

**COS DCE BOOT FSW v1.13 Component Test Results
Requirement 5.1.1.4 Memory Initialization on Power-Up Only**

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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 5.1.1.4 — Memory Initialization on Power-Up Only.

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 normal contents of locations 0x2562...0x2563 (symbolized in the script as **PCEND**), as set by FSW Boot State initialization, are the bytes 0x0x0501. Hence, if inspection of the contents of **PCEND** reveals a value other than 0x0501, it may be inferred that **PCEND** has been modified and that no initialization has intervened between the modification and the inspection. Conversely, if **PCEND** is modified to something other than 0x0501, and the FSW then processes an **LFDSTW** command, and the contents of **PCEND** are found to be 0x0501, it may be inferred that the locations have been re-initialized by the WDR. The script executes the following steps:

- Issue two **PORs**, each followed by one-second **WAITs** to ensure that the FSW is operating in Boot State and that EGSE buffers contain no HK data from earlier commanding.
- Initialize FSW, download **PCEND**, and verify that it is 0x0501.
- Upload 0x0602 to **PCEND**, and verify it.
- Issue **POR**, download **PCEND**, verify it has been reset back to 0x0501.
- Issue **LFDSTP**, download **PCEND**, verify it is 0x0501.
- Upload 0x0602 to **PCEND**, download **PCEND**, verify it is 0x0602.
- Enable watchdogs, issue **LFDSTW**, download **PCEND**, verify it is still 0x0602 — i.e., WDR has not re-initialized **PCEND**.

1.6 TEST SCRIPT IMPLEMENTATION

1.6.1 Test Script Arguments

The script is parameterized as shown in the following Table:

Table 1-1: Parameters/Arguments for stp5_1_1_4.tst

Parameter	Meaning	Correct Argument for Version 1.13
#0	Absolute hex storage address in Patchable Constants (PCEND)	2562

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

1.6.2 Test Script Coding

The script uses standard UniScript commands and directives.

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 Section 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 (shorty) Directory	File	Description
\disks\galex\users\galex\tcs\uniscrpt\	UniScript.pl	UniScript interpreter
\disks\galex\users\galex\tcs\uniscrpt\stp5_1_1_4\	u	Shell script for this procedure
Ditto	stp5_1_1_4.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-03-0044	<i>DCE FSW Test Procedure 5.1.1.4 (this document)</i>
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].

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 shorty.ssl.berkely.edu	Establish connection to shorty 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@shorty% cd ~galex/tcs tcs@shorty% 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		<pre>tcs@shorty% slogin -l eagcos shorty.ssl.berkeley.edu eagcos@shorty.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</pre>	slogin as eagcos ; get password from SSL personnel

4.1.6 Set Current Directory

Step	QA	Operator Entry/System Response	Description
5		<pre>eagcos:shorty% cd /disks/galex/users/galex/tcs/uniscript/stp5_1_1_4 eagcos:shorty% pwd /disks/galex/users/galex/tcs/uniscript/stp5_1_1_4</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@shorty% ls -l Total 12 -rw-r--r-- 1 tcs eag 1398 Oct 8 18:03 stp5_1_1_4.tst -rw-r--r-- 1 tcs eag 62 Oct 9 17:44 u</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:shorty% 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 \$estring=2562,0,0,0,0,0,0,0 Parameters are: Script File: stp5_1_1_4 #0: 2562 #1: 0 #2: 0 #3: 0 #4: 0 #5: 0 #6: 0 #7: 0 Report file >/disks/galex/users/galex/tcs/ver_1_13/stp5_1_1_4/ stp5_1_1_4.rp1 successfully opened. Report file >/disks/galex/users/galex/tcs/ver_1_13/stp5_1_1_4/ stp5_1_1_4.rp2 successfully opened. Script file /disks/galex/users/galex/tcs/ver_1_13/stp5_1_1_4/s tp5_1_1_4.tst successfully opened at level 0. "Address of PCEND is 2562" "Is this correct?" "If so, press Y; otherwise press N and edit shell file u" y Continuing. "Sending two PORs. WAITING 1sec twice" "Generating upload data" "Sending LFDRSTP to assure Boot State" </pre>	<p>Shell to u. You should see the accompanying output as UniScript executes</p>

