink and Downlink Frequencies

Vehicle	Uplink	Downlink
P&FS 1 (P1) Apollo 15	2101.8 MHz	2282.5 MHz
ALSEP 1 (A1) Apollo 12	2119.0 MHz	2278.5 MHz
ALSEP 2 (A2) Apollo 15	2119.0 MHz	2278.0 MHz
ALSEP 3 (A3) Apollo 16	2119.0 MHz	2276.0 MHz
ALSEP 4 (A4) Apollo 14	2119.0 MHz	2279.5 MHz
ALSEP 5 (A5) Apollo 17	2119.0 MHz	2275.5 MHz

Table 4-2. Uplink Modes

Mode	Information	Modulation Technique	Subcarrier Frequency	Peak Subcarrier Deviation	Peak Carrier Deviation	Carrier Suppression
00	-	-	-	-	-	No carrier
03	Updata	PSK/FM/ PM (P&FS)	70 kHz	5.0 kHz	1.85 rad	10.15 dB
09	Carrier only	-	-	-	-	-
16	Updata	PSK/PM (ALSEP)	-	-	3.0 rad	15.4 dB

Table 4-3. ALSEP Downlink Modes

Mode	Information	Modulation Technique	Peak Carrier Deviation	Carrier Suppression
01	530 b/sec PCM	PM	1.25 rad	10 dB
02	1060 b/sec PCM	PM	1.25 rad	10 dB
03	10.6 kb/sec PCM	PM	1.25 rad	10 dB
04	3.533-1/3 kb/sec	PM	1.25 rad	10 dB

Table 4-4. P&FS Downlink Modes

Mode	Information	Modulation Technique	Subcarrier Frequency	Peak Subcarrier Deviation	Peak Carrier Deviation	Carrier Suppression
01	Carrier Only	-	-	-	-	-
02	128 b/sec PCM	PCM/PSK/PM	32.768 kHz (Squarewave)	Biphase $\pm 180^{\circ}$	1.0 rad	5.35 dB

4.4 OPERATIONS

4.4.1 EQUIPMENT CONFIGURATION

The ALSEP/P&FS USB configurations are shown in figures 4-3 and 4-4. The configuration may vary depending on individual station capabilities. As many as six downlinks may be supported by utilizing the four S-band receivers for four downlinks and the VHF downconverters in conjunction with the TLM receivers (Microdyne) for two downlinks.

Note

Telemetry and angle channel phase shifter settings for each ALSEP and the P&FS downlink should be recorded to facilitate configuration changes.

4.4.2 PREPASS CHECKLIST

4.4.2.1 General. The following mission controlled USB system settings will be used in conjunction with section 4 of STDN Network Operations Procedures for Unified S-band System, STDN 502.4. This NOSP will take precedence over STDN 502.4 if a conflict exists.

4.4.2.2 ALSEP Prepass Checklist

a. Receiver/Exciter

(1) Exciter Console

(a) Acquisition Control Panel Switch Settings

Unit/Function	Indication/Setting
1. Spacecraft position	Zenith
2. Bias Bandwidth	WIDE
3. RCVR 1	STDN (set to DSN for 530 b/sec)
(b) Synthesizer	Set for 22.072917 MHz
(c) Exciter Control Panel	
1. Modulation Selector	ALSEP
2. Exc VCO Selector	Release all pushbuttons
3. Acquisition Sweep	RCVR 1

(2) Receiver 1 Console

(a) Telemetry Bandwidth	4.5 kHz (Mode 1 or 2) 60 kHz (Mode 3) 20 kHz (Mode 4)
(b) Loop Bandwidth	NARROW
(c) AGC Bandwidth	NARROW
(d) VCO Select	2

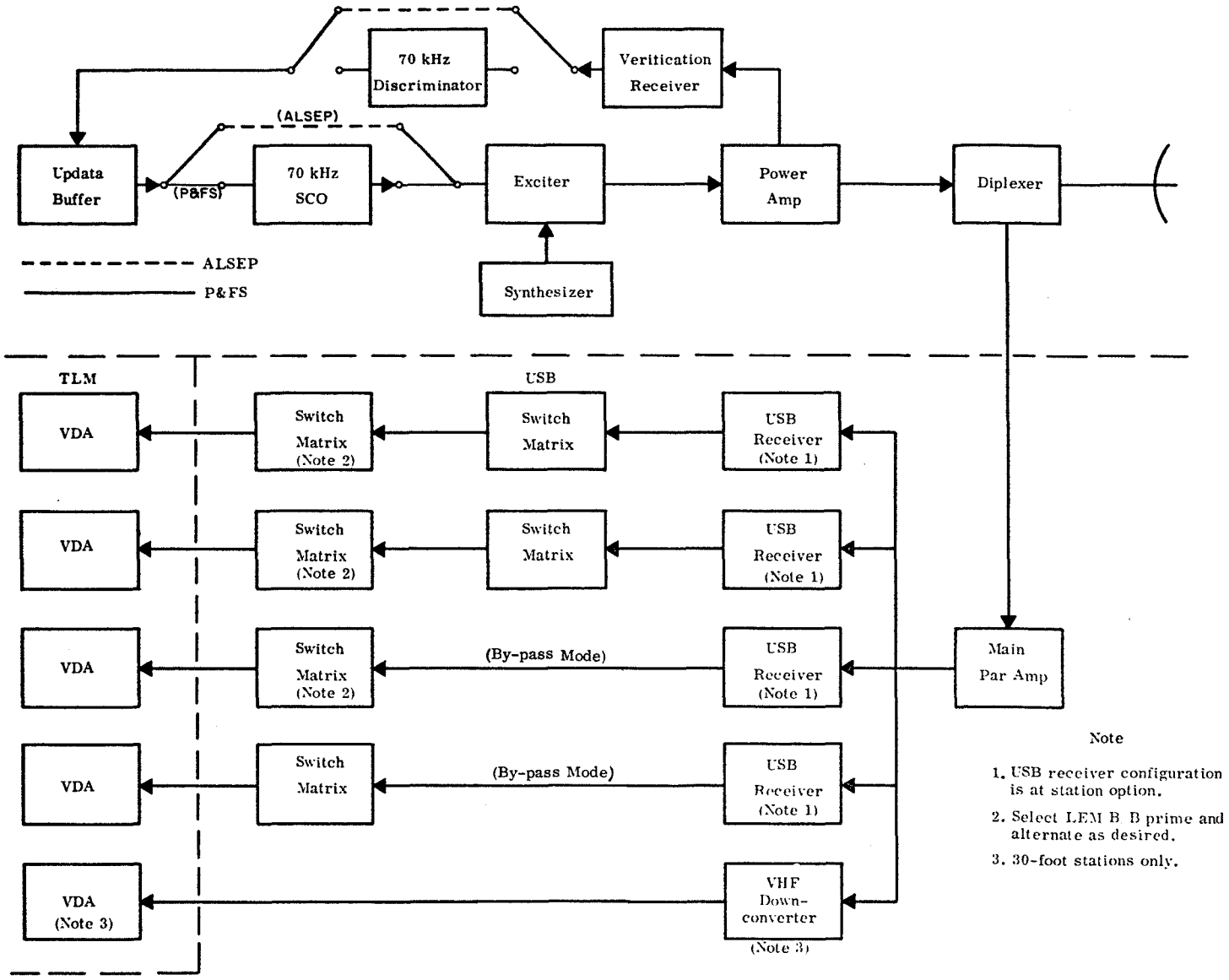

Figure 4-1. 30- and 85-foot USB Configuration

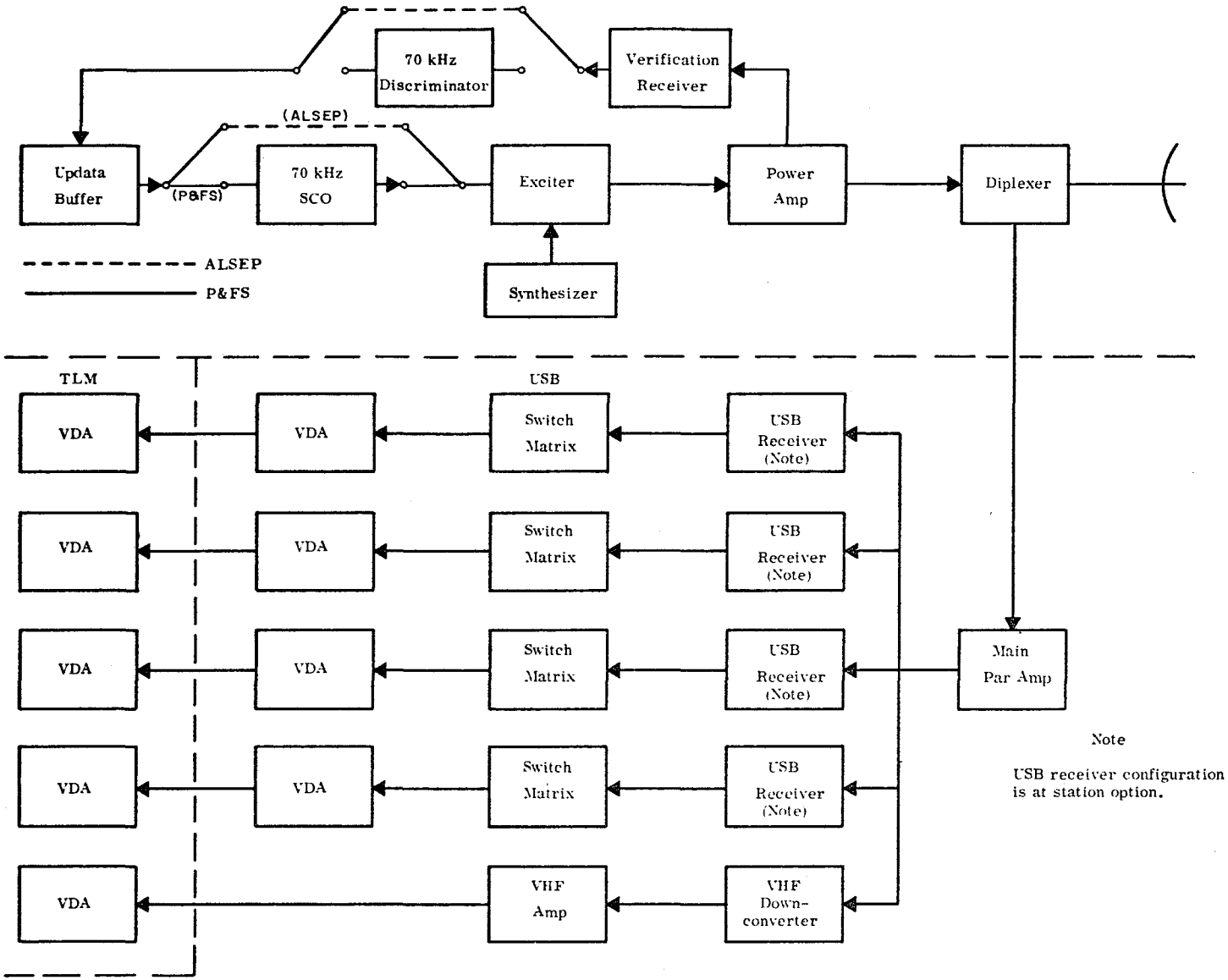

Figure 4-2. 30-foot Split Station USB Configuration

Unit/Function	Indication/Setting
(e) Remote VCO Control Panel. ALSEP frequency to be supported will be dialed into VCO control panel position 2.	
1. ALSEP 1	2278.500 MHz
2. ALSEP 2	2278.000 MHz
3. ALSEP 3	2276.000 MHz
4. ALSEP 4	2279.500 MHz
5. ALSEP 5	2275.500 MHz
(f) Receiver Loop filter	SHORT
(g) Acquisition Control	Adjust until frequency counter indicates the nominal ALSEP frequency to be supported.

(3) Receiver 2 Console: Configure the receiver 2 control panel the same as receiver 1 except that the ALSEP frequency to be supported will be dialed into the remote VCO position 2.

(4) Receivers 3 and 4. Configure receivers 3 and 4 the same as receiver 1, except proper VCO module must be selected for ALSEP frequency to be supported.

(5) Receiver Synthesizers

(a) Power ON/OFF	ON
(b) Synthesizer Mode	REMOTE
(c) Search Decade Selector	OFF

b. RF Control Console

(1) SCO Mode Panel

(a) SCO Mode switch	3
(b) TEST/OPERATE switch	OPERATE
(2) Intermediate Mode Switch (installed by EI 4583)	1-8

c. System Monitor Analog Data Recorder

Chart speed	STOP (Change to 2 mm/sec when required).

d. Verification Receiver

(1) Crystal Installed	ALSEP
(2) Crystal Select	2

Unit/Function	Indication/Setting
(3) Demodulator Installed	PMD-120A-1
(4) Video Output	Adjusted for 0 dB with uplink modulation ON per EMD (3)-17C-275.
(5) Video Filter	12.5 kHz

e. Switch Matrix. Verify matrix configuration shown in figure 4-3 or 4-4.

4 4.2.3 P&FS Prepass Checklist

a. Receiver/Exciter

(1) Exciter Console

(a) Acquisition Control Panel

Bias Bandwidth	WIDE
(b) Synthesizer	Set to 21.893772 MHz

(c) Exciter Control Panel

VCO selector	1

(2) Receiver 1 Console Control Panel

(a) Telemetry Bandwidth	60 kHz
(b) AGC Bandwidth	MEDIUM
(c) Loop Bandwidth	MEDIUM
(d) VCO select	3
(e) Remote VCO Control Panel	2282.500
(f) Receiver Loop Filter	OPERATE
(g) Acquisition Control	With MOM SHORT PBI depressed, adjust ACQ control for nominal P&FS downlink VCO frequency.

(3) Range Receiver Control Panel

Input Selector	Selected to RCVR as applicable for doppler data.

Unit/Function	Indication/Setting

(4) Receiver 2 Console. Configure receiver No. 2 control panel the same as receiver No. 1.

Receiver Synthesizer

(a) Power ON/OFF	ON
(b) Synthesizer Mode	Remote
(c) Search Decade Selector	OFF

b. RF Control Console

SCO Mode Selector

(1) Interim Mode Switch (installed by EI 4583)	1-8
(2) SCO Mode Switch	3

c. System Monitor

Analog Data Recorder

Chart speed	STOP (Change to 2 mm/sec when required.)

d. Switch Matrix. Verify matrix configuration shown in figure 4-3 or 4-4.

e. TDP

(1) TDP Local Control Panel

(a) Data Select	Receiver 1 and/or Receiver 2
(b) TTY Frame Rate	1/min
(c) Reperforator Rate	NORMAL

(2) TDP Rear Control Panel

(a) Communications Heading

Character 3 and 4: DD

(b) NORMAL/REDUCED RATE switch	NORMAL

4.4.3 VEHICLE AND STATION ID FOR P&FS

4.4.3.1 Vehicle ID. The vehicle ID will be as follows:

a. Set TTY character 9 for an octal 5.

b. HSD bits will be as follows:

Bit 17 equals a 1, bit 18 equals a 0, and bit 19 equals a 1.

4.4.3.2 Station ID. Station ID will be in accordance with STDN 502.4, except for MILX. MILX will use station ID's listed for MIL.

4.4.4 SUPIDEN NUMBER

4.4.4.1 The Supiden number for P&FS is 0791.

4.4.4.2 TTY characters and high-speed bits will be set as follows:

TTY Char 5	0
HS Bit 123	0
HS Bit 124	0
HS Bit 125	0

4.4.5 ACQUISITION PROCEDURES

4.4.5.1 ALSEP Downlink Acquisition. Refer to STDN 502.4.

4.4.5.2 ALSEP Uplink Acquisition. Refer to STDN 502.4.

4.4.5.3 P&FS Two-way Acquisition

a. Refer to STDN 502.4

b. Maximum sweep range required is ±37 kHz.

c. Handover Procedures. For the purpose of discussion, the term "outgoing station" refers to the two-way controlling station. The term "incoming station" refers to the three-way station receiving the handover. The procedure for normal handover is as follows:

(1) Initiation of Exciter Sweep. At least 30 seconds prior to the scheduled handover time, the incoming station should initiate exciter sweep. As in all acquisitions using sweep, the aim is to use the narrowest range which will contain all the frequency uncertainties which may be reasonably expected. Short the synthesizer loop and switch the sweep selector to EXC.

(2) Transmitter Drive Switching. One-second before scheduled transmitter on time, the incoming station should switch transmitter drive to ON. One-second later, the outgoing station should terminate transmission. A count-down cue will be provided to each station so that these times can be accurately controlled.

(3) Handover Completion. Use the monitors to establish that two-way lock is valid. When valid two-way lock is indicated, select NORMAL MODULATION ON.

4.4.5.4 P&FS Downlink Acquisition. Due to expected signal strength, the manual downlink acquisition mode should be used. Refer to STDN 502.4.

4.5 RECORDERS

4.5.1 GENERAL

a. USB stations record each parameter listed in para 4.5.3 for recorder No. 3. Station personnel may use any of the blank channels to record parameters they consider necessary for systems analysis during operational support.

b. Recorders No. 1 and 2 will be configured in accordance with STDN No. 502.4.

4.5.2 RECORDER SPEED

Recorders will be at a speed of 2 mm/sec.

4.5.3 PEN ASSIGNMENTS

Pen assignments for Recorder No. 3 (DSS No. 658) are given in table 4-5.

Table 4-5. Recorder No. 3 Pen Assignments (DSS No. 658)

Pen No.	Event	Pen No.	Analog
E1	NASA 28-bit Code	A1	ALSEP analog AGC (Receiver prelimit)
E2		A2	ALSEP transmitter AGC
E3		A3	ALSEP Receiver AGC (Receiver prelimit)
E4		A4	ALSEP transmitter AGC
E5		A5	
E6		A6	
E7		A7	
E8		A8	
E9	NASA 28-bit Code		

4.5.4 MAGNETIC TAPE RECORDERS

Parameters to be recorded on magnetic tape in the telemetry area will be configured in accordance with STDN No. 502.4.

4.5.5 ALSEP RECEIVER AND TRANSMITTER TELEMETERED AGC

a. Receiver AGC (Prelimit) ALSEP 1 AE-13)

Signal Strength (dBm)	DAC Output (Vdc)	PCM Count (Decimal)
-150	3.12	80
-140	3.32	85
-130	3.52	90
-120	3.72	95
-110	4.43	113
-100	5.93	151
-90	6.52	166
-80	6.68	170
-70	6.76	172

b. Transmitter AGC ALSEP 1 and 4 (AE-15 [Transmitter A]; AE-16 [Transmitter B]).

AGC (Vdc)	DAC Output (Vdc)	PCM Count (Decimal)
0.968	1.936	050
1.956	3.912	100
2.944	5.888	150
4.999	9.998	254

c. Receiver AGC (Prelimit) ALSEP 4 (AE-13)

Signal Strength (dBm)	DAC Output (Vdc)	PCM Count (Decimal)
-150	3.36	86
-140	3.44	88
-135	3.48	89
-130	3.52	90
-125	3.56	91
-120	3.60	92
-115	3.72	95
-110	4.11	105
-105	5.02	128
-100	6.01	153
-95	6.72	171
-90	7.08	180
-85	7.31	186
-80	7.47	190
-70	7.59	193

d. Receiver AGC (Prelimit) ALSEP 2 (AE-13)

Signal Strength (dBm)	DAC Output (Vdc)	PCM Count (Decimal)
*-120	0.08	3
-120	3.24	83
-110	4.11	105
-105	5.22	133
-100	5.85	149
-95	6.36	162
-90	6.64	169
-85	6.80	173
-80	6.88	175
-70	6.96	177
-60	7.00	178
*-60	9.99	254

* end of dynamic range

e. Transmitter A RF Power ALSEP 2 (AE-15)

RF Power (dBm)	DAC Output (Vdc)	PCM Count (Decimal)
*32.0	9.99	254
32.0	5.53	141
31.5	5.14	131
31.0	4.78	122
30.5	4.43	113
30.0	4.11	105
29.5	3.87	99
29.0	3.79	97
28.0	3.75	96
27.0	3.72	95
*27.0	0.08	3

f. Transmitter B RF Power ALSEP 2 (AE-16)

RF Power (dBm)	DAC Output (Vdc)	PCM Count (Decimal)
*32.0	9.99	254
32.0	5.30	135
31.5	4.90	125
31.0	4.51	115
30.5	4.15	106
30.0	3.95	101
28.5	3.83	98
27.0	3.79	97
*27.0	0.08	3

* end of dynamic range

g. Receiver A Input Signal Level ALSEP 3 (AE-19)

RF Power (dBm)	DAC Output (Vdc)	PCM Count (Decimal)
*-60.0	9.99	254
-60.0	9.01	229
-70.0	8.30	211
-80.7	7.08	180
-85.6	6.28	160
-90.3	5.49	140
-95.1	4.51	115
-100.8	3.32	85
-105.3	2.53	65
-110.0	1.54	40
*-110.0	0.00	1

h. Receiver B Input Signal Level ALSEP 3 (AE-20)

RF Power (dBm)	DAC Output (Vdc)	PCM Count (Decimal)
*-60.0	9.99	254
-60.0	9.01	229
-70.0	8.30	211
-81.2	7.08	180
-86.0	6.28	160
-90.7	5.49	140
-95.0	4.51	115
-100.2	3.32	85
-105.0	2.53	65
-110.0	1.54	40
*-110.0	0.00	1

* end of dynamic range

i. Transmitter A RF Power ALSEP 3 (AE-15)

RF Power (dBm)	DAC Output (Vdc)	PCM Count (Decimal)
33.0	7.47	190
32.5	7.04	179
32.0	6.64	169
31.5	6.28	160
31.0	5.81	148
30.5	5.49	140
30.0	5.18	132
29.5	4.86	124
29.0	4.58	117
28.5	4.31	110
28.0	4.11	105
27.0	3.91	100

j. Transmitter B RF Power ALSEP 3 (AE-16)

RF Power (dBm)	DAC Output (Vdc)	PCM Count (Decimal)
32.7	7.47	190
32.2	7.04	179
31.8	6.64	169
31.4	6.28	160
30.8	5.81	148
30.4	5.49	140
29.9	5.18	132
29.5	4.86	124
29.1	4.58	117
28.6	4.31	110
28.1	4.11	105
26.0	3.91	100

k. Receiver A Input Signal Level ALSEP 5 (AE-19)

RF Power (dBm)	DAC Output (Vdc)	PCM Count (Decimal)
*-110	.08	3
-110	2.13	55
-100	4.03	103
-90	6.28	160
-80	7.83	199
-70	8.70	221
-60	9.25	235
*-60	9.99	254

l. Receiver B Input Signal Level ALSEP 5 (AE-20)

RF Power (dBm)	DAC Output (Vdc)	PCM Count (Decimal)
*-110	.08	3
-110	1.54	40
-100	2.81	72
-90	5.14	131
-80	6.96	177
-70	8.22	209
-60	9.09	231
*-60	9.99	254

*End of dynamic range

SECTION 5. REMOTE SITE COMPUTER SYSTEMS

4.6 CALIBRATION PROCEDURES

All USB calibration procedures will be completed in accordance with procedures listed in STDN No. 502.4. If station support includes microdyne telemetry receivers, coordination with telemetry personnel is required to facilitate calibration of microdyne receiver AGC to the input level of the USB paramp.

SECTION 5. REMOTE SITE COMPUTER SYSTEMS

5.1 INTRODUCTION

5.1.1 GENERAL

This section summarizes the data acquisition and processing requirements in support of the ALSEP/P&FS mission. A description of the mission and its objectives are outlined in section 1.

5.1.2 SUPPORTING DOCUMENTATION

5.1.2.1 STDN Network Operations Procedures for Network Computer Systems, STDN No. 502.5, contains a description of the basic computing system and associated equipment.

5.1.2.2 The current issue of the Index of Documents for Spaceflight Tracking and Data Networks, STDN No. 102.3, contains a list of applicable manuals, reference documents, and tests.

5.1.2.3 The Software Catalog for the Network (SCAN), STDN No. 504, contains detailed operating instructions for all software required for the ALSEP/P&FS mission. When configurations and procedures in this document deviate from those contained in SCAN, this document will be followed.

5.1.3 SUPPORTING SOFTWARE

5.1.3.1 General. The supporting software required for the ALSEP/P&FS mission is contained on magnetic tape. This system tape contains all logic necessary to process any ALSEP or P&FS vehicle. Also contained on the system tape is the ROACH program. This program satisfies all requirements for postpass command histories.

