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BIF-4W-Y00005-84
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To: [redacted]

Date: 12 October 1984

Subject: MOD4.20 Reference Material

From: T. Driscoll

The attached document provides the necessary reference material needed to thoroughly review the MOD4.20 Critical Design Specification(CDS) for SATPAC. (Ref BIF-4W-30137-84 dated 12 October 84)

Included in this document are the updated MOD4.20 SATPAC Requirements, the modified Commanding Constraints, the corrected SATPAC Commands and the revised proposed SATPAC Command Sequences. Also provided is an appendix containing Applicable tables to be used for the review of the CDS.

DPRs written against this document should be provided to T. Driscoll or A. Rhodes at the HTC no later than 30 October 1984.

"WARNING - THIS DOCUMENT SHALL NOT BE USED AS A SOURCE FOR DERIVATIVE CLASSIFICATION"

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For classification purposes the MOD4.20 Critical Design Specification(CDS) (BIF-4W-30137-84 dated 12 October 84) and MOD4.20 Reference document have been published separately. The CDS contains the Introduction, TUNITY Overview, Milestone 4 type routine descriptions and the following appendices:

A. Routine to Requirement Cross Reference
B. Requirement to Routine Cross Reference
C. Compool Modifications
D. New and Modified Data Cards
E. Development Schedule.

The MOD4.20 Reference document contains the following appendices:

A. MOD4.20 Software Requirements
B. Summary of Commanding Constraints
C. New SATPAC Commands
D. New SATPAC Command Sequences
E. Applicable Tables.

Note that every effort has been made to meet the Cover Story for the SV-20 Pallet dated 29 May 1984 (BIF-0107-65012-84). If any discrepancy is noted, describe the discrepany on a DPR form and forward to HTC.

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APPENDIX A

MOD 4.20 SOFTWARE REQUIREMENTS

1.0 MOD 4.20 REQUIREMENTS

1.1 Performance Requirements

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1.1.1 Provide for automatic deletion of LORRI tasking if PPMU compartment space is inadequate for the specified rev span. Delete by revs, highest rev first.

1.1.2 Provide tape recorder summary data, readin and readout, for the two LORRI tape recorders ('TAPOUT display).

1.1.3 Provide for LORRI commands to be prioritized and directionalized for time-bumping in conflict situations.

1.1.4 Provide for power prediction including all applicable LORRI Pallet equipment ('TEDAP).

1.1.5 Provide for function tracking of LORRI commands - including the paired VSPC functions.

1.1.6 Provide for approximately 45 data base command sequences to be available for LORRI.

1.1.7 Provide for approximately TBD stored program macros to be available for LORRI. Macros will be defined later, possibly replacing some sequences.

1.1.8 Provide for all LORRI SPC commands to be contained within a single PPMU compartment. Establish the restriction that no other event generator commands will be placed in the LORRI compartment.

1.1.9 For automatic VBE logic and 'TREK spans, establish the end-of-rev/start-of-next-rev breakpoint to be at .75 (data base) revs (lowest Southern latitude). This will allow for significant tasking across the ascending node without interference of the rev breakpoint. (b)(1) (b)(3)

1.1.10 For the LORRI VSPC paired commands, provide the following capabilities:

1) Allow for input of paired commands by a single 4-digit octal number (XXYY) on the CMD card.
2) Place and maintain the paired commands .2 seconds apart; the data command is first and the execute command is last. Do not allow time-bumping to violate the .2 second rule.
3) Allow for the event generator filling specific bits in the 6-bit field for VPSCs in sequences.

1.1.11 Provide a command history listing (and tape) of LORRI commands executed during the previous day. The listing will be formatted to be Secret/Byeman. The following information is required for each command (including SPM expansion):

a) Command number
b) Command Descriptor
c) Rev number XXXXX.X
d) System Time XXXXX.X
e) Vehicle Time (22 bits) XXXXXX.X
f) Latitude ±XX.XX
g) Longitude ±XXX.XX
h) Date DDMMMYY
i) Sequence or SPM number (zero for manual SPCs)
j) Station cone identification
k) Message number.

The above information is to be formatted fixed field, the tape to be 1 record/command, listable, 7-track.

(b)(1)
(b)(3)

1.1.12 Provide for driving the DF antenna to nadir once per rev at the .75 rev (data base) breakpoint.

1.1.13 Provide for event generation of LORRI tasks. Inputs will be task definition parameters (TSK card), sequence calls will be used to assemble commands; individual commands will be accepted (CMD card). The logic for assembling commands and sequences will use the commanding constraints as defined in Appendix A. More detail on this requirement is in Section 1.2.

1.1.14 Provide for LORRI operations inhibit band card which will preclude LORRI tasking during the applicable time period. This will override any conflicting tasking data input. Insure that LORRI is put in the normal inactive state prior to inhibit region. Delete any tasks that conflict. Flag any tasking which was deleted within this band.

1.1.15 Provide for an option on the inhibit card which will put the high-gain antenna in a stow position. Following inhibit band, drive the antenna to nadir stop before assuming DF tasking (if stowed).

1.1.16 Provide for recognition of command conflicts due to tasking being placed too close together. If this occurs, delete the task with the lower priority.

1.1.17 Check and limit all target selections as to obliquity extremes for the DF antenna:

if $\Omega < 0°$, set to $0°$

if $\Omega > \Omega_{max}$, set to Ω_{max}

Ω_{max} is Ω at horizon - 1/2 (field of view)

if limiting is required, print an informational message indicating the angular difference between desired and actual.

1.1.18 Provide for a separate event generator number for LORRI events.

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1.1.19 Provide for placement of all daily tasking data on the data base (up to 36 revs of tasking). The event generator will be executed for a particular rev span; the tasking data for that span will automatically be used. Provide also for tasking data to be deleted or replaced by rev or rev span. Data will be listed when put on the data base. Provide for tape input of the tasking data.

1.1.20 Provide for Host tape recording during all LORRI power up and power down sequences. Also provide for easily deleting this requirement during the mission.

1.1.21 Provide for deletion of functionally-redundant commands, PSPCs, NSPCs, VSPCs, and paired VSPCs.

1.1.22 The Event Processor will have logic to turn off the payload and/or tape recorder if there is sufficient time between operations. The two time threshold values will be data base set. If the tape recorder is turned off by this logic, it will be turned back on 2 seconds prior to the next collect period (or TSG prior to collect, if required). If the payload is turned off by this logic, complete re-initialization will be required prior to the next collect period, as though it was the first operation of the rev (except for antenna positioning).

1.1.23 Provide for individual commands to be associated with each tasking operation for other-than-normal configurations. These commands will be provided as necessary by the [redacted] with tasking input (Section 1.2). These commands will be placed in time as specified with each command.

1.1.24 For Omni collection, specified task request in Section 1.2, all commanding will be the same as with high-gain collection except that antenna positioning will not be required for that particular target.

1.1.25 Provide for TSK card data being given in non-chronological order, or non-target acquisition order. They should be in order of TOBI.

1.1.26 Provide for proper selections of sequences in order to place the LORRI payload in the desired configuration, based on the test card parameters. Recognize the current configuration at all times in order to reconfigure the payload properly for subsequent tests. (b)(1) (b)(3)

1.1.27 Provide an informational message when tasking card images are not in sequence order (columns 78-80).

1.1.28 Provide for trimming tasks which violate station contacts constraints. Shorten the violating tasks if possible; if not, delete the task. Use TRAN/FADE ± a data base value for testing.

1.1.29 Provide a data base table for specifying configuration settings which will be event generator set but not specified on the tasking card.

1.1.30 Execute a VHF TSG (special sequence) just before the power off sequence if the VHF has been tasked during the pass, and the last task is not a VHF task.

1.1.31 Provide for movement of the EHF antenna for EHF (non-Omni) tasks. The antenna will be placed so that the boresight intercepts the target at TOBI. The antenna shall be at the tasking position 3 seconds prior to TOBI. It must stay at the tasking position until at least 3 seconds past TOBI; it should not be moved until necessary in order to arrive at the next EHF (non-Omni) target at the proper time.

1.1.32 Provide a "SAT" card to call the event generator and to specify the rev span.

(b)(1)
(b)(3)

1.1.33 An operational limitation will be that the 2 pallet tape recorders will not be on simultaneously.

1.1.34 In case of conflict in TR usage (task overlap with specified different recorders), switch recorders at the beginning of the second task unless the first task is an EHF; in that case continue with the EHF recorder until the end of the EHF task.

1.1.35 If the first task of a pass is a VHF task and it must be deleted, reject all subseqeunt VHF tasks until an EHF task is encountered.

1.1.36 If tape recorders are switched between tasks and the configuration change sequence does not contain a TSG, send a separate TSG sequence in addition.

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1.2 Event Processor Requirement

The Event Processor in the Host Vehicle Command Generation Software ('TUNITY) will perform the function of translating LORRI payload test requests (tasking) into command messages integrated with all other Host operations. The processor will operate on specified rev spans in conjunction with other event generators (SP, SE, OT, BC, 'TREK ,etc.). (b)(1) (b)(3)

Tasking input will be specified on data cards or tape, one TSK card and optionally several command cards per task. The parameters on the TSK card for each task are:

System	-	A for EHF, B for VHF, C for W-band, D for VHF being first task in pass - configure EHF also.
Rev Number	-	Start of Task.
Direction of Travel	-	Ascending or Descending Host Vehicle at start of task.
EHF Special	-	Flag for EHF Special Task (TSG-2) S = special N = not special.
Latitude	-	of Target.
Longitude	-	of Target.
Priority	-	Used only for manual editing (deletions) of task.
Buffer Priority	-	EHF and VHF share data channels. This is to indicate which has precedence in case of overlapping tasking. A for EHF or W, B for VHF.

Duration	-	of task (dwell or take time). Payload must be configured and warmed up, etc., by the beginning of this period. Reconfiguration can begin at the end.
Bias	-	Biases to the start of task biased from TOBI (time of boresight intercept). Negative bias results in task occurring earlier in time. Zero = start of duration of TOBI.
Frequency Band	-	For EHF system; bands 1-4 1 = 26-30 GHz 2 = 30-34 GHz 3 = 34-38 GHz 4 = 38-42 GHz.
W-band System Mode	-	Modes 1-9 possible; 1-8 are track modes, 9 is search mode.
EHF Antenna Flag	-	D = DF and Omni collect M = Omni only (DF antenna not tasked).
EHF Pulse-Only Flag	-	P = Collect Pulse Only N = Collect Pulse and CW Data.
EHF Antenna-to-Nadir Flag	-	D = Do not move to nadir N = Move to nadir after task completion.
VHF Frequency	-	130 to 180 MHz in steps of 1.
VHF Attenuator/ Threshold Setting	-	Mode number 0-15, corresponds to VSPC 32XX settings.
DBS Notch Filter	-	E = Enable (in); used for certain tasks which overlap DBS circles D = Disabled (out).
Short Pulse Collection	-	E = Enabled (on) D = Disabled (off).
VHF RF Sequence Select	-	Special mode takes less commands than normal mode N = Normal S = Special.
Recorder Number	-	0 = No record 1 = Use recorder #1 2 = Use recorder #2.

(b)(1)
(b)(3)

Transpond Flag - Tasking in station cone. Station to be configured for transpond. Also, may or may not record.
T = Transpond
N = Normal, not transpond.