Step	QA	Operator Entry/System Response	Description
		<p>LFDRSTP</p> <p>"Downloading PCEND, checking for nulls"</p> <p>LFDDNLOD PCEND,NBYTES</p> <p>WAIT 0: HKV0=2; HKV1=0; wc=5 WAIT 1: HKV1=0; wc=4 WAIT 1: HKV1=2; wc=3</p> <p>"Uploading 0602"</p> <p>LFDUPLOD PCEND,NBYTES,CRC1</p> <p>"Downloading it to make sure it got to PCEND"</p> <p>LFDDNLOD PCEND,NBYTES</p> <p>"Sending POR" "Downloading PCEND to verify it's 05 01 after POR"</p> <p>LFDDNLOD PCEND,NBYTES</p> <p>WAIT 0: HKV0=7; HKV1=0; wc=5 WAIT 1: HKV1=0; wc=4 WAIT 1: HKV1=7; wc=3</p> <p>"Test 5_1_1_4a completed successfully" "Generating 06 02" "Sending LFDRSTP to assure Boot State"</p> <p>LFDRSTP</p> <p>"Downloading PCEND, checking for 05 01"</p> <p>LFDDNLOD PCEND,NBYTES</p> <p>WAIT 0: HKV0=11; HKV1=0; wc=5 WAIT 1: HKV1=0; wc=4 WAIT 1: HKV1=11; wc=3</p>	

Step	QA	Operator Entry/System Response	Description
		<p>"Uploading 06 02"</p> <p>LFDUPLD PCEND,NBYTES,CRC1</p> <p>"Downloading it to make sure it got to PCEND"</p> <p>LFDDNLOD PCEND,NBYTES</p> <p>"Sending LFDRSTW"</p> <p>LFDWDOG ENABLE</p> <p>LFDRSTW</p> <p>WAIT 0: HKV0=17; HKV1=16; wc=5</p> <p>WAIT 1: HKV1=16; wc=4</p> <p>WAIT 1: HKV1=0; wc=3</p> <p>WAIT 1: HKV1=18; wc=2</p> <p>"Downloading PCEND to verify it's not reset after WDR"</p> <p>LFDDNLOD PCEND,NBYTES</p> <p>WAIT 0: HKV0=21; HKV1=19; wc=5</p> <p>WAIT 1: HKV1=20; wc=4</p> <p>WAIT 1: HKV1=21; wc=3</p> <p>"Test 5_1_1_4b terminated successfully"</p> <p>eagcos:taiyo%</p>	

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_4.tst**, **stp5_1_1_4.rp1**, and **stp5_1_1_4.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_4 "2562,0,0,0,0,0,0,0"  
cosnoopy&
```

Appendix B. Test Script stp5_1_1_4.tst

```
; *****  
; * DCE FSW Requirement 5.1.1.4 -- Memory Initialization on Power-Up Only *  
; *****  
; * Verify that variables are initialized after POR *  
; *****  
;  
SYM      PCEND =0x#0  
SYM      NBYTES=2  
SYM      ENABLE=1  
;  
ECHO     2  
WTO      "Address of PCEND is #0"  
WTO      "Is this correct?"  
WTOR     "If so, press Y; otherwise press N and edit shell file u"  
;  
; *****  
; * Try to clear out the EGSE's pipes *  
; *****  
;  
DTG      3,"(-1) Sending two PORs. WAITING 1sec twice"  
WTO      "Sending two PORs. WAITING 1sec twice"  
POR  
WAIT     1  
POR  
WAIT     1  
;  
; *****  
; * Clear both buffers *  
; *****  
;  
DATA     1,0,0,EMPTY  
DATA     2,0,0,EMPTY  
;  
; *****  
; * Generate 0602 for upload to 2562 *  
; *****  
;  
DTG      3,"(0) Generating upload data"  
WTO      "Generating upload data"  
DATA     1,0,NBYTES,CONST=0x0602  
LOG      1,1,2  
;  
; *****  
; * Make sure we're in Boot State *  
; *****  
;  
DTG      3,"(1) Sending LFDRSTP to assure Boot State"  
WTO      "Sending LFDRSTP to assure Boot State"  
LFDRSTP  
WAIT     1  
;  
; *****  
; * Download PCEND to make sure it's 00 00 00 00 00 ... 00 *  
; *****  
;  
DTG      3,"(2) Downloading PCEND, checking for nulls"  
WTO      "Downloading PCEND, checking for nulls"  
LFDDNLOD PCEND,NBYTES  
WAIT     5,HK  
RECV     2,0,NBYTES  
WAIT     1  
LOG      1,2  
CHECK    1,($B2 eq '0501')  
;  
; *****  
; * Upload the random data *  
;
```


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```

; *****
;
DTG      3,"(3) Uploading 0602"
WTO      "Uploading 0602"
WAIT     1
XMIT     1,NBYTES
LFDUPLOD PCEND,NBYTES,CRC1
;
; *****
; * Download PCEND *
; *****
;
DTG      3,"(4) Downloading it to make sure it got to PCEND"
WTO      "Downloading it to make sure it got to PCEND"
WAIT     1
LFDDNLOD PCEND,NBYTES
WAIT     1
RECV     2,0,NBYTES
;
; *****
; * Now, $B1 should equal $B2 *
; *****
;
LOG      1,1,2
CHECK    1,($B1 eq $B2)
;
; *****
; * Do a POR *
; *****
;
DTG      3,"(5) Sending POR"
WTO      "Sending POR"
POR
WAIT     1
;
; *****
; * Download PCEND (again) to make sure it's 05 01 *
; *****
;
DTG      3,"(6) Downloading PCEND to verify it's 05 01 after POR"
WTO      "Downloading PCEND to verify it's 05 01 after POR"
LFDDNLOD PCEND,NBYTES
WAIT     5,HK
RECV     2,0,NBYTES
WAIT     1
LOG      1,1,2
CHECK    1,($B2 eq '0501')
;
DTG      3,"(7) Test 5_1_1_4a completed successfully"
WTO      "Test 5_1_1_4a completed successfully"
;
-----
; *****
; * Verify that variables are NOT initializaed after WDR *
; *****
; *****
; * Clear both buffers *
; *****
;
DATA     1,0,0,EMPTY
DATA     2,0,0,EMPTY
;
; *****
; * Generate 0602 for upload *
; *****
;
DTG      3,"(10) Generating 06 02"
WTO      "Generating 06 02"
DATA     1,0,NBYTES,CONST=0x0602
LOG      1,1,2