5.1.3.2 Errata. Supporting software updates or changes are issued in the form of errata and disseminated as follows:

a. The high-speed errata transmission scheme is used to transmit errata to the 642B stations. The 642B ERP program (SCAN 6-602) is used for receipt and validation.

b. The low-speed errata transmission method can be used, as required to transmit errata to any Network station. The 1218 program, TELFED (SCAN 2-317), is used to generate errata and verification tapes at the 642B station.

c. Errata verification is in accordance with the STDN Operations Center and Station Interface Procedures, STDN No. 502.16.

d. Errata implementation will be specifically authorized by ISI. No errata, "patch", or change to the authorized software will be incorporated into a supporting system unless directed by ISI.

5.1.4 SOFTWARE ANOMALIES

5.1.4.1 All software anomalies are to be reported in the form of a problem report.

5.1.4.2 In the event of a program fault, halt, or loop condition, all recorded data and printouts associated with the problem are retained on station pending direction by GSFC.

5.2 642B COMPUTER

5.2.1 GENERAL

5.2.1.1 ACN, BDA, CRO, CYI, GDS, GWM, HAW, MAD, MIL, VAN, are required to provide ALSEP/P&FS command and telemetry data processing support. ETC will provide only receive and record support.

5.2.1.2 Whenever practical, the alternate 642B computer will be configured for dynamic standby.

5.2.2 PROGRAM CHANGES

The NCG-781 program design does not differ significantly from past ALSEP/P&FS programs. The major changes are as follows:

a. The addition of the following new Command Execute Functions (CE.)

773	ALSEP 5 RTC INV
774	PFS STAT
775	PFS RTC INV
776	ALS STAT
777	ALSEP RTC INV

b. CVW messaging techniques have been updated to present CVW data in a more useable form.

c. A new Format 3 has been added for LSP, ALSEP-5, processing.

d. The addition of ALSEP-5 LSP-unique RTC's.

e. The RSDP HSD has been upgraded from 4.8 kb/sec to 7.2 kb/sec. The change of data transfer rate has been compensated for by use of a "dummy" filler frame.

f. In the event of an unsuccessful DARTS recovery, or partial recovery, all normal initialization, restart, and recycle routines are locked out and a system reload must be performed.

g. The addition of a new MAN I/O routine called LUQ. This can be used to continuously monitor the contents of a designated cell, and display this content in the Q register on a time-available basis.

h. The elimination of the Mission Test Bit (MTB).

i. Command status bits have been changed to facilitate the incorporation of critical RTC groups 5 and 6.

j. The CAP 40-bit message has been changed to accomodate the inclusion of critical RTC groups 5 and 6.

5.2.3 KEY PROGRAM ADDRESSES

5.2.3.1 Command

a. Manual I/O Routines and Input Buffer Addresses

Routine/Input Buffer	Address
CAM/USB status input	10636
CAM keyboard	10675
GMT T/P (tape playback)	34321
USB status	10723
GMT R/T (real time)	34253
HSD input	10710-10722
UDB in-loop test	10455-10461
UDB out-loop test	24007-24013
VAD-A1	25563
B1	25564
A2	25565
B2	25566
A3	25567
B3	25570
A4	25571
B4	25572
A5	25573
P1	25413
MAP waiting period (ALSEP)	25602
(P&FS)	25603
CAM-in control	25612
Destination	25617
Subbit code (P&FS 1)	25600

b. ALSEP/P&FS CMD Fault Addresses. If the ALSEP/P&FS command program illegally enters specific subroutines, the program will inhibit all outputs and automatically fault without activating the fault light. While the following addresses reflect where the program faulted, they do not indicate why.

Subroutine	Address
CMD procedure	121141
UDB output	130310
UDB uplink	132570
UDB loop test	131272
UDB path selection	132062/132126
UDB control	133127
CMD backup (CMDB)	122301
High-speed command link (HSCL)	12403
Bad recovery area (OCDD)	64565

5.2.3.2 Telemetry Output Buffers. Table 5-1 lists the program output buffer addresses.

Table 5-1. Program Output Buffer Addresses

Buffer	Addresses
1	11047-11426
2	11427-12006
3	12007-12366
4	12367-13326
5	13327-14266
6	14267-15226

5.2.4 ALSEP/P&FS PREPASS CHECKLISTS

The RSDP prepass checklist to support ALSEP/P&FS is detailed in paras 5.2.4.1 through 5.2.4.8.

5.2.4.1 642B

Unit/Function	Indication/Setting
a. Auto Recovery	Down
b. Address Mode	UP (17 bit)
c. Bootstrap	I
d. Indicate/off/set	Indicate

Unit/Function	Indication/Setting
e. Stop	Down
f. Jump	Down
g. Disconnect	Down
h. Fault alarm	Enabled

5.2.4.2 1299

Unit/Function	Indication/Setting
ALSEP computer	UDB TX
	UDB RX
	CMD Status
	GMT (Tape)

5.2.4.3 1540

Unit/Function	Indication/Setting
a. Man/off/auto	Auto (all)
b. Clock control	Normal
c. Address 1	System tape*
d. Address 2	History tape
e. Address 3	Recovery tape
f. Address 4	Log/fault dump

*Write enable off; all others on.

5.2.4.4 1232

Unit/Function	Indication/Setting
a. On-line/off-line	On-line
b. Tape levels	6-7
c. Tape reader	DARTS mounted

5.2.4.5 DTU

Unit/Function	Indication/Setting
a. 2010/2011	2010
b. Transmit disabled/ enabled	Green (TLM)
c. Receive enabled/disabled	Green (CMD)

5.2.4.6 UDB

Unit/Function	Indication/Setting
a. Operate/test	Operate
b. Comp test/operate	Operate
c. VR1/VR2	VR1

5.2.4.7 CIT-68 ALSEP/P&FS

Unit/Function	Indication/Setting
a. AUX/reperforator	On
b. TTY motor	On
c. Page printer	Send
d. T-D	RCV
e. Keyboard	Neutral
f. Selector	K-T
g. Operate/test	Operate

5.2.4.8 HSP and 1222 Translator

Unit/Function	Indication/Setting
Power on	Lit

Note

1. Ensure that equipment has an adequate supply of printing ribbons, paper tape, and printing paper.

2. Fresh scratch tapes are mounted as the pass requires.

5.2.5 REAL-TIME COMMANDS

5.2.5.1 The following is a list of the ALSEP 1, 2, 3, and 4 RTC's and the vehicles for which they are valid:

CAM No.	Veh. No.	Critical Group No.	Review, Uplink, Inventory, and History Printouts
003	1,2,3,4		ASE HBR ON
005	1,2,3,4		ASE HBR OFF
006	1,2,3,4		NORM BIT RT SEL
007	1,2,3,4		LOW BIT RT SEL
011	1,2,3,4		NORM BIT RT RST

CAM No.	Veh. No.	Critical Group No.	Review, Uplink, Inventory, and History Printouts
012	1,2,3,4		XMTR A SEL
013	1,2,3,4		XMTR ON
014	1,2,3,4		XMTR OFF
015	1,2,3,4		XMTR B SEL
017	1,2,3,4		DISSIP R1 ON
021	1,2,3,4		DISSIP R1 OFF
022	1,2,3,4		DISSIP R2 ON
023	1,2,3,4		DISSIP R2 OFF
024	1,2,3,4		DSS HTR 3 ON
025	1,2,3,4		DSS HTR 3 OFF
027	1,2,4		DUST CELLS ON
031	1,2,4		DUST CELLS OFF
032	1,2,3,4		TIMER OUT ACCPT
033	1,2,3,4	Group 2	TIMER OUT INHIB
034	1,2,3,4		DSS/PROC X SEL
035	1,2,3,4		DSS/PROC Y SEL
036	1,2,3,4		EXP 1 OPER SEL
037	1,2,3,4		EXP 1 STBY SEL
041	1,2,3,4		EXP 1 STBY OFF
042	1,2,3,4		EXP 2 OPER SEL
043	1,2,3,4		EXP STBY 2 SEL
044	1,2,3,4		EXP 2 STBY OFF
045	1,2,3,4		EXP 3 OPER SEL
046	1,2,3,4		EXP 3 STBY SEL
050	1,2,3,4		EXP 3 STBY OFF
052	1,2,3,4		EXP 4 OPER SEL
053	1,2,3,4		EXP 4 STBY SEL
054	1,2,3,4		EXP 4 STBY OFF
055	1,2,3,4		DSS HTR 1 SEL
056	1,2,3,4		DSS HTR 2 SEL
057	1,2,3,4		DSS HTR 2 OFF
060	1,2,3,4	Group 2	PCU 1 SEL
062	1,2,3,4	Group 2	PCU 2 SEL
063	1,2,3,4		PSE/XY GAIN CH
064	1,2,3,4		PSE/Z GAIN CH
065	1,2,3,4		PSE/SP CAL CH
066	1,2,3,4		PSE/LP CAL CH

CAM No.	Veh No.	Critical Group No.	Review, Uplink, Inventory, and History Printouts
067	1,2,3,4		PSE/SP GAIN CH
070	1,2,3,4		LVL MTRX ON/OFF
071	1,2,3,4		LVL MTRY ON/OFF
072	1,2,3,4		LVL MTRZ ON/OFF
073	1,2,3,4		UNCAGE ARM/FIRE
074	1,2,3,4		LVL DIR POS/NEG
075	1,2,3,4		LVL SPEED HI/LO
076	1,2,3,4		PSE T CTL CH
101	1,2,3,4		PSE FILT IN/OUT
102	1,2,3,4		LVL SNSR IN/OUT
103	1,2,3,4		PSE LVL MDE A/M
104	1,2,4		SIDE LOAD 1
105	1,2,4		SIDE LOAD 2
106	1,2,4		SIDE LOAD 3
107	1,2,4		SIDE LOAD 4
110	1,2,4		SIDE EXECUTE
111	4		CPE OPR HTR ON
112	4		CPE OPR HTR OFF
113	4	Group 1	CPE CVR GO
114	4		CPE DEF SEQ ON
115	4		CPE DEF STEP
117	4		CPE DEF SEQ OFF
120	4		CPE CHAN/HI SEL
121	4		CPE CHAN/LO SEL
122	1,2	Group 1	SWS CVR GO
123	1,2,3		LSM RANGE STEPS
124	1,2,3		LSM FLD O/S CH
125	1,2,3		LSM O/S ADD CH
127	1,2,3		FLIP/CAL INHIB
131	1,2,3		FLIP/CAL GO
132	1,2,3		LSM FILT IN/OUT
133	1,2,3	Group 3	SITE SURVEY XYZ
134	1,2,3		LSM T CTL XYO
135	2,3		HFE MODE/G SEL
136	2,3		HFE MODE/LK SEL
140	2,3		HFE MODE/HK SEL

CAM No.	Veh No.	Critical Group No.	Review, Uplink, Inventory, and History Printouts
141	2,3		HFE SEQ/FUL SEL
142	2,3		HFE SEQ/P1 SEL
143	2,3		HFE SEQ/P2 SEL
144	2,3		HFE LOAD 1
145	2,3		HFE LOAD 2
146	2,3		HFE LOAD 3
150	2,3		TIMER RESET
152	2,3		HFE HTR STEPS
153	2		SIDE ON
154			SPARE 3
155			SPARE 4
156	3,4		GEO CAL GO
160			SPARE 5
162	3,4	Group 4	ASE SEQ/S FIRE
163	3,4	Group 4	GRENADE 1 FIRE
164	3,4	Group 4	GRENADE 2 FIRE
165	3,4	Group 4	GRENADE 3 FIRE
166	3,4	Group 4	GRENADE 4 FIRE
170	3,4	Group 4	GRENADE ARM
171			SPARE 6
172			SPARE 7
174			SPARE 8

5.2.5.2 The following is a list of the ALSEP 5 RTC's:

CAM No.	Critical Group No.	Review, Uplink Inventory, and History Printouts
003		LSP FMT ON
005		DP FMT ON
006		NBR
007		LBR
011		SPARE 11
012		XMTR A ON
013		XMTR A OFF
014		XMTR B OFF
015		XMTR B ON
017		PDR 1 ON
021		PDR 1 OFF

CAM No.	Critical Group No.	Review, Uplink, Inventory, and History Printouts
022		PDR 2 ON
023		PDR 2 OFF
024		ADP X SEL
025		ADP Y SEL
027		APM 1 ON
031		APM 1 OFF
032		RIPPLE-OFF RST
033		SPARE 33
034		DDP X SEL
035		DDP Y SEL
036		LMS ON
037		LMS STBY
041		LMS OFF
042		LEAM ON
043		LEAM STBY
044		LEAM OFF
045		HFE ON
046		HFE STBY
050		HFE OFF
052		LSG ON
053	Group 5	LSG STBY
054	Group 5	LSG OFF
055		LSP ON
056		LSP STBY
057		LSP OFF
060	Group 5	PCU 1 SEL
062	Group 5	PCU 2 SEL
063		LSG HTR ON
064		LSG HTR OFF
065		SPARE 65
066		SPARE 66
067		LSG CMD EX
070		LSG DECODER ON
071		LSG DECODER OFF
072		LSG STEP UP
073		SPARE 73

CAM No.	Critical Group No.	Review, Uplink, Inventory, and History Printout
074		LSG STEP ON
075		SPARE 75
076		SPARE 76
101		SPARE 101
102		SPARE 102
103		SPARE 103
104		PER CMDS EN
105		PER CMDS INH
106		SPARE 106
107		ADP BKUP
110		ADP PRI
111		LEAM CAL
112		LEAM MIR CVR
113		APM 2 OFF
114		LEAM SEN CVR
115		APM 2 ON
117		LEAM HTR STEP
120		PCU 1 AUTO SW
121		PCU 2 AUTO SW
122		DECODER SW
123		LMS LOAD 1
124		LMS LOAD 2
125		LMS LOAD 3
127		LMS LOAD 4
131		SPARE 131
132		LMS LOAD 5
133		LMS LOAD 6
134		LMS EX
135		HFE MODE/G SEL
136		HFE MODE/LK SEL
140		HFE MODE/HK SEL
141		HFE SEQ/FULL SEL
142		HFE SEQ/P1 SEL
143		HFE SEQ/P2 SEL
144		HFE LOAD 1
145		HFE LOAD 2

CAM No.	Critical Group No.	Review, Uplink Inventory, and History Printout
146		HFE LOAD 3
150		SPARE 150
152		HFE HTR STEP
153		EXP 4 PWR ON
154		SPARE 154
155		SPARE 155
156	Group 6	LSP XMTR ON
160		SPARE 160
162		LSP XMTR OFF
163		LSP GAIN NORM
164		LSP GAIN LOW
165		SPARE 165
166		SPARE 166
170		LSP GEO CAL
171		SPARE 171
172		SPARE 172
174		DECODER SW INH

5.2.5.3 The following is a list of the P&FS RTC's:

CAM No.	Review, Uplink, Inventory and History Printouts
001	SPARE P1
002	PHA THRES HI
003	SPARE P3
004	PHA THRES LO
005	SPARE P5
006	SPARE P6
007	CAL ON
010	CAL OFF
011	SPARE P11
012	SPARE P12
013	SPARE P13
014	SPARE P14
015	TRANSPONDER ON
016	TRANSPONDER OFF

CAM No.	Review, Uplink, Inventory, and History Printouts
017	SPARE P17
020	TEST CNTRL ON
021	SPARE P21
022	SPARE P22
023	TEST CNTRL OFF
024	SPARE P24
025	EXP/DATA PWR ON
026	EXP/DATA PWR OFF
027	SPARE P27
030	SPARE P30
031	HI VOLT OFF
032	HI VOLT ON
033	SPARE P33
034	UNVOLT PROT OUT
035	SPARE P35
036	SPARE P36
037	UNVOLT PROT IN
040	SPARE P40
041	SPARE P41
042	SPARE P42
043	SPARE P43
044	SPARE P44
045	REAL T DATA MD
046	MEM R/O MD
047	SPARE P47
050	SPARE P50
051	TLM STORE NORM
052	TLM STORE FAST
053	SPARE P53
054	SPARE 2
055	SPARE P55
056	SPARE P56
057	AUTO CYCLE MD
060	SPARE P60

CAM No.	Review, Uplink, Inventory, and History Printouts
061	SPARE 1
062	SPARE 3
063	SPARE P63
064	SPARE P64
065	SPARE P65
066	SPARE P66
067	SPARE 4
070	SPARE 5
071	SPARE P71
072	SPARE P72
073	SPARE P73
074	SPARE P74
075	SPARE P75
076	SPARE P76
077	SPARE P77

Note

Spare PXX RTC's are initally disabled; they can be enabled by CAM (see para 2.3.3e, STDN No. 502.5/ALSEP/P&FS); XX = RTC No.

5.3 1218 COMPUTER

5.3.1 DAPP

During ALSEP/P&FS support, all 85-foot prime and 30-foot USB stations will provide real-time designation to the APP using the RSVP program. These stations will also generate back-up paper drive tapes using the RSVP program.

5.3.2 TAM

When the USB station is providing real-time data to JSC or NOCC, it is desirable to monitor the data using the AMON/ALS program. Whenever the SPEC A02 errata is used with the ALSEP system program, Errata A99 will be used with the AMON/ALS program. When performing the program familiarization procedures in para 5.5 and 5.6, the AMON/ALS program is required.

5.4 CONTINGENCY PROCEDURES

Contingency procedures for ALSEP/P&FS are contained in STDN No. 502.5/ALSEP/P&FS.

5.5 COMMAND FAMILIARIZATION PROCEDURES

5.5.1 GENERAL

This paragraph contains those procedures primarily intended to familiarize the operators with the command functions of the ALSEP/LSP operational program. Successful completion of these sequences is also necessary to ensure proper hardware/software compatability.

5.5.2 DETAILED SEQUENCES

5.5.2.1 ALSEP Sequences

5.5.2.2 P&FS Sequences

Tables

Sequence No. A. Preliminary Configuration

Step	Action	Indication	Purpose
1	Load the ALSEP/LSP program.		
2	Configure for USB turn-around of data.		
3	Place the M&O SAFE/OPERATE switch in the OPERATE position.		
4	Configure for ALS/ASTAM UDB display.		

Sequence No. 1. Initialization

Step	Action	Indication	Purpose
1	Set address mode switch down and initialize at $10,000_8$ - Phase I.	1232: 17 BIT MODE SWITCH IS OFF 642: PROGRAM 4 STOP	To verify proper program initialization.
2	Set program mode switch up, and B7 switch up. Perform a Phase I initialization.	1232: B7 IS DISCONNECTED 642: PROGRAM 4 STOP	
3	Set B7 switch down and RTC switch up. Perform a Phase I initialization.	1232: RTC IS DISCONNECTED 642: PROGRAM 4 STOP	
4	Set Bootstrap switch to II, and set RTC switch down. Perform a Phase I initialization.	1232: BOOT 1 DISCONNECTED 642: PROGRAM 4 STOP	
5	Set Bootstrap switch to I and perform a Phase I initialization. The program will type out the following on the 1232:	1232: ALSEP/LSP INITIALIZATION STA, XXX, ↑ STA,	
6	Refer to Table 5-5 and type in digits and acronyms other than those prescribed.	1232 will request legal entry.	To verify proper station input.
7	Initialize the station ID.		

Sequence No. 1. Initialization (cont)

Step	Action	Indication	Purpose
8	The program will type out the following on the 1232:	1232: FMT, X YA, ZB, FMT,	
9	Type in formats other than 1 2 or 3.	1232 will request legal entry.	To verify proper format input.
10	Initialize with FMT, 1, 3A, 2B, ↑		
11	The program will type out the following on the 1232:	1232: MTU CHAN, XX, ↑ MTU CHAN,	
12	Type in alphanumeric characters other than 11 or 6.	1232 will request legal entry.	To verify proper MTU channel input.
13	Initialize with applicable channel.		
14	The program will type out the following:	1232: CAM, XXX, ↑ CAM,	

Sequence No. 1. Initialization (cont)

Step	Action	Indication	Purpose
15	Type in alphanumeric characters other than TLM or CMD.	1232 will request legal entry.	Verify proper CAM input.
16	Initialize with applicable CAM.		
17	The program will type out the following on the 1232:	1232: GMT XX, ↑ GMT, ↑	Verify proper GMT input.
18	Type in alphanumeric characters other than 72 or 73.	1232 will request legal entry	
19	Set key 2 down and initialize with GMT, 72, ↑	Observe that the program will 4-STOP questioning key 2 not set. If the operator does not wish to write a new CVA, he need only press START/STOP. It is recommended that key 2 always be SET during initialization.	

Sequence No. 1. Initialization (cont)

Step	Action	Indication	Purpose
23	Set key 2 and press START.	Observe that the CVA is written on tape and the program initializes. The HSP will present the parameter list and the 1232 will present the hardware status. Example: 1232: ALSEP/LSP READY GMT ENABLED USB STATUS ON-LINE UDB M&O SWITCH-OPER MTU 2 ON-LINE MTU 3 ON-LINE MTU 4 ON-LINE UDB LOOP GOOD-ALSEP UDB LOOP GOOD-P&FS	

Sequence No. 2. Command Mode Functions

Step	Action	Indication	Purpose
1	Select Mode II - 980.	HSP: MODE 2 REQ HSP: MODE CONFIRMED	To verify legal/illegal function in Mode II - FC Mode
2	Select FC Mode - 977.	HSP: F/C MODE REQ HSP: MODE CQNFIRMED	
3	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: NOT IN MODE 1 978	
4	RTC uplink attempt, CLR, ALSEP 3, A, 003, INITIATE. UPL, INITIATE	HSP: ALSEP RTC 003 3A ASE HBR ON UPL REQ HSP: NOT IN MODE 1 003	
5	Select MAP OVERRIDE ON - 983.	HSP: MAP OVRD ON REQ HSP: NOT IN MODE 1 983	
6	Select MAP OVERRIDE OFF - 984.	HSP: MAP OVRD OFF REQ HSP: MODE CONFIRMED	

Sequence No. 2. Command Mode Functions (cont)

Step	Action	Indication	Purpose
7	Select RTC TTY inventory CLR ALSEP 3, 981, INITIATE . INITIATE The inventory will take approximately 6.5 minutes to complete.	HSP: CAM ALS TTY INV REQ HSP: INV SUM IN PROGRESS TTY: (Inventory Summary) HSP: INV SUM COMPLETED	To verify legal/illegal function in Mode II - FC Mode
8	Select RTC HSP inventory CLR ALSEP 3, 982, INITIATE . INITIATE	HSP: ALSEP HSP INV REQ HSP: (RTC INVENTORY)	
9	Select USB carrier status-CLR ALSEP 3, 988, INITIATE . INITIATE	HSP: CAM ALSEP STATUS REQ HSP: UDB STATUS XXX YYY	XXX denotes OK or BAD depending on result of test. YYY denotes ALS if status good. YYY denotes USB if status bad.
10	Repeat steps 7 and 8, substituting P1 for ALSEP 3. While step 7 is in progress, proceed with the remainder of this sequence.	HSP/TTY: (Same except P&FS.)	