Record Stop Option - S = Stop recorder after this task.
G = Do not stop recorder unless time interval to next task exceeds data base threshold.

Deck Sequence Number - 1 to 999. (b)(1)

Following each TSK card are the individual command cards, one card per command. These commands will be placed by time specified relative to the beginning of the task. (b)(3)

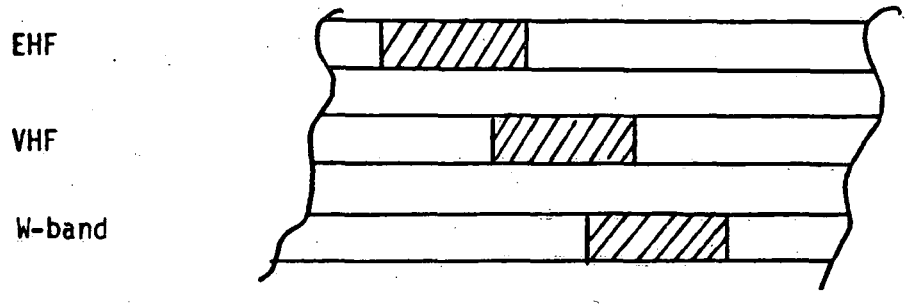
All tasking data cards (TSK, CMD) will be ordered and sequence numbers will be assigned in ascending order beginning with 1. TSK data cards need not be in target acquisition or time order, but CMD cards must follow their applicable TSK card and the CMD cards must be in order of execution.

The purpose of the individual command cards is to provide for any unusual or particular commanding for each task, or span of tasks not covered by the nominal LORRI data base sequences.

The commands will be placed in time order as they are defined by the time bias on each command card.

Tasking Modes

Each task (TSK card) will specify one, and only one, of the three systems to use - EHF, VHF, or W-band. The payload is configured such that there can be tasking overlap of the VHF system with either of the other two: (b)(1) (b)(3)



If the first task of a tasking span is a VHF task, the TSK card will contain information for configuring the EHF system. All EHF parameters will apply.

The EHF and W-band systems cannot overlap and there must be a certain amount of time required to transition from one to the other. There are also specified times required to transition from one task to another, even using the same system.

The above transition times are a function of what kind of transition is being made. A data base table should be used to identify the time required for each possible transition. These values will be used to determine task conflicts.

The kind of transition also dictates which sequence to use in order to reconfigure the payload properly. (b)(1) (b)(3)

Note the following system power constraints:

a) EHF power is required for EHF tasking
b) EHF and VHF power are required for VHF tasking
c) EHF, VHF, and W-band power are required for W-band tasking
d) Once power is turned on for any system, it is left on until the total power down is issued (PSPC 5).

In addition to payload configuration changes, sequences must be issued for:

a) DF antenna movement
b) Pallet tape recorder on/offs
c) TSGs required only for a TR change during a tasking span
d) Power off
e) EHF hot loads warmup and selection.

Hot loads warmup (120 seconds) and hot load selection will be done prior to the beginning of the first "EHF Normal" task. The selection will be done such that all bands needed by the EHF for the entire pass will be left on. Insure that there is enough time for this before the first EHF task (potential conflict).

APPENDIX B

(b)(1)

SUMMARY OF COMMANDING CONSTRAINTS

(b)(3)

Commanding Constraints

General

(b)(1)

1. The following commands are latching commands which will retain their status until commanded to a new state (regardless of payload power on or off): NSPC 6 and 7; VSPC's 45, 46, 51, 52, 55, 75, 76.

(b)(3)

2. All paired VSPC's command status revert to null when PSPC 5 (all off) is used. The next payload power on (VSPC 0000) will turn on payload power and all states are set at zero until commanded differently. Zero states have been chosen to be the nominal payload configuration to minimize the number of VSPC command executions.

3. Following an OFF command the first relay VSPC execution function should only turn on payload power in the low power mode. 600 msec must then elapse between this first VSPC and subsequent paired VSPC executions.

4. Payload power on will nominally be maintained between target accesses.

5. Payload power will be turned off for any of the following situations:

   a) Tasking completed for the rev
   b) No more tasking for at least X seconds (data base defined)
   c) Prior to any Host vehicle maneuvers
      (Recovery, Yaw-Aft, SSP, etc..)

6. At least 1 PSPC 5 is required per rev.

7. Payload power must be applied before paired VSPCs can be loaded in the payload multiplexer.

8. Command order within sequences must not be changed if a command is slipped due to an interference (not a TUNITY requirement).

9. Paired VSPCs must be executed in pairs and moved as a command pair in the event of interference.

10. The redundant transmitter is to be used only when the primary transmitter has failed.

11. Deleted.

(b)(1)

EHF TSG Requirements

(b)(3)

12. An EHF TSG mode 1 (TSG1) requires 37 seconds to complete.

13. An EHF TSG mode 2 (TSG2) requires 314 seconds to complete.

14. An EHF TSG mode 3 (TSG3) requires 12 seconds to complete.

15. The high gain (DF) antenna shall not be moved during the last 23 seconds of an EHF TSG 1 sequence operation.

16. The high gain (DF) antenna shall not be moved during EHF TSG 2 or TSG 3 sequence operation.

17. An EHF TSG 3 preceded by AGC sampling shall be executed as part of the EHF payload/power-on sequence and shall occur immediately before scheduled EHF collection is initiated except if said collection is to be in the "Pulse-Only" mode.

18. An EHF TSG 3 preceded by AGC sampling shall be executed immediately preceding the initiation of a scheduled collection in a new band except if said collection is to be in the "Pulse Only" mode.

*19. An EHF TSG 3 preceded by AGC sampling shall be executed whenever a payload tape recorder is activated (switched during tasking span) if an EHF band change has not occured and the "Pulse-Only" mode has not been enabled.

*Host Vehicle software requirement.

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20. An EHF TSG 1 execution shall be scheduled as a special event. (b)(1)
(FPA/Memogram)

21. One EHF TSG 2 shall be scheduled weekly as a special event.

22. An EHF TSG mode shall not be required when configuring the payload in Band 4 for a scheduled enabling of W-Band.

(b)(3)

VHF TSG Requirements

23. A VHF long mode TSG (TSG-L) requires 6 seconds to complete.

24. A VHF short mode TSG (TSG-S) requires 400 msec to complete.

25. A VHF TSG-S shall be executed immediately preceding scheduled VHF collection.

*25. A VHF TSG-S in selected cases shall be executed immediately following a VHF frequency change.

26. A VHF TSG-S shall be required immediately following the final VHF collection.

**27. A VHF TSG-S is required whenever a payload tape recorder is activated (switched during tasking span) and a frequency change has not taken place.

28. A VHF TSG-L shall be scheduled once per day.

*Information on tasking card

**Host vehicle software requirement

W-Band TSG Requirements

29. A W-Band TSG requires 200 msec to complete.

30. A W-Band TSG is required preceding initial scheduled collection.

31. Deleted.

(b)(3)
(b)(1)

Tape Recorder

32. At least one tape recorder shall be operating during all scheduled TSG and tasking activities (except for specified transpond operations) including periods during which the DF antenna is slewed between targets. Note, however, if a recorder overflow condition occurs during planned tasking, the [redacted] will have the option of specifying that a given recorder be turned off following any operation. The indicated recorder may subsequently be turned on again based on task recording requirements.

33. Operation of TRs during real time (transpond) monitoring of payload functions shall be scheduled if required.

34. An NSPC 2 shall be used to turn on tape recorder No. 1 and a PSPC 7 shall be used to turn on tape recorder No. 2 for data recording operations.

35. NSPC 6 or 7 shall be used to stop either/or both tape recorders. CAUTION Selection of NSPC 6 or 7 must agree with the existing (previously commanded) data system configuration.

36. Specified tape recorder(s) shall be turned on two seconds before any scheduled activity requiring recorder operation.

37. An operational TR shall be turned off two seconds after the end of a scheduled recorder operation interval.

38. Switching from one tape recorder to another during scheduled operations shall require the issuance of a "recorder-OFF" command (NSPC 6 or 7) followed by a "recorder-ON" command (NSPC 2 or PSPC 7) for the appropriate recorder, switching shall be timed according to the rules indicated in items 36 and 37 with the following exception:

> "If a tape recorder switch is indicated when other commanding sequences are not required, the recorder-OFF command shall be executed at the completion of the last task preceeding the "recorder switch", and the recorder-ON command for the next specified recorder shall be executed within a minimum execution interval after the OFF command (i.e 0.2 sec for NSPC 2 or 0.4 sec for PSPC 7).

39. The use of the last 15 seconds of tape recorder capacity should be avoided, and prohibited for critical data recording.

40. Host tape recorder must be on for LORRI II power up and power down commanding only. This requirement may be waived at any time during flight.

41. Deleted.

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Antenna Movement

42. The antenna must be positioned for tasking while payload power is on. Power can be off when driving to either stop. (b)(1)

43. The antenna will be positioned on the target by at least 3 seconds prior to "time of boresight intercept" (when the flight path normal intercepts the target). (b)(3)

44. The antenna will remain on the target until at least 3 seconds following time of boresight intercept.

Note that biasing the center of the task duration does not change the time of boresight intercept.

45. Minimum duration for a EHF/DF collect is 6.0 seconds.

46. Minimum duration for DF antenna drive is 0.6 seconds.

47. The maximum antenna move on-time will be 190 seconds.

48. The antenna will be positioned at Nadir at least once per rev. It will be moved enough to insure that it is against the stop (over-slewing by 2 seconds).

49. The antenna will be positioned at stow (180°) prior to any Host vehicle maneuvers, and will remain there until the Host vehicle is returned to trim. Trim is defined to be under geodetic, or horizon sensor, control. Host vehicle maneuvers are defined to be any non-trim condition which exceeds 5° from trim in any axis.

49a. Antenna movement for the first scheduled EHF/DF task after EHF power-on shall start at the start of the first EHF task (i.e. at T_o) and achieve the desired position at least three (3) secords before TOBI.

49b. For each subsequent EHF/DF task of a given power-on cycle, antenna movement to the scheduled position shall be completed no earlier than three (3) seconds before TOBI. (Note this requirement ensures maximum dwell at each antenna position).

49c. If an EHF TSG conflicts with 49b (paragraph 15,16), the antenna movement shall be completed one (1) second before the conflict.

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Band Changes

50. The payload receiver requires 6 seconds to switch bands and 30 seconds to warm up before tasking or calibration. (b)(1)

51. Prior to beginning of collection in a particular RF band, the hot load for that band must be turned on for at least 120 sec. for warmup. (b)(3)

52. All hot loads needed for an entire collection pass will be turned on and selected prior to the first task any one of them is required, and will remain on for the entire duration. This requirement is for Host software compatibility.

Station Contacts

53. Every RTS contact at which the LORRI II payload is turned on (either for readout or for transpond operation) must be followed by a PSPC 5, to be executed (2-30) seconds after RTS fade time.

54. There will be no LORRI II stored program commands executed in the cone of an SCF load station. Pallet calibrations will not be done in SCF load stations.

Redundant Systems

55. Switching between primary and redundant EHF data systems or IFs must be accomplished with payload power OFF.

* 56. The EHF fuse bypass mode, PSPC 3 following an NSPC 7, must only be used by program direction and then only after a failure in the payload.

57. DCU-II shall be OFF when the DCU-II power converter is switched from primary to redundant.

58. The DCU-II redundant power converter, PSPC-8, must only be used by program direction and then only after a failure in the primary converter.

