

**COS DCE BOOT FSW v1.13 Component Test Results
Requirement 5.1.1.1c Initialize to Boot State After Reset**

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1. INTRODUCTION

1.1 PURPOSE

This document presents the Cosmic Origins Spectrograph (COS) Device Control Electronics (DCE) Flight Software (FSW) certification procedure. The purpose of this procedure is to verify that the FSW satisfies Software Requirements according to the method specified in the DCE FSW Test Plan (STP).

1.2 SCOPE

This test procedure comprises the steps necessary to verify that the FSW satisfies Software Requirements Document (SRD) paragraph 5.1.1.1 — Initialize to Boot State after Reset: Verify that all Boot State commands are accepted by the DCE.

1.3 LIMITATIONS AND CONSTRAINTS

This test cannot be run in parallel with any other commanding activity directed at the DCE FSW (such as, for example, the periodic transmission of NOOP commands). Test hardware shall be visually inspected, and its configuration noted, prior to conducting this test.

1.4 PROCEDURE OVERVIEW

The procedure requires the `hks` tools running on the Sun SparcStation Electronic Ground Support Equipment (EGSE) whose network IP address is one of

shorty.ssl.berkeley.edu
taiyo.ssl.berkeley.edu
ginger.ssl.berkeley.edu.

Test time shall be scheduled in advance. The Test Conductor must be logged into the Unix system as user `eagcos`, and be commanding from the appropriate directory. This directory contains both the test script file and the shell script file; these two files control test execution. The test is conducted by invoking the shell script. This shell script in turn invokes the Perl 5 program `UniScript.pl`, which resides in its own distinct directory. The test procedure steps have been pre-recorded in the test script file, and are executed interpretively by the `UniScript` program. The shell script and test script are attached to this document as appendices. As `UniScript` executes the test script it sends results to the operator console and to two report files, which are also placed in the current directory. After completion of the test script, the Test Conductor can certify successful test

execution by examining the contents of the report files and determining that required outputs are present in them. Printed copies of the report files are attached to the manually completed checklist (Paragraph 4 below) as documentation of the test.

1.5 THEORY OF TEST

The script, `stp5_1_1_1c.tst`, issues all of the commands (the “Boot State Commands”) in the following table (blank parameter entries in the table are coded as 0 in the associated command).

Table 1-1: Boot State Commands

Command	Parameter 1	Parameter 2	Parameter3	Parameter4	Parameter 5
LFDCOPY	Saddr	Daddr	Nbytes	0=DATA 1=CODE	
LFDCRC	Addr	Nbytes	0=DATA 1=CODE		
LFDDIAGC					
LFDDNLOD	Addr	Nbytes			
LFDGOTO	Addr				
LFDHKREQ					
LFDJMPCS	0=TOGGLE 1=LOWER 2=UPPER				
LFDMADDR	Monitor 0..7	0..FFFF 0..FFFF 0..FF	0=DATA 1=CODE 2=INTERN		
LFDNOOP	0=IGNORE 1=START				
LFDRSTP					
LFDRSTW					
LFDUPLD	Addr	Nbytes	CRC		
LFDWDOG	0=DISABLE 1=ENABLE				

The arguments to the commands are selected so that no harm will be done to the FSW as a result of command execution. After a command is sent to the DCE, the script **WAITS** for one second, reads the HK telemetry, and examines the diagnostic array (**LFDDIAGS**) to ensure that diagnostic code **DIAG0011** is not present. If it is present as the result of the sending of any Boot State command, this test *fails* — otherwise, it *succeeds*. The

following paragraphs supply details of the use and parameterizations of selected commands.

1.5.1 Verification of Boot State

Following the issuance of the **LFDRSTP** command the script **WAITS** for one second, reads the HK data, and tests bit **LFDOPERT** of the **LFSBITS1** word. Its value should be 0 (“FSW is in Boot State”). It also clears the diagnostic stack (**LFDDIAGS** in the HK data), so spurious codes don’t appear during the subsequent tests.

1.5.2 LFDCOPY

The script performs a 16-byte copy of the storage region **C000...C00F** to the storage region **C100...C10F**. This region is used because it not currently employed by FSW Boot State.

1.5.3 LFDDNLOD

The script downloads 16 bytes from the region **C100...C10F** to **UniScript Buffer 1**.

1.5.4 LFDGOTO

The script uploads the hex constant **2200** to addresses **C000...C001** of 8051 memory (the value of **#1** specified in the shell script); this constant represents the two-instruction 8051 code sequence

RET
NOP

The script then issues the **LFDGOTO** specifying **C000** (parameter **#1**) as the target address. The result should be that 8051 execution proceeds from the command-processing code to location **C000**, then *returns to the FSW code that invoked the command processor*, that is to the instruction following the **LCALL COMMAND_VECTOR** at label **PROCESS_COMMAND_10** — after which, FSW execution should proceed normally.

1.5.5 LFDJMPCS

The script performs an **LFDJMPCS 2** (jump to upper code segment). Since this should result in FSW’s performing a change to Operate State, the script then issues an **LFDRSTP** to restore Boot State for the remaining tests.

1.5.6 LFDUPL0D

The script generates the 16-byte constant **00 01 02 03 04 ... 0F** into Buffer 1, executes the **XMIT 1,16** local directive to move the Buffer contents to the upload buffer in FSW,

then issues **LFDUPLOD**, specifying **C100** (parameter #2) as the destination address, 16 as the length, and the automatically generated **CRC1** as the CRC.

1.6 TEST SCRIPT IMPLEMENTATION

1.6.1 Test Script Arguments

The script is parameterized as shown in the following Table:

Table 1-2: Parameters/Arguments for stp5_1_1_1c.tst

Parameter	Meaning	Correct Argument for Version 1.13
#0	Absolute hex storage address in FSW of the DCE_LFDNOOP command action-routine	0340
#1	Absolute hex storage address of "source" buffer for LFDCOPY command	C000
#2	Absolute hex storage address of "destination" buffer for LFDCOPY command	C100

These parameters must be encoded into the shell script **u** (see Appendix A).

2. SPECIAL INSTRUCTIONS

2.1 QUALITY ASSURANCE

QA support is required to verify the configuration and setup environment as well as monitoring test steps and verifying results.