Sequence No. 2. Command Mode Functions (cont)

Step	Action	Indication	Purpose
11	Enable critical RTC's-CLR, ENABLE, 911 INITIATE . INITIATE	HSP: RTC GRP 1 ENABLE REQ HSP: NOT IN M/O 911	
12	Disable critical RTC's-CLR, RTC CLEAR, 900, INITIATE . INITIATE	HSP: CRIT RTC DSBL REQ HSP: NOT IN M/O 900	
13	Write EOF - 996 . Write log tape dump 995 .	HSP: CMDH EOF REQ HSP: CMDH EOF HSP: LOG TAPE DUMP REQ HSP: LOG TAPE DUMP	
14	Select parameter listing - 990.	HSP: PARAMETER LIST REQ HSP: (Listing)	
15	Select Mode I - 979.	HSP: MODE 1 REQ HSP: CMD MODE 1 CST: MODE 1/FC	

Sequence No. 2. Command Mode Functions (cont)

Step	Action	Indication	Purpose
16	RTC uplink attempt: CLR, ALSEP 3, A, 003, INITIATE . UPL, INITIATE	HSP: ALSEP RTC 003 3A ASE HBR ON UPL REQ HSP: CAM UPLINK 003 3A ASE HBR ON RF DATA 062 174 003 S/C REJECT 000 0	To verify legal/illegal function in Mode I - FC Mode
17	Select MAP OVERRIDE ON-CLR, 983, INITIATE . INITIATE	HSP: MAP OVRD ON REQ HSP: MAP OVERRIDE ON CST: MAP OVERRIDE ON	To verify legal/illegal function in Mode I - FC Mode
18	Repeat step 17.	HSP: MAP OVRD ON REQ HSP: MODE CONFIRMED	
19	Select MAP OVERRIDE OFF-CLR, 984 INITIATE . INITIATE	HSP: MAP OVRD OFF REQ HSP: MAP OVERRIDE OFF CST: MAP OVERRIDE OFF	
20	Repeat step 19.	HSP: MAP OVRD OFF REQ HSP: MODE CONFIRMED	

Sequence No. 2. Command Mode Functions (cont)

Step	Action	Indication	Purpose
21	Select RTC TTY inventory-CLR, ALSEP 3, 981, INITIATE. INITIATE	HSP: CAM ALS TTY INV REQ HSP: INV SUM IN PROGRESS TTY: (Inventory summary)	
22	Abort TTY inventory, CLR, 971, INITIATE. INITIATE	HSP: TTY INV ABORT REQ HSP: TTY INV ABORTED TTY: RTC INV SUM ABORTED	
23	Select RTC HSP inventory, CLR, ALSEP 3, 982, INITIATE. INITIATE	HSP: ALSEP HSP INV REQ HSP: (RTC INVENTORY)	To verify legal/illegal function in Mode I - FC Mode
24	Abort HSP inventory - 972.	After the abort occurs: HSP: HSP INV ABORT REQ HSP: HSP INV ABORTED	
25	Select USB carrier status-CLR, ALSEP 3, 988 INITIATE. INITIATE	HSP: CAM ALSEP STATUS REQ HSP: UDB STATUS XXX YYY where: XXX = OK or BAD YYY = ALS or USB	

Sequence No. 2. Command Mode Functions (cont)

Step	Action	Indication	Purpose
26	Enable critical GROUP 1 RTC's - CLR, RTC ENABLE, 911, INITIATE. INITIATE	HSP: RTC GRP 1 ENABLE REQ HSP: NOT IN M/O 911	
27	Disable critical RTC's -CLR, RTC CLEAR, 900, INITIATE. INITIATE	HSP: CRIT RTC DSBL REQ HSP: NOT IN M/O 900	
28	Write CMDH EOF-996. Write log tape dump-995.	HSP: CMDH EOF REQ HSP: CMDH EOF HSP: LOG TAPE DUMP REQ HSP: LOG TAPE DUMP	
29	Select parameter list - 990.	HSP: PARAMETER LIST REQ HSP: (Listing)	
30	Select Mode I - 979.	HSP: MODE 1 REQ HSP: MODE CONFIRMED	
31	Select M&O Mode-CLR, 978, INITIATE. INITIATE	HSP: M/O MODE REQ HSP: CMD M/O MODE CST: MODE 1 M/O	

Sequence No. 2. Command Mode Functions (cont)

Step	Action	Indication	Purpose
32	RTC uplink attempt-CLR, ALSEP 3, A, 003, INITIATE. UPL, INITIATE	HSP: ALSEP RTC 003 3A ASE HBR ON UPL REQ HSP: NOT IN F/C 003	To verify legal/illegal functions in Mode 1 - M&O Mode
33	Select MAP OVERRIDE ON-CLR, 983, INITIATE. INITIATE	HSP: MAP OVRD ON REQ HSP: NOT IN F/C 983	
34	Select RTC TTY inventory-CLR, ALSEP 3, 981, INITIATE. INITIATE While the inventory is in progress continue with the rest of the sequence.	HSP: CAM ALS TTY INV REQ HSP: INV SUM IN PROGRESS TTY: (Inventory summary) HSP: INV SUM COMPLETED (6 minutes after TTY INV started)	
35	Select RTC HSP inventory-CLR, ALSEP 3, 982, INITIATE. INITIATE	HSP: ALSEP HSP INV REQ HSP: RTC INVENTORY	

Sequence No. 2. Command Mode Functions (cont)

Step	Action	Indication	Purpose
36	Select USB carrier status-CLR, ALSEP 3, 988, INITIATE INITIATE	HSP: CAM ALSEP STATUS REQ HSP: NOT IN F/C 988	To verify legal/illegal functions in Mode 1-M&O Mode
37	Enable critical Group 1 RTC's-CLR, RTC ENABLE, 911, INITIATE. INITIATE.	HSP: RTC GRP 1 ENABLE REQ HSP: RTC ENBL CRIT GRP 1 RTC/DATA CPE CVR GO 113/113 SWS CVR GO 122/122 CST: AL GR1	
38	Disable critical RTC's-CLR, RTC CLEAR, 900, INITIATE. INITIATE	HSP: CRIT RTC DSBL REQ HSP: RTC DSBL CRIT ALL RTC/DATA HSP: (All CRIT RTC's in numerical order)	
39	Write CMDH EOF-996. Write LOG TAPE DUMP-995.	HSP: CMDH EOF REQ HSP: CMDH EOF HSP: LOG TAPE DUMP REQ HSP: LOG TAPE DUMP	
40	Select parameter list-CLR 990.	HSP: PARAMETER LIST REQ HSP: (Listing)	
41	Select FC Mode-977.	HSP: F/C MODE REQ HSP: CMD F/C MODE CST: MODE 1/FC	

Sequence No. 3. Critical RTC's (Enable/Disable)

Step	Action	Indication	Purpose
1	Select Mode I - 979.	HSP: MODE 1 REQ HSP: MODE CONFIRMED	To verify enabling and disabling critical RTC's.
2	Select M&O Mode - 978	HSP: M/O MODE REQ HSP: CMD M/O MODE	
3	Select parameter listing - 990. Verify all groups disabled.	HSP: PARAMETER LIST REQ HSP: (Listing)	
4	Enable all ALSEP critical RTC's-911, 922, 933, and 944.	HSP: RTC GRP X ENABLE REQ HSP: RTC ENBL CRIT GRP X RTC/DATA HSP: (CRIT RTC WITHIN GRP X) CST: (ALL GROUPS ENABLED)	
5	Select parameter listing - 990 Verify all ALSEP groups enabled.	HSP: PARAMETER LIST REQ HSP: (Listing)	

Sequence No. 3. Critical RTC's (Enable/Disable) (cont)

Step	Action	Indication	Purpose
6	Select HSP inventory-CLR, ALSEP 4, 982, INITIATE . INITIATE Verify all ALSEP critical RTC's and noncritical RTC's contain required data.	HSP: ALSEP HSP INV REQ HSP: (Inventory)	
7	Clear critical RTC's - 900.	HSP: CRIT RTC DSBL REQ HSP: RTC DSBL CRIT ALL RTC/DATA HSP: (All CRIT RTC's in numerical order)	
8	Select HSP inventory-CLR, ALSEP, 1, 982, INITIATE . INITIATE Verify all critical RTC's = 000.	HSP: ALSEP HSP INV REQ HSP: (Inventory)	
9	Enable all critical RTC's 911, 922, 933, and 944.	HSP: RTC GRP X ENABLE REQ HSP: RTC ENBL CRIT GRP X RTC/DATA HSP: (CRIT RTC WITHIN GRP X)	Enable all RTC's for testing.

Sequence No. 3. Critical RTC's (Enable/Disable) (cont)

Step	Action	Indication	Purpose
10	Select parameter listing - 990 . Verify that all ALSEP groups enable.	HSP: PARAMETER LIST REQ HSP: (Listing)	
11	Select HSP inventory-CLR, ALSEP, 1, 982, INITIATE . INITIATE Verify that all ALSEP critical RTC's and non-critical RTC's contain required data.	HSP: ALSEP HSP INV REQ HSP: (Inventory)	

Sequence No. 4. RTC Reviews

Step	Action	Indication	Purpose
1	*Review RTC's 001_8 through 037_8 CLR, ALSEP 3, RTC REVIEW, 001, INITIATE. INITIATE	HSP: ALS RTC 001 REV REQ HSP: RTC 001 NOT FOUND Note The HSP printout for DEFINED RTC's is: RTC XXX/DDD EEEEEEEEEEEEEE where: XXX = CAM number DDD = data content E = English description of RTC	To review RTC's in Mode I, M/O Mode.
2	Select FC Mode - 977.	HSP: F/C MODE REQ HSP: CMD F/C MODE CST: MODE 1/FC	To review RTC's in Mode I, FC Mode.
3	*Review RTC's 040_8 through 100_8	HSP: (Same as step 1.)	
4	Select Mode II - 980.	HSP: MODE 2 REQ HSP: CMD MODE 2 CST: MODE 2/FC	To review RTC's in Mode II, FC Mode.
	*Station option on quantity of RTC's reviewed.		

Sequence No. 4. RTC Reviews (cont)

Step	Action	Indication	Purpose
5	*Review RTC's 101_8 through 177_8.	(Same as step 1)	
6	Attempt to clear undefined, defined, and critical RTC's 001, 003, and 033.	HSP: ALS RTC XXX DSBL REQ HSP: NOT IN M/O XXX where: XXX = RTC number	To verify cannot clear RTC's in Mode II, FC Mode.
7	Select Mode I - 979.	HSP: MODE 1 REQ HSP: CMD MODE 1 CST: MODE 1/FC	To verify cannot clear RTC's in Mode I, FC Mode.
8	Repeat step 6.	HSP: ALS RTC XXX DSBL REQ HSP: NOT IN M/O XXX	
9	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: CMD M/O MODE CST: MODE 1/ M/O	
10	Attempt to clear individual critical RTC's	HSP: ALS RTC XXX DSBL REQ HSP: ILLEGAL REQ XXX	To verify cannot clear critical RTC's individually.
	*Station option on quantity of RTC's reviewed.		

Sequence No. 4. RTC Reviews (cont)

Step	Action	Indication	Purpose
11	Clear all critical RTC's - 900.	HSP: CRIT RTC DSBL REQ HSP: RTC DSBL CRIT ALL RTC/DATA HSP: (All CRIT RTC's in numerical order) CST: (All GRPS DISABLED)	To verify clearing of all critical RTC's.
12	Attempt to clear undefined and defined RTC's-001, 003, 033.	HSP: ALS RTC XXX DSBL REQ HSP: RTC 001 NOT FOUND or HSP: ALS RTC DSBL 003/000 or HSP: ILLEGAL REQ 033	To verify clearing of defined RTC.
13	Review selected critical RTC's and defined RTC number 003. Verify that data equals 000.	HSP: ALS RTC XXX REV REQ HSP: ALS RTC XXX/000 EEEEEEEEEEEEEEE	To review RTC's in Mode I, M&O Mode.
14	Select FC Mode - 977.	HSP: F/C MODE REQ HSP: CMD F/C MODE CST: MODE 1/FC	
15	Repeat step 13	HSP: (Same as step 13.)	To review RTC's in Mode I, FC Mode.

Sequence No. 4. RTC Reviews (cont)

Step	Action	Indication	Purpose
16	Select Mode II - 980.	HSP: MODE 2 REQ HSP: CMD MODE 2 CST: MODE 2/FC	To review RTC's in Mode II, FC Mode
17	Repeat step 13.	HSP: (Same as step 13.)	
18	Select Mode I - 979.	HSP: MODE 1 REQ HSP: CMD MODE 1 CST: MODE 1/FC	To enable RTC 003.
19	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: CMD M/O MODE CST: MODE 1/M/O	To enable RTC 003.
20	Enable RTC 003.	HSP: ALS RTC 003 ENBL REQ HSP: ALS RTC ENBL 003/003	
21	Select CMDH EOF-996.		Clear buffers in core
22	Select Log Tape Dump-995.		
23	Manually rewind the history tape to BOT.		

Sequence No. 5. RTC Uplinking

Step	Action	Indication	Purpose
1	Select Mode I - 979.	HSP: MODE 1 REQ HSP: MODE CONFIRMED	To verify uplinking of non-critical RTC's in normal bit rate.
2	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: MODE CONFIRMED	
3	Via I/O routine MWP, change the ALSEP MAP waiting period to 1000 msec.	HSP: (Parameter Listing.)	Verify MWP is 1000 msec.
4	Select FC Mode - 977	HSP: F/C MODE REQ HSP: CMD F/C MODE	
5	Ensure valid uplink and ground loops. Select status test, CLR, ALSEP, 988, INITIATE INITIATE	HSP: CAM ALSEP STATUS REQ HSP: UDB STATUS OK ALS	

Sequence No. 5. RTC Uplinking (cont)

Step	Action	Indication	Purpose
6	Uplink non-critical RTC's to ALSEP 4, decoder A-CLR, ALSEP 4, A, 003, INITIATE UPL, INITIATE	HSP: ALSEP RTC 003 4A ASE HBR ON UPL REQ HSP: CAM UPLINK 003 4A ASE HBR ON RF DATA 025 174 003 S/C REJECT 000 0	
7	Have the PCM simulator and decoms loaded with the normal bit rate ALSEP programs for ALSEP 3. PSE.	HSP: NBR LK CX ALSEP 3 RT A3 CX CVW 034 0 1232: NBR LOCK CX ALSEP 3 RT	Uplink to vehicle 3.
8	Using table 5-2 have the PCM tech insert sim data in downlink word 46, address 75 in simulator. Uplink associated command to ALSEP 3, decoder A. *Uplink RTC's in table 5-2. Verify English description and RF loop data.	HSP: A3 CX CVW XXX C NNNN A3 CX CVW XXX 1 HSP: ALSEP RTC XXX 3A E—E UPL REQ CAM UPLINK XXX 3A E—E RF DATA 062 KKK XXX HSP: MAP VERIFY XXX 1	
9	Write EOF - 996	HSP: CMDH EOF REQ HSP: CMDH EOF	
10	LOG tape dump - 995.	HSP: LOG TAPE DUMP REQ HSP: LOG TAPE DUMP	
	*Station option on quantity of RTC's uplinked.		

Sequence No. 5. RTC Uplinking (cont)

Step	Action	Indication	Purpose
11	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: CMD M/O MODE	
12	Perform HSP ROACH: take all histories.	HSP: LOS T A3 CX CVW XXX C NNNN HSP: CMDH EOF	Check ability to retrieve uplink histories. XXX=RTC C=Checkbit NNNN= Total number of occurrences
13	Have the PCM simulator and decoms loaded with the normal bit rate ALSEP programs for ALSEP 4 PSE NBR. Terminate ROACH program, return to ALSEP/P&FS program.	HSP: NBR LK CX ALSEP 4 RT 1232: NBR LOCK CH X ALSEP 4 RT	Uplink to vehicle 4.
14	Select FC Mode - 977.	HSP: F/C MODE REQ HSP: CMD F/C MODE	
15	Using Table 5-2. have the PCM tech insert SIM data in downlink word 5, address 435 in simulator. Uplink associated command to ALSEP 4, decoder B. Uplink selected RTC's in table 5-2*. Verify English description and RF data.	HSP: A4 CX CVW XXX C NNNN A4 CX CVW XXX 1 HSP: ALSEP RTC XXX 4B E-E UPL REQ CAM UPLINK XXX 4B E-E RF DATA 065 KKK XXX HSP: MAP VERIFY XXX 1	
	*Station option on quantity of RTC's uplinked.		

Sequence No. 5. RTC Uplinking (cont)

Step	Action	Indication	Purpose
16	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: CMD M/O MODE	
17	PERFORM HSP and TTY ROACH. Terminate ROACH program. Return to ALSEP/P&FS program.	HSP: LOS T HSP: A4 CX CVW XXX 1 NNNN HSP: CMDH E OF	
18	Select FC Mode - 977.	HSP: F/C MODE REQ HSP: CMD F/C MODE CST: MODE 1/FC	
19	Select MAP OVERRIDE ON - 983.	HSP: MAP OVRD ON REQ HSP: MAP OVRRIDE ON CST: MAP OVRD ON	
20	*Uplink selected RTC's in table 5-2 to remaining vehicles and decoders. *Station option on quantity of RTC's uplinked.	ALSEP RTC XXX VV E——E UPL REQ CAM UPLINK XXX VV 0 E——E RF DATA VVV KKK XXXX MAP Verify 000 0 Where: VV = Vehicle decoder VVV = address XXX = RTC KKK = Complement RTC	

Sequence No. 5. RTC Uplinking (cont)

Step	Action	Indication	Purpose
21	Select M&O Mode - 978. Perform HSP ROACH for each vehicle and decoder. Upon completion of ROACH return to ALSEP/P&FS.	HSP: M&O MODE REQ HSP: CMD M/O MODE	
22	Select F/C MODE - 977.	HSP: F/C MODE REQ HSP: CMD F/C MODE	
23	Select MAP OVERRIDE OFF -984.	HSP: MAP OVRD OFF REQ HSP: MAP OVERRIDE OFF	
24	Using CVW data specified in table 5-3, uplink ALSEP 4B RTC 003 and verify printout. (Refer to Step 15.)	HSP: A4 CX CVW XXX C NNNN A4 CX CVW XXX C HSP: ALSEP RTC 003 4B BASE HBRON UPL REQ CAM UPLINK 003 4B ASE HBR ON RF DATA 065 174 003 HSP: S/C REJECT XXX C	
25	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: CMD M/O MODE	
26	Perform HSP ROACH. On completion of the history, return to ALSEP/LSP program.		

Sequence No. 5 RTC Uplinking (cont)

Step	Action	Indication	Purpose
27	At the UDB, remove the LD-22 card from slot A-32.		
28	Select F/C Mode - 977	HSP: F/C MODE REQ HSP: CMD F/C MODE	
29	Uplink ALSEP 4B RTC 003 and verify the printout.	HSP: ALSEP RTC 003 4B ASE HBR ON UPL REQ CAM UPLINK 003 4B ASE HBR ON RT DATA 06* *74 003 HSP: GND REJECT 177 1 5	
30	Repeat step 29 for RTC's 017, 027 037 and 156.	(Same as step 29) HSP: UDB MOD/DEMOD S XX Where: X = 0 for normal 1 for reverse	
31	Have the computer tech replace card removed in step 27.		
32	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: CMD M/O MODE	
33	Perform HSP ROACH Terminate ROACH, return to ALSEP/ P&FS program.	HSP: LOS, T A4 CX CVW 177 1 XXXX HSP: CMDH EOF	

Sequence No. 5. RTC Uplinking (cont)

Step	Action	Indication	Purpose
34	Manually position the history tape to BOT.		
35	PCM tech: Configure for ALSEP 3 ASE 10.6 kb/sec.	HSP: PCM LK CX ASE RT 1232: PCM LOCK CH X ASE RT	
36	Select F/C Mode - 977	HSP: F/C MODE REQ MSP: CMD F/C MODE	
37	Test conductor. Uplink RTC 003 to ALSEP 3A.	HSP: S/C REJECT 000 0	
38	Test conductor: Uplink RTC 003 to the remaining vehicles/decoders.	(Same as step 37)	
39	Select M&O Mode - 978	HSP: M/O MODE REQ HSP: CMD M/O MODE	
40	Perform ROACH. Terminate ROACH, return to ALSEP/ P&FS program	HSP: LOS, T HSP: CMDH EOF	
41	Computer tech: Manually position the history tape to BOT.		Configure for following sequences.

Sequence No. 5. RTC Uplinking (cont)

Step	Action	Indication	Purpose
42	PCM tech: Configure for ALSEP 3 LBR PSE 0.53 kb/sec. (SIM FMT 1 Decom FMT 1). Set SIM address 120 bit 10 to "0"; set SIM address 121 bit 10 to "1"	HSP: LBR LK CX ALSEP 3 RT 1232: LBR LOCK CH X ALSEP 3 RT	
43	PCM tech: Set CVW (Word 46) to 007 in simulator.		
44	Computer tech: Change MWP for ALSEP to 2000 MSec.	1232: MWP, A, 02000, ↑ MWP, □.	

Sequence No. 6. Uplinking ALSEP Critical RTC's

Step	Action	Indication	Purpose
1	Select Mode I - 979.	HSP: MODE 1 REQ HSP: MODE CONFIRMED	To verify uplinking of critical RTC's in the contingency bit rate.
2	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: MODE CONFIRMED	
3	Enable critical groups 1, 2, 3, and 4.	HSP: RTC GRP X ENABLE REQ HSP: RTC ENBL CRIT GRP X RTC/DATA HSP: (GRP X CRIT RTC's in numerical order)	
4	Select FC Mode - 977	HSP: F/C MODE REQ HSP: CMD F/C MODE	
5	Ensure valid commanding loop. Select ALSEP Site Status Test - 988.	HSP: CAM ALSEP STATUS REQ HSP: UDB STATUS OK ALS	
6	*Using table 5-4 uplink critical RTC's to the ALSEP 3 vehicle, changing associated sim data.	HSP: MAP VERIFY XXX C where: XXX = downlink data word 46 C = check bit	
	*Station option of quantity of RTC's uplinked.		

Sequence No. 6. Uplinking ALSEP Critical RTC's (cont)

Step	Action	Indication	Purpose
7	*Have the PCM tech set word 46 to 001 in sim and uplink selected critical RTC's.	HSP S/C REJECT 000 1	
8	Have the computer tech remove the LD-22, slot A-32 from UDB and repeat step 7 several times.	HSP: GND REJECT 000 1 5 HSP: UDB MOD/DEMODS XX	Verify BAD GND loop detection and new path selection. Repeat as necessary.
9	Have the computer tech replace card removed in step 8.		
10	Select MAP OVERRIDE ON - 983.	HSP: MAP OVRD ON REQ HSP: MAP OVERRIDE ON	
11	Repeat step 7.	HSP: MAP VERIFY 000 0	
12	Select MAP OVERRIDE OFF - 984	HSP: MAP OVERRIDE OFF	
13	Repeat step 7.	HSP: S/C REJECT 000 1	
14	Write EOF - 996.	HSP: CMDH EOF REQ HSP: CMDH EOF	
	*Station option of quantity of RTC's uplinked.		

Sequence No. 6. Uplinking ALSEP Critical RTC's (cont)

Step	Action	Indication	Purpose
15	LOG TAPE DUMP - 995.	HSP: LOG TAPE DUMP REQ HSP: LOG TAPE DUMP	
16	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: CMD M/O MODE	
17	Perform ROACH	HSP: LOS T A3 CX CVW 000 1 NNNN HSP: CMDH EOF	Verify ability to retrieve uplink histories.
18	Manually rewind the history tape to BOT.		
19	Terminate ROACH. Return to ALSEP/ P&FS program.		