59. Tape recorders should be empty when they are reconfigured.

60. The redundant transmitter is to be used only when the primary transmitter has failed.

61. An OFF command must follow the application of H/V +Y power.

62. An OFF command must precede removal of power from the pallet.

63. Encryption bypass shall not be given without program authorization.

* Host Vehicle Software check

64. The VHF payload converter power shall not be switched when power is applied. (b)(1) (b)(3)

65. The VHF normal/redundant RF/IF switching should not be done with power applied.

66. The VHF fuse bypass must only be used by program direction and then only after a failure in the payload.

W-Band

67. At least 1 second is required between the first W-system RF enable and the second W-system power on.

68. The first W-system power on command activates the +5 volt power source. The next power on adds the +10, +15, -5 volt power sources.

* 69. When the W-system is commanded to a particular mode, it will remain in that mode until the mode duration expires. Any mode change commanded during the current mode will be held until expiration of the current mode. At that time, it will immediately switch to the new mode, if one has been commanded; otherwise, it will restart the current mode.

70. The W system has two operational configurations, search and track.

71. There is one search mode and it repeats at a .400 second interval.

72. There are eight track modes that vary in length from 238 sec to 394 sec and repeat.

73. Deleted.

74. Once the W-system has been powered-up and EHF tasking is planned in bands 1, 2, 3, or 4, the W-system must be put in the "RF Disable" state.

* Host Vehicle Software check

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APPENDIX C

NEW SATPAC COMMANDS

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Commands

(b)(3)

LORRI II Pallet commands are executed through the Host command system. Allocated to LORRI II are eight NSPCs, three RTCs, one 6-bit VSPC and ten PSPCs. RTC's, NSPC's, PSPC's and VSPC's are defined in the following pages.

The 6-bit VSPC is used in two different modes- relay (or latching) and paired commands. The relay commands are characterized by bit 33=1, which allows for up to 32 distinct relay commands. Only 18 are assigned however, and described in the following pages. These commands act alone in performing their specified function.

Paired commands act in sets of 2 VSPC's in order to perform their function. The first VSPC of the pair is called the "data" command, and the second VSPC is called the "execute" command. Nothing happens until the execute command executes. They act together to define a possible 256 distinct functions. The data command is characterized by bit 33=0 and bit 34=0. The execute command has bit 33=0 and bit 34=1. Thus:

Type *	Bits 33-38	Octal
Relay	1xxxxx	40-77
Data	00xxxx	00-17
Execute	01xxxx	20-37

Paired commands will be placed and maintained together, with the execute VSPC following the data VSPC by .2 seconds. The paired commands are shown in simplified notation as a single "12-bit VSPC", with the 6 execute bits first:

VSPC xxyy

xx = execute 6-bit VSPC octal
yy = data 6-bit VSPC octal

*An exception to the rule is the EHF low power on command (00).

It acts as a relay (pwr on) and a data command also (which will not have any effect unless an execute follows).

LORRI-II

RTC'S

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(b)(3)

RTC-1	TR-1 READOUT
	P/L BASEBAND ON
	DIU NO. 1 POWER ON
	DCU-II CH. 1 CONNECTED
	KG NO. 1 ENABLED
	DCU-II ON
RTC-2	TR-2 READOUT
	P/L BASEBAND ON
	DIU NO. 2 POWER ON
	DCU-II CH.2 CONNECTED
	KG NO. 2 ENABLED
	DCU-II ON
RTC-3 (PSPC-5) (VSPC - 72)	TR-1 STOP
	TR-2 STOP
	KG NO. 1 DISABLED
	KG NO. 2 DISABLED
	DIU NO. 1 POWER OFF
	DIU NO. 2 POWER OFF
	DCU-11 CH. 1 DISCONNECTED
	DUC-11 CH. 2 DISCONNECTED
	HOT LOADS OFF
	DISABLE CONVERTERS A AND B
	SELECT P/L VSPC NORMAL MULTIPLEXER
	DCU-II OFF

LORRI-II

NSPC'S

NSPC-1	NORMAL IF AMP/HOT LOADS ON
NSPC-2 (VSPC 62)	TR-1 RECORD (b)(1) DCU-II ON (b)(3)
NSPC-3 (VSPC 65)	STOP ANTENNA
NSPC-4	SELECT COAX SWITCH TRANSFER POSITION
NSPC-5 (VSPC 71)	ANTENNA DOWN
NSPC-6 (VSPC 76)	PRIMARY DATA SOURCE AND PRIMARY BASEBAND SELECT MOTOR DRIVE NO. 1 SELECT TR-1 AT 4:1 SELECT TR-2 AT 2:1 STOP RECORD ENABLE NORMAL P/L FUSE SELECT DCU-11 CH. 1 AT 512 KBPS SELECT DCU-11 CH. 2 AT 256 KBPS SELECT DUC-11 TO P/L NORMAL B/B SELECT DIU NO. 1 TRACK 1 SELECT DIU NO. 1 AT 512 KBPS SELECT DIU NO. 2 TRACK 1 SELECT DIU NO. 2 AT 256 KBPS

LORRI-II

NSPC'S CONTD.

NSPC-7 (VSPC 75)

BACKUP DATA SOURCE AND BACKUP BASEBAND (b)(1)

SELECT MOTOR DRIVE NO. 2

(b)(3)

SELECT TR-1 AT 2:1

SELECT TR-2 AT 4:1

STOP RECORD

ENABLE P/L FUSE BYPASS

SELECT DCU-11 CH. 1 AT 256 KBPS

SELECT DCU-11 CH. 2 AT 512 KBPS

SELECT DCU-11 TO P/L BACKUP B/B

SELECT DIU NO. 1 TRACK 2

SELECT DIU NO. 1 AT 256 KBPS

SELECT DIU NO. 2 TRACK 2

SELECT DIU NO. 2 AT 512 KBPS

NSPC-8

REDUNDANT IF AMP/HOT LOADS ON

Handle Via
BYEMAN
Control System Only

LORRI-II

PSPC'S

PSPC-1	HIGH GAIN ANTENNA PIN PULLERS
PSPC-2	VHF ANTENNA PIN PULLERS (b)(1)
PSPC-3	SELECT: P/L FUSE AS ENABLED (b)(3) COAX SWITCH NORMAL POSITION DCU-II PRIMARY POWER ENCRYPTION
PSPC-4 (VSPC 66)	ANTENNA UP
PSPC-5 (RTC-3) (VSPC - 72)	TR-1 RECORDER STOP TR-2 RECORDER STOP KG NO. 1 DISABLED KG NO. 2 DISABLED DIU NO. 1 POWER OFF DI NO. 2 POWER OFF DCU-11 CH. 1 DISCONNECTED DCU-11 CH. 2 DISCONNECTED HOT LOADS OFF DISABLE CONVERTERS A AND B SELECT P/L VSPC NORMAL MULTIPLEXER
PSPC-6	SELECT ENCRYPTION BYPASS
PSPC-7 (VSPC 61)	TAPE RECORDER 2 ON DCU-II ON
PSPC-8	SELECT DCU-11 REDUNDANT POWER
PSPC-9	DCU-II ON
PSPC-10	SELECT P/L VSPC BACKUP MULTIPLEXER

VSPC RELAY COMMANDS

FUNCTION	VSPC OCTAL	SYSTEM
EHF LOW PWR	00	EHF
EHF HI PWR	44	EHF
DIRECT TRANSPOND	41	BASIC
VHF PWR ON	42	VHF
VFH PRIME CONV. DC-DC POWER	45	VHF
VHF REDUN. CONV. DC-DC POWER	46	VHF
VHF FUSE BYPASS	51	VHF
VHF NORMAL RF/IF	52	VHF
VHF REDUN. RF/IF	55	VHF
W BAND PWR ON	56	W
PSPC 7 B/U TR-2 RECORD	61	BASIC
NSPC 2 B/U TR-1 RECORD	62	BASIC
NSPC 3 B/U STOP ANTENNA	65	EHF
PSPC 4 B/U ANTENNA UP	66	EHF
NPSC 5 B/U ANTENNA DOWN	71	EHF
PSPC 5 B/U	72	BASIC
NSPC 7 B/U BACKUP DATA SOURCE	75	BASIC
NSPC 6 B/U PRIMARY DATA SOURCE	76	BASIC

(b)(3)

(b)(1)

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VSPC PAIRED COMMANDS

FUNCTION	VSPC OCTAL	SYSTEM
ALL HOT LOADS ON	2000	EHF
BANDS 1, 2, & 3 ON; BAND 4 OFF	2001	EHF
BANDS 1, 2 & 4 ON; BAND 3 OFF	2002	EHF
BANDS 1 & 2 ON; BANDS 3 & 4 OFF	2003	EHF
BANDS 1, 3 & 4 ON, BAND 2 OFF	2004	EHF
BANDS 1 & 3 ON; BANDS 2 & 4 OFF	2005	EHF
BANDS 1 & 4 ON; BANDS 2 & 3 OFF	2006	EHF
BAND 1 ON; BANDS 2, 3 & 4 OFF	2007	EHF
BANDS 2, 3 & 4 ON; BAND 1 OFF	2010	EHF
BANDS 2 & 3 ON; BANDS 1 & 4 OFF	2011	EHF
BANDS 2 & 4 ON; BANDS 1 & 3 OFF	2012	EHF
BAND 2 ON; BANDS 1, 3 & 4 OFF	2013	EHF
BANDS 3 & 4 ON; BANDS 1 & 2 OFF	2014	EHF
BAND 3 ON; BANDS 1, 2 & 4 OFF	2015	EHF
BAND 4 ON; BANDS 1, 2 & 3 OFF	2016	EHF
ALL HOT LOADS OFF	2017	EHF

BAND 1 = 26 - 30 GHz BAND 3 = 34 - 38 GHz

BAND 2 = 30 - 34 GHz BAND 4 = 38 - 42 GHz

(b)(3)

(b)(1)

VSPC PAIRED COMMANDS
(continued)

FUNCTION	VSPC OCTAL	SYSTEM
34-38 PEN A/OM-B	2100	EHF
38-42 PEN A/OM-B	2101	EHF
30-34 LOAD A/LOAD B	2102	EHF
26-30 LOAD A/LOAD B	2103	EHF
34-38 PEN A/LOAD B	2104	EHF
38-42 PEN A/LOAD B	2105	EHF
30-34 LOAD A/OM-B	2106	EHF
26-30 LOAD A/OM-B	2107	EHF
34-38 LOAD A/OM-B	2110	EHF
38-42 LOAD A/OM-B	2111	EHF
30-34 PEN A/LOAD B	2112	EHF
26-30 PEN A/LOAD B	2113	EHF
34-38 LOAD A/LOAD B	2114	EHF
38-42 LOAD A/LOAD B	2115	EHF
30-34 PEN A/OM-B	2116	EHF
26-30 PEN A/OM-B	2117	EHF

PEN = PENCIL OM = Omni

(b)(3)

(b)(1)

VSPC PAIRED COMMANDS
(continued)