2.2 SAFETY

2.2.1 Personal Safety

To ensure the safety of the test personnel during test execution the guidelines contained in Paragraph 3.4, Reference [1] will be adhered to.

2.2.2 Test Article and Equipment Safety

- If access within one (1) meter of COS bench electronics is necessary, wrist straps attached to technical ground shall be used by all personnel involved in handling of any COS test article. Overcurrent and overvoltage shall be set to remove power if nominal limits are exceeded.
- Emergency Power Shutdown — If, during the COS DCE FSW test, power is ON and a severe test equipment failure results in the power system exceeding specified limits, the Test Conductor shall direct or perform shutdown of power.

2.3 CONTAMINATION

All flight hardware shall be handled with clean latex gloves; it shall be covered with clean ESD material and/or stored in a clean flow-bench.

3. SUPPORT REQUIREMENTS

3.1 PERSONNEL

Execution of the COS DCE FSW certification procedure requires the following personnel (to be completed at the Test Readiness Review (TRR):

Test Director: _____

Test Conductor: _____

Test Technician: _____

QA: _____

3.2 TOOLS, EQUIPMENT, AND MATERIALS

The following is a list of tools, equipment, or materials required in this test. Record manufacturer and model, metrology, or property numbers of equipment used, where appropriate. Record calibration due dates where appropriate.

Boot Mode ROM: schematic **27C256**

Engineering Ground Support Equipment (see paragraph 1.4). Indicate specific configuration:

EGSE			DCE		
taiyo	shorty	ginger	ETU	DCE #1	DCE #2
X				X	

3.3 DATA/SOFTWARE

The following files must be present:

Table 3-1: Required Program and Data Files

EGSE (taiyo) Directory	File	Description
/disks/galex/users/galex/tcs/uniscript/	UniScript.pl	UniScript interpreter
/disks/galex/users/galex/tcs/uniscript/stp5_1_1_1c/	u	Shell script for this procedure
Ditto	stp5_1_1_1c.tst	Test script for this procedure (Appendix B)

In addition, the **hks** tools must be active. Directions for activating **hks** are given in UCB-COS-DOC-1118 (Paragraph 3.4, Reference [4]).

3.4 REQUIRED DOCUMENTATION

Reference	Document Number	Title
1	NHB 1700.1(V1-A)	<i>NASA Basic Safety Manual</i>
2	COS-03-0040	<i>DCE FSW Test Procedure 5.1.1.1c</i> (this document)
3	UCB-COS-008	<i>COS FUV Detector Software Test Plan</i>
4	UCB-COS-DOC-1118	<i>COS EGSE Startup Procedure</i>

4. PROCEDURE/TASK STEPS

4.1 PRE-OPERATION ACTIVITIES

4.1.1 Make Sure that **hks** Tools Are Active

Follow the procedure given in Paragraph 3.4, Reference [4].

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4.1.2 Make Sure that the Proper ROM Is Installed

Visually verify that the ROM under test is installed: if EEPROM, in U18: if PROM, in U2 and U7.

4.1.3 Log In to the EGSE

Step	QA	Operator Entry/System Response	Description
1		C:\tcs\us> telnet taiyo.ssl.berkely.edu	Establish connection to taiyo via Telnet client program
2		Login: xxx Password: -----	Using telnet window, login as user tcs

4.1.4 Set Current Directory

Step	QA	Operator Entry/System Response	Description
3		tcs@taiyo% cd ~galex/tcs tcs@taiyo% pwd /disks/galex/users/galex/tcs	Change current directory as shown

4.1.5 Slogin as eagcos

Step	QA	Operator Entry/System Response	Description
4		tcs@taiyo% slogin -l eagcos taiyo.ssl.berkeley.edu eagcos@taiyo.ssl.berkeley.edu's password: (<i>get from SSL personnel</i>) Last login: Sat Oct 7 10:41:05 2000 from auntem.ssl.berke Sun Microsystems Inc. SunOS 5.8 Generic February 2000 You have mail. COS EGSE software version: devel	slogin as eagcos ; get password from SSL personnel

4.1.6 Set Current Directory

Step	QA	Operator Entry/System Response	Description
5		<pre>eagcos:taiyo% cd /disks/galex/users/galex/tcs/uniscript/stp5_1_1_1 c eagcos:taiyo% pwd /disks/galex/users/galex/tcs/uniscript/stp5_1_1_1c</pre>	Change current directory as shown

4.1.7 Ensure that Proper Files are Present

Step	QA	Operator Entry/System Response	Description
6		<pre>eagcos@taiyo% ls -l Total 12 -rw-r--r-- 1 tcs eag 1398 Oct 8 18:03 stp5_1_1_1c.tst -rw-r--r-- 1 tcs eag 62 Oct 9 17:44 u eagcos@taiyo% more < u #!/bin/sh perl ../UniScript.pl stp5_1_1_1c "0,0,0,0,0,0,0"</pre>	List files; the .tst file and the shell script u should be present

4.2 OPERATION EXECUTION

4.2.1 Establish Initial Test Conditions

Step	QA	Operator Entry/System Response	Description
7		<pre>eagcos:taiyo% set path=(\$path ~dbb/scripts/bin)</pre>	Set path as shown to enable access to hks tools

4.2.2 Execute the Script

Step	QA	Operator Entry/System Response	Description
8		<pre> sh u \$psstring=0x0340,0xC000,0xC100,0,0,0,0,0 Parameters are: Script File: stp5_1_1_1c #0: 0x0340 #1: 0xC000 #2: 0xC100 #3: 0 #4: 0 #5: 0 #6: 0 #7: 0 Report file >/disks/galex/users/galex/tcs/ver_1_13/stp5_1_1_1 c/stp5_1_1_1c.rp1 successfully opened. Report file >/disks/galex/users/galex/tcs/ver_1_13/stp5_1_1_1 c/stp5_1_1_1c.rp2 successfully opened. Script file /disks/galex/users/galex/tcs/ver_1_13/stp5_1_1_1c/ stp5_1_1_1c.tst successfully opened at level 0. "Has the location NO_OPER=0x0340 been correctly updated?" "Reply Y or N." y Continuing. "LFDRSTP being sent to create POR" LFDRSTP WAIT 0: HKV0=1; HKV1=195; wc=1 </pre>	<p>Shell to u. You should see the accompanying output as UniScript executes</p>