Sequence No. 6. Uplinking ALSEP Critical RTC's (cont)

Step	Action	Indication		Purpose
20	Disable critical RTC's - 900.	HSP: CRIT RTC DSBL REQ		
		HSP: RTC DSBL CRIT ALL	RTC/DATA	
		ALSEP		
		TIMER OVT INHIB	033/000	
		PCV 1 SEL	060/000	
		PCV 2 SEL	062/000	
		CPE CVR GO	113/000	
		SWS CVR GO	122/000	
		SITE SURVEY XYZ	133/000	
		ASE SEQ/s FIRE	162/000	
		GRENADE 1 FIRE	163/000	
		GRENADE 2 FIRE	164/000	
		GRENADE 3 FIRE	165/000	
		GRENADE 4 FIRE	166/000	
		GRENADE ARM	170/000	
		LSP		
		LSG STBY	053/000	
		LSG OFF	054/000	
		PCV 1 SEL	060/000	
		PCV 2 SEL	062/000	
		LSP XMTR ON	156/000	

Sequence No. 7. LUK Function

Step	Action	Indication			Purpose	
1	Verify the contents of the following addresses via the 1232 I/O routine:				To verify LUK routine.	
					Vehicle	Decoder Address
	25563	1232:	06101	00130	1	A
	25564		06201	00030	1	B
	25565		06102	00116	2	A
	25566		06202	00016	2	B
	25567		06103	00062	3	A
	25570		06203	00144	3	B
	25571		06104	00025	4	A
	25572		06204	00065	4	B
	25573		06105	00151	5	A
	25602		00000	04000	MWP	
	25612		00000	10000	CAM-TLM	
			00000	04000	CAM- CMD	

Sequence No. 8. Modify MWP

Step	Action	Indication	Purpose
1	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: MODE CONFIRMED	To verify proper operation of MWP routine.
2	Perform LUK 25602. 1232 will indicate MWP.	1232: 00000 04000	
3	Select F/C Mode - 977.	HSP: F/C MODE REQ HSP: CMD F/C MODE	
4	Select MAP OVERRIDE OFF - 984.	HSP: MAP OVRD OFF REQ HSP: MODE CONFIRMED	
5	Ensure invalid MAP's (SIM contents = 0001_8).		
6	Uplink 005-CLR, ALSEP 3, A, 005, INITIATE. UPL, INITIATE *The difference in time between GMTA and GMTB should equal the MAP waiting period.	HSP: ALSEP RTC 005 3A ASE HBR OFF UPL REQ HSP: CAM UPLINK 005 3A ASE HBR OFF RF DATA 062 172 005 GMTA)* HSP: S/C REJECT 0001 (GMTB)* (this printout will occur when the MWP elapses)	

Sequence No. 8. Modify MWP (cont)

Step	Action	Indication	Purpose
7	Repeat step 6 for MWP times of 3000, 4000, and 5000.	(LUK at address 25602 to confirm the appropriate MWP value.) MWP — Contents (Octal) 3000 — 06000 4000 — 10000 5000 — 12000	To verify proper operation of MWP routine.
8	Write EOF - 996.	HSP: CMDH EOF REQ HSP: CMDH EOF	
9	Log tape dump - 995.	HSP: LOG TAPE DUMP REQ HSP: LOG TAPE DUMP	

Sequence No. 9. Modify VAD

Step	Action	Indication	Purpose
1	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: CMD M/O MODE	To verify proper operation of VAD routine
2	Modify the VAD for A1 to 127. Upon termination of routine, observe change is written on recovery MTU. Illegal Inputs: a. Octal numbers greater than 177. b. Decimal numbers 8 and 9.	Verify the change is written onto the recovery tape at the completion of each change.	
3	Repeat step 2 for the remaining vehicles and decoders. Change: B1 to 147 A2 to 061 B2 to 161 A3 to 026 B3 to 126 A4 to 166 B4 to 010 A5 to 057		

Step	Action	Indication	Purpose
4	TERMINATE the routine.	HSP: (Listing) DECODER VEH ADD 1 2 3 4 5 A 127 061 026 166 051 B 147 161 126 010	
5	Perform LUK at A1 25563 B1 25564 A2 25565 B2 25566 A3 25567 B3 25570 A4 25571 B4 25572 A5 25573 1232 will indicate VAD change.	1232: 06101 00127 06201 00147 06102 00061 06202 00161 06103 00026 06203 00126 06104 00166 06204 00010 06105 00051	To verify proper operation of VAD routine.
6	Select FC Mode - 977.	HSP: F/C MODE REQ HSP: CMD F/C MODE	

Sequence No. 9. Modify VAD (cont)

Step	Action	Indication	Purpose
7	Select MAP OVERRIDE ON - 983.	HSP: MAP OVRD ON REQ HSP: MAP OVERRIDE ON	
8	Uplink RTC 007 to all combinations of vehicles and decoders as follows: 1A 1B 2A 2B 3A 3B 4A 4B *5A	HSP: **ALSEP RTC 007 VV LOW BIT RT SEL UPL REQ HSP: CAM UPLINK 007 VV O LOW BIT RT SEL RF DATA DDD DDD DDD MAP VERIFY 000 0 VV = 1A DD = 127 170 007 VV = 1B DD = 147 170 007 VV = 2A DD = 061 170 007 VV = 2B DD = 161 170 007 VV = 3A DD = 026 170 007 VV = 3B DD = 126 170 007 VV = 4A DD = 166 170 007 VV = 4B DD = 010 170 007	To verify proper operation of VAD routine.

*The method of selecting ALSEP 5 is to latch (SUM) both ALSEP 1 and ALSEP 4
**5A will indicate LSP or HSP

Sequence No. 9. Modify VAD (cont)

Step	Action	Indication	Purpose
9	Select MAP OVRD OFF - 984.	HSP: MAP OVRD OFF REQ HSP: MAP OVERRIDE OFF CST: MAP OVRD OFF	
10	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: CMD M/O MODE	
11	Perform ROACH.	HSP: LOS T HSP: CMDH EOF	
12	Terminate ROACH. Return to ALSEP/ P&FS program.		
13	Perform a DARTS reload without CCDP recovery. Refer to sequence 16, step 22, and SCAN.	HSP: (Listing) DECODER VEHADD 1 2 3 4 5 A 130 116 62 25 151 B 30 16 144 65	Reestablish initalization value for VAD.

Sequence No. 10. Modify Station ID

Step	Action	Indication	Purpose
1	Select Mode I - 979.	HSP: MODE 1 REQ HSP: CMD MODE 1	To verify proper operation of STA routine.
2	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: CMD M/O MODE	
3	Modify station ID to other than program initialization using table 5-5 as reference. Note Type in decimal or acronym.	HSP: STATION XXX SELECT Verify HSD Source Code using ALS/ASTAM	
4	Select parameter listing - 990.	HSP: PARAMETER LIST REQ HSP: (listing - verify STA ID)	
5	Select TTY inventory, CLR, ALSEP 4, 981, INITIATE INITIATE	HSP: CAM ALS TTY INV REQ HSP: INV SUM IN PROGRESS TTY: (Inventory)	
6	Verify TTY heading.		

Sequence No. 10. Modify Station ID (cont)

Step	Action	Indication	Purpose
7	Select TTY inventory abort CLR, 971, INITIATE. INITIATE	HSP: TTY INV ABORT REQ HSP: TTY INV ABORTED TTY: (Inventory aborted)	To verify TTY inventory abort.
8	Repeat steps 3 through 7 for selected remaining stations.		

Sequence No. 11. Modify CAM

Step	Action	Indication	Purpose
1	Select Mode I - 979.	HSP: MODE 1 REQ HSP: MODE CONFIRMED	To verify proper operation of CAM routine.
2	Select M&O Mode - 978	HSP: M/O MODE REQ HSP: MODE CONFIRMED	
3	Modify the command program to accept the CAM input from the TLM CAM.	HSP: TLM CAM ENABLED	
4	Perform LUK at 25612.	1232: 00000 10000	
5	Perform several CAM functions from the TLM CAM.	(As noted in previous sequences)	
6	Perform several CAM functions from the CMD CAM.	(No acknowledges from the ALSEP/P&FS program)	
7	Using the TLM CAM, select F/C Mode - 977	HSP: F/C MODE REQ HSP: CMD F/C MODE	
8	Modify CAM to CMD CAM.	HSP: CMD CAM ENABLED	Change CAM in FC Mode

Sequence No. 11. Modify CAM (cont)

Step	Action	Indication	Purpose
9	Perform LUK at 25612.	1232: 00000 04000	
10	Perform several CAM functions from the CMD CAM.	(As noted in previous sequences)	To verify proper operation of CAM routine.
11	Perform several CAM functions from the TLM CAM.	(No acknowledges from the ALSEP/P&FS program)	

Sequence No. 12 LSP RTC's

Step	Action	Indication	Purpose
1	Confirm Mode 1/FC	CST: MODE 1/FC	Demonstrate the differences in ALSEP 5 RTC's and operator indications.
2	Select M&O Mode - 978	HSP: M/O MODE REQ HSP: CMD M/O MODE	
3	Enable LSP critical groups 5 and 6 - 955, 966	HSP: RTC GRP 5 ENABLE REQ HSP: RTCENBL CRIT GRP 5 RTC/DATA LSG STBY 053/053 LSG OFF 054/054 PCU 1 SEL 060/060 PCU 2 SEL 062/062 HSP: RTC GRP 6 ENABLE REQ HSP: RTC ENBL CRIT GRP 6 RTC/DATA LSP XMTR ON 156/156	Demonstrate LSP critical groups 5 and 6.

Sequence No. 12 LSP RTC's (cont)

Step	Action	Indication	Purpose
4	Select parameter listing - 990 Verify parameter listing and Command Status indicators reflect groups 5 and 6 enabled.	HSP: PARAMETER LIST REQ HSP: (listing) CST: (LSP GRP 5) (LSP GRP 6)	Verify critical groups 5 and 6 indicate enabled.
5	Review ALSEP 1 RTC 003 - CLR, ALSEP 1, REVIEW, 003, INITIATE. INITIATE.	HSP: ALS RTC 003 REV REQ HSP: RTC 003/003 ASE HBR ON	Demonstrate differences in ALS nad LSP RTC's.
6	Review ALSEP 4 RTC 003 - CLR, ALSEP 4, REVIEW, 003, INITIATE. INITIATE.	HSP: ALS RTC 003 REV REQ HSP: RTC 003/003 ASE HBR ON	Demonstrate that RTC's for ALSEPs 1 through 4 are common.

Sequence No. 12 LSP RTC's (cont)

Step	Action	Indication	Purpose
7	Review ALSEP 5 RTC 003 - CLR, ALSEP 1, ALSEP 4, REVIEW, 003, INITIATE. INITIATE. Note that the method of selecting ALSEP 5 is to latch (sum) both ALSEP 1 and ALSEP 4.	HSP: LSP RTC 003 REV REQ HSP: RTC 003/003 LSP FMT ON	Demonstrate method of selecting ALSEP 5 (LSP) and the results of that selection.
8	Select FC Mode - 977	HSP: F/C MODE REQ HSP: CMD F/C MODE	
9	Configure PCM for ALSEP 5 PSE (1.060 kb/sec)input from the S/P simulator.	HSP: NBR LK CX ALSEP 5 RT HSP: A5 CX CVW 010 1 1232: NBR LOCK CHX ALSEP 5 RT	Configure for ALSEP 5 commanding. Demonstrate new construction of CVW message.

Sequence No. 12 LSP RTC's (cont)

Step	Action	Indication	Purpose
10	Uplink ALSEP 5 RTC 003 - CLR, ALSEP 5 (1+4), A, 003, INITIATE. UPLINK, INITIATE.	HSP: LSP RTC 003 5A LSP FMT ON UPL REQ HSP: CAM UPLINK 003 5A LSP FMT ON. RF DATA 151 174 003 HSP: S/C REJECT 010 1	Command the LSP through decoder A with invalid MAPS.
11	Attempt to uplink through decoder B - CLR, ALSEP 5, B, 003, INITIATE	HSP: ILLEGAL VEHICLE 003	Demonstrate the unavailability of ALSEP 5 decoder B.

Sequence No. 12 LSP RTC's (cont)

Step	Action	Indication	Purpose
12	* Use table 5-2, changing A/G word 7 to the appropriate content. CLR, ALSEP 5, A, XXX, INITIATE. UPLINK, INITIATE.	HSP: A5 CX CVW 0101 NNNN HSP: A5 CX CVW XXX 1 HSP: LSP RTC XXX 5A E——E UPL REQ HSP: CAM UPLINK XXX 5A E——E HSP: RF DATA 151 YYY XXX HSP: MAP VERIFY XXX 1 Where XXX = RTC NUMBER YYY = complement of RTC E__E = English of RTC	Uplink to ALSEP 5A with valid MAPS.
13	Select M&O Mode - 978	HSP: M/O MODE REQ HSP: MCD M/O MODE	Finalize uplink sequence.
14	Perform HSP ROACH for all times, all vehicles	HSP: LOS T HSP: CMDH EOF	Demonstrate ROACH annotation of LSP RTC's
15	Manually rewind the history tape to BOT.		

*Station option as to number of RTC's uplinked.

Sequence No. 12 LSP RTC's (cont)

Step	Action	Indication	Purpose
16	Terminate ROACH	HSP: NBR LK CH X ALSEP 5 RT HSP: A5 CX CVW XXX 1 1232: NBR LOCK CH X ALSEP 5 RT	
17	Select FC Mode - 977	HSP: F/C MODE REQ HSP: CMD F/C MODE	

Sequence No. 13. Status Requests and Error Conditions

Step	Action	Indication	Purpose
1	Have the computer tech ensure UDB is configured back-to-back.		To verify site status requests and error conditions.
2	Ensure SAFE/OPERATE switch on M&O console is in OPERATE.	1232: (UDB M&O switch - OPERATE)	
3	Select ALSEP Status Test - 988.	HSP: CAM ALSEP STATUS REQ HSP: UDB STATUS OK ALS	
4	Have the computer tech pull card LD-22 of slot A-32 in the UDB.		To verify responses for a data error.
5	Select ALSEP Status Test - 988.	HSP: CAM ALSEP STATUS REQ HSP: UDB STATUS BAD ALS 1232: RF DATA ERR 11110 ALSEP	
6	On the UDB, have the computer tech configure the status register as follows: 30 29 28 27 26 1 1 0 0 0 1 = Up (On) 0 = Down	UDB Status Register: 11000.	To verify responses for systems 1 and 2 off, and data error.

Sequence No. 13. Status Requests and Error Conditions (cont)

Step	Action	Indication	Purpose
7	Select ALSEP Status Test - 988.	HSP: CAM ALSEP STATUS REQ HSP: UDB STATUS BAD ALS 1232: RF D/S ERROR 11000 ALSEP	
8	Replace card removed in step 4.		
9	On the UDB, have the computer tech configure the status register as follows: 30 29 28 27 26 1 = Up 0 0 0 1 0 0 = Down	VDB status register: 00010	Verify responses for system 1 not configured properly.
10	Select ALSEP Status Test - 988.	HSP: CAM ALSEP STATUS REQ HSP: UDB STATUS BAD ALS 1232: RF STATUS ERROR 00010 ALSEP	
11	On the UDB, have the computer tech configure the status register as follows: 30 29 28 27 26 0 1 0 1 0	UDB status register: 01010	

Sequence No. 13. Status Requests and Error Conditions (cont)

Step	Action	Indication	Purpose
12	Select ALSEP Status Test - 988.	HSP: CAM ALSEP STATUS REQ HSP: UDB STATUS OK ALS 1232: UDB LOOP GOOD - ALSEP	
13	Normalize the UDB status register 30 29 28 27 26 1 1 1 1 0		

Sequence No. 14. CAM Cancel

Step	Action	Indication	Purpose
1	CLR, ALSEP 2, A, 003, INITIATE	HSP: ALSEP RTC 003 2A ASE HBR ON UPL REQ	To verify ability to cancel CAM.
2	CLR, ALSEP 2, A, 003, INITIATE	HSP: ILLEGAL REQ 003	
3	INITIATE	HSP: ALSEP RTC 003 2A ASE HBR ON UPL REQ	
4	CLR, 999, INITIATE	HSP: CANCEL CAM	
5	CLR, ALSEP 2, A, 003, UPLINK INITIATE	HSP: SEQUENCE A ERROR 003	
6	CLR, ALSEP 2, A, 003, INITIATE	HSP: ALSEP RTC 003 2A ASE HBR ON UPL REQ	
7	CLR, 999, INITIATE	HSP: CANCEL CAM	
8	CLR, 990, INITIATE	HSP: PARAMETER LIST REQ	
9	CLR, 999, INITIATE	HSP: CANCEL CAM	

Sequence No. 14. CAM Cancel (cont)

Step	Action	Indication	Purpose
10	CLR, 990, INITIATE	HSP: PARAMETER LIST REQ	
11	INITIATE	HSP: (Listing)	

Sequence No. 15. Illegal Conditions for I/O Routines

Step	Action	Indication	Purpose
1	Have the computer tech attempt to perform the following I/O routines: VAD, MWP, STA, CAM, CMH, DTU, LUK, DES, and FMT.	1232: M AND O DISABLE (Exception: LUK, DTU, FMT, and CAM will be successful)	To verify I/O routine inoperable in FC Mode.
2	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: CMD M/O MODE	To verify switching to FC Mode will interrupt I/O routine and disable same.
3	Repeat step 1 with the exception of LUK, FMT, DTU, and CAM. Midway through each routine, notify the M&O.		
4	Upon notification, select FC Mode - 977.	HSP: F/C MODE REQ HSP: CMD F/C MODE	
5	Have the computer tech continue I/O routine.	1232: M AND O DISABLE	
6	Repeat steps 2 through 5 for the remainder of the mnemonics.		

Sequence No. 16. Program Recovery

Step	Action	Indication	Purpose
1	Mount the appropriate DARTS paper tape in the 1232 reader.		To verify proper operation of DARTS.
2	Select M&O Mode - 978	HSP: M&O MODE REQUEST HSP: CMD M&O MODE	
3	Select parameter listing - 990.	HSP: PARAMETER LIST REQ HSP: (Listing)	
4	Verify Mode I/M&O Mode.	(Parameter Listing)	
5	Select HSP Inventory - CLR, ALSEP 2, 982, INITIATE INITIATE.	HSP: ALSEP HSP INV REQ HSP: (Inventory)	
6	Disable RTC - No. 011. CLR, ALSEP 2, RTC CLEAR, 011, INITIATE. INITIATE.	HSP: ALS RTC 011 DSBL REQ HSP: ALS RTC DSBL 011/000	To prepare changes that will be noted for recovery.
7	Disable RTC - No. 174. CLR, ALSEP 2, RTC CLEAR, 174. INITIATE INITIATE.	HSP: ALS RTC 174 DSBL REQ HSP: ALS RTC DSBL 174/000	

Sequence No. 16. Program Recovery (cont)

Step	Action	Indication	Purpose
8	Enable critical RTC (group 3) - 933.	HSP: RTC GRP 3 ENABLE REQ HSP: RTC ENBL CRIT GRP 3 RTC/DATA SITE SURVEY XYZ 133/133	
9	Have the computer tech make the following parameter changes: STA - other than initialization MWP - 2000 FMT - 2 CAM - opposite, DTU - 15 VAD - A2 to 107	HSP: FMT 2 SELECT HSP: XXX CAM ENABLED HSP: STATION XXX SELECT	To prepare changes that will be noted for recovery.
10	Request a parameter listing on the reassigned CAM - 990	HSP: PARAMETER LIST REQ HSP: (Listing)	
11	Verify the changes made in steps 8 and 9 are indicated on the listing.		
12	Select an ALSEP HSP inventory - 982.	HSP: ALSEP RTC HSP INV REQ HSP: (Inventory)	
13	Verify the changes made in steps 6 through 8.		

Sequence No. 16. Program Recovery (cont)

Step	Action	Indication	Purpose
14	Perform a phase II initialization with CCDP recovery.	HSP: (Listing)	To verify proper operation of reinitialization.
15	Verify that listing of steps 10 and 14 are the same with the exception of, the header - Initialized phase II, recovery option exercised, critical RTC's which will be disabled, Mode II, FC Mode.		
16	Select an HSP inventory - 982.	HSP: ALSEP HSP INV REQ HSP: (Inventory)	
17	Verify critical RTC's and RTC's 011 and 174 are disabled.		To verify proper operation of reinitialization.
18	Perform a phase II initialization without CCDP recovery.	HSP: (Listing)	
19	Verify that listings of steps 10 and 18 are the same with the exception that, header initialized phase 2 and the critical RTC's are disabled, Mode II, FC Mode.		

Sequence No. 16. Program Recovery (cont)

Step	Action	Indication	Purpose
20	Select an HSP inventory - 982.	HSP: ALSEP HSP INV REQ HSP: (Inventory)	
21	Verify that critical RTC's are disabled and RTC's 011 and 174 are enabled.		
22	Fault the computer in the following manner: 1. Stop the program using STOP-7 2. Reset STOP-7 3. Select OP STEP 4. MC the computer 5. Select RUN 6. Depress START	1232: FAULT AT ADDRESS 000000 XXX:XX:XX:XX FAULT 000000 65000 10230 XXX:XX:XX:XX FAULT DUMP HSP: (Parameter Listing)	
23	Verify that the listings of steps 14 and 22 are the same.		
24	Select HSP inventory - 982. Verify that critical RTC's are disabled and RTC's 011 and 174 are enabled.	HSP: RTC HSP INV REQ HSP: (Inventory)	To verify proper operation of DARTS.

Sequence No. 16. Program Recovery (cont)

Step	Action	Indication	Purpose
25	Force a computer fault (refer to step 22), but do not perform a CCDP recovery.	HSP: (Listing) Verify that listing is the same as when program was initialized with the exception of the header which will be initialized phase 2.	To verify proper operation of DARTS.
26	Select HSP inventory - 982.	HSP: ALSEP HSP INV REQ HSP: (Inventory)	
27	Verify that inventories of steps 24 and 26 are the same.		
28	Select Mode I - 979.	HSP: MODE 1 REQ HSP: CMD MODE 1	
29	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: CMD M/O MODE	
30	Disable the following RTC's: 003, 007, 005, 011, 006, 012,	HSP: ALS RTC XXX DSBL REQ HSP: ALS RTC DSBL XXX/000	

Sequence No. 16. Program Recovery (cont)

Step	Action	Indication	Purpose
31	Select HSP inventory - 982. Verify following RTC's are disabled: 003, 005, 006, 007, 011, 012.	HSP: ALSEP HSP INV REQ HSP: (Inventory)	
32	Force a computer fault (refer to step 22) and allow the program to perform a CCDP recovery.	1232: FAULT AT ADDRESS 000000 XXX:XX:XX:XX FAULT 000000 65000 10230 XXX:XX:XX:XX FAULT DUMP HSP: (Parameter Listing) Verify listings in steps 25 and 32 are the same, with header initialized phase 2 recovery option exercised.	
33	Select HSP INV - 982. Verify RTC's disabled in step 30 remain cleared.	HSP: ALSEP HSP INV REQ HSP: (Inventory)	
34	Repeat step 22 but do not perform a CCDP recovery.	1232: FAULT AT ADDRESS 000000 XXX:XX:XX:XX FAULT 000000 65000 10230 XXX:XX:XX:XX FAULT DUMP HSP: (Parameter Listing) Verify listings in steps 32 and 34 are the same.	
35	Select HSP INV - 982.	Verify all RTC's disabled in step 30 are now enabled and all critical RTC's are disabled.	

Sequence No. 16. Program Recovery

Step	Action	Indication	Purpose
36	Set STOP 6 and perform a DARTS recovery.	1232: FAULT AT ADDRESS 000000 1232: FAULT 000000 65000 010230 642: 6-STOP	Demonstrate CCDP protection feature.
37	At the MTU, depress and hold STATUS REG STAR bit 7.		Force MTU error.
38	Release STOP 6 and depress START continue recovery.	1232: (Various error messages) 642: 4-STOP	Abort CCDP
39	Attempt any phase of program initialization	1232: FAULT AT 064565	Demonstrate the program will not cycle without a valid recovery read.
40	Allow a valid DARTS recovery.	1232: FAULT 064565 65070 00000	Restore the program to a normal configuration.

Sequence No. 17. ROACH

Step	Action	Indication	Purpose
1	Select Mode I - 979.	HSP: MODE 1 REQ HSP: CMD MODE 1	To verify proper operation of the Off - Line Command History program, ROACH.
2	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: CMD M/O MODE	
3	Enable critical RTC's 911, 922, 933, and 944.	HSP: RTC GRP X ENABLE REQ RTC ENBL CRIT GRP X RTC/DATA	
4	Select FC Mode - 977.	HSP: F/C MODE REQ HSP: CMD F/C MODE	
5	Select ALSEP Site Status - 988.	HSP: CAM ALSEP STATUS REQ HSP: UDB STATUS OK ALS	
6	Set CMD History Tape Handler Address to ADDRESS 5.	1232: MAG TAPE 2 OFF-LINE	Verify that a disabled MTU will give a BAD EOF printout.
7	Uplink two RTC's.		

Sequence No. 17. ROACH (cont)

Step	Action	Indication	Purpose
8	Write EOF - 996.	HSP: CMDH EOF REQ HSP: CMDH EOF BAD	Verify that a disabled MTU will give a BAD EOF printout.
9	Change the CMD history tape handler address switch to ADDRESS 2.		
10	Uplink RTC (critical and non-critical) to different ALSEP's and decoders. Ensure that all combinations are selected.		To develop history for ROACH verification.
11	Write EOF - 996.	HSP: CMDH EOF REQ HSP: CMDH EOF	
12	Uplink two more RTC's.		
13	Write EOF - 996.	HSP: CMDH EOF REQ HSP: CMDH EOF	
14	Uplink two more RTC's		

Sequence No. 17. ROACH (cont)

Step	Action	Indication	Purpose
15	Write EOF - 996.	HSP: CMDH EOF REQ HSP: CMDH EOF	To develop history for ROACH verification.
16	Select Mode I - 979.	HSP: MODE 1 REQ HSP: MODE CONFIRMED	
17	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: CMD M/O MODE	
18	At 1232, select CMH, ↑	1232: INIT CMD HISTORY HSP: LOS T HSP: CMDH EOF	Initiate ROACH.
19	Initialize for type-ALSEP Time-All, Vehicle-All and Destination -TTY. Verify correct header and abort history. Return to operational program.	HSP: CMD HIST ALSEP A ALL TIME GMT ENABLED HISTORY ABORTED LOG TAPE DUMP ROS T PARAMETER LISTING 1232: GMT ENABLED HISTORY ABORTED	

Sequence No. 17. ROACH (cont)

Step	Action	Indication	Purpose
20	Repeat step 18.		Initiate ROACH.
21	Initialize for between times, before time, since time, and A-entire mission.		To verify proper time parameter.
22	Initialize for different vehicles: 1, 2, 3, 4, and A-all.		To verify proper vehicle parameters.
23	Initialize for different destinations: teletype, HS printer, and both.		To verify proper destination parameters.
24	Select various different histories and abort them.		To verify abort functions.