FUNCTION	VSPC OCTAL	SYSTEM
DICKE A TO B, LOG VIDEO 20 MHz	2200	EHF
DICKE A TO B, LOG VIDEO 2 MHz	2201	EHF
DICKE A ONLY, LOG VIDEO 20 MHz	2202	EHF
DICKE A ONLY, LOG VIDEO 2 MHz	2203	EHF
DICKE A TO B INVERT, LOG VIDEO 20 MHz	2204	EHF
DICKE A TO B INVERT, LOG VIDEO 2 MHz	2205	EHF
DICKE B ONLY, LOG VIDEO 20 MHz	2206	EHF
DICKE B ONLY, LOG VIDEO 2 MHz	2207	EHF
26 - 34 ; 34 - 42 ; LOG VIDEO GHz GHz MHz		
HOT TO AMB; AMB TO HOT; 20	2210	EHF
HOT TO AMB; AMB TO HOT; 2	2211	EHF
HOT ONLY; AMB ONLY; 20	2212	EHF
HOT ONLY; AMB ONLY; 2	2213	EHF
AMB TO HOT; HOT TO AMB; 20	2214	EHF
AMB TO HOT; HOT TO AMB; 2	2215	EHF
AMB ONLY; HOT ONLY; 20	2216	EHF
AMB ONLY; HOT ONLY; 2	2217	EHF

A = PENCIL B = OMNI

(b)(3)

(b)(1)

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VSPC PAIRED COMMANDS
(continued)

FUNCTION	VSPC OCTAL	SYSTEM
FBR AGC NO SAMPLE & TSG OFF	2300	EHF
ILLEGAL COMMAND	2301	
ILLEGAL COMMAND	2302	
TSG OFF (REDUN CMD), FBR AGC NO SAMPLE	2303	EHF
TSG MODE 3, FBR AGC NO SAMPLE	2304	EHF
TSG MODE 1, FBR AGC NO SAMPLE	2305	EHF
TSG MODE 2, FBR AGC NO SAMPLE	2306	EHF
TSG OFF (REDUN CMD), FBR AGC NO SAMPLE	2307	EHF
FBR AGC SAMPLE & TSG OFF	2310	EHF
ILLEGAL COMMAND	2311	
ILLEGAL COMMAND	2312	
FBR AGC SAMPLE & TSG OFF (REDUN)	2313	EHF
FBR AGC SAMPLE & TSG MODE 3	2314	EHF
FBR ACG SAMPLE & TSG MODE 1	2315	EHF
FBR ACG SAMPLE & TSG MODE 2	2316	EHF
FBR ACG SAMPLE & TSG OFF (REDUN)	2317	EHF

(b)(3)

(b)(1)

VSPC PAIRED COMMANDS
(continued)

FUNCTION	VSPC OCTAL	SYSTEM
EHF PRIORITY, DATA LINK WB, NBT ON, NOT PULSE ONLY	2400	BASIC
EHF PRIORITY, DATA LINK WB, NBT ON, PULSE ONLY	2401	BASIC
EHF PRIORITY, DATA LINK WB, NBT DISABLED, NOT PULSE ONLY	2402	BASIC
EHF PRIORITY, DATA LINK WB, NBT DISABLED, PULSE ONLY	2403	BASIC
EHF PRIORITY, DATA LINK NB, NBT ON, NOT PULSE ONLY	2404	BASIC
EHF PRIORITY, DATA LINK NB, NBT ON, PULSE ONLY	2405	BASIC
EHF PRIORITY, DATA LINK NB, NBT DISABLED, NOT PULSE ONLY	2406	BASIC
EHF PRIORITY, DATA LINK NB, NBT DISABLED, PULSE ONLY	2407	BASIC
VHF PRIORITY, DATA LINK WB, NBT ON, NOT PULSE ONLY	2410	BASIC
VHF PRIORITY, DATA LINK WB, NBT ON, PULSE ONLY	2411	BASIC
VHF PRIORITY, DATA LINK WB, NBT DISABLED, NOT PULSE ONLY	2412	BASIC
VHF PRIORITY, DATA LINK WB, NBT DISABLED, PULSE ONLY	2413	BASIC
VHF PRIORITY, DATA LINK NB, NBT ON, NOT PULSE ONLY	2414	BASIC
VHF PRIORITY, DATA LINK NB, NBT ON, PULSE ONLY	2415	BASIC
VHF PRIORITY, DATA LINK NB, NBT DISABLED, NOT PULSE ONLY	2416	BASIC
VHF PRIORITY, DATA LINK NB, NBT DISABLED, PULSE ONLY	2417	BASIC

(b)(3)

(b)(1)

VSPC PAIRED COMMANDS
(continued)

FUNCTION	VSPC OCTAL	SYSTEM
PRIMARY LO, FIFO USED, DO NOT DISABLE FBR CHANNEL CALLED BY (26XX) CMD	2500	EHF
PRIMARY LO, FIFO BYPASS, DO NOT DISABLE FBR CHANNEL CALLED BY (26XX) CMD	2501	EHF
PRIMARY LO, FIFO USED, DISABLE FBR CHANNEL CALLED BY (26XX) CMD	2502	EHF
PRIMARY LO, FIFO BYPASS, DISABLE FBR CHANNEL CALLED BY (26XX) CMD	2503	EHF
REDUN LO, FIFO USED, DO NOT DISABLE FBR CHANNEL CALLED BY (26XX) CMD	2504	EHF
REDUN LO, FIFO BYPASS, DO NOT DISABLE EBR CHANNEL CALLED BY (26XX) CMD	2505	EHF
REDUN LO, FIFO USED, DISABLE FBR CHANNEL CALLED BY (26XX) CMD	2506	EHF
REDUN LO, FIFO BYPASS, DISABLE FBR CHANNEL CALLED BY (26XX) CMD	2507	EHF
PRIMARY LO, FIFO USED, DO NOT DISABLE FBR CHANNEL CALLED BY (26XX) CMD	2510	EHF
PRIMARY LO, FIFO BYPASS, DO NOT DISABLE FBR CHANNEL CALLED BY (26XX CMD	2511	EHF
PRIMARY LO, FIFO USED, DISABLE FBR CHANNEL CALLED BY (26XX) CMD	2512	EHF
PRIMARY LO, FIFO BYPASS, DISABLE FBR CHANNEL CALLED BY (26XX) CMD	2513	EHF
REDUN LO, FIFO USED, DO NOT DISABLE FBR CHANNEL CALLED BY (26XX) CMD	2514	EHF
REDUN LO, FIFO BYPASS, DO NOT DISABLE FBR CHANNEL CALLED BY (26XX) CMD	2515	EHF
REDUN LO, FIFO USED, DISABLE FBR CHANNEL CALLED BY (26XX) CMD	2516	EHF
REDUN LO, FIFO BYPASS, DISABLE FBR CHANNEL CALLED BY (26XX) CMD	2517	EHF

NOTE: SPARE BIT AVAILABLE TO DISTINGUISH BETWEEN 2500-2507 AND 2510 -2517

(b)(3)

(b)(1)

VSPC PAIRED COMMANDS
(continued)

FUNCTION	VSPC OCTAL	SYSTEM
FBR CHAN 0 DISABLE	2600	EHF
FBR CHAN 1 DISABLE	2601	EHF
FBR CHAN 2 DISABLE	2602	EHF
FBR CHAN 3 DISABLE	2603	EHF
FBR CHAN 4 DISABLE	2604	EHF
FBR CHAN 5 DISABLE	2605	EHF
FBR CHAN 6 DISABLE	2606	EHF
FBR CHAN 7 DISABLE	2607	EHF
FBR CHAN 8 DISABLE	2610	EHF
FBR CHAN 9 DISABLE	2611	EHF
FBR CHAN 10 DISABLE	2612	EHF
FBR CHAN 11 DISABLE	2613	EHF
FBR CHAN 12 DISABLE	2614	EHF
FBR CHAN 13 DISABLE	2615	EHF
FBR CHAN 14 DISABLE	2616	EHF
FBR CHAN 15 DISABLE	2617	EHF

(b)(1) (b)(3)

SECRET/H

Handle Via
BYEMAN
Control System Only

VSPC PAIRED COMMANDS
(continued)

FUNCTION	VSPC OCTAL	SYSTEM
FBR AGC ON, MWFE PRIME LOGIC, WBT ON, LOG AGC ON	2700	EHF
FBR AGC ON, MWFE PRIME LOGIC, WBT ON, LOG FIX GAIN	2701	EHF
FBR AGC ON, MWFE PRIME LOGIC, WBT OFF, LOG AGC ON	2702	EHF
FBR AGC ON, MWFE PRIME LOGIC, WBT OFF, LOG FIX GAIN	2703	EHF
FBR AGC ON, MWFE REDUN LOGIC, WBT ON, LOG AGC ON	2704	EHF
FBR AGC ON, MWFE REDUN LOGIC, WBT ON, LOG FIX GAIN	2705	EHF
FBR AGC ON, MWFE REDUN LOGIC, WBT OFF, LOG AGC ON	2706	EHF
FBR AGC ON, MWFE REDUN LOGIC, WBT OFF, LOG FIX GAIN	2707	EHF
FBR FIX GAIN, MWFE PRIME LOGIC, WBT ON, LOG AGC ON	2710	EHF
FBR FIX GAIN, MWFE PRIME LOGIC, WBT ON, LOG FIX GAIN	2711	EHF
FBR FIX GAIN, MWFE PRIME LOGIC, WBT OFF, LOG AGC ON	2712	EHF
FBR FIX GAIN, MWFE PRIME LOGIC, WBT OFF, LOG FIX GAIN	2713	EHF
FBR FIX GAIN, MWFE REDUN LOGIC, WBT ON, LOG AGC ON	2714	EHF
FBR FIX GAIN, MWFE REDUN LOGIC, WBT ON, LOG FIX GAIN	2715	EHF
FBR FIX GAIN, MWFE REDUN LOGIC, WBT OFF, LOG AGC ON	2716	EHF
FBR FIX GAIN, MWFE REDUN LOGIC, WBT OFF, LOG FIX GAIN	2717	EHF

(b)(1)

(b)(3)

VSPC PAIRED COMMANDS
(continued)

FUNCTION	VSPC OCTAL	SYSTEM
142, 158, 174 MHz	3000	VHF
143, 159, 175 MHz	3001	VHF
144, 160, 176 MHz	3002	VHF
145, 161, 177 MHz	3003	VHF
130, 146, 162, 178 MHz	3004	VHF
131, 147, 163, 179 MHz	3005	VHF
132, 148, 164, 180 MHz	3006	VHF
133, 149, 165, MHz	3007	VHF
134, 150, 166, MHz	3010	VHF
135, 151, 167, MHz	3011	VHF
136, 152, 168, MHz	3012	VHF
137, 153, 169, MHz	3013	VHF
138, 154, 170, MHz	3014	VHF
139, 155, 171, MHz	3015	VHF
140, 156, 172, MHz	3016	VHF
141, 157, 173, MHz	3017	VHF

VHF RF FREQUENCY STEPS

(USED WITH 31XX COMMANDS)

[SEE NEXT 2 PAGES FOR USAGE]

(b)(1)

(b)(3)

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VSPC PAIRED COMMANDS
(continued)

FUNCTION	VSPC OCTAL	SYSTEM
PRIME 158 to 173 MHz	3100	VHF
PRIME 174 to 180 MHz	3101	VHF
PRIME 130 to 141 MHz	3102	VHF
PRIME 142 to 157 MHz	3103	VHF
ILLEGAL COMMAND	3104	
ILLEGAL COMMAND	3105	
ILLEGAL COMMAND	3106	
ILLEGAL COMMAND	3107	
REDUN 158 to 173 MHz	3110	VHF
REDUN 174 to 180 MHz	3111	VHF
REDUN 130 to 141 MHz	3112	VHF
REDUN 142 to 157 MHz	3113	VHF
ILLEGAL COMMAND	3114	
ILLEGAL COMMAND	3115	
ILLEGAL COMMAND	3116	
ILLEGAL COMMAND	3117	