		<p>LFDHKREQ</p> <p>LFDCOPY SOURCE,DEST,NBYTES,CODE</p> <p>WAIT 0: HKV0=3; HKV1=195; wc=1 WAIT 0: HKV0=3; HKV1=196; wc=1</p> <p>LFDCRC SOURCE,NBYTES,CODE</p> <p>WAIT 0: HKV0=4; HKV1=196; wc=1 WAIT 0: HKV0=4; HKV1=3; wc=1 WAIT 1: HKV1=3; wc=0</p> <p>LFDDIAGC</p> <p>WAIT 0: HKV0=6; HKV1=4; wc=1 WAIT 1: HKV1=5; wc=0 WAIT 0: HKV0=6; HKV1=6; wc=1</p> <p>LFDDNLOD DEST,NBYTES</p> <p>WAIT 0: HKV0=8; HKV1=7; wc=1 WAIT 1: HKV1=7; wc=0</p> <p>LFDGOTO NO_OPER</p> <p>WAIT 0: HKV0=10; HKV1=8; wc=1 WAIT 1: HKV1=9; wc=0 WAIT 0: HKV0=10; HKV1=10; wc=1</p> <p>LFDHKREQ</p> <p>WAIT 0: HKV0=12; HKV1=10; wc=1 WAIT 1: HKV1=11; wc=0</p> <p>LFDUPL0D SOURCE,2,CRC1</p>	
--	--	---	--

	<p>LFDJMPCS</p> <p>WAIT 0: HKV0=15; HKV1=12; wc=1 WAIT 1: HKV1=13; wc=0</p> <p>LFDRSTP</p> <p>WAIT 0: HKV0=17; HKV1=16; wc=1 WAIT 1: HKV1=16; wc=0</p> <p>LFDMADDR MONITOR,DEST,MEMSPACE</p> <p>WAIT 0: HKV0=19; HKV1=0; wc=1 WAIT 1: HKV1=18; wc=0 WAIT 0: HKV0=19; HKV1=19; wc=1</p> <p>LFDNOOP</p> <p>WAIT 0: HKV0=21; HKV1=19; wc=1 WAIT 1: HKV1=20; wc=0</p> <p>LFDRSTP</p> <p>WAIT 0: HKV0=23; HKV1=21; wc=1 WAIT 1: HKV1=22; wc=0 "DCE is in Boot State" WAIT 0: HKV0=23; HKV1=0; wc=1 WAIT 1: HKV1=0; wc=0</p> <p>LFDRSTW</p> <p>WAIT 0: HKV0=26; HKV1=25; wc=1 WAIT 1: HKV1=25; wc=0</p> <p>LFDUPLD DEST,NBYTES,CRC1</p> <p>WAIT 0: HKV0=28; HKV1=0; wc=1 WAIT 1: HKV1=27; wc=0</p> <p>LFDWDOG ENABLE</p>	
--	--	--

		WAIT 0: HKV0=30; HKV1=28; wc=5 WAIT 1: HKV1=29; wc=4 WAIT 1: HKV1=30; wc=3 eagcos:taiyo%	
--	--	---	--

4.3 POST-OPERATION ACTIVITIES

4.3.1 Copy Reports to PC Files and Print Them

Using an FTP client, copy the **u**, **stp5_1_1_1c.tst**, **stp5_1_1_1c.rp1**, and **stp5_1_1_1c.rp2** files to appropriate PC files. Include these files as Appendices A, B, C, and D with this completed form.

4.3.2 Complete The Test Procedure Form

Ensure that all blank fields in this report are completed correctly and submit the completed report to QA.

SUMMARY SHEET

OPERATION TITLE: _____ WOA# _____

TEST ARTICLES IDENTIFICATION (including serial and/or part numbers):

TASKS/STEPS COMPLETED: _____

LOCATION: _____

TEST STARTED:	TEST TERMINATED
TIME: _____ Hr/Min	TIME: _____ Hr/Min
DATE: _____	DATE: _____

LOGS USED: _____

ANOMALY REPORTS GENERATED: _____

COMMENTS: _____

TEST CONDUCTOR: _____
Signature/Date

QA REPRESENTATIVE: _____
Signature/Date

Appendix A. Shell Script u

```
#!/bin/sh  
pkill cosnoopy  
perl ../UniScript.pl stp5_1_1_1c "0x0340,0xC000,0xC100,0,0,0,0,0"  
cosnoopy&
```

Appendix B. Test Script stp5_1_1_1c.tst

```

; *****
; * DCE FSW Requirement 5.1.1.1c -- Initialize to Boot State after Reset *
; *****
;
;*****
; Arguments to level-0 script: #0: NO_OPER = 0x0330 = Addr of DCE LFDNOOP *
; *                               #1: SOURCE  = 0xC000 = Source Buffer   *
; *                               #2: DEST   = 0xC100 = Destination Buffer *
;*****
;
;*****
;*****
;**  M O D I F I E D  0 8 / 2 3 / 2 0 0 0  **
;**  per working group meeting at SSL      **
;**  ----- **
;** Modified 10/10 (added ,HK to WAIT direct- **
;** ives; added (nn) serial numbers to DTGs  **
;** to help tracing them; corrected command  **
;** ops; added parameters to LOG directives) **
;** ----- **
;** Modified 10/12 **
;** (parameterized NO_OPER, SOURCE, DEST)   **
;*****
;*****
;
; *****
; * Verify that all Boot State Commands Are Accepted by the DCE *
; *****
;
;
;-----+
; | The Boot State commands are |
;-----+-----+-----+-----+
; | LFDPCOPY * | Saddr | Daddr | Nbytes | 0=DATA |
; | | | | | | 1=CODE |
;-----+-----+-----+-----+
; | LFDRCRC * | Addr | Nbytes | 0=DATA |
; | | | | | 1=CODE |
;-----+-----+-----+-----+
; | LFDIAGC * | | | | |
;-----+-----+-----+-----+
; | LFDNLLOD * | Addr | Nbytes | | |
;-----+-----+-----+-----+
; | LFDGOTO * | Addr | | | |
;-----+-----+-----+-----+
; | LFDHKREQ * | | | | |
;-----+-----+-----+-----+
; | LFDJMPCS * | 0=TOGGLE | | | |
; | | 1=LOWER | | | |
; | | 2=UPPER | | | |
;-----+-----+-----+-----+
; | LFDMADDR * | Monitor | 0..FFFF | 0=DATA |
; | | 0..7 | 0..FFFF | 1=CODE |
; | | 0..FF | 2=INTERN |
;-----+-----+-----+-----+
; | LFDNOOP * | 0=IGNORE | | | |
; | | 1=START | | | |
;-----+-----+-----+-----+
; | LFDRSTP * | | | | |
;-----+-----+-----+-----+
; | LFDRSTW * | | | | |
;-----+-----+-----+-----+
; | LFDUPLD * | Addr | Nbytes | CRC |
;-----+-----+-----+-----+
; | LFDWDOG * | 0=DISABLE | | | |
; | | 1=ENABLE | | | |
;-----+-----+-----+-----+
;