Sequence No. 18. RTC Reviews

Step	Action	Indication	Purpose
1	Perform a phase II initialization of the ALSEP/LSP program. Do not perform a CCDP recovery.	HSP: (PARAMETER LISTING)	Configure system for P&FS RTC reviews.
2	Select Mode 1 - 979.	HSP: MODE 1 REQ HSP: CMD MODE 1	To review RTC's in Mode 1, FC Mode.
3	Select RTC TTY inventory-CLR, P&FS1, 981, INITIATE. INITIATE. Continue with remaninder of sequence while TTY SUM is in progress.	HSP: CAM PFS TTY INV REQ HSP: INV SUM IN PROGRESS TTY: (Inventory summary) HSP: INV SUM COMPLETED (at completion of inventory)	
4	Select RTC HSP inventory-CLR, P&FS 1, 982, INITIATE. INITIATE.	HSP: P&FS HSP INV REQ HSP: RTC INVENTORY	
5	Review P&FS RTC's 001 through 032*-CLR, P&FS 1, REVIEW, XXX, INITIATE. INITIATE.	HSP: PFS RTC XXX REV REQ HSP: RTC XXX/DDD EEEEE Where: XXX = CAM number DDD = data content EEEEE = English Description	

*Station option on quantity of RTC's reviewed.

Sequence No. 18. RTC Reviews (cont)

Step	Action	Indication	Purpose
6	Select Mode II - 980.	HSP: MODE 2 REQ HSP: CMD MODE 2	To review RTC's in Mode II FC Mode.
7	*Review P&FS RTC's 033 through 077-CLR, P&FS 1, REVIEW, XXX, INITIATE.	(same as step 5)	
	*Station option on quantity of RTC's reviewed.		

Sequence No. 19. RTC's (Enable/Disable)

Step	Action	Indication	Purpose
1	Select Mode I - 979.	HSP: MODE 1 REQ HSP: CMD MODE 1	Verify inability to clear RTC's in FC Mode.
2	Select P&FS HSP inventory - CLR, P&FS 1, 982, INITIATE. INITIATE.	HSP: P&FS HSP INV REQ HSP: (RTC INVENTORY)	
3	Attempt to clear any P&FS RTC-CLR, P&FS 1, RTC CLEAR, XXX, INITIATE. INITIATE.	HSP: PFS RTC XXX DSBL REQ HSP: NOT IN M/O XXX	
4	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: CMD M/O MODE	Verify ability to disable and enable RTC's.
5	Disable several P&FS RTC's. CLR, P&FS 1, RTC CLEAR, XXX, INITIATE. INITIATE.	HSP: PFS RTC XXX DSBL REQ HSP: PFS RTC DSBL XXX/ 000	
6	Select P&FS HSP inventory - 982.	(Same as step 2)	

Sequence No. 19. RTC's (Enable/Disable) (cont)

Step	Action	Indication	Purpose
7	Verify the data of the RTC's disabled in step 5 equals 000.		Verify ability to disable and enable RTC's.
8	Enable some of the P&FS RTC's disabled in step 5, CLR, P&FS 1 ENABLE, XXX, INITIATE. INITIATE.	HSP: PFS RTC XXX ENBL REQ HSP: PFS RTC ENBL XXX/XXX.	
9	Select P&FS HSP inventory - 982.	(Same as step 2)	
10	Verify the RTC's enabled in step 8 contain the required data.		
11	Enable the remainder of the P&FS RTC's disabled in step 5.	(Same as step 8)	
12	Select P&FS HSP inventory.	(Same as step 2)	
13	Verify the HSP inventory taken in step 12 is identical to the one taken in step 2.	All defined P&FS RTC's are enabled and contain required data.	

Sequence No. 20. Manual I/O Routines

Step	Action	Indication	Purpose
1	Select FC Mode - 977.	HSP: F/C MODE REQ HSP: CMD F/C MODE	Verify the integrity of the P&FS sensitive manual I/O routines.
2	Select parameter listing - 990.	HSP: PARAMETER LIST REQ HSP: (Listing)	
3	Select M&O Mode - 978.	HSP: M/O MODE REQ HSP: CMD M/O MODE	
4	Using the VAD routine, change the P&FS 1 vehicle address to a legal address other than that indicated on the parameter listing taken in step 2.	(Verify the change is written on the recovery tape.)	Verify the proper operation of the VAD, SBC, and MWP routines.
5	Using the SBC routine, change the P&FS subbit codes to a legal code other than that indicated on the parameter listing taken in step 2.	(Verify the change is written on the recovery tape.)	
6	Using the MWP routine, change the P&FS MWP to a legal value other than that indicated on the parameter listing taken in step 2.	(Verify the change is written on the recovery tape.)	

Sequence No. 20. Manual I/O Routines (cont)

Step	Action	Indication	Purpose
7	Use the LUK routine to confirm the appropriate values entered in steps 4, 5, and 6.	1232: (Appropriate printout of the octal contents of the address being inspected.) (Refer to STDN No. 502.5/ALSEP for applicable contents.)	Verify the proper operation of the VAD, SBC, and MWP routines.
8	Perform a DARTS reload without a CCDP recovery.	HSP: (Listing)	Restore initialization values.

Sequence No. 21. RTC Uplinking

Step	Action	Indication	Purpose
1	Select Mode I - 979.	HSP: CMD MODE REQ HSP: CMD MODE 1	
2	Select a parameter listing - 990.	HSP: PARAMETER LIST REQ HSP: (Parameter Listings)	
3	Write EOF - 996.	HSP: CMDH EOF REQ HSP: CMDH EOF	
4	Ensure valid uplink and ground loops. Select Site Status Test-CLR, P&FS 1, 988, INITIATE. INITIATE.	HSP: CAM P&FS STATUS REQ HSP: UDB STATUS OK PFS	
5	Uplink several RTC's to P&FS 1-CLR, P&FS 1, XXX, INITIATE. UPL INITIATE.	HSP: EEEEE UPL REQ P&FS RTC XXX P1 HSP: CAM UPLINK XXX P1 EEEEE RF DATA 26 YY S/C REJECT 000D Where: XXX = RTC number EEE = English description YY = RTC Number decoded	

Sequence No. 21. RTC Uplinking (cont)

Step	Action	Indication	Purpose
6	Write EOF - 996.	HSP: CMDH EOF REQ HSP: CMDH EOF	
7	Ensure valid MAP's are being input to the computer from the PCM simulator.		
8	Repeat step 5, uplinking several more RTC's to the P&FS 1 vehicle.	HSP: (Same as step 5 except for the following:) HSP: MAP VERIFY 013 0	
9	Write EOF - 996.	(Same as step 6)	
10	Log tape dump - 995.		
11	Insert 01^2_8 in simulator MAP word.		
12	Select MAP OVERRIDE ON - 983.	HSP: MAP OVRD ON REQ HSP: MAP OVERRIDE ON	

Sequence No. 21. RTC Uplinking (cont)

Step	Action	Indication	Purpose
13	Repeat step 5, uplinking several more RTC's to the P&FS 1 vehicle.	HSP: (Same as step 8 except for the following:) HSP: MAP VERIFY 000 0	
14	Select MAP OVERRIDE OFF - 984.	HSP: MAP OVRD OFF REQ HSP: MAP OVERRIDE OFF	
15	Write EOF - 996.	(Same as step 6)	
16	Log tape dump - 995.		
17	Repeat step 5.	HSP: (Same as step 5 except for following:) HSP: S/C Reject 012 0	
18	Write EOF-996	HSP: CMDH EOF REQ HSP: CMDH EOF	
19	Write LOG TAPE DUMP-995	HSP: LOG TAPE DUMP REQ HSP: LOG TAPE DUMP	

Sequence No. 22. Command History

Step	Action	Indication	Purpose
1	Select Mode I - 979.	HSP: MODE 1 REQ HSP: MODE CONFIRMED	Verify the capability of retrieving uplinked P&FS RTC's.
2	Select M&O Mode - 978.	HSP: M&O MODE REQ HSP: CMD M&O MODE	
3	At 1232, type CMH, ↑.	1232: INIT CMD HISTORY HSP: LOS T HSP: CMDH EOF	
4	Initialize the ROACH program with the following parameters: Type: P Time: A Vehicle: A Destination: A	HSP: (Header information; RTC uplink history) TTY: (RTC uplink history)	
5	Verify the history printout corresponds to the RTC's uplinked in sequence No. 21.		

Table 5-2. Simulator/Command Verification List

CAM No.	Sim Data	CAM No.	Sim Data	CAM No.	Sim Data	CAM No.	Sim Data	CAM No.	Sim Data
003	007	034	071	064	151	110	221	141	303
005	013	035	073	065	153	111	223	142	305
006	015	036	075	066	155	112	225	143	307
007	017	037	077	067	157	114	231	144	311
011	023	041	103	070	161	115	233	145	313
012	025	042	105	071	163	117	237	146	315
013	027	043	107	072	165	120	241	150	321
014	031	044	111	073	167	121	243	152	325
015	033	045	113	074	171	123	247	153	327
017	037	046	115	075	173	124	251	154	331
021	043	050	121	076	175	125	253	155	333
022	045	052	125	101	203	127	257	156	335
023	047	053	127	102	205	131	263	160	341
024	051	054	131	103	207	132	265		
025	053	055	133	104	211	134	271	171	363
027	057	056	135	105	213	135	273	172	365
031	063	057	137	106	215	136	275	174	371
032.	065	063	147	107	217	140	301		

Table 5-3. ALSEP Simulator Data Printout

Sim Data	HS Printout
0001	S/C REJECT 000 1
0002	S/C REJECT 001 0
0003	S/C REJECT 001 1
0004	S/C REJECT 002 0
0005	S/C REJECT 002 1
0006	S/C REJECT 003 0
0077	S/C REJECT 037 1
0777	S/C REJECT 177 1
1777	S/C REJECT 177 1

Table 5-4. ALSEP RTC MAP Content

RTC No.	Sim Data
033	067
060	141
062	145
113	227
122	245
133	267
162	345
163	347
164	351
165	353
166	355
170	361

Table 5-5. Station Identification Bits

ALSEP/P&FS Station Acronym	ALSEP/ P&FS Station ID (Decimal)	TLM WORD 3 SOURCE CODES (WRD 3 2^4 - 2^9) (WRD 4 2^0 - 2^1)	TLM Word 18 Bits 2^3 - 2^7 CAP ID (Octal) / ALCS to Station ID (Octal)
MIL	71	100	01
BDA	02	114	04
ACN	75	117	05
CYI	04	121	06
MAD	23	122	07
CRO	08	244	10
GWM	24	253	12
HAW	12	255	13
GDS	28	260	14
VAN	62	112	17
ETC	77	130	24
GLN	78	166	25

Note

1. The station ID is typed in at a 1232 keyboard and used by GSFC/MCC to determine the originator.

2. ALCS to station ID: Bits 25-29 of the CER or CEF.

3. Source Code: MCC/GSFC (494) uses this ID to identify station transmitting data.

4. Destination Code: ALCS - $160_{(8)}$
NOCC - $200_{(8)}$
NOCC/ALCS - $236_{(8)}$

5. CAP ID: CCATS uses bits 20-24 of CMD return subblock to identify station transmitting CAP.

5.6 TELEMETRY FAMILIARIZATION PROCEDURES

5.6.1 GENERAL

This paragraph contains procedures primarily intended to familiarize the operators with the telemetry functions of the ALSEP/LSP operation program. Successful completion of these sequences is also necessary to ensure proper hardware/software compatability.

5.6.2 DETAILED SEQUENCES

Tables

Table 5-6. ALSEP/P&FS Telemetry Program Verification Configurations

Decom	Vehicle	Bit Rate (kb/sec)
	Configuration A*	
1	P&FS	0.128 (real time)
2	*ALSEP 2 (LBR)	0.530 (real time)
3	*ALSEP 3 (NBR)	1.060 (real time)
Sim	P&FS 1	0.128 (input to decom 1)
	Configuration B*	
1	P&FS	0.128 (real time)
2	*ALSEP 4 (ASE)	10.600 (real time)
3	*ALSEP 3 (LBR)	0.530 (real time)
Sim	P&FS 1	0.128 (to decom 1)
	Configuration C*	
2	ALSEP 3 (NBR)	1.060 (type playback)
3	ALSEP 3 (NBR)	1.060 (real time)
Sim	ALSEP 3 (NBR)	1.060 (to decoms 2 & 3)

* Use AS-511 ALSEP confidence tape as data source.

Sequence No. 1. Slot Assignment for One Vehicle (ALSEP or P&FS)

Step	Action	Indication	Purpose
1	Load and initialize the ALSEP/LSP DTU CH 12, format 1, 3A, and 2B. Use configuration A.	1232: MTB, M HSP: FMT 1, 3A, 2B	Initialize parameters
2	Set the HSD monitor for 7.2 kb/sec, input to ALS/ASTAM from CH 12 output. Enable decoms 1 and 3.	1232: NBR LOCK CH X ALSEP 3 RT PCM LOCK CH X P&FS 1 RT HSP: NBR LK CX ALSEP 3 RT PCM LK CX P&FS 1 RT	Verify RSDP lock indications.
3	Using the ALS/ASTAM, verify the A frame status word for active data and B frame status word for fill or static data.	FRAME A NLFI/LIVE/REAL SYNC/ /NLOK NLOK/3-D /MISS FRAME B NLFI/ /PLBK SYNC/FILL/NLOK NLOK/2-A2/	Verify proper status indication.
4	Check HSD format for P&FS data status.	P&FS NLFI/LIVE/REAL SYNC/ /NLOK /P-I /	

Sequence No. 1. Slot Assignment for One Vehicle (ALSEP or P&FS) (cont)

Step	Action	Indication	Purpose
5	Enable decom 2 and inhibit decom 3.	1232: SYNC LOST CH Y ALSEP 3 LBR LOCK CH Y ALSEP 2 RT HSP: SYNC LOST CH Y ALSEP 3 LBR LK CX ALSEP 2 RT	
6	Using ALS/ASTAM. verify proper status word for frame "B" assignment and P&FS.	FRAME A NLFI/ /REAL SYNC/STAT/NLOK NLOK/3-D / FRAME B NLFI/*LIVE/REAL SYNC/* /NLOK NLOK/2-A2/ P&FS NLFI/LIVE/REAL SYNC/ /NLOK /P-1 /	Verify proper status indication when vehicle downlink is received.
		* When processing LBR (0.530) data, the associated slot status will alternate between "LIVE" and "FILL."	

Sequence No. 2. Active Format Change

Step	Action	Indication	Purpose
1	Inhibit decoms and change to configuration "B".	1232: SYNC LOST CH X ALSEP 2 SYNC LOST CH X P&FS 1 HSP: SYNC LOST CH X ALSEP 2 SYNC LOST CH X P&FS 1	
2	Verify ALSEP and P&FS status words using the HSD monitor.	FRAME A NLFI/ /REAL SYNC/STAT/NLOK NLOK/3- D / P&FS NLFI/FILL/REAL SYNC/ /NLOK /P-1 / FRAME B NLFI/ /REAL SYNC/STAT/NLOK NLOK/2-A2/	
3	Enable decoms; RSDP operator monitor 1232 and HSP for proper lock indications.	1232: PCM LOCK CH X ASE RT LBR LOCK CH X ALSEP 3 RT HSP: PCM LK CX ASE RT LBR LK CX ALSEP 3 RT A3 CX CVW 0340 PCM LK CX P&FS 1 RT	
4	Verify frame "A" and "B" and P&FS status words using ALS/ASTAM.	FRAME A NLFI/LIVE/REAL SYNC/ /NLOK NLOK/3-D / P&FS NLFI/LIVE/REAL SYNC/ /NLOK /P-1 /	

Sequence No. 2. Active Format Change (cont)

Step	Action	Indication	Purpose
4 (cont)		FRAME B NLFI/ /REAL SYNC/STAT/NLOK NLOK/2-A2/	
5	Perform 1232 format change to format 2.	1232: FMT, 2↑ HSP: FMT 2 SELECT	
6	Verify the ALSEP and P&FS status words using ALS/ASTAM.	FMT = ASE NLFI/LIVE/REAL SYNC/ /NLOK NLOK/4-C / P&FS NLFI/LIVE/REAL SYNC/ /NLOK /P-1 /	Verify HSD outputs ASE format.

Sequence No. 3. Slot Assignment (Three Input Vehicles)

Step	Action	Indication	Purpose
1	Inhibit all decoms and change decom configuration to "A".	1232: SYNC LOST CH X ASE SYNC LOST CH Y ALSEP 3 SYNC LOST CH X P&FS 1 HSP: SYNC LOST CH X ASE 2 SYNC LOST CH Y ALSEP 3 SYNC LOST CH X P&FS 1	
2	Perform 1232 format 1 changes.	1232: FMT, 1, 3A, 2B FMT 1 SELECT, 3A, 2B HSP: FMT 1 3A 2B	
3	Enable decoms 1, 2, and 3.	1232: NBR LOCK CH X ALSEP 3 RT LBR LOCK CH X ALSEP 2 RT PCM LOCK CH X P&FS 1 RT HSP: NBR LK CX ALSEP 3 RT LBR LK CX ALSEP 2 RT PCM LK CX P&FS 1 RT	
4	Verify status word using ALS/ASTAM	FRAME A NLFI/LIVE/REAL SYNC/ /NLOK NLOK/3-D / FRAME B NLFI/LIVE/REAL SYNC/ /NLOK NLOK/2-A2/ P&FS NLFI/LIVE/REAL SYNC/ /NLOK /P-1 /	Verify status words.

Sequence No. 4. Passive Format Change

Step	Action	Indication	Purpose
1	Perform 1232 format 1 frame assignment change.	1232: FMT, 1, 2A, 3B, ↑ FMT 1 SELECT, 2A, 3B HSP: FMT 1 SELECT 2A 3B	
2	Verify "A" and "B" frame status word.	FRAME A NLFI/LIVE/REAL SYNC/ /NLOK NLOK/2-A2/ FRAME B NLFI/LIVE/REAL SYNC/ /NLOK NLOK/3-D / P&FS NLFI/LIVE/REAL SYNC/ /NLOK /P-1 /	Verify vehicle I/O change in slot status word
3	Perform 1232 format 1 frame assignment change.	1232: FMT, 1, 3A, 2B, ↑ FMT 1 SELECT, 3A, 2B HSP: FMT 1 SELECT 3A 2B	
4	Verify "A" and "B" frame status words.	FRAME A NLFI/LIVE/REAL SYNC/ /NLOK NLOK/3-D /	

Sequence No. 4. Passive Format Change (cont)

Step	Action	Indication	Purpose
4 (cont)		FRAME B NLFI/LIVE/REAL SYNC/ /NLOK NLOK/2-A2/	

Sequence No. 5. LOS/ROS Routine

Step	Action	Indication	Purpose
1	On 1232; perform LOS typein.	1232: LOS, P, ↑ HSP: LOS P&FS	
2	Verify P&FS status word.	P&FS LFI /FILL/REAL SYNC/ /NLOK /P-1 /	To verify LFI condition.
3	Perform steps 1 and 2 for each ASLEP	1232: LOS, A, 3, ↑ HSP: LOS ALSEP 3 1232: LOS, A, 2, ↑ HSP: LOS ALSEP 2 FRAME A LFI / /REAL SYNC/STAT/NLOK NLOK/3-D / FRAME B LFI / /REAL SYNC/STAT/NLOK NLOK/2-A2/	
4	On 1232, perform ROS typein.	1232: ROS, A, 3, ↑ NBR LOCK CHX ALSEP 3 RT HSP: ROS ALSEP 3 NBR LK CX ALSEP 3 RT	

Sequence No. 5. LOS/ROS Routine (cont)

Step	Action	Indication	Purpose
5	Verify "A" frame status word.	FRAME A NLFI/LIVE/REAL SYNC/ / NLOK NLOK/3-D /	
6	Perform 1232 LOS T and verify HSD TERMINATES.	1232: LOS, T, ↑ HSP: LOS T	
7	Perform 1232 ROS typein.	1232: ROS, T, ↑ PCM LOCK CHX P&FS 1 RT NBR LOCK CHX ALSEP 3 RT LBR LOCK CHX ALSEP 2 RT HSP: ROS T PCM LK CX P&FS 1 RT NBR LK CX ALSEP 3 RT NBR LK CX ALSEP 2 RT	
8	Verify "A", "B", and P&FS status words.	FRAME A NLFI/LIVE/REAL SYNC/ /NLOK NLOK/3-D/ P&FS NLFI/LIVE/REAL SYNC/ /NLOK /P-1/ FRAME B NLFI/LIVE/REAL SYNC/ /NLOK NLOK/2-A2/	

Sequence No. 5. LOS/ROS Routine

Step	Action	Indication	Purpose
9	Inhibit all data and configure for ASE and PFS. Enable data to the computer.	HSP/1232: SYNC LOST CH X ALSEP 3 SYNC LOST CH X ALSEP 2 SYNC LOST CH X P&FS 1 HSP: PCM LK CX ASE RT PCM LK CX P&FS 1 RT 1232: PCM LOCK CH X ASE RT PCM LOCK CH X P&FS 1 RT	Demonstrate LOS/ROS for ASE.
10	Select output format 2.	1232: FMT, 2, ↑ HSP: FMT 2 SELECT	
11	Observe output status.	ASE: NLFI/LIVE/REAL SYNC/ /NLOK NLOK/4-C/ P&FS: NLFI/LIVE/REAL SYNC/ /NLOK /P-1 /	
12	Select LOS for ASE.	1232: LOS, A, A, ↑ HSP: LOS ALSEP A	Demonstrate selective LOS for ASE.
13	Observe the output status words.	ASE: LFI/FILL/REAL SYNC/ /NLOK NLOK/4-C/ P&FS: NLFI/LIVE/REAL SYNC/ /NLOK /P-1 /	

Sequence No. 5. LOS/ROS Routine (cont)

Step	Action	Indication	Purpose
14	Select ROS for ASE.	1232: ROS, A, A, ↑ HSP: ROS ALSEP A 1232: PCM LOCK CH X ASE RT HSP: PCM LK CX ASE RT	Demonstrate ROS for ASE.
15	Observe the output status words.	ASE: NLFI/LIVE/REAL SYNC/ /NLOK NLOK/4-C/ P&FS: NLFI/LIVE/REAL SYNC/ /NLOK /P-1 /	
16	Select output format 1.	1232: FMT, 1, 3A, 2B, ↑ FMT 1 SELECT, 3A, 2B HSP: FMT 1 SELECT 3A, 2B	Configure for PSE.