VHF RF FREQUENCY RANGES
(USED WITH 30XX COMMANDS)
[SEE NEXT PAGE FOR DIAGRAM]

(b)(1)

(b)(3)

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VSPC PAIRED CO[illegible]DS
([illegible]ntinue[illegible])
SY[illegible]EM B (V[illegible])
RF FREQUENCY SELECTION

Backup VSPC	3110	3111	3112	3113	
VSPC	3100	3101	3102	3103	STEP
3000	158	174		142	1
3001	159	175		143	2
3002	160	176		144	3
3003	161	177		145	4
3004	162	178	130	146	5
3005	163	179	131	147	6
3006	164	180	132	148	7
3007	165		133	149	8
3010	166		134	150	9
3011	167		135	151	10
3012	168		136	152	11
3013	169		137	153	12
3014	170		138	154	13
3015	171		139	155	14
3016	172		140	156	15
3017	173		141	157	16
	1	2	3	4	RANGE

(b)(1)

(b)(3)

EXAMPLE: VSPC 3102 (RANGE 3)
+ =RF136
VSPC 3012 (STEP 11)

Handle Via
BYEMAN
Control System Only

VSPC PAIRED COMMANDS
(continued)

FUNCTION	VSPC OCTAL	SYSTEM
ATTEN = 0; THD = -42 dB	3200	VHF
ATTEN = 0; THD = -52 dB	3201	VHF
ATTEN = 0; THD = -62 dB	3202	VHF
ATTEN = 0; THD = -70 dB	3203	VHF
ATTEN = 10 dB; THD = -32 dB	3204	VHF
ATTEN = 10 dB; THD = -42 dB	3205	VHF
ATTEN = 10 dB; THD = -52 dB	3206	VHF
ATTEN = 10 dB; THD = -60 dB	3207	VHF
ATTEN = 20 dB; THD = -22 dB	3210	VHF
ATTEH = 20 dB; THD = -32 dB	3211	VHF
ATTEN = 20 dB; THD = -42 dB	3212	VHF
ATTEN = 20 dB; THD = -50 dB	3213	VHF
ATTEN = 30 dB; THD = -12 dB	3214	VHF
ATTEN = 30 dB; THD = -22 dB	3215	VHF
ATTEN = 30 dB; THD = -32 dB	3216	VHF
ATTEN = 30 dB; THD = -40 dB	3217	VHF

(b)(1)
(b)(3)

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VSPC PAIRED COMMANDS
(continued)

FUNCTION	VSPC OCTAL	SYSTEM
TSG OFF	3300	VHF
ILLEGAL COMMAND	3301	
TSG OFF	3302	VHF
ILLEGAL COMMAND	3303	
TSG OFF	3304	VHF
ILLEGAL COMMAND	3305	
PRIMARY SHORT REPEAT	3306	VHF
ILLEGAL COMMAND	3307	
PRIMARY SHORT TSG	3310	VHF
ILLEGAL COMMAND	3311	
PRIMARY LONG TSG	3312	VHF
ILLEGAL COMMAND	3313	
REDUNDANT RF/IF TSG	3314	VHF
ILLEGAL COMMAND	3315	
PRIMARY SHORT REPEAT	3316	VHF
ILLEGAL COMMAND	3317	

VSPC PAIRED COMMANDS
(continued)

FUNCTION	VSPC OCTAL	SYSTEM
NOTCH FILTER (NF) IN; SHORT PULSE ENABLE (SPE) OFF REDUN PROCESS ENABLE (RPE) OFF	3400	VHF
	3401	VHF
NF IN; RPE ON; SPE OFF	3402	VHF
	3403	VHF
NF IN; RPE OFF; SPE ON	3404	VHF
	3405	VHF
NF IN; RPE & SPE ON	3406	VHF
	3407	VHF
NF OUT; RPE & SPE OFF	3410	VHF
	3411	VHF
NF OUT; RPE ON; SPE OFF	3412	VHF
	3413	VHF
NF OUT; RPE OFF; SPE ON	3414	VHF
	3415	VHF
NF OUT; RPE & SPE ON	3416	VHF
	3417	VHF

ODD-NUMBER COMMANDS - SAME AS ABOVE

(b)(1)

(b)(3)

VSPC PAIRED COMMANDS
(continued)

FUNCTION	VSPC OCTAL	SYSTEM
W-BAND 4 LSB's FOR MODE SELECTION	3600	W
	3601	W
	3602	W
	3603	W
	3604	W
	3605	W
	3606	W
	3607	W
	3610	W
	3611	W
	3612	W
	3613	W
	3614	W
	3615	W
	3616	W
	3617	W

(b)(1)

(b)(3)

SECRET/H/

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VSPC PAIRED COMMANDS
(concluded)

FUNCTION	VSPC OCTAL	SYSTEM
MODE MSB 0, TSG OFF, ANTENNA CHANNELS DISABLE, NEW MODE TOGGLE 0	3700	W
MODE MSB 1, TSG OFF, ANTENNA CHANNELS DISABLE, NEW MODE TOGGLE 0	3701	W
MODE MSB 0, TSG ON, ANTENNA CHANNELS DISABLE, NEW MODE TOGGLE 0	3702	W
MODE MSB 1, TSG ON, ANTENNA CHANNELS DISABLE, NEW MODE TOGGLE 0	3703	W
MODE MSB 0, TSG OFF, ANTENNA CHANNELS ENABLE, NEW MODE TOGGLE 0	3704	W
MODE MSB 1, TSG OFF, ANTENNA CHANNELS ENABLE, NEW MODE TOGGLE 0	3705	W
MODE MSB 0, TSG ON, ANTENNA CHANNELS ENABLE, NEW MODE TOGGLE 0	3706	W
MODE MSB 1, TSG ON, ANTENNA CHANNELS ENABLE, NEW MODE TOGGLE 0	3707	W
MODE MSB 0, TSG OFF, ANTENNA CHANNELS DISABLE, NEW MODE TOGGLE 1	3710	W
MODE MSB 1, TSG OFF, ANTENNA CHANNELS DISABLE NEW MODE TOGGLE 1	3711	W
MODE MSB 0, TSG ON, ANTENNA CHANNELS DISABLE, NEW MODE TOGGLE 1	3712	W
MODE MSB 1, TSG ON, ANTENNA CHANNELS DISABLE, NEW MODE TOGGLE 1	3713	W
MODE MSB 0, TSG OFF, ANTENNA CHANNELS ENABLE, NEW MODE TOGGLE 1	3714	W
MODE MSB 1, TSG OFF, ANTENNA CHANNELS ENABLE, NEW MODE TOGGLE 1	3715	W
MODE MSB 0, TSG ON, ANTENNA CHANNELS ENABLE, NEW MODE TOGGLE 1	3716	W
MODE MSB 1, TSG ON, ANTENNA CHANNELS ENABLE, NEW MODE TOGGLE 1	3717	W

(b)(1)

(b)(3)

Backup System Commanding

VSPC Backup Multiplexer:	PSPC 10
Redundant IF Amplifier:	NSPC 8 Instead of 1
Data System B, DC/DC Converter B:	NSPC 7 Instead of 6 (b)(1)
(This affects recorder speeds, and should not be followed by PSPC 3.)	(b)(3)
Input Power Fuse Bypass:	NSPC 7 followed by PSPC 3
Coax Switch Transfer Position:	NSPC 4
Encryption Bypass:	PSPC 6
DCU II Redundant Power:	PSPC 8
Redundant LO:	Data VSPC 00X1XX
Bypass FIFO Storage:	Data VSPC 00XXX1

This command will allow pulse words to be transmitted as they are generated, without FIFO storage. It is thus possible that pulses may be lost, if the rate is very high or the spacing is very short.

Filter Bank Radiometer AGC:	
Set to Fixed Gain:	Data VSPC 001XXX

(This sets the AGC to a factory selected fixed gain, to replace the AGC action, should it malfunction. Note that each IF has such an AGC.)

Disable Individual FBR Channels:	
Specify Channel Number 0 - 15:	Data VSPC 00XXXX
Disable the Designated Channel:	Data VSPC 00XX1X
LOG ACG	
Set to Fixed Gain:	Data VSPC 00XXX1
WBT Disable:	Data VSPC 00XX1X
MWFE Logic	
Redundant Logic:	Data VSPC 00X1XX
NBT Disable	Data VSPC 00XX1X
2 MHz Log Video Bandwidth:	Data VSPC 00XXX1
VHF Redundant RF/IF:	VSPC 101101
VHF Redundant Converter:	VSPC 100110

APPENDIX D

(b)(1)

NEW SATPAC COMMAND SEQUENCES

(b)(3)

SATPAC SEQUENCES

SEQ 1	TRANSPOND CONFIGURATION
SEQ 2	EHF SYSTEM POWER UP
SEQ 3	EHF POWER UP, PULSE ONLY
SEQ 4	EHF BAND CHANGE, NORMAL TO NORMAL
SEQ 5	EHF BAND CHANGE, NORMAL TO PULSE, PULSE TO PULSE (b)(1)
SEQ 6	EHF HOT LOADS ON (b)(3)
SEQ 7	EHF BAND CHANGE, PULSE TO NORMAL
SEQ 8	VHF POWER UP, EHF NORMAL
SEQ 9	VHF POWER UP, EHF PULSE ONLY
SEQ 10	W SYSTEM POWER UP, SEARCH MODE
SEQ 11	W SYSTEM POWER UP, TRACK MODE
SEQ 12	ADD VHF SYSTEM
SEQ 13	ADD W SYSTEM, SEARCH MODE
SEQ 14	ADD W SYSTEM, TRACK MODE
SEQ 15	W-BAND SEARCH TO W-BAND TRACK
SEQ 16	EHF/VHF PRIORITY SELECTION
SEQ 17	W-BAND SEARCH TO EHF NORMAL, W-BAND DISABLED
SEQ 18	W-BAND SEARCH TO EHF PULSE ONLY, W-BAND DISABLED
SEQ 19	W-BAND DISABLED TO W-BAND SEARCH
SEQ 20	W-BAND DISABLED TO W-BAND TRACK
SEQ 21	EHF TO W-BAND SEARCH
SEQ 22	EHF TO W-BAND TRACK
SEQ 23	VHF FREQUENCY CHANGE - NORMAL
SEQ 24	VHF FREQUENCY CHANGE - SPECIAL

SATPAC SEQUENCES
(CONCLUDED)

SEQ 25	ANTENNA UP
SEQ 26	ANTENNA DOWN
SEQ 27	RECORDER #1 ON RECORD
SEQ 28	RECORDER #2 ON RECORD
SEQ 29	RECORDER STOP
SEQ 30	POWER OFF
SEQ 31	TSG1
SEQ 32	TSG2
SEQ 33	TSG3
SEQ 34	TSG-LONG
SEQ 35	TSG-SHORT

(b)(1)
(b)(3)

SEQ. 1 TRANSPOND CONFIGURATION

VSPC-0041	DIRECT TRANSPOND	0.0

NOTE: SEQUENCE REFERENCE TIME (0.0) IS TBD.