```

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```

SYM      NO_OPER  =#0
SYM      SOURCE   =#1
SYM      DEST     =#2
SYM      NBYTES   =16
SYM      CODE     =2
SYM      DIAG0011=0x0011
;
SYM      MONITOR  =0
SYM      MEMSPACE=0
;
SYM      ENABLE   =1
;
; *****
; * Wait 1 seconds for any in-progress reset to complete *
; *****
;
WTO      "Has the location NO_OPER=#0 been correctly updated?"
WTOR     "Reply Y or N."
ECHO     2
DTG      3,"(1) Verify that DCE is in Boot State after WDR"
DTG      3,"(2) First 1-second wait ..."
WAIT     1
;
; *****
; * Use LFDRSETP to create POR *
; *****
;
WTO      "LFDRSTP being sent to create POR"
DTG      3,"(3) LFDRSTP being sent to create POR"
LFDRSTP
;
; *****
; * Wait 1 seconds for reset to complete, then read HK, *
; * test bit LFDOPERT (16F4.03) of LFSBITS1 (0="Boot State") *
; * Once we're sure that we're in Boot State we can issue *
; * "harmless" forms of the Boot State commands and see *
; * whether they are accepted (test "PASSES") or rejected. *
; *****
;
DTG      3,"(4) Second 1-second wait ..."
WAIT     1,HK
LFDHKREQ
LOG      1,LFSBITS1
CHECK    1,((LFSBITS1 & LFDOPERT) == 0)
;
; =====
;
; *****
; * LFDCOPY Source, Dest, Nbytes, SPACE *
; *****
;
DTG      3,"(5) Sending LFDCOPY"
;
LFDCOPY  SOURCE,DEST,NBYTES,CODE
WAIT     1,HK
LOG      1,LFDDIAGS
DIAG     1,NOTANY,DIAG0011
;
DTG      3,"(6) LFDCOPY accepted"
;
; =====
;
; *****
; * LFDCRC Source, Nbytes, SPACE *
; *****
;
WAIT     1,HK
DTG      3,"(7) Sending LFDCRC"
;
LFDCRC   SOURCE,NBYTES, CODE

```

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```
WAIT      1,HK
LOG       1,LFDDIAGS
DIAG     1,NOTANY,DIAG0011
;
DTG      3,"(8) LFDCRC accepted"
;
; =====
;
; *****
; * LFDDIAGC *
; *****
;
WAIT      1,HK
DTG      3,"(9) Sending LFDDIAGC"
;
LFDDIAGC
WAIT      1,HK
LOG       1,LFDDIAGS
DIAG     1,NOTANY,DIAG0011
;
DTG      3,"(10) LFDDIAGC accepted"
;
; =====
;
; *****
; * LFDDNLOD Addr,Nbytes *
; *****
;
; *****
; *****
; ** N O T E : This test uses the DEST RAM address from the **
; **           LFDCOPY test above                          **
; *****
; *****
;
WAIT      1,HK
DTG      3,"(11) Sending LFDDNLOD"
;
LFDDNLOD  DEST,NBYTES
RECV     2,0,NBYTES
WAIT     1,HK
LOG      1,1,2,LFDDIAGS
DIAG     1,NOTANY,DIAG0011
;
DTG      3,"(12) LFDDNLOD accepted"
;
; =====
;
; *****
; * LFDGOTO Addr *
; *****
;
; *****
; *****
; ** W A R N I N G: The location of NO OPER MUST BE UPDATED TO **
; **           REFLECT THE CURRENT DCE BUILD                    **
; **           Boot Mode = DCE_LFDNOOP = 0x0330                 **
; *****
; *****
;
DTG      3,"(13) Sending LFDGOTO"
;
LFDGOTO  NO_OPER
WAIT     1,HK
LOG      1,LFDDIAGS
DIAG     1,NOTANY,DIAG0011
;
DTG      3,"(14) LFDGOTO accepted"
;
; =====
```