Sequence No. 6. Data Priority (Tape Playback and Real-time)

Step	Action	Indication	Purpose
1	Set up decom configuration "C". Verify formats 1, 3A, 2B.		
2	Enable decoms to the RSDP.	HSP: NBR LK CX ALSEP 3 TP A3 CX CVW VVV 2 NBR LK CX ALSEP 3 RT A3 CX CVW VVV3 1232: NBR LOCK CH Y ALSEP 3 TP NBR LOCK CH Y ALSEP 3 RT	
3	Verify the "A" frame status word using ALS/ASTAM.	FRAME A NLFI/LIVE/REAL SYNC/ /NLOK NLOK/3-D /	
4	Inhibit decom configured for real time.	HSP: A3 CX CVW VVV Z XXXX SYNC LOST CH X ALSEP 3 1232: SYNC LOST CH X ALSEP 3 VVV = RTC XXXX = number of occurrences Z = checkbit	Verify tape playback data is output when real-time data is dropped.
5	Verify the frame A status word indicates playback data.	FRAME A NLFI/LIVE/PLBK SYNC/ /NLOK NLOK/3-D /	
6	Enable decom configured for real time.	HSP: NBR LK CX ALSEP 3 RT A3 CX CVW VVV Z 1232: NBR LOCK CH X ALSEP 3 RT	

Sequence No. 6. Data Priority (Tape Playback and Real-time) (cont)

Step	Action	Indication	Purpose
7	Verify GMT for FRAME "A" is current and updating.	FRAME A NLFI/LIVE/REAL SYNC/ /NLOK NLOK/3-D / XXX : XX : XX : XX	Verify real-time data has priority over tape playback data.
8	Set time code translator to a time other than GMT. Enable time code translator to RSDP.	HSP: GMT TP ENABLED 1232: GMT TP ENABLED	
9	Using ALS/ASTAM, verify GMT word indicate current GMT.	FRAME A XXX : XX : XX : XX	Verify GMT output in HSD format.
10	Inhibit decom configured for real time.	1232: SYNC LOST CHX ALSEP 3 HSP: A3 CX CVW VVV Z XXXX SYNC LOST CHX ALSEP 3	

Sequence No. 6 Data Priority Tape (Playback and Real-time) (cont)

Step	Action	Indication	Purpose
11	Using ALS/ASTAM verify GMT words indicate translator GMT.	FRAME A XXX : XX : XX : XX	

Sequence 7. Destination Verification

Step	Action	Indication	Purpose
1	Verify destination code using ALS/ ASTAM.	DES = ALCS	Verify output. Destination can be changed by RSDP operator.
2	Select Mode 1-979 Select M&O - 978	HSP: CMD MODE 1 HSP: CMD M&O MODE	
3	Perform 1232 destination change to NOCC.	1232: DES, 200, ↑ HSP/1232: DES 200 SELECT	
4	Verify destination.	DES = NOCC	
5	Perform destination change to ALCS/ NOCC.	1232: DES, 236, ↑ HSP/1232: DES 236 SELECT	
6	Verify destination.	DES = BOTH	
7	Perform destination change to ALCS.	1232: DES, 160 HSP/1232: DES 160 SELECT	
8	Verify destination.	DES = ALCS	

Sequence No. 8. DTU Channel Change

Step	Action	Indication	Purpose
1	Patch the ALSEP/LSP channel 15 DTU output to the ALS/ASTAM DTU channel 2 input.		Establish alternate output patch
2	At the ALS/ASTAM, type: HSD, 4, NON ↑ HSD, 2, TLM ↑	Obseve that the input from the HSDM is terminated; also observe the ALS displays static data.	
3	At the ALSEP/LSP computer, perform a DTU channel change. Verify channel 12 DTU turns off and channel 15 turns on.	1232: DTU, 15, ↑ HSP + 1232: (DTU 15 IN SYNC)* *This message will only occur if an out-of-sync condition was previously detected. CAUTION This change has only selected the alternate output channel. High-speed command input is fixed to channel 12 and has not been affected by this change.	Change to alternate DTU
4	Select Param list - 990	HSP: PARAMETER LIST REQ (listing) STA XXX FMT 1 3A 2B DTU CH 15 DES 160	

Sequence No. 8. DTU Channel Change (cont)

Step	Action	Indication	Purpose
5	Verify ALS displays correspond to the HSP parameter listing.	STA XXX DES ALCS FRAME A LIVE/3-D FRAME B FILL/2-A2	Verify valid transition to the alternate output channel.
6	At the ALSEP/LSP computer, select output channel 12.	1232: DTU, 12, ↑	Configure back to normal output channel.
7	Select parameter LIST - 990	HSP: PARAMETER LIST REQ (listing) STA XXX FMT 1 3A, 2B DTU CH 12 DES 160	
8	At the ALS/ASTAM type: HSD, 2, NON ↑ HSD, 4, TLM ↑	Verify the ALS displays corresponds to the HSP parameter listing. STA XXX DES ALCS FRAME A LIVE/3-D FRAME B FILL/2-A2	

Sequence No. 9. Vehicle ID

Step	Action	Indication	Purpose
1	Configure one decom for NBR ALSEP 3 RT from the simulator and input to the computor.	1232: NBR LOCK CHX ALSEP 3 RT HSP: NBR LK CHX ALSEP 3 RT	
2	In the S/P simulator, change vehicle ID from 000 to 111 in binary progression.	(000) CH X INVALID ID 000 (001) NBR LOCK CH X ALSEP 3 RT (010) NBR LOCK CH X ALSEP 1 RT (011) NBR LOCK CH X ALSEP 2 RT (100) NBR LOCK CH X ALSEP 5 RT (101) CH X INVALID ID 101 (110) NBR LOCK CH X ALSEP 4 RT (111) CH X INVALID ID 111	Invalid vehicle ID.
3	In the S/P simulator, change vehicle ID to 001.	HSP: NBR LK CX ALSEP 3 RT 1232: NBR LOCK CHX ALSEP 3 RT	

Sequence No. 10. Master Frame Validations

Step	Action	Indication	Purpose
1	Ensure NBR ALSEP 3 RT is input to the program.	HSP: NBR LK CX ALSEP 3 RT 1232: NBR LOCK CH X ALSEP 3 RT	
2	Configure decom to maintain lock with 2 bit errors. Set A-G word 2, bit 7 to a 0.	HSP: PCM CX SYNC ERROR (XXXX) where (XXXX) is included following the initial SYNC ERROR message and is used to indicate the number of errors detected in the previous 1 minute.	Invalid frame sync.
3	Set A-G word 2, bits 5 and 6 to 0. Decom will drop lock.	HSP: A3 CX CVW XXX C NNNN HSP: SYNC LOST CX ALSEP 3 1232: SYNC LOST ON CHX ALSEP 3	Abnormal interrupt.
4	Restore A-G word 2.	HSP: NBR LK CX ALSEP 3 RT 1232: NBR LOCK CHX ALSEP 3 RT	Normal lock.
5	At the decom, inhibit ALSEP 3 data.	HSP: A3 CX CVW XXX C NNNN SYNC LOST CX ALSEP 3 1232: SYNC LOST CHX ALSEP 3	Input time out.

Sequence No. 11 ALSEP 5/PSE Downlink Validation

Step	Action	Indication	Purpose
1	Configure the S/P simulator and one decom for ALSEP 5, PSE, NBR, RT (1.060 kb/sec).		Demonstrate ALSEP 5 PSE downlink.
2	Select HSD output format.	1232: FMT, 1, 5A, 1B, ↑ FMT 1 SELECT, 5A, 1B HSP: FMT 1 SELECT 5A 1B	
3	Enable ALSEP 5 to the computer.	HSP: A5 CX CVW 010 1 HSP: NBR LK CX ALSEP 5RT 1232: NBR LOCK CHX ALSEP 5RT	
4	AT the ALS/ASTAM verify the FRAME A status word.	FRAME A NLFI/LIVE/REAL SYNC/ /NLOK NLOK/5-E/	
5	At the ALS ASTAM display A-G word 7 (all output samples).	ALS/1232: TDW, PSE, 1, 020, A/G WD 7 TDW, PSE, 1, 160 ↑ TDW, PSE, 2, 067 ↑ TDW, PSE, 2, 206 ↑ TDW, PSE, 3, 113 ↑ TDW, □	
6	Inhibit decom data and configure for ALSEP 5 PSE LBR RT (0.530 kb/sec) from the S/P simulator.	HSP: A5 CX CVW 010 1 XXXX SYNC LOST CH X ALSEP 5 1232: SYNC LOST CH X ALSEP 5	

Sequence No. 11. ALSEP 5/PSE Downlink Validation (cont)

Step	Action	Indication	Purpose
7	Enable LBR ALSEP 5 to the computer.	HSP: A5 CX CVW 010 1 HSP: LK CX ALSEP 5 RT 1232: LBR LOCK CH X ALSEP 5 RT	Demonstrate LBR. processing
8	At the ALS/ASTAM, verify the "A" FRAME status word. Note that the status will alternate between "LIVE" and "FILL" as a direct result of the downlink bit rate.	Frame A NLFI/"LIVE/REAL SYNC/"FILL"/NLOK NLOK/5 E /	Demonstrate that the output status is a direct result of the input bit rate.
9	Inhibit all data to the computer.	1232: SYNC LOST CH X ALSEP 5 HSP: A5 CX CVW 010 1 XXXX SYNC LOST CH X ALSEP 5	

Sequence No. 12 LSP Validation Processing.

Step	Action	Indication	Purpose
1	Configure for ALSEP 5 LSP NBR RT (3.533 kb/sec) input from the S/P simulator. Enable data to the computer.	HSP: PCM LK CX LSP RT 1232: PCM LOCK CHX LSP RT	Set up for LSP validation.
2	At the ALS/ASTAM, verify that the PSE FMT 1, 5S, 1B does not indicate	FRAME A NLFI/ /REAL SYNC/STAT/NLOK NLOK/5 E / XXX:XX:XX:XX (STATIC GMT)	Demonstrat LSP is not output in the PSE format.
3	Selct HSD output format 3.	1232L FMT, 3, ↑ FMT 3 SELECT HSP: FMT 3 SELCET	Select LSP output format.
4	At the ALS/ASTAM, verify frame/SF status indicates processing of LSP data (refer to NOP 502.5/ALSEP for additional information).	FRAME A NLFI/REAL/SYNC LIVE /NLOK/NLOK AVAL/BVAL/CVAL FRAME B NLFI/REAL/NLOK /NLOK/NLOK AVAL/BVAL/CVAL	Demonstrate Frame/SF status.
5	Select LOS for LSP.	1232: LOS, A, L, ↑ HSP: LOS ALSEP L	Demonstrate new LOS type in.

Sequence No. 12 LSP Validation Processing (cont)

Step	Action	Indication	Purpose
6	Observe the FMT3 frame status indicates LOS.	FRAME A LFI/REAL/SYNC INVAL DROP/NLOK/NLOK ANVL/BNVL/CNVL FRAME B LFI/REAL/SYNC INVAL DROP/NLOK/NLOK ANVL/BNVL/CNVL	
7	Configure for ALSEP 5 LSP NBR TP (3.533 kb/sec) and input data to the computer.		
8	Configure the TCT/G for time other than current GMT and input to the computer.	1232: GMT TP ENABLED HSP: GMT TP ENABLED	Configure for T/P processing of LSP.
9	Select ROS for LSP.	1232: ROS. A, L, ↑ HSP: ROS ALSEP L ↑ 1232: PCM LOCK CH X LSP TP	Process LSP tape playback data.

Sequence No. 12 LSP Validation Processing (cont)

Step	Action	Indication	Purpose
10	Observe FMT 3 indicates processing of valid LSP T/P.	FRAME A LIVE NLFI/PLBK/SYNC NLOK/NLOK AVAL/BVAL/CVAL GMT (TRANSLATOR) FRAME B LIVE NLFI/PLBK/SYNC /NLOK/NLOK AVAL/BVAL/CVAL GMT (TRANSLATOR)	Demonstrate LSP T/P processing
11	Select total LOS.	1232: LOS, T ↑ HSP: LOST T ↑ HSD: (OFF)	
12	Inhibit LSP data to the computer.		Turn off output data.
13	Select total ROS.	1232: ROS, T ↑ HSP: ROS T ↑	Turn on output data and enable downlink processing.

Sequence No. 12 LSP Validation Processing (cont)

Step	Action	Indication	Purpose
14	Observe LSP status.	FRAME A NLFI/PLBK/SYNC INVAL DROP/NLOK/NLOK ANVL/BNVL/CNVL FRAME B NLFI/PLBK/SYNC INVAL DROP/NLOK/NLOK ANVL/BNVL/CNVL	Demonstrate fill status.
15	Configure for ALSEP 5 LSP LBR RT and input to the computer (1.060 kb/sec).		
16	Observe the FMT3 status word.	FRAME A NLFI/REAL/SYNC INVAL /NLOK/NLOK AXXX/VNVL/CNVL FRAME B NLFI/REAL/SYNC INVAL /NLOK/NLOK AXXX/BNVL/CNVL (Where: XXX = Val NVL) Note The program has no convenient method of detecting low bit rate data without a PCM format change. Since the LBR downlink rate is approximately 1/3 the normal rate, the program processes only one A-G frame in the time allotted to process all three. This data is then output in the first available slot.	Demonstrate nonrequired LSP LBR processing.

SECTION 7. COMPUTER SUPPORT

Acquisition messages will be supplied to supplemental supporting stations only.

SECTION 8. COMMUNICATIONS

SECTION 8. COMMUNICATIONS

The ALSEP/P&FS PSRD is applicable to ALSEP/P&FS with the following additions:

a. Voice conferencing will be accomplished at GSFC Switching, Conferencing, and Monitoring Arrangement (SCAMA). Configuration control is under the direction of the ALSEP NOM.

b. Mission traffic will originate from Network Operations Control Center (NOCC) and commands from MCC. Messages will include in the first line of the text: mission traffic identification, SUPIDEN test number, and mission identification (e.g., USB, SUPIDEN M0782, ALSEP).

c. Table 8-1 represents network configuration for phases II and III of ALSEP/P&FS support.

Table 8-1. Network Communications Configuration (Phase II and III Only)

Station	Net 2 (Phase II/III)	Net 4 (Phase II)	Net 5 (Phase II)	GOSS 11 NST/IST Coord (Phase II)	TTY A (Phase II/III)	TTY B (Phase II/III)
ACN	X	X	X		X	X
AGO	X	X	X		X	X
BDA	X	X	X		X	X
BUR	X	X	X		X	X
CRO	X	X	X		X	X
CYI	X	X	X		X	X
GDS	X	X	X		X	X
GWM	X	X	X		X	X
HAW	X	X	X		X	X
MAD	X	X	X		X	X
MIL	X	X	X		X	X
VAN	X				X	X
ORR	X				X	X
ROS	X				X	X
QUI	X				X	X
TAN	X				X	X
ULA	X				X	X
ETC*	X				X	X
JSC	X	X	X	X	X	X
NOC	X	X	X	X	X	X

*Receive and record only

Table 8-1. Network Communications Configuration (Phase II and III Only) (cont)

Note
1. Net 2: Required during Phase II and Phase III for ALSEP Conference between station and ALSEP NC/NOM.
2. Net 4: Required only during real-time Phase II.
3. Net 5: Required only during Phase II P&FS tracking.
4. GOSS 11: Required during Phase II for coordination between ALSEP NOM and ALSEP NC.
5. Additional circuits: In the event of an ALSEP/P&FS emergency, ALSEP NC/NOM will contact Voice Control for additional circuits to make necessary off-set calls.
6. Do not patch the CIT-68 to the receive communications lines.

SECTION 11. DATA MANAGEMENT

SECTION 11. DATA MANAGEMENT

11.1 GENERAL

This section describes the data management procedures to be followed by all STDN stations supporting the ALSEP/P&FS missions. Except as otherwise noted in this NOSP, all recorded mission data will be identified, annotated, labeled, packaged, and shipped in accordance with the STDN Network Operations Procedures for Data Management, STDN No. 502.11. During the phase II and phase III support periods, all recorder data will be handled in accordance with this NOSP.

11.2 DATA REQUIREMENTS AND DISPOSITION

The data requirements and disposition instructions for all recorded ALSEP/P&FS mission data are specified in table 1-1. The following procedures are also applicable:

a. Magnetic Tapes. ALSEP/P&FS magnetic tapes (DSS No. 630 and 631), recorded during a scheduled support period on any given day, will be held on station for 24 hours after the final LOS of that day, for possible playback. After 24 hours, the tapes will be shipped by airfreight or airmail in accordance with the shipping instructions in para 11.4.

Note

When one station is supporting all ALSEP/P&FS downlinks three-way and a second station is supporting P&FS only two-way, the two-way station will not ship the tape off station. The two-way station will hold the tape on station for one week then make disposition in accordance with para 11.7.

b. Other Data Recordings. All other data recordings (stripcharts, paper tapes, etc.) are to be handled in accordance with the disposition instructions in table 11-1. Data items which have been held for the time period specified in table 11-1 and have not been requested will be disposed of in accordance with existing station procedures.

11.3 DATA ANNOTATION

11.3.1 GENERAL

Detailed procedures for annotating and attaching data labels are described in STDN No. 502.11. The following labels will be used:

a. Analog Magnetic Tapes, 14-inch, STDN No. 2097 and 2102. Attach one 2097 label to the tape reel hub and one to the reel container lid. Attach one 2102 label to the top narrow edge of the individual cardboard sleeve containing the tape.

b. Digital Magnetic Tapes, STDN No. 2096. Attach one 2096 label to the tape reel hub.

c. Stripcharts and Flat Paper Records, STDN No. 2090. Attach according to instructions in STDN No. 502.11.

Note

When required, the continuation data label, STDN No. 2103 will be used with any of the preceding labels.

11.3.2 SUPIDEN LABEL ANNOTATIONS

Enter ALSEP and/or P&FS on all data labels in the SUPIDEN space provided. In addition, the abbreviated vehicle codes corresponding to all vehicles recorded will be entered in the VEHICLE(S) space on the data label. Vehicle codes are as follows:

SUPIDEN No.	Vehicle	Abbreviated Vehicle Code
M0781	ALSEP 1	A1
M0782	ALSEP 2	A2
M0783	ALSEP 3	A3
M0784	ALSEP 4	A4
M0785	ALSEP 5	A5
M0791	P&FS-1	P1

11.4 SHIPPING

11.4.1 STDN STATIONS

11.4.1.1 All stations (except ACN) making shipments that require customs clearance will ship via airfreight to GSFC/Code 864.2. In order to take advantage of airfreight weight/price breaks, stations will make one shipment per week vice daily shipments except for special support specified in para 11.4.3. Shipments will be sent to the following address:

NASA - Goddard Space Flight Center
Building 16
Greenbelt Road
Greenbelt, Maryland 20771
M/F: Archiving and Distribution Section, Code 864.2

11.4.1.2 All stations making shipments not requiring customs clearance may use either of the following methods except for special support specified in para 11.4.3:

a. Ship via airfreight once per week.

b. Ship via the U.S. Postal Service as registered, certified, or insured (minimum fee) air mail daily.

All shipments will be sent directly to the following address:

NASA - Johnson Space Center
Central Metric Data File
Building 12, Room 133
Houston, Texas 77058
M/F: Code FD-5

11.4.1.3 ACN will ship magnetic tapes (DSS No. 630 and 631) via Eastern Test Range (ETR) aircraft to:

Transportation Officer
Building 310
Patrick Air Force Base, Florida 32925
Attn: NASA/Bendix Traffic Coordinator

The NASA/Bendix Traffic Coordinator will be responsible for forwarding the shipments to JSC and furnishing shipping information to JSC/Betty Thomas, FD-5, by telephone at 713-483-5251.

11.4.1.4 ETC will forward magnetic tapes to GSFC/Code 864.2.

11.4.2 GSFC/Code 864.2

GSFC/Code 864.2 will trans-ship all magnetic tapes (DSS No. 630 and No. 631) received form stations.

11.4.3 SPECIAL ALSEP/P&FS SHIPPING

Stations occasionally are required to support ALSEP/P&FS under special conditions. Special support requirements are normally issued by ISI, which may also specify unique data disposition and shipping instructions. If the ISI does not give such instructions, stations will ship the magnetic tapes (DSS No. 630 and 631)by airfreight on the next available flight (instead of holding the data on station for 24 hours). Shipments requiring customs clearance will be forwarded to GSFC/Code 864.2 for trans-shipment to JSC/FD-5. Shipments that do not require customs clearance will be shipped directly to the JSC/FD-5 address specified in para 11.4.1.2.

11.5 PASS SUMMARY REPORT

Stations will include a copy of the Pass Summary Report (PASSUM) with the magnetic tape when it is shipped.

11.6 DATA SHIPMENT ADVISORY MESSAGE

All stations will send a Data Shipment Advisory message within 3 hours after a data shipment is turned over to a carrier. This message will be addressed to GCEN/NOCC, with an information copy to HMSC/FD-5. The message format is contained in STDN No. 502.16, and the message header information is contained in section 16 of this NOSP.

11.7 MAGNETIC TAPE DEGAUSSING AND REHABILITATION

Magnetic tapes held on station for the time period specified in table 11-1 and not requested will be degaussed and reused. It is not feasible to set a firm number of times that tapes can be degaussed and reused before any deterioration; therefore, this will be determined by each station. Stations will ensure that no deterioration of recording occurs due to utilizing bad tapes. Tapes determined to be unfit for reuse by degaussing will be returned to GSFC for rehabilitation.

11.8 MAGNETIC TAPE NUMBERING

All magnetic tapes will be sequentially numbered in accordance with procedures contained in STDN No. 502.11 and this NOSP. The three separate numbering sequences which will be used are as follows:

DSS No.	Tape No. Assignment
231, 248, 249	Number sequentially only if tapes are requested and shipped off station.
630	Magnetic tapes shipped in accordance with para 11.4 will be numbered sequentially.
631	Magnetic tapes shipped in accordance with para 11.4 will be numbered sequentially.

Table 11-1. Data Requirements and Disposition

DSS No.	Data Description	Disposition
	Computer Complex (RSDP)	
174	RSDP HSP hardcopy printout	Hold on station 1 week only if an anomaly occurs, then destroy. Otherwise destroy after support release.
175	HSP CDP tabular printout (VAN only)	Hold on station 1 week only if an anomaly occurs, then destroy. Otherwise destroy after support release.
	Command	
200	CMD history paper tape	Hold on station 1 week only if an anomaly occurs, then destroy. Otherwise destroy after support release.
231	CMD history magnetic tape	Hold on station for one week, then handle in accordance with para 11.7.
248	CMD recovery magnetic tape	Hold on station 1 week only if an anomaly occurs. After 1 week, or if no anomaly occurs, handle in accordance with para 11.7.
249	CMD log/fault dump magnetic tape	Hold on station 1 week only if an anomaly occurs. After 1 week, or if no anomaly occurs, handle in accordance with para 11.7.
	Telemetry	
554	Event stripchart (ALSEP CVW's)	Hold on station for 1 week, then destroy.
558	Function/event stripchart (ALSEP analogs)	Hold on station for 1 week, then destroy.
559	Function/event stripchart (ALSEP analog, if required)	Hold on station for 1 week, then destroy.
	Unifed S-band (USB)	
600	USB low-speed tracking data paper tape (normal rate TDP local output)	Hold on station for 2 weeks, then destroy.
602	USB low-speed tracking data paper tape (recorded in GCC area as backup to DSS No. 600)	Confirm that all data is on DSS No. 600, then destroy.
630	Magnetic tape (one inch, fourteen track)	Ship in accordance with para 11.4. Report in accordance with para 11.6. (See note in para 11.2.a.)
631	Magnetic tape (one-half inch, seven track)	Ship in accordance with para 11.4. Report in accordance with para 11.6. (See note in para 11.2a).
658	Function/event stripchart	Hold on station for 1 week, then destroy.
659	Function/event stripchart	Hold on station for 1 week, then destroy.
660	Function/event stripchart	Hold on station for 1 week, then destroy.

Table 11-1. Data Requirements and Disposition (cont)

DSS No.	Data Description	Disposition
	Miscellaneous	
875	Pass Summary Report (PASSUM)	Transmit via TTY postpass. Ship 1 copy with magnetic tape

SECTION 16. NETWORK OPERATION CENTER AND STATION INTERFACE PROCEDURES

SECTION 16. NETWORK OPERATIONS CENTER AND STATION INTERFACE PROCEDURES

16.1 NOCC/NETWORK STANDARD OPERATING PROCEDURES

16.1.1 GENERAL

This section designates the network operations procedures which will apply to ALSEP/P&FS. For all network operations procedures not covered in this NOSP, refer to the Network Operations Center and Station Interface Procedures, STDN No. 502.16.

16.1.2 VOICE CALLSIGNS

ALSEP/P&FS voice callsigns for MCC console positions are:

Position	Callsign
ALSEP Network Controller	"ALSEP NETWORK"
ALSEP Senior Engr.	"ASE"

16.1.3 MISSION STATUS

The network will be considered to be on mission status for ALSEP/P&FS until the terminating ISI is issued by the Network Director (ND).

16.1.4 STATION RELEASE

16.1.4.1 Phase II. During phase II operations, stations will be released to the ALSEP NOM as soon as possible after their scheduled support (except personnel required for data playback). Stations will be released verbally by the NOM.

16.1.4.2 Phase III. Stations will be released verbally by the ALSEP NOM upon completion of scheduled activities.

16.1.5 STATION BRIEFING

Verbal station briefings will take place normally at S-25 and other times as required.

16.2 REPORTING

STDN No. 502.16 will apply.

16.3 TELETYPE MESSAGE FORMATS AND PROCEDURES

16.3.1 GENERAL

16.3.1.1 This paragraph defines and authorizes the use of operational teletype messages peculiar to ALSEP/P&FS missions. For messages not contained in this NOSP, refer to STDN No. 502.16.