(b)(1)
(b)(3)

SEQ 2 EHF SYSTEM POWER UP

VSPC-0000	EHF LOW POWER	-47.0
VSPC-0044	EHF HIGH POWER	-45.0
VSPC-21GG	BAND/INPUT SELECTION	-43.0
VSPC-2310	TSG OFF/FBR AGC SAMPLE	-13.0
VSPC-2304	TSG MODE 3/NO FBR AGC SAMPLE	-12.0

NOTE: 1. "G"=HOST VEHICLE GENERATOR FILLED

2. REFERENCE IS START TIME OF COLLECT PERIOD

3. START L II TAPE RECORDER AT -15.0

4. HOT LOADS ON AND HOT LOAD SELECTION PROVIDED BY SEQUENCE #6.

SEQ.3 EHF POWER UP,PULSE ONLY

VSPC-0000	EHF LOW POWER	-12.0
VSPC-0044	EHF HIGH POWER	-10.0
VSPC-21GG	BAND/INPUT SELECTION	-8.0
VSPC-24GG	MODE PULSE/NOT PULSE PRIORITY EHF/VHF NBT ON/DISABLED DATA LINK WB/NB	-5.0

NOTE: 1. SEQUENCE REFERENCE TIME (0.0) IS START OF TASKING PERIOD.

2. START TAPE RECORDER AT REF.-2.0 SEC.

(b)(1)

(b)(3)

SEQ.4 EHF BAND CHANGE,NORMAL TO NORMAL

VSPC-21GG	BAND/INPUT SELECTION	-43.0
VSPC-2310	TSG OFF/FBR AGC SAMPLE	-13.0
VSPC-2304	TSG MODE 3/NO FBR AGC SAMPLE	-12.0

NOTE: 1. SEQUENCE REFERENCE TIME (0.0) IS START OF TASKING PERIOD.

2. START TAPE RECORDER AT REF.-15.0 SEC.

3. G=GENERATOR FILLED

SEQ. 5 EHF BAND CHANGE,NORMAL TO PULSE,PULSE TO PULSE

VSPC-21GG	BAND/INPUT SELECTION		-6.0
VSPC-24GG	MODE	PULSE/NOT PULSE	-4.0
	PRIORITY	EHF/VHF	
	NBT	ON/DISABLED	
	DATA LINK	WB/NB	

NOTE: 1. "G"=HOST VEHICLE GENERATOR FILLED

(b)(1)
(b)(3)

2. REFERENCE IS START TIME OF START OF COLLECT PERIOD.

3. START TR AT -2.0 SECONDS

SEQ. 6 EHF HOT LOADS ON

NSPC-1	HOT LOADS ON	-133.0
VSPC-20GG	HOT LOAD SELECTION	-44.0

NOTE: 1. "G"=HOST VEHICLE GENERATOR FILLED

2. REFERENCE IS START TIME OF FIRST DF/OMNI COLLECT PERIOD

SEQ.7 EHF BAND CHANGE.PULSE TO NORMAL

VSPC-21GG	BAND/INPUT SELECTION		-43.0
VSPC-24GG	MODE	PULSE/NOT PULSE	-41.0
	PRIORITY	EHF/VHF	
	NBT	ON/DISABLED	
	DATA LINK	WB/NB	
VSPC-2310	TSG OFF/FBR AGC SAMPLE		-13.0
VSPC-2304	TSG MODE 3/ND FBR AGC SAMPLE		-12.0

NOTE: 1. SEQUENCE REFERENCE TIME (0.0) IS START OF TASKING PERIOD. (b)(1)

2. START TAPE RECORDER AT REF.-15.0 SEC. (b)(3)

3. G=GENERATOR FILLED

SEQ 8 VHF POWER UP,EHF NORMAL

VSPC-0000	EHF LOW POWER	-50.0	
VSPC-0044	EHF HIGH POWER	-44.0	
VSPC-21GG	BAND/INPUT SELECTION	-45.0	
VSPC-24GG	MODE PULSE/NOT PULSE PRIORITY EHF/VHF NBT ON/DISABLED DATA LINK WB/NB	-43.0	
VSPC-0042	VHF POWER ON	-20.0	(b)(1)
VSPC-31GG VSPC-30GG	RF FREQUENCY SELECTION	-19.0 -18.0	(b)(3)
VSPC-32GG	ATTENUATOR/THRESHOLD SETTING	-17.0	
VSPC-34GG	NOTCH FILTER IN/OUT SHORT PULSE ENABLE ON/OFF REDUNDENT PROCESS ENABLE ON/OFF	-16.0	
VSPC-2310	TSG OFF/FBR AGC SAMPLE	-13.0	
VSPC-2304	TSG MODE 3/NO FBR AGC SAMPLE	-12.0	
VSPC-3310	VHF SHORT TSG	-00.4	

NOTE: 1. "G"=HOST VEHICLE GENERATOR FILLED

2. REFERENCE TIME (0.0) IS START TIME OF COLLECT PERIOD

3. START L II TAPE RECORDER AT -15.0

4. HOT LOADS ON AND HOT LOAD SELECTION PROVIDED BY SEQUENCE #6.

SEQ.9 VHF POWER UP,EHF PULSE ONLY

VSPC-0000	EHF LOW POWER	-28.0
VSPC-0044	EHF HIGH POWER	-26.0
VSPC-21GG	BAND/INPUT SELECTION	-24.0
VSPC-24GG	MODE PULSE/NOT PULSE PRIORITY EHF/VHF NBT ON/DISABLED DATA LINK WB/NB	-22.0
VSPC-0042	VHF POWER ON	-20.0
VSPC-31GG	RF FREQUENCY SELECTION	-19.0
VSPC-30GG		-18.0
VSPC-32GG	ATTENUATOR/THRESHOLD SETTING	-17.0
VSPC-34GG	NOTCH FILTER IN/OUT SHORT PULSE ENABLE ON/OFF REDUNDENT PROCESS ENABLE ON/OFF	-16.0
VSPC-3310	VHF SHORT TSG	-00.4

(b)(1)
(b)(3)

NOTE: 1. "G"=HOST VEHICLE GENERATOR FILLED

2. REFERENCE TIME (0.0) IS START TIME OF COLLECT PERIOD

3. START L II TAPE RECORDER AT -2.4

SEQ.10 W SYSTEM POWER UP-SEARCH MODE

VSPC-0000	EHF LOW POWER	-28.0		
VSPC-0044	EHF HIGH POWER	-26.0		
VSPC-21GG	EHF BAND 4 PEN/OM CONFIGURATION	-24.0		
VSPC-0042	VHF POWER ON	-20.0	RF=158 ATTEN=0 THD=-42 dB TSG OFF NOTCH FILTER IN SHORT PULSE ENABLE RPE-OFF	
VSPC-0056	W BAND POWER ON (+5V)	-11.0		(b)(1)
VSPC-3714	MODE XXX0 TSG OFF RF ENABLE TOGGLE=1	-9.0	SEARCH MODE #0	(b)(3)
VSPC-0056	W BAND POWER ON (+10V,+15V,-5	-7.0		
VSPC-3605	MODE 0101	-2.0	TSG MODE #5	
VSPC-3706	MODE XXX0 TSG ON RF ENABLE TOGGLE=0	-1.0	TSG MODE #5	
VSPC-3715	MODE XXX1 TSG OFF RF ENABLE TOGGLE=1	+1.0	SEARCH MODE #21	
VSPC-3600 VSPC-3714	MODE 0000 MODE XXX0 TSG OFF RF ENABLE TOGGLE=1	+2.0 +3.0	SEARCH MODE #16 SEARCH MODE #0	

NOTE: 1. SEQUENCE REFERENCE TIME (0.0) IS START OF TASKING PERIOD.

2. START TAPE RECORDER AT REF.-3.0 SEC.

SEQ.11 W SYSTEM POWER UP-TRACK MODE

VSPC-0000	EHF LOW POWER	-28.0	
VSPC-0044	EHF HIGH POWER	-26.0	
VSPC-21GG	EHF BAND 4 PEN/OM CONFIGURATION	-24.0	
VSPC-0042	VHF POWER ON	-20.0	RF=158 ATTEN=0 THD=-42dB TSG OFF NOTCH FILTER IN SHORT PULSE ENABLE RPE-OFF
VSPC-0056	W BAND POWER ON (+5V)	-11.0	(b)(1)
VSPC-3714	MODE XXX0 TSG OFF RF ENABLE TOGGLE=1	-9.0	SEARCH MODE #0 (b)(3)
VSPC-0056	W BAND POWER ON (+10V,+15V,-5V)	-7.0	
VSPC-3605	MODE 0101	-4.0	TSG MODE #5
VSPC-3706	MODE XXX0 TSG ON RF ENABLE TOGGLE=0	-3.0	TSG MODE #5
VSPC-3715	MODE XXX1 TSG OFF RF ENABLE TOGGLE=1	-2.0	SEARCH MODE #21
VSPC-36GG	MODE XXXX	-1.0	SEARCH MODE #XX
VSPC-3704	MODE XXX0 TSG OFF RF ENABLE TOGGLE=0	0.0	TRACK MODE (TASKED)
VSPC-3715	MODE XXX1 TSG OFF RF ENABLE TOGGLE=1	+5.0	SEARCH MODE #XX

SEQ.14 CONT:

NOTE: 1. SEQUENCE REFERENCE TIME (0.0) IS START OF TASKING PERIOD.

2. START TAPE RECORDER AT REF.-5.0 SEC.

3. * G=GENERATOR FILLED (b)(1)

4. ** WILL NOT EXECUTE UNTIL END OF SELECTED TRACK MODE. (b)(3)

5. SEARCH MODE XX=#23,25,26,27,28,29,30,OR 31.

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(b)(1)
(b)(3)

SEQ.12 ADD VHF SYSTEM

VSPC-0042	VHF POWER ON		-9.0
VSPC-31GG	RF FREQUENCY SELECTION		-7.0
VSPC-30GG			-6.0
VSPC-32GG	ATTENUATOR/THRESHOLD SETTING		-4.0
VSPC-24GG	MODE	PULSE/NOT PULSE	-3.0
	PRIORITY	EHF/VHF	
	NBT	ON/DISABLED	
	DATA LINK	WB/NB	
VSPC-34GG	NOTCH FILTER	IN/OUT	-1.0
	SHORT PULSE ENABLE	ON/OFF	
	REDUNDENT PROCESS ENABLE	ON/OFF	
VSPC-3310	VHF SHORT TSG		-00.4

NOTE: 1. "G"=HOST VEHICLE GENERATOR FILLED

2. REFERENCE TIME (0.0) IS START TIME OF COLLECT PERIOD

3. START L II TAPE RECORDER AT -2.4 SEC

SEQ.13 ADD W SYSTEM,SEARCH MODE

(b)(1)
(b)(3)

VSPC-2101	EHF BAND 4 PEN A/OM-B	-17.0	
VSPC-24GG	MODE PULSE/NOT PULSE PRIORITY EHF/VHF NBT ON/DISABLED DATA LINK WB/NB	-15.0	
VSPC-0056	W BAND POWER ON (+5V)	-11.0	
VSPC-3714	MODE XXX0 TSG OFF RF ENABLE TOGGLE=1	-9.0	SEARCH MODE #0
VSPC-0056	W BAND POWER ON (+10V,+15V,-5V)	-7.0	
VSPC-3605	MODE 0101	-2.0	TSG MODE #5
VSPC-3706	MODE XXX0 TSG ON RF ENABLE TOGGLE=0	-1.0	TSG MODE #5
VSPC-3715	MODE XXX1 TSG OFF RF ENABLE TOGGLE=1	+1.0	SEARCH MODE #21
VSPC-3600	MODE 0000	+2.0	SEARCH MODE #16
VSPC-3714	MODE XXX0 TSG OFF RF ENABLE TOGGLE=1	+3.0	SEARCH MODE #0

NOTE: 1. SEQUENCE REFERENCE TIME (0.0) IS START OF TASKING PERIOD.