```

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```
;
; *****
; * Make sure we're in Boot State *
; *****
;
DTG      3,"(11) Sending LFRSTP to assure Boot State"
WTO      "Sending LFRSTP to assure Boot State"
LFRSTP
WAIT     1
;
; *****
; * Download PCEND to make sure it's 00 00 00 00 00 ... 00 *
; *****
;
DTG      3,"(12) Downloading PCEND, checking for 05 01"
WTO      "Downloading PCEND, checking for 05 01"
LFDDNLOD PCEND,NBYTES
WAIT     5,HK
RECV     2,0,NBYTES
WAIT     1
LOG      1,2
CHECK    1,($B2 eq '0501')
;
; *****
; * Upload the random data *
; *****
;
DTG      3,"(13) Uploading 06 02"
WTO      "Uploading 06 02"
WAIT     1
XMIT     1,NBYTES
LFDUPLD  PCEND,NBYTES,CRC1
;
; *****
; * Download PCEND *
; *****
;
DTG      3,"(14) Downloading it to make sure it got to PCEND"
WTO      "Downloading it to make sure it got to PCEND"
WAIT     1
LFDDNLOD PCEND,NBYTES
WAIT     1
RECV     2,0,NBYTES
;
; *****
; * Now, $B1 should equal $B2 *
; *****
;
LOG      1,1,2
CHECK    1,($B1 eq $B2)
;
; *****
; * Do a Watchdog Reset *
; *****
;
DTG      3,"(15) Sending LFRSTW"
WTO      "Sending LFRSTW"
LFDWDOG  ENABLE
WAIT     1
LFRSTW
WAIT     1
WAIT     5,HK
LOG      1,LFSBITS1,LFDOPERT,LFDDIAGS
;
; *****
; * Download PCEND (again) to make sure it's 06 02 *
; *****
;
DTG      3,"(16) Downloading PCEND to verify it's not reset after WDR"
WTO      "Downloading PCEND to verify it's not reset after WDR"
```

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```
LFDDNLOD  PCEND,NBYTES
WAIT      5,HK
RECV      2,0,NBYTES
WAIT      1
LOG        1,1,2
CHECK      1,($B2 eq '0602')
;
DTG        3,"(17) Test 5_1_1_4b terminated successfully"
WTO        "Test 5_1_1_4b terminated successfully"
```

Appendix C. Test Report stp5_1_1_4.rp1

```

4                                     55555          1          1          4
4                                     5             11         11         4
4          ssss ttttt pppp 555          1          1          4
4          s          t    p  p    5          1          1
444444          sssss t    pppp  5          1          1
4          s          t    p    5  5          1          1
4          ssss      t    p    555  _____ 111  _____ 111  _____
4
Ver 01.13 Tue Jan 16 13:04:15 2001  "(-1) Sending two PORs. WAITING 1sec twice"
Ver 01.13 Tue Jan 16 13:04:17 2001  "(0) Generating upload data"
Len  CRC  Buffer          Data
----  ----  -
0002 97EB 1             06 02
0000 FFFF 2
Ver 01.13 Tue Jan 16 13:04:17 2001  "(1) Sending LFDRSTP to assure Boot State"
LFDRSTP
Ver 01.13 Tue Jan 16 13:04:18 2001  "(2) Downloading PCEND, checking for nulls"
LFDDNLOD PCEND,NBYTES
Len  CRC  Buffer          Data
----  ----  -
0002 F2DB 2             05 01
CHECK:  ($B2 eq '0501')
eval:   (0501... eq '0501')
S U C C E S S
Ver 01.13 Tue Jan 16 13:04:22 2001  "(3) Uploading 0602"
LFDUPLD PCEND,NBYTES,CRC1
Ver 01.13 Tue Jan 16 13:04:23 2001  "(4) Downloading it to make sure it got to PCEND"
LFDDNLOD PCEND,NBYTES
Len  CRC  Buffer          Data
----  ----  -
0002 97EB 1             06 02
0002 97EB 2             06 02
CHECK:  ($B1 eq $B2)
eval:   (0602... eq 0602...)
S U C C E S S
Ver 01.13 Tue Jan 16 13:04:25 2001  "(5) Sending POR"
Ver 01.13 Tue Jan 16 13:04:26 2001  "(6) Downloading PCEND to verify it's 05 01 after
POR"
LFDDNLOD PCEND,NBYTES
```