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```

;
; *****
; * LFDHKREQ *
; *****
;
;
WAIT      1,HK
DTG       3,"(15) Sending LFDHKREQ"
;
LFDHKREQ
WAIT      1,HK
LOG       1,LFDDIAGS
DIAG      1,NOTANY,DIAG0011
;
;
DTG       3,"(16) LFDHKREQ accepted"
;
; =====
;
; *****
; * LFDJMPCS CODEAREA *
; *****
;
; *****
; *****
; ** N O T E : This test causes a transition from Boot to **
; **                               Operate Mode                               **
; *****
; *****
;
; *****
; * Send  22   RET          *
; *      00   NOP          *
; * to address SOURCE in external RAM *
; *****
;
;
DTG       3,"(17) Sending RET, NOP to #1"
DATA      1,0,2,CONST=0x2200
XMIT      1,2
LFDUPLD   SOURCE,2,CRC1
;
DTG       3,"(18) Sending LFDJMPCS"
LFDJMPCS
WAIT      1,HK
LOG       1,LFDDIAGS,LFSBITS1,LFDOPERT,1
DIAG      1,NOTANY,DIAG0011
;
;
DTG       3,"(19) LFDJMPCS accepted"
;
LFDRSTP
DTG       3,"LFDRSTP sent to re-establish Boot State"
WAIT      1
;
; =====
;
; *****
; * LFDMADDR Monitor,Addr,Space *
; *****
;
; *****
; *****
; ** N O T E : This test uses the DEST RAM address from the **
; **                               LFD COPY test above                               **
; *****
; *****
;
;
WAIT      1,HK
DTG       3,"(20) Sending LFDMADDR"
;
;
LFDMADDR  MONITOR,DEST,MEMSPACE
WAIT      1,HK
LOG       1,LFDDIAGS,LFDMONS,LFDMADD

```

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```

DIAG      1,NOTANY,DIAG0011
;
DTG      3,"(21) LFDMADDR accepted"
;
; =====
;
; *****
; * LFDNOOP *
; *****
;
WAIT     1,HK
DTG      3,"(22) Sending LFDNOOP"
;
LFDNOOP
WAIT     1,HK
LOG      1,LFDDIAGS
DIAG     1,NOTANY,DIAG0011
;
DTG      3,"(23) LFDNOOP accepted"
;
; =====
;
; *****
; * LFRSTP *
; *****
;
DTG      3,"(24) Sending LFRSTP followed by 1-second WAIT."
;
LFRSTP
;
; *****
; * Wait 1 seconds for reset to complete, then read HK.      *
; * Beside testing whether LFRSTP was accepted we test bit *
; * LFDOPERT (16F4.03) of LFSBITS1 (0="Boot State")         *
; *****
;
WAIT     1,HK
LOG      1,LFDDIAGS,LFSBITS1,LFDOPERT
DIAG     1,NOTANY,DIAG0011
;
DTG      3,"(25) LFRSTP accepted"
;
CHECK    1,((LFSBITS1 & LFDOPERT) == 0)
WTO      "DCE is in Boot State"
;
; =====
;
; *****
; * LFRSTW *
; *****
;
WAIT     1,HK
DTG      3,"(26) Sending LFRSTW followed by 1-second WAIT."
;
LFRSTW
;
; *****
; * Wait 1 seconds for reset to complete, then read HK.      *
; * Beside testing whether LFRSTW was accepted we test bit *
; * LFDOPERT (16F4.03) of LFSBITS1 (0="Boot State")         *
; *****
;
WAIT     1
WAIT     1,HK
LOG      1,LFDDIAGS,LFSBITS1,LFDOPERT
DIAG     1,NOTANY,DIAG0011
;
DTG      3,"(27) LFRSTW accepted"
;
CHECK    1,((LFSBITS1 & LFDOPERT) == 0)

```

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```
;
; =====
;
; *****
; * LFDUPLD Addr,Nbytes,CRC *
; *****
;
DATA      1,0,NBYTES,CONST=0x0001_0203_0405_0607_0809_0A0B_0C0D_0E0F
LOG       1,1
;
DTG       3,"(28) Sending LFDUPLD"
;
XMIT      1,NBYTES
LFDUPLD   DEST,NBYTES,CRC1
;
WAIT      1,HK
LOG       1,1,LFDDIAGS
DIAG      1,NOTANY,DIAG0011
;
DTG       3,"(29) LFDUPLD accepted"
;
; =====
;
; *****
; * LFDWDOG ENABLE *
; *****
;
DTG       3,"(30) Sending LFDWDOG"
;
LFDWDOG   ENABLE
;
;WAIT     1,HK
WAIT      5,HK
LOG       1,LFDDIAGS,LFDWDDIS
DIAG      1,NOTANY,DIAG0011
;
DTG       3,"(31) LFDWDOG accepted"
DTG       3,"Test 5.1.1.1c completed successfully"
```


Appendix C. Test Report stp5_1_1_1c.rp1

```

      5555      1      1      1
      5      11     11     11
sss tttt pppp 555      1      1      1      1 cccc
s  t  p  p  5      1      1      1      1 c
sssss t  pppp 5      1      1      1      1 c
s  t  p  5  5      1      1      1      1 c
sss  t  p  555  ___ 111  ___ 111  ___ 111 cccc
```

Ver 01.13 Tue Jan 16 12:19:07 2001 "(1) Verify that DCE is in Boot State after WDR"

Ver 01.13 Tue Jan 16 12:19:07 2001 "(2) First 1-second wait ..."

Ver 01.13 Tue Jan 16 12:19:08 2001 "(3) LFDRSTP being sent to create POR"

LFDRSTP

Ver 01.13 Tue Jan 16 12:19:08 2001 "(4) Second 1-second wait ..."

LFDHKREQ

Addr Addr HK-Name Value

16F4-16F5 LFSBITS1 0000

CHECK: ((SLFSBITS1 & SLFDOPERT) == 0)
eval: ((0000 & 0008) == 0)

S U C C E S S

Ver 01.13 Tue Jan 16 12:19:08 2001 "(5) Sending LFDCOPY"

LFDCOPY SOURCE,DEST,NBYTES,CODE

Addr Addr HK-Name Value

1780-179F LFDDIAGS 011C 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
17A0-17BF 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000

DIAG 1,NOTANY,DIAG0011

S U C C E S S

Ver 01.13 Tue Jan 16 12:19:08 2001 "(6) LFDCOPY accepted"

Ver 01.13 Tue Jan 16 12:19:08 2001 "(7) Sending LFDCRC"

LFDCRC SOURCE,NBYTES,CODE

Addr Addr HK-Name Value

1780-179F LFDDIAGS 011C 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
17A0-17BF 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000

DIAG 1,NOTANY,DIAG0011

S U C C E S S

Ver 01.13 Tue Jan 16 12:19:08 2001 "(8) LFDCRC accepted"

*** WAIT interval elapsed before new S/N available.

Ver 01.13 Tue Jan 16 12:19:10 2001 "(9) Sending LFDDIAGC"

LFDDIAGC

*** WAIT interval elapsed before new S/N available.

Addr Addr HK-Name Value

1780-179F LFDDIAGS 0413 0313 0206 011B 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
17A0-17BF 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000

DIAG 1,NOTANY,DIAG0011

S U C C E S S

Ver 01.13 Tue Jan 16 12:19:11 2001 "(10) LFDDIAGC accepted"

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Ver 01.13 Tue Jan 16 12:19:11 2001 "(11) Sending LFDDNLOD"

LFDDNLOD DEST,NBYTES

*** WAIT interval elapsed before new S/N available.