2. START TAPE RECORDER AT REF.-3.0 SEC.

SEQ.14 ADD W SYSTEM,TRACK MODE

	*VSPC-21GG	EHF BAND 4 PEN/OMNI CONFIGURATION	-17.0		
	*VSPC-24GG	MODE PULSE/NOT PULSE PRIORITY EHF/VHF NBT ON/DISABLED DATA LINK WB/NB	-15.0		(b)(1) (b)(3)
	VSPC-0056	W BAND POWER ON (+5V)	-11.0		
	VSPC-3714	MODE XXX0 TSG OFF RF ENABLE TOGGLE=1	-9.0	SEARCH MODE #0	
	VSPC-0056	W BAND POWER ON (+10V,+15V,-5V)	-7.0		
	VSPC-3605	MODE 0101	-4.0	TSG MODE #5	
	VSPC-3706	MODE XXX0 TSG ON RF ENABLE TOGGLE=0	-3.0	TSG MODE #5	
	VSPC-3715	MODE XXX1 TSG OFF RF ENABLE TOGGLE=1	-2.0	SEARCH MODE #21	
*	VSPC-36GG	MODE XXXX	-1.0	SEARCH MODE #XX	
	VSPC-3704	MODE XXX0 TSG OFF RF ENABLE TOGGLE=0	0.0	TRACK MODE (TASKED)	
**	VSPC-3715	MODE XXX1 TSG OFF RF ENABLE TOGGLE=1	+5.0	SEARCH MODE #XX	
	VSPC-3600	MODE 0000	+6.0	SEARCH MODE #16	
	VSPC-3714	MODE XXX0 TSG OFF RF ENABLE TOGGLE=1	+7.0	SEARCH MODE #0	

SEQ.11 CONT:

VSPC-3600	MODE 0000	+6.0	SEARCH MODE #16
VSPC-3714	MODE XXX0	+7.0	SEARCH MODE #0
	TSG OFF		
	RF ENABLE		
	TOGGLE=1		

(b)(1)

(b)(3)

NOTE: 1. SEQUENCE REFERENCE TIME (0.0) IS START OF TASKING PERIOD.

2. START TAPE RECORDER AT REF.-5.0 SEC.

3. * G=GENERATOR FILLED

4. ** WILL NOT EXECUTE UNTIL END OF SELECTED TRACK MODE.

5. SEARCH MODE XX=#23,25,26,27,28,29,30,OR 31.

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SE0.15 W-BAND SEARCH TO W-BAND TRACK

VSPC-3715	MODE XXX1 TSG OFF RF ENABLE TOGGLE=1	-2.0	SEARCH MODE #16	(b)(1) (b)(3)
VSPC-36GG VSPC-3705	MODE XXXX MODE XXX0 TSG OFF RF ENABLE TOGGLE=0	-1.0 0.0	SEARCH MODE #XX TRACK MODE (TASKED)	
* VSPC-3715	MODE XXX1 TSG OFF RF ENABLE TOGGLE=1	+5.0	SEARCH MODE #XX	
VSPC-3600	MODE 0000	+6.0	SEARCH MODE #16	

NOTE: 1. SEQUENCE REFERENCE TIME (0.0) IS START OF TASKING PERIOD.

2. START TAPE RECORDER AT REF.-3.0 SEC.

3. * G=GENERATOR FILLED

4. ** WILL NOT EXECUTE UNTIL END OF SELECTED TRACK MODE.

5. SEARCH MODE XX=#23.25.26.27,28,29,30.OR 31.

SEQ. 16 EHF/VHF PRIORITY SELECTION

(b)(1)
(b)(3)

VSPC-24GG	MODE	PULSE/NOT PULSE	- 0.0
	PRIORITY	EHF/VHF	
	NBT	ON/DISABLED	
	DATA LINK	WB/NB	

NOTE: G = GENERATOR FILLED

Handle Via
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(b)(1)
(b)(3)

SEQ. 17 W-BAND SEARCH TO EHF NORMAL,W-BAND DISABLED

VSPC-3710	MODE XXX0 TSG OFF RF DISABLE TOGGLE=1	-45.0	SEARCH MODE #0
VSPC-21GG	BAND/INPUT SELECTION	-43.0	
VSPC-2310	TSG OFF/FBR AGC SAMPLE	-13.0	
VSPC-2304	TSG MODE 3/NO FBR AGC SAMPLE	-12.0	

NOTE: 1. SEQUENCE REFERENCE TIME (0.0) IS START OF TASKING PERIOD.

2. START TAPE FEEDER AT REF.-15.0 SEC.

3. * G=GENERATOR FILLED

SEQ. 18 W-BAND SEARCH TO EHF PULSE ONLY.W-BAND DISABLED (b)(1)

VSPC-3710	MODE XXX0 TSG OFF RF DISABLE TOGGLE=1		-8.0	SEARCH MODE #0 (b)(3)
VSPC-21GG	BAND/INPUT SELECTION		-6.0	
VSPC-24GG	MODE PRIORITY NBT DATA LINK	PULSE/NOT PULSE EHF/VHF ON/DISABLED WB/NB	-4.0	

NOTE: 1. SEQUENCE REFERENCE TIME (0.0) IS START OF TASKING PERIOD.

2. START TAPE RECORDER AT REF.-2.0 SEC.

3. * G=GENERATOR FILLED

SEQ. 19 W-BAND DISABLED TO W-BAND SEARCH

VSPC-3714	MODE XXX0 TSG OFF RF ENABLE TOGGLE=1	-8.0	SEARCH MODE ≠0
VSPC-21GG	EHF BAND 4 PEN/OM CONFIGURATION	-6.0	
VSPC-24GG	MODE PULSE/NOT PULSE PRIORITY EHF/VHF NBT ON/DISABLED DATA LINK WB/NB	-4.0	

(b)(1)

NOTE: 1. SEQUENCE REFERENCE TIME (0.0) IS START OF TASKING PERIOD. (b)(3)

2. START TAPE RECORDER AT REF.-2.0 SEC.

SEQ.22 CONT:

VSPC-3600	MODE 0000	+6.0	SEARCH MODE ≠16
VSPC-3714	MODE XXX0	+7.0	SEARCH MODE ≠0
	TSG OFF		
	RF ENABLE		
	TOGGLE=1		

(b)(1)

(b)(3)

NOTE: 1. SEQUENCE REFERENCE TIME (0.0) IS START OF TASKING PERIOD.

2. START TAPE RECORDER AT REF.-5.0 SEC.

3. * G=GENERATOR FILLED

4. ** WILL NOT EXECUTE UNTIL END OF SELECTED TRACK MODE.

5. SEARCH MODE XX=≠23,25,26,27,28,29,30,OR 31.

SEQ. 23 VHF FREQUENCY CHANGE NORMAL

VSPC-24GG	MODE	PULSE/NOT PULSE	-8.0
	PRIORITY	EHF/VHF	
	DATA LINK	WB/NB	
	NBT	ON/DISABLE	
VSPC-31GG			-6.0
VSPC-30GG	RF SELECTION		-5.0
VSPC-32GG	ATTENUATOR/THRESHOLD SETTING		-4.0
VSPC-34GG	NOTCH FILTER	IN/OUT	-3.0
	SHORT PULSE ENABLE	ON/OFF	
	RPE	ON/OFF	
VSPC-3310	SHORT TSG		-0.4

(b)(1)
(b)(3)

NOTE: 1. "G"=GENERATOR FILLED BITS

2. REFERENCE TIME (0.0) IS START OF TASKING PERIOD.

3. START TAPE RECORDER AT -2.4 SEC.

SEQ. 24 VHF FREQUENCY CHANGE SPECIAL

VSPC-31GG		-0.4
VSPC-30GG	RF SELECTION	-0.0
VSPC-32GG	ATTENUATOR/THRESHOLD SETTING	+1.0

NOTE: 1. "G"=GENERATOR FILLED BITS

2. REFERENCE TIME (0.0) IS START OF TASKING PERIOD.

3. START TAPE RECORDER AT -2.0 SEC.

4. SEQUENCE 24 SHOULD NOT BE USED UNLESS SEQUENCE 23 WAS USED PRIOR TO IT DURING THE SAME TASKING SPAN.

SEQ. 20 W-BAND DISABLED TO W-BAND TRACK

VSPC-3715	MODE XXX1 TSG OFF RF ENABLE TOGGLE=1		-8.0	SEARCH MODE #16
VSPC-21GG	EHF BAND 4 PEN/OM CONFIGURATION		-6.0	
VSPC-24GG	MODE PRIORITY NBT DATA LINK	PULSE/NOT PULSE EHF/VHF ON/DISABLED WB/NB	-4.0	
* VSPC-36GG	MODE XXXX		-1.0	SEARCH MODE #XX
VSPC-3704	MODE XXX0 TSG OFF RF ENABLE TOGGLE=0		0.0	TRACK MODE (TASKED)
** VSPC-3600	MODE 0000		+5.0	SEARCH MODE #1E
VSPC-3714	MODE XXX0 TSG OFF RF ENABLE TOGGLE=1		+6.0	SEARCH MODE #0

(b)(1)

(b)(3)

NOTE:
1. SEQUENCE REFERENCE TIME (0.0) IS START OF TASKING PERIOD.
2. START TAPE RECORDER AT REF.-2.0 SEC.
3. * G=GENERATOR FILLED
4. ** WILL NOT EXECUTE UNTIL END OF SELECTED TRACK MODE.
5. SEARCH MODE XX= 3,25,26,27,28,29,30,OR 31.

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SEG.21 EHF TO W-BAND SEARCH

VSPC-21GG	EHF BAND 4 PEN/OMNI CONFIGURATION	-24.0	
VSPC-24GG	MODE PULSE/NOT PULSE PRIORITY EHF/VHF NBT ON/DISABLED DATA LINK WB/NB	-22.0	
VSPC-0042	VHF POWER ON	-20.0	RF=158 ATTEN=0 THD=-42 dB TSG OFF NOTCH FILTER IN SHORT PULSE ENABLE (b)(1) RPE-OFF
VSPC-0056	W BAND POWER ON (+5V)	-11.0	(b)(3)
VSPC-3714	MODE XXX0 TSG OFF RF ENABLE TOGGLE=1	-9.0	SEARCH MODE #0
VSPC-0056	W BAND POWER ON (+10V,+15V,-5V	-7.0	
VSPC-3605	MODE 0101	-2.0	TSG MODE #5
VSPC-3706	MODE XXX0 TSG ON RF ENABLE TOGGLE=0	-1.0	TSG MODE #5
VSPC-3715	MODE XXX1 TSG OFF RF ENABLE TOGGLE=1	+1.0	SEARCH MODE #21
VSPC-3600 VSPC-3714	MODE 0000 MODE XXX0 TSG OFF RF ENABLE TOGGLE=1	+2.0 +3.0	SEARCH MODE #16 SEARCH MODE #0

NOTE: 1. SEQUENCE REFERENCE TIME (0.0) IS START OF TASKING PERIOD.