16.3.1.2 ISI's and Requests for Instrumentation Clarification (RIC's) will continue to be transmitted in numerical sequence. Should any deployed package deteriorate to a point where all data becomes useless, stations will receive a terminating ISI. The documentation will then be recycled as required. The implementation of the ALSEP/P&FS NOSP and revisions will be by ISI during mission periods. Changes to the NOSP will be issued by a DCN.

16.3.2 REQUEST FOR INSTRUMENTATION CLARIFICATION

16.3.2.1 General

a. RIC's will be generated by participating stations to request information on all items relating to mission instrumentation support. RIC's should be addressed to GUNV/ALSEP NOM, with information copies to HANC/ALSEP NC.

b. ALSEP and P&FS RIC procedures will remain in effect until the issuance of the terminating ALSEP or P&FS ISI.

16.3.2.2 Message Sample

RR GUNV HANC
DE ACRO 015
26/1326Z
FM OPSR
TO GUNV/ALSEP NOM
INFO HANC/ALSEP NC

RIC
ALSEP/P&FS
.....TEXT.....

26/1352Z AUG 71 ACRO

16.3.2.3 RIC Answers. RIC answers will be sent to the originating station OPSR with information copies to HANC/ALSEP NC.

16.3.3 INSTRUMENTATION SUPPORT INSTRUCTIONS

16.3.3.1 ISI No. 001. If a station is not on mission status from a previous ALSEP/P&FS mission, ISI No. 001 will be retransmitted placing the supporting stations on mission status and will contain a list of all ISI's applicable to ALSEP/P&FS support.

16.3.3.2 Subsequent ISI's. Subsequent ISI's will be coordinated with the ALSEP NC and issued by the ALSEP NOM. Stations will implement ISI's as required or will respond by RIC if they cannot be effected.

16.3.3.3 Recycling of ISI's. ISI's will normally be recycled to 000 when the NOSP is revised. Outstanding ISI's will be reissued with new ISI numbers.

16.3.3.4 Message Example

RR DSDD HANC HMSC HNET
DE GCEN 010A
26/1455Z
FM NOM
TO (Action Stations)
INFO HANC/ALSEP NC HMSC/TDX - BENDIX
HNET/DOC
SDI-104D

ISI
ISI NO. 072 ALSEP/P&FS
SUBJECT:
ACTION: STADIR/OPSR

.....TEXT.....

26/1505Z AUG 71 GCEN

16.3.3.5 DCN Header. The DCN header will be the same as the ISI header except "FM NOCC" vice "FM NOM" and "TO ALL" vice "TO (Action Stations)."

16.3.3.6 DCN Coordination. All DCN's will be coordinated with ALSEP Network prior to being issued by the ALSEP NOM.

16.3.4 ALSEP PASS SUMMARY (PASSUM) MESSAGE

16.3.4.1 General. An ALSEP PASSUM will be transmitted after each support period. A PASSUM is required from all stations within 45 minutes after end of support. When complete information concerning non-nominal support is not available prior to the required transmission time of PASSUM, a problem report will be required.

16.3.4.2 Sample PASSUM

a. Sample Message

PP DSDD DSDS HANC HMSC
DE LMAD 025
24/2128Z
FM OPSR
TO HANC/ALSEP NC
INFO HSMC/TDX - BENDIX, FC9 - KUNDEL, C30 - ROWE

REF: PASS SUMMARY
A. ACTIVITY 6906605

STATON	SUPIDEN	ORBIT	YRMODA	STRT	STOP	REMARKS
MAD-P	M0781MS		74 0 524	1125	2100	1RQ

B. TAPES

NUMBR	TYPES	STRT	STOP	MINS	SF	FILE	PARAMS	DSSNR	REMARKS
00315	SR	1115	1854			001F		630	
00316	R	1851	1230			001F		630	

E. QUICK LOOK

MEAS	A1	A2	A3	A4	A5
	AOS LOS	AOS LOS	AOS LOS	AOS LOS	AOS LOS
AB04	000-000	000-000	001-001	202-202	226-226
AB05	000-000	202-202	001-000	000-000	242-242
AL05	000-003				
AB11					000-000
AB13					342-342
WD15				DYN-DYN	

G. GENERAL REMARKS

1. AGC:

		A1	A2	A3	A4	A5
AOS	24/1115Z	-129	-129	-130	-129	-132
MAX EL		-129	-130	-126	-128	-133
LOS	24/2052Z	-129	-129	-127	-128	-132

2. STATION PROBLEM DESCRIPTION: NONE

3. CVW REPORTING: NONE

4. STATION COMMENTS ON SUPPORT: PHASE II SUPPORT FROM 1327Z to 1607Z. A5 HBR FROM 1500Z TO 1530

24/2136Z MAY 74 LMAD

b. Text Explanation

(1) Activity (Para A). The column title, contents, and locations are as follows:

Column/Title	Content	Start Character	Column Width
1 (STATON)	Station name/link	1	6
2 (SUPIDEN)	SIC Nr.	8	7
3 (ORBIT)	Orbit number	16	5
4 (YRMODA)	Year/month/day	22	6
5 (STRT)	START time	29	4
6 (STOP)	STOP time	34	4
7 (REMARKS)	Remarks/results	39	Variable

(2) Tapes (Para B). The column title, contents, and locations are as follows:

Column/Title	Content	Start Character	Column Width
1 (NUMBR)	Tape number	1	5
2 (TYPES)	Bit rate and data type	7	5
3 (STRT)	Recorder start	13	4
4 (STOP)	Recorder stop	18	4
5 (MINS)	Estimated minutes of data	23	4
6 (SF)	Speed/frequency link	28	2
7 (FILE)	File number	31	4
8 (PARAMS)	Equipment parameters	36	6
9 (DSSNR)	DSS number	43	5
10 (REMARKS)	Remarks code	49	Variable

(3) Quick Look (Para E). Vehicle, measurement, and AOS and LOS octal value for each required parameter as stated in section 1. Report vehicle, octal value change, and GMT date and time of change for each parameter that is out of limits.

(4) General Remarks (Para G)

(a) AGC (Para 1). USB receiver signal strength in dBm for AOS, maximum elevation, and LOS. Indicate GMT date and time of AOS and LOS.

(b) Station Problem Description (Para 2). GMT date and time of signal loss (except for nominal LOS) and of weak signal strength or intermittent dropouts. (Weak signal strength is predicted as below -140 dBm at 30-foot stations, and below -131 dBm at 85-foot stations.) Enter the reason for the signal conditions in the comments section (5).

(c) CVW Reporting (Para 3). ALSEP Command Verification Words (CVW) with bit 10 set will be reported as follows: GMT date and time of activity, vehicle, and bits 3 through 9 in octal.

(d) Station Comments (Para 4). Comments by station personnel concerning ALSEP support should include, but not be restricted to, any anomalies experienced. In evaluating the anomaly, the station should indicate whether command or telemetry (real-time or recorded) data was affected. The station should determine if loss of data was due to equipment failure, operator error, procedural error, spacecraft anomaly, or of unknown origin. This information may provide MCC with indications of critical vehicle problems and alert GSFC to station problems which occurred during support. Stations utilizing a Microdyne receiver for support will comment on which ALSEP(s) were supported using this system.

16.3.5 P&FS PASS SUMMARY (PASSUM) MESSAGE

16.3.5.1 General. A P&FS PASSUM will be transmitted after each support period. A PASSUM is required from all stations within 45 minutes after end of support.

16.3.5.2 Sample PASSUM

a. Sample Message

PP DSDD DSDS HANC HMSC
DE ACRO 019
26/1854Z
FM OPSR
TO HANC/ALSEP NC
INFO HMSC TDX-BENDIX, FC9-KUNDEL, C30-ROWE

REF: PASS SUMMARY
A. ACTIVITY

STATON	SUPIDEN	ORBIT	YRMODA	STRT	STOP	REMARKS
CRO	MO791MS		74 0 8 2 6	0530	1815	

G. GENERAL REMARKS

1. REV	TRK	AOS	S/S	MOD	LOS	S/S	MOD
1100		26/0546	-143	ON	26/0558	-143.5	ON
1101		26/0758	-143.5	ON	26/0810	-138.5	OFF
1102	2	26/0855	-138	OFF	26/1005	-138.5	OFF
1103-1106		BCM					

2. STATION PROBLEM DESCRIPTION:

EXPERIENCED DECOM/DEMOD DROPOUTS ON REVOLUTION 1101.

3. STATION COMMENTS ON SUPPORT:

26/1858Z AUG 74 ACRO

b. Text Explanation

(1) Activity (Para A). The column title, contents, and locations are as follows:

Column/Title	Content	Start Character	Column Width
1 (STATON)	Station name/link	1	6
2 (SUPIDEN)	SIC Nr.	8	7
3 (ORBIT)	Orbit number	16	5
4 (YRMODA)	Year/month/day	22	6
5 (STRT)	START time	29	4
6 (STOP)	STOP time	34	4
7 (REMARKS)	Remarks/results	39	Variable

(2) General Remarks (Para G)

(a) Para 1. Revolution number, GMT date and time of AOS and LOS, USB signal strength and downlink modulation status at AOS and LOS. A2 or 3 will be indicated in the TRK column if the REV was a tracking revolution--2 indicates two-way station; 3 indicates three-way station. When the vehicle is in the Battery Charge Mode (BCM), the revolution numbers should be reported, with BCM indicated.

(b) Station Problem Description (Para 2). GMT date and time of demod/decom dropouts which can be associated to a signal below TLM threshold. Enter the reasons for dropouts in the comments section (3).

(c) Station Comments on Support (Para 3). Comments by station personnel concerning P&FS support should include, but not be restricted to, any anomalies experienced. In evaluating the anomaly, the station should indicate whether command, tracking, or TLM (real-time or recorded) data was affected. The station should determine if loss of data was due to equipment failure, operator error, procedural error, spacecraft anomaly (if numerous SC TLM dropouts occurred during any revloution due to a known SC anomaly, include a general statement to this effect), or was unknown (if made to determine). This information may provide MCC with indications of critical vehicle problems and alert GSFC to station problems which occur during support.

16.3.6 SPACECRAFT/VEHICLE ANOMALY REPORT

NN DSDD HANC
DE LCYI 003A
12/1631Z
TO GUNV/ALSEP/NOM
INFO HANC/NC

16.3.7 DATA SHIPMENT ADVISORY MESSAGE

RR GCEN HMSC
DE ACRO 046A
08/2145Z
FM OPSR
TO GCEN/NOCC
INFO HMSC/FD-5

16.3.8 COMPUTER FAULT MESSAGE

16.3.8.1 General. This message is discussed in section 5 of these supplements.

16.3.8.2 Sample Message

RR GNOC
DE GMIL 009B
20/1228Z
FM OPSR
TO GNOC/NOCC

16.3.9 SRT COMPLETION STATUS

Refer to STDN No. 502.16 (use unmanned routing).

16.3.10 DOCUMENTATION ADVISORY MESSAGE

RR DSDD HANC HNET
DE GCEN 006
23/0110Z
ADVISORY ALSEP/P&FS

16.3.11 P&FS LOW-SPEED TRACKING DATA MESSAGE.

16.3.11.1 General. All sites will transmit postpass, P&FS low-speed tracking data recorded during orbits.

16.3.11.2 Precedence. RR

16.3.11.3 Routing Indicators. GWWW

16.3.11.4 Message Example.

RR GWWW
DE LCYI 003
10/1705Z

USBAND 7106304 710810 CYI 172000Z P&FS DATA
(LOW SPEED TRACKING DATA)

10/1707Z AUG 71 LCYI

16.3.11.5 Text Explanation.

1. Line one
   characters 1 thru 6 - USBAND
   character 7 - space
   characters 8 thru 14 - International Satellite ID
   character 15 - space
   characters 16 thru 21 - year/month/day of first data frame
   character 22 - space
   characters 23 thru 25 - 3 letter station designator
   character 26 - space
   characters 27 thru 33 - hours/minutes/seconds zulu of first data frame
   character 34 - space
   characters 35 thru 60 - vehicle name

2. Line two thru end
   recorded low speed tracking data

16.3.12 P&FS CURRENT VECTOR MESSAGE

16.3.12.1 General. The ALSEP NC will provide the ALSEP NOM with the current vector to be used in generating ephemeris for determining the emergence/occultation times.

16.3.12.2 Message Example.

RR GSTS GUNV HANC
DE HMSC 007
17/1700Z
FM ALSEP NC
TO GSTS/CODE 570 R MAZUR
INFO GUNV/ALSEP NOM

CVM M0791NA P&FS 1

THIS MSG REPLACES VECTOR MSG DTG 13/1455Z. P&FS VECTOR IN MCI COORDINATE SYSTEM AND TIME OF VECTOR FOR REV 396 ARE AS FOLLOWS:

TIME.	71/09/06/	14:00:00
VECTOR	X MINUS	.239 661 673 ER
	Y MINUS	.120 489 043 ER
	Z PLUS	.122 586 402 ER
	X DOT MINUS	.531 383 449 ER/HR
	Y DOT MINUS	.442 232 980 ER/HR
	Z DOT PLUS	.584 772 303 ER/HR

17/1703Z SEP 71 HMSC

16.3.12.3 Text Explanation

Text is self explanatory.

16.3.13 SCHEDULE REQUEST MESSAGE

16.3.13.1 General. M0781/0782/0783/0784/0785/0791 Phase II Schedule Request Message (SRM).

16.3.13.2 Sample SRM

a. Sample Message

NOCC DE JSC
08/1400Z
FM FOSO
TO NESAF

SRM M0781/0782/0783/0784/0785/0791 FOR 07-13 MAY 73

1.

DY	CMD	STRT	STOP	TP1
07	SP	2200	2330	1242-1
08	SA	2200	2230	
09	MA	1900	2200	
10	MP	2130	2255	1279-2
10	MA	2000	2330	1279-2
10	AP	2320	2330	
11	SP	0200	0230	
12	SA	0230	0300	

2. COMMENTS: ALL SA APPLIES TO ALSEP-2 ONLY.

b. Text Explanation

(1) Field 1 (DY): Indicates day of support.

(2) Field 2 (CMD): Indicates uplink requirements as follows:

(a) Column 1: Indicates source of command initiation.

M: Indicates MCC.
S: Indicates station.

(b) Column 2: Indicates uplink requirements.

A: ALSEP uplink required.
P: P&FS uplink required.

(c) An A in column 1 and a P in column 2 will indicate the site (MA) will be reconfigured to P&FS uplink (times are approximate).

(3) Field 3 (STRT STOP)

XXXX - XXXX: Indicates Phase II support period.

(4) Field 4 (TP1)

XXXX-X: Indicates the P&FS-1 high-speed tracking data to MCC for the specified revolution(s); a subsequent 1 indicates single-station track, a 2 indicates two-station track.

16.3.14 CONFIRMATION OF SCHEDULE REQUEST MESSAGE

16.3.14.1 Message Example. The confirmation of schedule request message format is as follows:

```
740511 GENERAL SCHEDULE
SUPIDEN STA START   STOP RTCONF  REMARKS

M0781MS CRO 0000    0430         R       XX    SEG
            0000    0430 01 VOIC ACRO/MCC S/V 2-5

M0782MS CRO 0000    0430         RC      SX/0200-0230

M0783MS CRO 0000    0430         R       XX    SEG

M0784MS CRO 0000    0430         R       XX    SEG

M0785MS CRO 0000    0430         R       XX    SEG

M0781MS BDA 0430    1630         R       XX
            0420    1630 01 VOIC GBDA/       S/V 2-5

M0782MS BDA 0430    1630         R       XX

M0783MS BDA 0430    1630         R       XX

M0784MS BDA 0430    1630         R       XX

M0785MS BDA 0430    1630         R       XX

M0781MS GWM 1630    2400         RCD MX/1730-1900 SEG
            1620    2400 01 VOIC PGWM/MCC S/V 2-5
            1700    1900 02 VODA PGWM/MCC S/V 2-5

M0782MS GWM 1630    2400         RCD MX/1730-1900 SEG

M0783MS GWM 1630    2400         RCD MX/1730-1900 SEG

M0784MS GWM 1630    2400         RCD MX/1730-1900 SEG

M0785MS GWM 1630    2400         RCD MX/1730-1900 SEG HBR

M0791MS GWM 1730    1845         RCD X3/1730-1845

M0791MS CRO 1730    1845         RCD M2/1730-1845
            1700    1845 01 VOIC ACRO/MCC
            1700    1845 01 VODA ACRO/MCC
```

16.3.14.2 Text Explanation

a. Event Line. The event line explanation is as follows:

(1) SUPIDEN: support identification code of the vehicle being supported.

(2) Station: supporting station.

(3) Start: start time of support.

(4) Stop: stop time of support.

(5) RT conf: NA.

(6) Remarks

(a) Field 1. Field 1 indicates type of support required:

R - receive/record

RC - receive/record and command

RCD - receive/record/command and real time data

(b) Field 2. Field 2 consists of two columns as follows:

1. Column 1: indicates uplink responsibility.

M - MCC initiates commands.

S - station initiated commands.

X - no command responsibility.

2. Column 2: indicates tracking responsibility.

1 - indicates the 2-way station of a 1-station track.

2 - indicates the 2-way station of a 2-station track.

3 - indicates the 3-way station of a 2-station track.

X - indicates no tracking responsibility.

(c) Field 3. Field 3 is as follows:

XXXX-XXXX: indicates the real-time CMD/TLM support period.

(d) Field 4. Field 4 is as follows:

HBR: indicates high-bit rate support required.

(e) Field 5. Field 5 is as follows:

Seg: indicates activity segmented in accordance with STDN No. 502.16.

Note

ALSEP NC will brief P&FS supporting stations as to tracking revolutions that will be supported and other information.

b. Communications Line Entries. (The communications line entries consists of three fields:

(1) Start: start of communications requirements.

(2) Stop: stop of communications requirements.

(3) Remarks: the quantity and type of lines and the users.

S/V 2-5: indicates the voice circuit is shared with ALSEP packages 2 through 5.

16.3.15 ALSEP/P&FS DATA LOSS MESSAGE (ADLM)

16.3.15.1 General. Use of this message is discussed in section 1 of this NOSP.

16.3.15.2 Sample Message

RR HANC HMSC
DE GCEN
14/2330Z
FM ALSEP NOM
TO HANC/ALSEP NC
INFO HMSC/TDX - BENDIX, FC9 - KUNDEL, C30 - ROWE

ADLM
ALSEP/P&FS

VEH	TIME
P1	14/0830-1015
A1, A4	14/1300-1405
P1	14/1800-1930

REASON: NETWORK RESOURCES NOT AVAILABLE

16.3.17.3 Text Explanation

a. VEH: Indicates affected vehicle(s).

b. TIME: Indicates GMT date and time period that vehicle(s) was not supported.

c. REASON: Indicates reason vehicle(s) not supported. If reason has to do with another project, specify other project.

SECTION 26. DOCUMENTATION BRIEFING REPORT

26.1 STATION DOCUMENTATION BRIEFING REPORT

Documentation required on station by GSFC for support of the ALSEP/P&FS mission is shown in table 26-1. The mission support documentation includes paper and magnetic tapes as well as printed material.

26.2 DBR COLOR CODE SYSTEM

The GSFC Documentation Group has developed a color code system in order to identify mission support documentation listed in the DBR. White labels will be used for mission-oriented DBR items (items 34 through 75). Gold-colored labels will be used on DBR items that will be used for all future missions (items 1 through 33).

Table 26-1. ALSEP Documentation Requirements

DBR No.	Title	Originator	Station																							
			ACN	BDA	CYI	CRO	ETC	GDS	GWM	HAW	BUR	MAD	MIL	ORR	QUI	ROS	AGO	TAN	VAN			CSW	MAD	(SW)		
1.	NA																									
2.	NA																									
3.	NA																									
4.	NA																									
5.	NA																									
6.	NA																									
7.	NA																									
8.	SCAN No. 6-038(R) COST (MT)	GSFC	X	X	X	X	X	X	X	X		X	X						X							
9.	NA																									
10.	NA																									
11.	SCAN No. 6-600(R) RCP Ch. 6, (PT)	GSFC	X	X	X	X	X	X	X	X		X	X						X							
12.	SCAN No. 6-601(R) RCP Ch. 11, (PT)	GSFC	X	X	X	X	X	X	X	X		X	X						X							
13.	* SCAN No. 6-602(R) ESP, (MT)	GSFC	X	X	X	X	X	X	X	X		X	X						X							
14.	* SCAN No. 6-603(R) ERP, (MT)	GSFC	X	X	X	X	X	X	X	X		X	X						X							
15.	SCAN No. 6-606(R) MERCH, (PT)	GSFC	X	X	X	X	X	X	X	X		X	X						X							
16.	NA																									
17.	NA																									
18.	* SCAN No. 6-612 (R) MAGTRAN, (MT)	GSFC	X	X	X	X	X	X	X	X		X	X						X							
19.	* SCAN No. 6-613(R) MAGREC, (MT)	GSFC	X	X	X	X	X	X	X	X		X	X						X							
20.	NA																									
21.	NA																									
22.	NA																									
23.	NA																									

(R) Only operational programs are listed. Other programs listed in STDN No. 504 (SCAN) and designated (R) are required at the stations specified in SCAN.

* Items 13, 14, 18, and 19 are on one magnetic tape.

Table 26-1. ALSEP Documentation Requirements (cont)

DBR No.	Title	Originator	Station																							
			ACN	BDA	CYI	CRO	ETC	GDS	GWM	HAW	BUR	MAD	MIL	ORR	QUI	ROS	AGO	TAN	VAN			CSW	MAD	(SW)		
24.	SCAN No. 6-804(R) DARTS	GSFC	X	X	X	X	X	X	X	X		X	X						X							
	Ch. 6, (PT)																									
25.	SCAN No. 6-804(R) DARTS	GSFC	X	X	X	X	X	X	X	X		X	X						X							
	Ch 11, (PT)																									
26.	NASA Communications Operating	GSFC	X	X	X	X	X	X	X	X		X	X						X			X	X			
	Procedures (NASCOP)																									
27.	NA																									
28.	No. 501 Network Operations	GSFC	X	X	X	X	X	X	X	X		X	X						X			X	X			
	Directive (NOD)																									
29.	STDN No. 601/MIL	GSFC											X													
	Prelaunch Operations NOSP																									
30.	NA																									
31.	STDN No. 601/ALSEP/P&FS	GSFC	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X			
	NOSP																									
32.	No. 401.1 ALSEP Station Readiness Test	GSFC	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X			
33.	NA																									
34.	NA																									
35.	NA																									
36.	NA																									
37.	NA																									
38.	NA																									
39.	NA																									
40.	NA																									

(R) Only operational programs are listed. Other programs listed in STDN No. 504 (SCAN) and designated (R) are required at the stations specified in SCAN.