```
Len CRC Buffer Data
-----
0000 FFFF 1
0010 6A4B 2 FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

```
Addr Addr HK-Name Value
-----
1780-179F LFDDIAGS 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
17A0-17BF 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
```

DIAG 1,NOTANY,DIAG0011

S U C C E S S

Ver 01.13 Tue Jan 16 12:19:12 2001 "(12) LFDDNLOD accepted"

Ver 01.13 Tue Jan 16 12:19:12 2001 "(13) Sending LFDGOTO"

LFDGOTO NO_OPER

*** WAIT interval elapsed before new S/N available.

```
Addr Addr HK-Name Value
-----
1780-179F LFDDIAGS 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
17A0-17BF 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
```

DIAG 1,NOTANY,DIAG0011

S U C C E S S

Ver 01.13 Tue Jan 16 12:19:13 2001 "(14) LFDGOTO accepted"

Ver 01.13 Tue Jan 16 12:19:14 2001 "(15) Sending LFDHKREQ"

LFDHKREQ

*** WAIT interval elapsed before new S/N available.

```
Addr Addr HK-Name Value
-----
1780-179F LFDDIAGS 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
17A0-17BF 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
```

DIAG 1,NOTANY,DIAG0011

S U C C E S S

Ver 01.13 Tue Jan 16 12:19:15 2001 "(16) LFDHKREQ accepted"

Ver 01.13 Tue Jan 16 12:19:15 2001 "(17) Sending RET, NOP to 0xC000"

LFDUPL0D SOURCE,2,CRC1

Ver 01.13 Tue Jan 16 12:19:15 2001 "(18) Sending LFDJMPCS"

LFDJMPCS

*** WAIT interval elapsed before new S/N available.

```
Addr Addr HK-Name Value
-----
1780-179F LFDDIAGS 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
17A0-17BF 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
```

16F4-16F5 LFSBITS1 0000

```
Addr Mask HK-Bit-Name Value
-----
16F4 0008 LFDOPERT 0
```

```
Len CRC Buffer Data
-----
```

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0002 7D8B 1 22 00

DIAG 1,NOTANY,DIAG0011

S U C C E S S

Ver 1030 Tue Jan 16 12:19:16 2001 "(19) LFDJMPCS accepted"

LFRSTP

Ver 1030 Tue Jan 16 12:19:16 2001 "LFRSTP sent to re-establish Boot State"

* * * * WAIT interval elapsed before new S/N available.

Ver 01.13 Tue Jan 16 12:19:18 2001 "(20) Sending LFDMAADR"

LFDMAADR MONITOR,DEST,MEMSPACE

* * * * WAIT interval elapsed before new S/N available.

Addr	Addr	HK-Name	Value											
1780-179F	LFDDIAGS	011B	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
0000	0000	0000	0000	0000										
17A0-17BF		0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
0000	0000	0000	0000	0000										
1738-173F	LFDMONS	FF FF	FF FF	FF FF	FF FF	FF FF	FF FF							
1740-174F	LFDMAADR	0000	0000	0000	0000	0000	0000	0000	0000	0000				

DIAG 1,NOTANY,DIAG0011

S U C C E S S

Ver 01.13 Tue Jan 16 12:19:20 2001 "(21) LFDMAADR accepted"

Ver 01.13 Tue Jan 16 12:19:20 2001 "(22) Sending LFDNOOP"

LFDNOOP

* * * * WAIT interval elapsed before new S/N available.

Addr	Addr	HK-Name	Value											
1780-179F	LFDDIAGS	011B	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
0000	0000	0000	0000	0000										
17A0-17BF		0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
0000	0000	0000	0000	0000										

DIAG 1,NOTANY,DIAG0011

S U C C E S S

Ver 01.13 Tue Jan 16 12:19:21 2001 "(23) LFDNOOP accepted"

Ver 01.13 Tue Jan 16 12:19:21 2001 "(24) Sending LFRSTP followed by 1-second WAIT."

LFRSTP

* * * * WAIT interval elapsed before new S/N available.

Addr	Addr	HK-Name	Value											
1780-179F	LFDDIAGS	011B	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
0000	0000	0000	0000	0000										
17A0-17BF		0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
0000	0000	0000	0000	0000										

16F4-16F5 LFSBITS1 0000

Addr Mask HK-Bit-Name Value

Center for Astrophysics & Space Astronomy

```

-----
16F4 0008 LFDOPERT      0

DIAG      1,NOTANY,DIAG0011

S U C C E S S

Ver 01.13 Tue Jan 16 12:19:22 2001    "(25) LFDRSTP accepted"

CHECK:    (($LFSBITS1 & $LFDOPERT) == 0)
eval:     ((0000 & 0008) == 0)

S U C C E S S

* * * * WAIT interval elapsed before new S/N available.

Ver 01.13 Tue Jan 16 12:19:23 2001    "(26) Sending LFDRSTW followed by 1-second WAIT."

LFDRSTW

* * * * WAIT interval elapsed before new S/N available.

Addr Addr HK-Name      Value
-----
1780-179F LFDDIAGS      011B 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000
17A0-17BF      0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000

16F4-16F5 LFSBITS1      0000

Addr Mask HK-Bit-Name  Value
-----
16F4 0008 LFDOPERT      0

DIAG      1,NOTANY,DIAG0011

S U C C E S S

Ver 01.13 Tue Jan 16 12:19:26 2001    "(27) LFDRSTW accepted"

CHECK:    (($LFSBITS1 & $LFDOPERT) == 0)
eval:     ((0000 & 0008) == 0)

S U C C E S S

Len  CRC  Buffer      Data
-----
0010 3B37 1          00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

Ver 01.13 Tue Jan 16 12:19:26 2001    "(28) Sending LFDUPLDOD"

LFDUPLDOD  DEST,NBYTES,CRC1

* * * * WAIT interval elapsed before new S/N available.

Len  CRC  Buffer      Data
-----
0010 3B37 1          00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

Addr Addr HK-Name      Value
-----
1780-179F LFDDIAGS      011C 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000
17A0-17BF      0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000

DIAG      1,NOTANY,DIAG0011

S U C C E S S

```

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Ver 01.13 Tue Jan 16 12:19:27 2001 "(29) LFDUPL0D accepted"

Ver 01.13 Tue Jan 16 12:19:27 2001 "(30) Sending LFDWDOG"