2. START TAPE RECORDER AT REF.-3.0 SEC.

Handle Via
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SE0.22 EHF TO W-BAND TRACK

(b)(1)

VSPC-21GG	EHF BAND 4 PEN/OM CONFIGURATION		-24.0	(b)(3)
VSPC-24GG	MODE PRIORITY NBT DATA LINK	PULSE/NOT PULSE EHF/VHF ON/DISABLED WB/NB	-22.0	
VSPC-0042	VHF POWER ON		-20.0	RF=158 ATTEN=0 THD=-42dB TSG OFF NOTCH FILTER IN SHORT PULSE ENABLE RPE-OFF
VSPC-0056	W BAND POWER ON (+5V)		-11.0	
VSPC-3714	MODE XXX0 TSG OFF RF ENABLE TOGGLE=1		-9.0	SEARCH MODE #0
VSPC-0056	W BAND POWER ON (+10V,+15V,-5V)		-7.0	
VSPC-3605	MODE 0101		-4.0	TSG MODE #5
VSPC-3706	MODE XXX0 TSG ON RF ENABLE TOGGLE=0		-3.0	TSG MODE #5
VSPC-3715	MODE XXX1 TSG OFF RF ENABLE TOGGLE=1		-2.0	SEARCH MODE #21
VSPC-36GG	MODE XXXX		-1.0	SEARCH MODE #XX
VSPC-3704	MODE XXX0 TSG OFF RF ENABLE TOGGLE=0		0.0	TRACK MODE (TASKED)
VSPC-3715	MODE XXX1 TSG OFF RF ENABLE TOGGLE=1		+5.0	SEARCH MODE #XX

SEQ. 25 ANTENNA UP

PSPC-4	ANTENNA UP	0.0
NSPC-3	ANTENNA STOP	0.0 DT

NOTE: 1. ANTENNA DRIVE RATE IS 1.08 DEGREES/SECOND WITH PAYLOAD POWER ON AND 1.07 DEGREES/SECOND WITH PAYLOAD POWER OFF.

(b)(1)
(b)(3)

SEQ. 26 ANTENNA DOWN

NSPC-5	ANTENNA DOWN	0.0
NSPC-3	ANTENNA STOP	0.0 DT

NOTE: 1. ANTENNA DRIVE RATE IS 1.08 DEGREES/SECOND WITH PAYLOAD POWER ON AND 1.07 DEGREES/SECOND WITH PAYLOAD POWER OFF.

SEQ. 27 RECORDER #1 ON-RECORD

NSPC-2 RECORDER #1 RECORD 0.0

NOTE: 1. REFERENCE FOR TIME (0.0) IS VARIBLE AND IS DETERMINED BY THE REQUIREMENT THAT INVOKED THE RECORD.

SEQ. 28 RECORDER #2 ON-RECORD (b)(1)

PSPC-7 RECORDER #2 RECORD 0.0 (b)(3)

NOTE: 1. REFERENCE FOR TIME (0.0) IS VARIBLE AND IS DETERMINED BY THE REQUIREMENT THAT INVOKED THE RECORD.

SEQ. 29 RECORDERS STOP

NSPC-6 RECORDERS STOP +2.0

NOTE: 1. REFERENCE TIME (0.0) IS THE END OF A REQUIRED RECORDING SPAN.
2. USE THIS SEQUENCE IF IS REQUIRED TO LEAVE THE PAYLOAD ON AFTER THE END OF THE RECORD PERIOD.
3. SEQUENCE #29 WILL STOP BOTH RECORDERS.

SEQ. 30 POWER OFF

PSPC-5 P/L POWER OFF +2.0

(b)(1)
(b)(3)

NOTE: 1. REFERENCE TIME (0.0) IS END OF LAST TASKING PERIOD OF A TASKING SPAN.

2. SEQUENCE 30 WILL BE USED TO STOP RECORDERS IF RECORD REQUIREMENT WAS THE LAST TASK OF THE CURRENT SPAN.

SEQ. 31 EHF-TSG1

(WILL BE PROVIDED AT A LATER DATE)

SEQ. 32 EHF-TSG2

NSPC-1	HOT LOADS ON	-120.0
VSPC-0000	EHF LOW POWER	-34.0
VSPC-0044	EHF HIGH POWER	-32.0
VSPC-2306	TSG MODE 2/NO FBR AGC SAMPLE	0.0

NOTE: 1. REFERENCE IS START TIME OF COLLECT PERIOD
2. START L II TAPE RECORDER AT -2.0 SEC
3. THIS SEQUENCE IS USED FOR THE "EHF SPECIAL TASK".

(b)(1)
(b)(3)

SEQ. 33 EHF-TSG3

VSPC-2310	TSG OFF/FBR AGC SAMPLE	0.0
VSPC-2304	TSG MODE 3/NO FBR ACG SAMPLE	1.0

SEQ. 34 VHF-TSG LONG

(WILL BE PROVIDED AT A LATER DATE)

SEQ. 35 VHF-TSG SHORT

VSPC-3310	TSG SHORT	0.0

NOTE: 1. REFERENCE TIME (0.0) IS END OF LAST VHF TASK IN A TASKING SPAN.

(b)(1)
(b)(3)

APPENDIX E

APPLICABLE TABLES

Table 2 - W Band Mode Durations

(b)(1)
(b)(3)

Mode	Time to Execute	Optimized Distance from Nadir
Track 1	394.4 seconds	0-50 nm
Track 2	392.8	50-95
Track 3	389.6	95-140
Track 4	384.0	140-200
Track 5	373.6	200-280
Track 6	353.6	280-380
Track 7	310.8	380-500
Track 8	238.0	500-640
TSG	.2	-
PRS	.4	0-640

TABLE 3 - POSSIBLE TASKING MODES

SYSTEM CONFIGURATION

System	$Mode_a$	$Mode_b$	EHF On	VHF Off	W-Band Off	EHF On	VHF On	W-Band Off	EHF Inactive	VHF On	W-Band On	EHF On	VHF On	W-Band Disable
EHF	Normal	Omni + DF		X			X						X	
		Omni Only		X			X						X	
	Pulse Only	Omni + DF		X			X						X	
		Omni Only		X			X						X	
VHF	Normal						X			X			X	
	Special						X			X			X	
W-Band	Search									X				
	Track									X				

[redacted]

(b)(1)

(b)(3)

TABLE - 4 PAYLOAD CONFIGURATION CHANGE SEQUENCE NUMBERS

EHF OFF	EHF ON-NORMAL		EHF ON-PULSE	VHF OFF	VHF ON	W-BAND OFF	W-BAND ON	W-BAND DISABLE	NEW TASK: EHF Normal	EHF Pulse Only	VHF Normal	VHF Special	W-Band Search	W-Band Track
X				X		X			2	3	8 or 9	NA	10	11
	X			X		X			4*, 16	5	12	NA	21	22
	X				X	X			4*, 16	5	23	24, 16	13	14
	X	OR	X		X		X		17, 16	18	23	24, 16	None	15, 16
	X				X			X	4*, 16	5	23	24, 16	19	20
			X	X		X			7	5*	12	NA	21	22
			X		X	X			7	5*	23	24, 16	13	14
			X		X			X	7	5*	23	24, 16	19	20

(b)(1)
(b)(3)

Notes:
- o NA - Not applicable, 1st VHF task can not be "Special"
- o * - If band change only; if no band change, use Sequence 16 if necessary
- o For 1st EHF task in pass, add Sequence 6 (Hot Loads on)
- o For EHF tasks, not Omni Only, add Sequences 25, 26 as necessary (Antenna movement)
- o For VHF 1st task in pass, set up for an EHF task in parallel
- o For transpond task, add Sequence 1 before setup (xpond mode)
- o Sequence 16 used only if necessary to change buffer priority

(b)(1)
(b)(3)

TABLE 5
TST CARD COLUMN DESCRIPTION

CARD COLUMNS	PARAMETER SIZE (TYPE)	DESCRIPTION	REQUIRED FIELD BY SYSTEM A	B	C	D
1-3	XXX(H)	Card type identifier (TST)	X	X	X	X
5	X(H)	System (A-EHF, B=VHF, C=W-band, D=VHF + EHF)	X	X	X	X
7-10	XXXX(I)	Start rev (1 to 8191)	X	X	X	X
12	X(H)	Direction of travel (A or D)	X	X	X	X
14	X(H)	EHF Special Sequence Select Flag (N = No Special, S = Special)	X			
16-21	±XX.XX(F)	Latitude (-85.00 to 85.00 degrees)	X	X	X	X
23-29	±XXX.XX(F)	Longitude (-180.00 to 180.00 degrees)	X	X	X	X
31-32	XX(I)	Priority (0 to 99)	X	X	X	X
34	X(H)	Buffer Priority (A=EHF/W, B=VHF)	X	X	X	X
36-39	XXXX(I)	Duration of task (0 to 6553 seconds)	X	X	X	X
41-45	±XXXX(I)	Bias of task (-5400 to 5400 seconds)	X	X	X	X
47	X(I)	Frequency band for EHF (1 to 4)	X			X
49-50	XX(I)	W-band ops Mode (1-9)			X	
52	X(H)	EHF Antenna Flag (D=DF/Omni, M = Omni Only)	X			X
54	X(H)	EHF Pulse-only Flag (P=Pulse Only, N=Normal)	X			X
56	X(H)	EHF Antenna to Nadir Flag D = Don't move N = Move to Nadir	X			X
58-60	XXX(I)	VHF Frequency (MHz) (130 to 180)		X		X
63-64	XX(I)	VHF Attenuator/Threshold Mode Setting (0-15)		X		X
66	X(H)	DBS Notch Filter (E=Enabled, D=Disabled)		X		X
68	X(H)	Short Pulse Collection E = Enabled, D - Disabled		X		X
70	X(H)	VHF RF Sequence Select Flag N = Normal, S = Special		X		
72	X(I)	Recorder Number (0-2) 0 = Don't record	X	X	X	X
74	X(H)	Transpond flag (T = Transpond, N = Normal)	X	X	X	X
76	X(H)	Record stop option (G or S) G = recorder state to be determined by software, S = recorder off after task	X	X	X	X
78-80	XXX(I)	Deck sequence number	X	X	X	X

(b)(1)

(b)(3)

APPENDIX F
SAMPLE DPR FORM

~~SECRET/H~~

DESIGN PROBLEM REPORT

BIF-4W-Y00005-84
CONTROL NO. Page 85

ORIGINATOR NO. _____

DATE _____

CATEGORY

(1) GENERAL ☐ (3) FORMAT ☐
(2) SPECIFIC ☐ (4) TYPO ☐

SUBSYSTEM NAME _____

REVIEWER/AGENCY _____ FUNCTION/ROUTINE _____

DOCUMENT _____ PAGE/SECTION/FIG. _____

PROBLEM:

(b)(1)

(b)(3)

SUGGESTION:

RESPONSE:

RESPONSE: APPROVED ☐ ACTION ☐
DISAPPROVED ☐ REWORK ☐
DATE _____ DATE _____

DPR: APPROVED ☐
DISAPPROVED ☐

~~SECRET/H~~

Handle Via BYEMAN Control System Only