Table 26-1. ALSEP Documentation Requirements (cont)

DBR No.	Title	Originator	Station																							
			ACN	BDA	CYI	CRO	ETC	GDS	GWM	HAW	BUR	MAD	MIL	ORR	QUI	ROS	AGO	TAN	VAN			CSW	MAD	(SW)		
41.	(781-03) Systems (6-600/6-601 RCP,	GSFC	X	X	X	X	X	X	X	X		X	X						X							
	6-750 ALSEP/P&FS/ROACH) (MT)																									
42.	NA																									
43.	MSFTP-2 DECOM Seq 1048D, (PT)	GSFC	X	X	X	X	X	X	X	X		X	X	X			X		X							
44.	MSFTP-2 SIM Seq 1049S, (PT)	GSFC	X	X	X	X	X	X	X	X		X	X	X			X		X							
45.	MSFTP-2 DECOM & SIMS	GSFC	X	X	X	X	X	X	X	X		X	X	X			X		X							
	Program Listing Seq 1048D & 1049S																									
46.	ALSEP Confidence Tape Script	JSC	X	X	X	X	X	X	X	X		X	X						X							
47.	ALSEP Confidence (MT)	JSC	X	X	X	X	X	X	X	X		X	X						X							
48.	NA																									
49.	MSFTP-3 DECOM Seq 1057MD	GSFC	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
50.	NA																									
51.	NA																									
52.	NA																									
53.	NA																									
54.	NA																									
55.	Seq 454 DD	GSFC					X				X			X		X	X									
56.	Seq 455 RD	GSFC					X							X	X			X								
57.	NA																									
58.	NA																									
59.	NA																									
60.	NA																									

Table 26-1. ALSEP Documentation Requirements (cont)

DBR No.	Title	Originator	Station																							
			ACN	BDA	CYI	CRO	ETC	GDS	GWM	HAW	BUR	MAD	MIL	ORR	QUI	ROS	AGO	TAN	VAN			CSW	MAD	(SW)		
61.	NA																									
62.	NA																									
63.	NA																									
64.	NA																									
65.	NA																									
66.	NA																									
67.	NA																									
68.	DAP ANNEX F MCC/MSFN	JSC	X	X	X	X	X	X	X	X		X	X						X							
	Validation Testing and Support Manual																									
	- Skylab																									
69.	NA																									
70.	NA																									
71.	NA																									
72.	NA																									
73.	NA																									
74.	Applicable 502 series NOP's**	GSFC	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X			
75.	NA																									
76.	Seq 455 RS	GSFC					X							X				X								
77.	Seq 454 DS	GSFC									X			X	X	X	X									

** STDN No. 502.5, Vol. 2, section 22 ALSEP/P&FS is necessary for mission support.

APPENDIX A

ALSEP SUNRISE/SUNSET PREDICTIONS

APPENDIX A. ALSEP SUNRISE/SUNSET PREDICTIONS 1974

	ALSEP 5 APOLLO 17 20.17 N 30.80 E	ALSEP 3 APOLLO 16 9.00 S 15.52 E	ALSEP 2 APOLLO 15 26.10 N 3.65 E	ALSEP 4 APOLLO 14 3.67 S 17.35 W	ALSEP 1 APOLLO 12 2.99 S 23.41 W
LUN	14	22	31	37	52
SR				JAN 02/1300	JAN 03/0010
SS	JAN 13/0950	JAN 14/1600	JAN 15/1520	JAN 17/0905	JAN 17/2040
LUN	15	23	32	38	53
SR	JAN 28/0440	JAN 29/1050	JAN 30/1010	FEB 01/0350	FEB 01/1530
SS	FEB 12/0020	FEB 13/0630	FEB 14/0550	FEB 15/2330	FEB 16/1120
LUN	16	24	33	39	54
SR	FEB 26/1850	FEB 28/0050	MAR 01/0020	MAR 02/1750	MAR 03/0540
SS	MAR 13/1410	MAR 14/2020	MAR 15/1940	MAR 17/1320	MAR 18/0100
LUN	17	25	34	40	55
SR	MAR 28/0820	MAR 29/1420	MAR 30/1340	APR 01/0720	APR 01/1900
SS	APR 12/0310	APR 13/0910	APR 14/0830	APR 16/0200	APR 16/1350
LUN	18	26	35	41	56
SR	APR 26/2050	APR 28/0230	APR 29/0200	APR 30/1930	MAY 01/0720
SS	MAY 11/1510	MAY 12/2100	MAY 13/2030	MAY 15/1400	MAY 16/0140
LUN	19	27	36	42	57
SR	MAY 26/0830	MAY 27/1410	MAY 28/1330	MAY 30/0700	MAY 30/1850
SS	JUN 10/0230	JUN 11/0820	JUN 12/0740	JUN 14/0110	JUN 14/1250
LUN	20	28	37	43	58
SR	JUN 24/1920	JUN 26/0120	JUN 27/0030	JUN 28/1800	JUN 29/0550
SS	JUL 09/1310	JUL 10/1920	JUL 11/1830	JUL 13/1200	JUL 13/2330
LUN	21	29	38	44	59
SR	JUL 24/0615	JUL 25/1210	JUL 26/1125	JUL 28/0500	JUL 28/1645
SS	AUG 08/0015	AUG 09/0610	AUG 10/0525	AUG 11/2300	AUG 12/1050
LUN	22	30	39	45	60
SR	AUG 22/1725	AUG 23/2320	AUG 24/2245	AUG 26/1615	AUG 27/0400
SS	SEP 06/1150	SEP 07/1750	SEP 08/1700	SEP 10/1045	SEP 10/2250

	ALSEP 5 APOLLO 17 20.17 N 30.80 E	ALSEP 3 APOLLO 16 9.00 S 15.52 E	ALSEP 2 APOLLO 15 26.10 N 3.65 E	ALSEP 4 APOLLO 14 3.67 S 17.35 W	ALSEP 1 APOLLO 12 2.99 S 23.41 W
LUN	23	31	40	46	61
SR	SEP 21/0510	SEP 22/1115	SEP 23/1040	SEP 25/0410	SEP 25/1600
SS	OCT 06/0000	OCT 07/0600	OCT 08/0530	OCT 09/2300	OCT 10/1050
LUN	24	32	41	47	62
SR	OCT 20/1800	OCT 22/0000	OCT 22/2330	OCT 24/1700	OCT 25/0420
SS	NOV 04/1315	NOV 05/1920	NOV 06/1850	NOV 08/1220	NOV 09/0005
LUN	25	33	42	48	63
SR	NOV 19/0750	NOV 20/1250	NOV 21/1310	NOV 23/0650	NOV 23/1840
SS	DEC 04/0340	DEC 05/0940	DEC 06/0855	DEC 08/0240	DEC 08/1415
LUN	26	34	43	49	64
SR	DEC 18/2205	DEC 20/0405	DEC 21/0330	DEC 22/2115	DEC 23/0900

Legend

All date/time groups are in GMT.

LUN equals lunation.

SR equals sunrise.

SS equals sunset.

APPENDIX B

ALSEP SUPPLEMENTAL SUPPORT

APPENDIX B. ALSEP SUPPLEMENTAL SUPPORT

I. GENERAL

AGO, BUR, ORR, ROS, QUI, TAN, and ULA will be scheduled to provide ALSEP support when the primary ALSEP station(s) cannot be utilized. Support from 40-foot stations will be considered before that of 85-foot supplemental stations. When a five-downlink station is not available, limited support will be provided. The procedures contained in this appendix are to be used by supplemental stations only.

II. TELEMETRY

When scheduled, stations will configure to support five ALSEP's simultaneously. The configuration is described in the following paragraphs.

A. TELEMETRY/TRACKING RECEIVERS

MFR/DTR receivers will be used to provide error signals to the antenna and video outputs to the magnetic tape recorders. The ALSEP downlink frequencies and bit rates are as follows:

(1) Downlink Frequencies

ALSEP No.	Frequency (MHz)
1	2278.5
2	2278.0
3	2276.0
4	2279.5
5	2275.5

(2) Bit Rates

Mode	Bit Rate
1	530 b/sec (CBR)
2	1060 b/sec (NBR)
3	10.6 kb/sec (HBR)
4	3.533 kb/sec (LSP HBR)

All downlinks are PCM/PM/split phase. All frequencies can vary as much as ±30 kHz. Receivers will be tuned accordingly.

Unit/Function	Indication/Setting
Normal/invert:	As required.
Bandwidth (NBW or WBW):	WBW
LOCAL/REMOTE	LOCAL
Bit rate:	As required.

b. Group Synchronizer

Unit/Function	Indication/Setting
Prime frame sync check, bit errors allowed:	0.
Prime frame sync check, samples checked:	1.
Prime frame sync lock, bit errors allowed:	1.
Prime feame sync lock, misses allowed:	0.

c. Decom program, TESOC No. : 3-455

d. Decom program format: 455.1RD

(2) Dynatronics PCM DHS Configuration. The configuration details for the Dynatronics equipment are as follows:

a. Decommutator Systems Control Panel

Unit/Function	Indication/Setting
Data source:	bit sync.
Start source:	LOCAL.
Mode select:	DECOM.

b. Decommutator Memory Address Display Panel

Unit/Function	Indication/Setting
Start address, real time:	0010.

c. Decommutator Peripheral Control Panel

Unit/Function	Indication/Setting
Sync validity:	all switches off.
Computer override:	all switches off.
Event relays:	switch off.

d. Decom program, TESOC No.: 3-454

e. Decom program format: 454.1DD

(3) Magnavox PCM DHE Configuration. The patchboard configurations of the Magnavox equipment are presented in figures B-1 through B-3. The details are as follows:

a. Signal Conditioner and Synchronizer

Code type	SP
Bit rate	As required.
Bandwidth	Wide
Normal/invert	As required.
Integrate and dump/ filter and slice	INT and DUMP
Bits per word	10

E. COMMAND VERIFICATION

The five ALSEP experiments each transmit a command verification word which must be monitored. Bits 3 through 9 reflect the 7-bit command as received by the ALSEP, bit 10 is a message acceptance pulse, and bits 1 and 2 hold the same value as bit 3. The CV word will be all zero's except for the first mainframe following receipt of a command. The data tag of the word should be set on the binary display. Data tag assignments are as follows:

	Magnavox Word No.	DHS/DHE Data Tag
ALSEP 1	46	0056
ALSEP 2	46	0056
ALSEP 3	46	0056
ALSEP 4	5	0005
ALSEP 5	7	0007

Note

Command verification can also be monitored on channel selectors by setting the syllable start and stop switches to the bit to be examined and dialing up the data tag.

III. STATION READINESS TEST (SRT)

Section 4 of the Station Readiness Test for ALSEP, STDN No. 401.1/ALSEP, revision 1, dated September 1973, contains the SRT for Supplemental stations.

IV. ACQUISITION DATA

Acquisition messages will be generated by GSFC computers (Code 570).

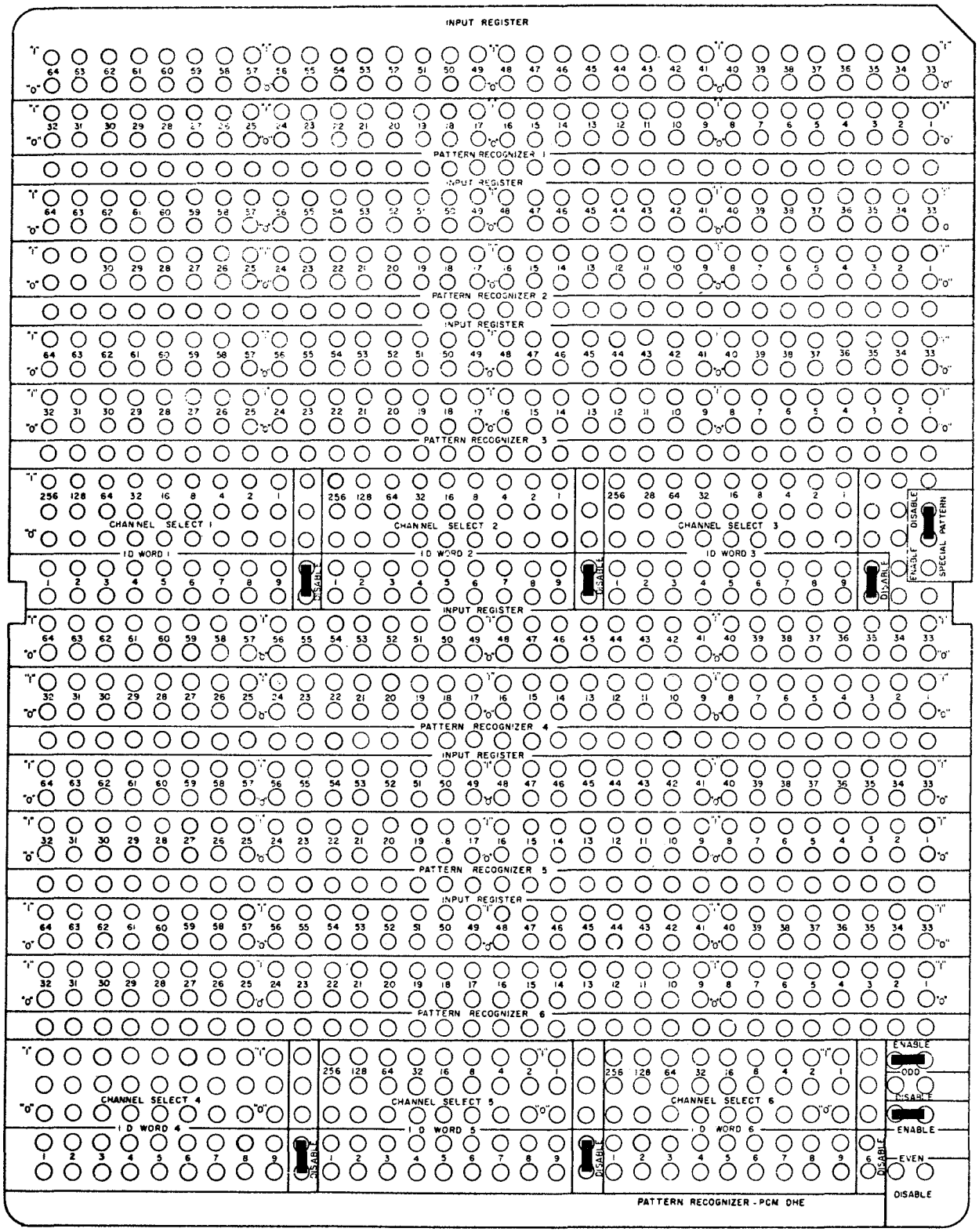

Figure B-1. Magnavox PCM DHE Pattern Recognizer Configuration

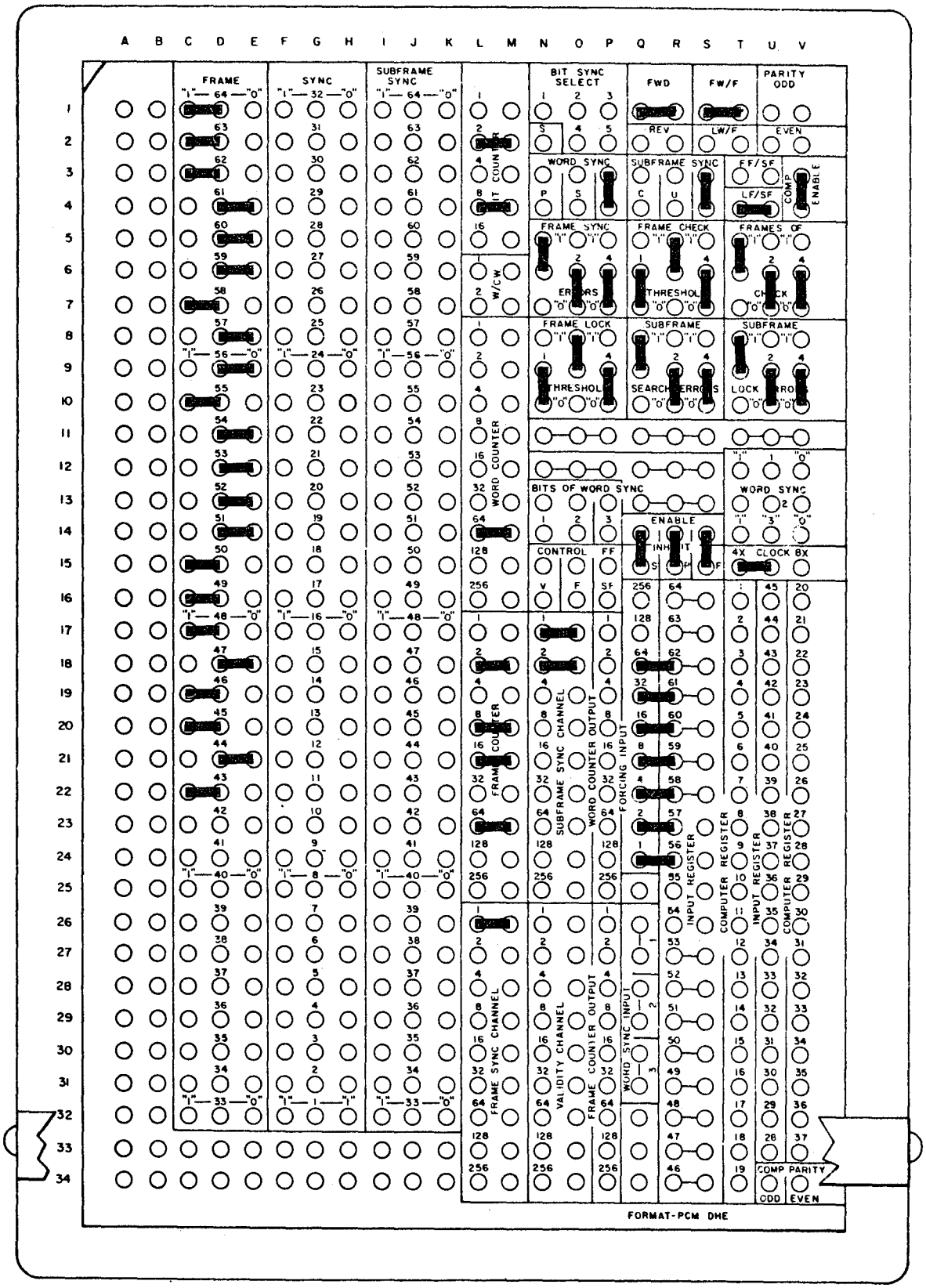

Figure B-2. Magnavox PCM DHE Format Configuration

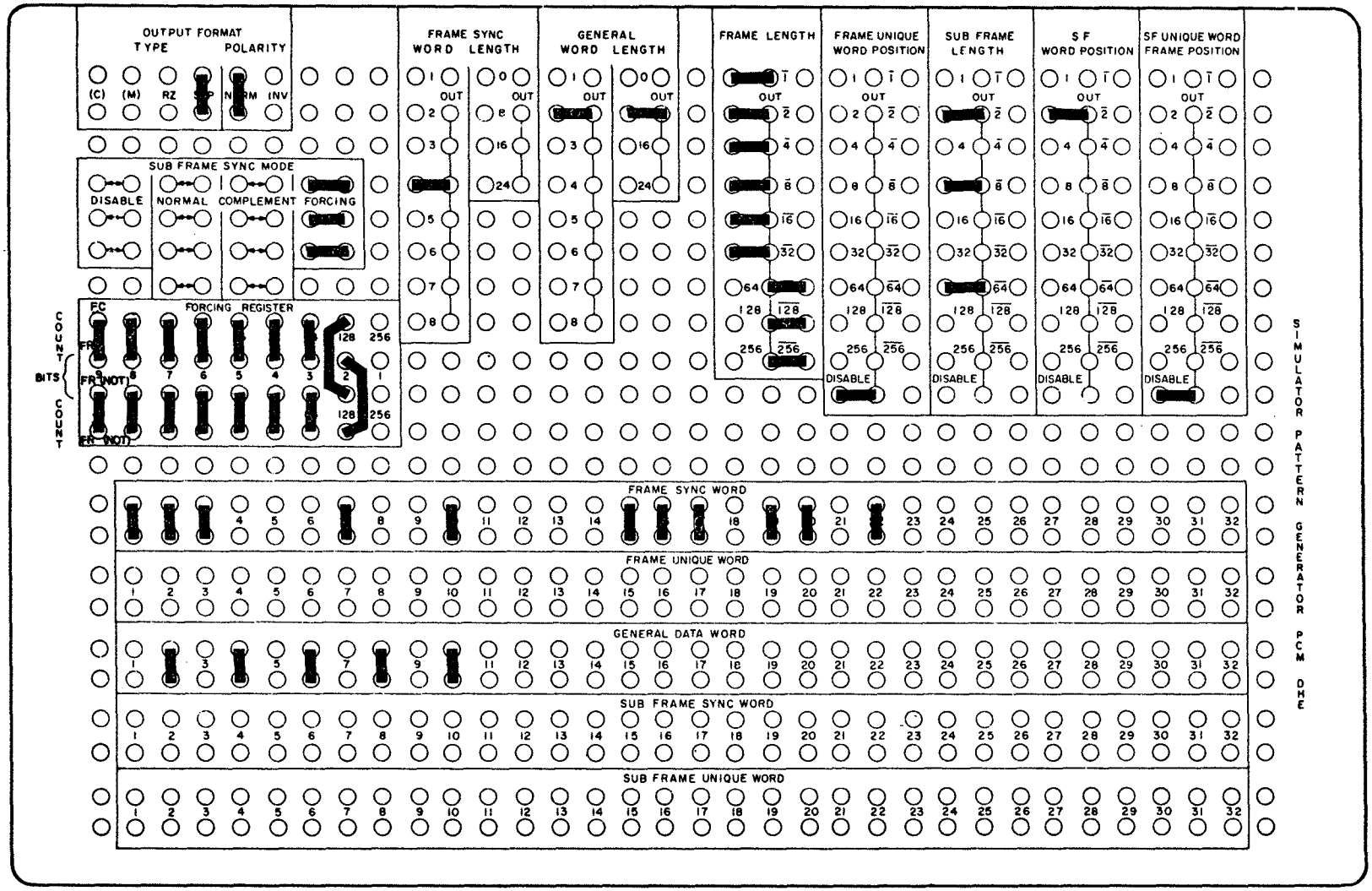

Figure B-3. Magnavox PCM DHE Simulator Pattern Generator Configuration

V. DATA MANAGEMENT

The one-half inch magnetic tapes will be numbered DSS-631. All other procedures for the DSS-630 magnetic tapes in section 11 of this NOSP will apply. Shipping instructions are contained in para 11.4.

VI. PASS SUMMARY (PASSUM) MESSAGE

Refer to para 16.3.4 for the PASSUM format. Sections 1, 2, 3, and 5 of this NOSP are applicable.

VII. NOCC/STATION INTERFACE

Time	Position	Action
S-10	NOM OPSR	ALSEP NOM will establish voice conference with stations, obtain station status from the OPSR and conduct verbal briefing, as required.
S-3	NOM OPSR	To ensure overlap of recorded data between stations, the OPSR of the station scheduled to begin support will start recorders, advise NOM of the recorder on time and the signal strengths of the ALSEP packages being supported.
S-0	NOM OPSR	ALSEP NOM will obtain final signal strengths of the station scheduled to end support and will advise OPSR he may stop his recorder. ALSEP NOM will then conduct a debriefing, as required, and terminate voice conference.

DISTRIBUTION LIST

1. STANDARD DISTRIBUTION

NASA		Quantity
470	J. Beckham	1
510	H. Lynn	1
512	C. Maskaleris	14
513	D. Fahnestock	1
564.1	W. Anonsen	1
570.1	R. Mazur	1
571	C. Packard	1
801	R. Nuttall	2
815.1	E. Kirwan	1
816	P. Pashby	5
841.1	Communications Engineer	1
842	L. Manning	1
850.1	D. Call	1
851	R. Britner	1
851.1	E. Danko	1
851.2	E. Young	1
851.3	M. Bowes	1
852	C. Roberts	1
	C. Walker	1
	J. McAdory	1
852.1	W. Stonesifer	1
852.2	F. Rul	1
852.3	G. Borkenhagen	1
861.2	R. Greene	1
862.1	J. Horton	1
862.2	L. Covington	1
862.3	R. Stanley	1
863.3	R. Capo	2
864.1	R. Morgan (Library)	1
864.2	F. Keith	1

BFEC		Quantity
NCS	M. Danials	1
PEO	J. Zaratzian	1
TOP	R. Lutz	1
MDS	J. McDowell	3
TMS	J. Adams	1
TKS	R. Roloff	1
DCS	D. Battle	1
	NOCC Library	11
CPS	R. Woodring	1
OPS	P. Colwell	1
CSS	J. Johnson	1
SDS	I. Collins	2
DDS	J. Bradford	20

Switching Centers	Quantity
CSW	2
ROB	2
LDN	2

STANDARD:	100
STATIONS:	172
SPECIAL:	43
GRAND TOTAL:	315

2. STATIONS

Supporting Stations	Quantity
Alaska	10
Ascension Island	10
Bermuda	10
Canary Island	10
Carnarvon	10
Goldstone	10
Guam	10
Hawaii	10
Johannesubrg	10
Madrid	10
Merritt Island	10
Greenbelt	10
Orroral	10
*Quito	5
Rosman	5
Santiago	10
Tananarive	10
Vanguard	10

*1 copy via Embassy Pouch

Nonsupporting Stations	
Glenn Dale Bldg	1
Winkfield	1

TOTAL TO STATIONS: 172

3. SPECIAL DISTRIBUTION

	Quantity
American Projects Branch Dept. of Supply, Canberra ACT, Australia	
R. Leslie	1
Lyndon B. Johnson Space Center, Houston, Texas 77058	
FS-4	35
W. Easter	1
GSFC	
Code 811	3
UNIVAC, Glenn Dale Bldg	1
NASA Headquarters Code MAS/Raleigh	1
BFEC	
L. Jochen	1

TOTAL SPECIAL DISTRIBUTION: 43

STDN No.
601 ALSEP/
P & FS

NETWORK OPERATIONS SUPPORT PLAN FOR ALSEP/P & FS

REVISION 1