LFDWDOG ENABLE

Addr	Addr	HK-Name	Value
1780-179F	LFDDIAGS	011C	0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0000 0000	0000 0000	0000	0000
17A0-17BF		0000	0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0000 0000	0000 0000	0000	0000

Addr	Mask	HK-Bit-Name	Value
16E4	4000	LFDWDDIS	1

DIAG 1,NOTANY,DIAG0011

S U C C E S S

Ver 01.13 Tue Jan 16 12:19:29 2001 "(31) LFDWDOG accepted"

Ver 01.13 Tue Jan 16 12:19:29 2001 "Test 5.1.1.1c completed successfully"

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Test Report stp5_1_1_1c.rp2

```
55555      1      1      1
5          11     11     11
  ssss  ttttt  pppp  555      1      1      1      cccc
s        t      p  p      5      1      1      1      c
  ssss  t      pppp  5      5      1      1      1      c
        s      t      p      5  5      1      1      1      c
  ssss  t      p      555      111     111     111     cccc
```

Ver 01.13 Tue Jan 16 12:19:07 2001 "(1) Verify that DCE is in Boot State after WDR"
Ver 01.13 Tue Jan 16 12:19:07 2001 "(2) First 1-second wait ..."
Ver 01.13 Tue Jan 16 12:19:08 2001 "(3) LFDRSTP being sent to create POR"

```
-----  
C O M M A N D P A C K E T  
-----  
PARM4 PARM3 PARM2 PARM1 PARM0  
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000  
-----  
SN OPCODE  
0446FFFE 04440001 04420F0F 0440F0F0  
-----
```

Ver 01.13 Tue Jan 16 12:19:08 2001 "(4) Second 1-second wait ..."

```
-----  
C O M M A N D P A C K E T  
-----  
PARM4 PARM3 PARM2 PARM1 PARM0  
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000  
-----  
SN OPCODE  
0446FFFD 04440002 04420000 0440FFFF  
-----
```

Ver 01.13 Tue Jan 16 12:19:08 2001 "(5) Sending LFDCOPY"

```
-----  
C O M M A N D P A C K E T  
-----  
PARM4 PARM3 PARM2 PARM1 PARM0  
045AFFFF 04580000 0456FFFD 04540002 0452FFEF 04500010 044E3EFF 044CC100 044A3FFF 0448C000  
-----  
SN OPCODE  
0446FFFC 04440003 04427C7C 04408383  
-----
```

Ver 01.13 Tue Jan 16 12:19:08 2001 "(6) LFDCOPY accepted"
Ver 01.13 Tue Jan 16 12:19:08 2001 "(7) Sending LFDCRC"

```
-----  
C O M M A N D P A C K E T  
-----  
PARM4 PARM3 PARM2 PARM1 PARM0  
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500002 044EFFF 044C0010 044A3FFF 0448C000  
-----  
SN OPCODE  
0446FFFB 04440004 04427D7D 04408282  
-----
```

Ver 01.13 Tue Jan 16 12:19:08 2001 "(8) LFDCRC accepted"

```
-----  
C O M M A N D P A C K E T  
-----  
PARM4 PARM3 PARM2 PARM1 PARM0  
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000  
-----  
SN OPCODE  
0446FFFA 04440005 04427F7F 04408080  
-----
```

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Ver 01.13 Tue Jan 16 12:19:10 2001 "(9) Sending LFDDIAGC"

C O M M A N D P A C K E T

PARM4 PARM3 PARM2 PARM1 PARM0
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000

SN OPCODE
0446FFF9 04440006 04420B0B 0440F4F4

C O M M A N D P A C K E T

PARM4 PARM3 PARM2 PARM1 PARM0
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000

SN OPCODE
0446FFF8 04440007 04427F7F 04408080

Ver 01.13 Tue Jan 16 12:19:11 2001 "(10) LFDDIAGC accepted"

Ver 01.13 Tue Jan 16 12:19:11 2001 "(11) Sending LFDDNLOD"

C O M M A N D P A C K E T

PARM4 PARM3 PARM2 PARM1 PARM0
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0010 044A3EFF 0448C100

SN OPCODE
0446FFF7 04440008 04425151 0440AEAE

C O M M A N D P A C K E T

PARM4 PARM3 PARM2 PARM1 PARM0
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000

SN OPCODE
0446FFF6 04440009 04427F7F 04408080

Ver 01.13 Tue Jan 16 12:19:12 2001 "(12) LFDDNLOD accepted"

Ver 01.13 Tue Jan 16 12:19:12 2001 "(13) Sending LFDGOTO"

C O M M A N D P A C K E T

PARM4 PARM3 PARM2 PARM1 PARM0
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFCBF 04480340

SN OPCODE
0446FFF5 0444000A 04421515 0440EAEA

C O M M A N D P A C K E T

PARM4 PARM3 PARM2 PARM1 PARM0
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000

SN OPCODE
0446FFF4 0444000B 04427F7F 04408080

Ver 01.13 Tue Jan 16 12:19:13 2001 "(14) LFDGOTO accepted"

Ver 01.13 Tue Jan 16 12:19:14 2001 "(15) Sending LFDHKREQ"

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```
-----  
C O M M A N D   P A C K E T  
-----  
          PARM4          PARM3          PARM2          PARM1          PARM0  
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000  
-----  
          SN          OPCODE  
0446FFF3 0444000C 04420000 0440FFFF  
-----
```

```
-----  
C O M M A N D   P A C K E T  
-----  
          PARM4          PARM3          PARM2          PARM1          PARM0  
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000  
-----  
          SN          OPCODE  
0446FFF2 0444000D 04427F7F 04408080  
-----
```

```
Ver 01.13 Tue Jan 16 12:19:15 2001 "(16) LFDHKREQ accepted"  
Ver 01.13 Tue Jan 16 12:19:15 2001 "(17) Sending RET, NOP to 0xC000"
```

```
-----  
U P L O A D   P A C K E T  
-----  
00400022  
-----
```

```
-----  
C O M M A N D   P A C K E T  
-----  
          PARM4          PARM3          PARM2          PARM1          PARM0  
045AFFFF 04580000 0456FFFF 04540000 04528274 04507D8B 044EFFFF 044C0002 044A3FFF 0448C000  
-----  
          SN          OPCODE  
0446FFF1 0444000E 04425252 0440ADAD  
-----
```

```
Ver 01.13 Tue Jan 16 12:19:15 2001 "(18) Sending LFDJMPCS"
```

```
-----  
C O M M A N D   P A C K E T  
-----  
          PARM4          PARM3          PARM2          PARM1          PARM0  
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000  
-----  
          SN          OPCODE  
0446FFF0 0444000F 04420C0C 0440F3F3  
-----
```

```
-----  
C O M M A N D   P A C K E T  
-----  
          PARM4          PARM3          PARM2          PARM1          PARM0  
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000  
-----  
          SN          OPCODE  
0446FFEF 04440010 04427F7F 04408080  
-----
```

```
Ver 1030 Tue Jan 16 12:19:16 2001 "(19) LFDJMPCS accepted"
```

```
-----  
C O M M A N D   P A C K E T  
-----  
          PARM4          PARM3          PARM2          PARM1          PARM0  
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000  
-----  
          SN          OPCODE  
0446FFEE 04440011 04420F0F 0440F0F0  
-----
```


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Ver 1030 Tue Jan 16 12:19:16 2001 "LFDRSTP sent to re-establish Boot State"

C O M M A N D P A C K E T

PARM4 PARM3 PARM2 PARM1 PARM0
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000

SN OPCODE
0446FFED 04440012 04427F7F 04408080

Ver 01.13 Tue Jan 16 12:19:18 2001 "(20) Sending LFDADDR"

C O M M A N D P A C K E T

PARM4 PARM3 PARM2 PARM1 PARM0
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044E3EFF 044CC100 044AFFFF 04480000

SN OPCODE
0446FFEC 04440013 04427E7E 04408181

C O M M A N D P A C K E T

PARM4 PARM3 PARM2 PARM1 PARM0
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000

SN OPCODE
0446FFEB 04440014 04427F7F 04408080

Ver 01.13 Tue Jan 16 12:19:20 2001 "(21) LFDADDR accepted"

Ver 01.13 Tue Jan 16 12:19:20 2001 "(22) Sending LFDNOOP"

C O M M A N D P A C K E T

PARM4 PARM3 PARM2 PARM1 PARM0
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000

SN OPCODE
0446FFEA 04440015 04427F7F 04408080

C O M M A N D P A C K E T

PARM4 PARM3 PARM2 PARM1 PARM0
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000

SN OPCODE
0446FFE9 04440016 04427F7F 04408080

Ver 01.13 Tue Jan 16 12:19:21 2001 "(23) LFDNOOP accepted"

Ver 01.13 Tue Jan 16 12:19:21 2001 "(24) Sending LFDRSTP followed by 1-second WAIT."

C O M M A N D P A C K E T

PARM4 PARM3 PARM2 PARM1 PARM0
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000

SN OPCODE
0446FFE8 04440017 04420F0F 0440F0F0

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```
-----  
C O M M A N D   P A C K E T  
-----  
          PARM4          PARM3          PARM2          PARM1          PARM0  
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000  
-----  
          SN          OPCODE  
0446FFE7 04440018 04427F7F 04408080  
-----
```

Ver 01.13 Tue Jan 16 12:19:22 2001 "(25) LFD RSTP accepted"

```
-----  
C O M M A N D   P A C K E T  
-----  
          PARM4          PARM3          PARM2          PARM1          PARM0  
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000  
-----  
          SN          OPCODE  
0446FFE6 04440019 04427F7F 04408080  
-----
```

Ver 01.13 Tue Jan 16 12:19:23 2001 "(26) Sending LFD RSTW followed by 1-second WAIT."

```
-----  
C O M M A N D   P A C K E T  
-----  
          PARM4          PARM3          PARM2          PARM1          PARM0  
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000  
-----  
          SN          OPCODE  
0446FFE5 0444001A 04420A0A 0440F5F5  
-----
```

```
-----  
C O M M A N D   P A C K E T  
-----  
          PARM4          PARM3          PARM2          PARM1          PARM0  
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000  
-----  
          SN          OPCODE  
0446FFE4 0444001B 04427F7F 04408080  
-----
```

Ver 01.13 Tue Jan 16 12:19:26 2001 "(27) LFD RSTW accepted"

Ver 01.13 Tue Jan 16 12:19:26 2001 "(28) Sending LFD UPL O D"

```
-----  
U P L O A D   P A C K E T  
-----  
00400100 00420302 00440504 00460706 00480908 004A0B0A 004C0D0C 004E0F0E  
-----
```

```
-----  
C O M M A N D   P A C K E T  
-----  
          PARM4          PARM3          PARM2          PARM1          PARM0  
045AFFFF 04580000 0456FFFF 04540000 0452C4C8 04503B37 044EFFF E 044C0010 044A3EFF 0448C100  
-----  
          SN          OPCODE  
0446FFE3 0444001C 04425252 0440ADAD  
-----
```

```
-----  
C O M M A N D   P A C K E T  
-----  
          PARM4          PARM3          PARM2          PARM1          PARM0  
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000  
-----  
          SN          OPCODE  
0446FFE2 0444001D 04427F7F 04408080  
-----
```

Ver 01.13 Tue Jan 16 12:19:27 2001 "(29) LFD UPL O D accepted"

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Ver 01.13 Tue Jan 16 12:19:27 2001 "(30) Sending LFDWDOG"

C O M M A N D P A C K E T

PARM4 PARM3 PARM2 PARM1 PARM0
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480001

SN OPCODE
0446FFE1 0444001E 04420E0E 0440F1F1

C O M M A N D P A C K E T

PARM4 PARM3 PARM2 PARM1 PARM0
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000

SN OPCODE
0446FFE0 0444001F 04427F7F 04408080

C O M M A N D P A C K E T

PARM4 PARM3 PARM2 PARM1 PARM0
045AFFFF 04580000 0456FFFF 04540000 0452FFFF 04500000 044EFFFF 044C0000 044AFFFF 04480000

SN OPCODE
0446FFDF 04440020 04427F7F 04408080

Ver 01.13 Tue Jan 16 12:19:29 2001 "(31) LFDWDOG accepted"

Ver 01.13 Tue Jan 16 12:19:29 2001 "Test 5.1.1.1c completed successfully"