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```

Len  CRC  Buffer      Data
----  ----  -
0002 97EB 1           06 02

0002 F2DB 2           05 01
    
```

```

CHECK:  ($B2 eq '0501')
eval:   (0501... eq '0501')
    
```

S U C C E S S

```

Ver 01.13 Tue Jan 16 13:04:29 2001 "(7) Test 5_1_1_4a completed successfully"
Ver 01.13 Tue Jan 16 13:04:29 2001 "(10) Generating 06 02"
    
```

```

Len  CRC  Buffer      Data
----  ----  -
0002 97EB 1           06 02

0000 FFFF 2
    
```

```

Ver 01.13 Tue Jan 16 13:04:29 2001 "(11) Sending LFDRSTP to assure Boot State"
LFDRSTP
    
```

```

Ver 01.13 Tue Jan 16 13:04:30 2001 "(12) Downloading PCEND, checking for 05 01"
LFDDNLOD PCEND,NBYTES
    
```

```

Len  CRC  Buffer      Data
----  ----  -
0002 F2DB 2           05 01
    
```

```

CHECK:  ($B2 eq '0501')
eval:   (0501... eq '0501')
    
```

S U C C E S S

```

Ver 01.13 Tue Jan 16 13:04:34 2001 "(13) Uploading 06 02"
LFDUPLD PCEND,NBYTES,CRC1
    
```

```

Ver 01.13 Tue Jan 16 13:04:35 2001 "(14) Downloading it to make sure it got to PCEND"
LFDDNLOD PCEND,NBYTES
    
```

```

Len  CRC  Buffer      Data
----  ----  -
0002 97EB 1           06 02

0002 97EB 2           06 02
    
```

```

CHECK:  ($B1 eq $B2)
eval:   (0602... eq 0602...)
    
```

S U C C E S S

```

Ver 01.13 Tue Jan 16 13:04:37 2001 "(15) Sending LFDRSTW"
LFDWDOG ENABLE
LFDRSTW
    
```

```

Addr Addr HK-Name      Value
----  ----  -
16F4-16F5 LFSBITS1      0000
    
```

```

Addr Mask HK-Bit-Name  Value
----  ----  -
    
```

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```
16F4 0008 LFDOPERT      0
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

Ver 01.13 Tue Jan 16 13:04:42 2001 "(16) Downloading PCEND to verify it's not reset
after WDR"

LFDDNLOD PCEND,NBYTES

Len CRC Buffer      Data
----
0002 97EB 1      06 02
0002 97EB 2      06 02

CHECK: ($B2 eq '0602')
eval: (0602... eq '0602')

S U C C E S S

Ver 01.13 Tue Jan 16 13:04:46 2001 "(17) Test 5_1_1_4b terminated successfully"
```

Appendix D. Test Report stp5_1_1_4.rp2

```

4          55555          1          1          4
4          5          11          11          4
4          ssss ttttt pppp 555          1          1          4
4          s          t          p          p          5          1          1
44444
4          sssss          t          pppp          5          1          1
4          s          t          p          5          5          1          1
4          ssss          t          p          555          111          111
4

```

Ver 01.13 Tue Jan 16 13:04:15 2001 "(-1) Sending two PORs. WAITING 1sec twice"

```

-----
P O R   P A C K E T
-----
80000000
-----

```

```

-----
P O R   P A C K E T
-----
80000000
-----

```

Ver 01.13 Tue Jan 16 13:04:17 2001 "(0) Generating upload data"

Ver 01.13 Tue Jan 16 13:04:17 2001 "(1) Sending LFDRSTP to assure 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
0446FFFE 04440001 0442F0F0 0440F0F0
-----

```

Ver 01.13 Tue Jan 16 13:04:18 2001 "(2) Downloading PCEND, checking for nulls"

```

-----
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 044C0002 044ADA9D 04482562
          SN          OPCODE
0446FFFD 04440002 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
-----

```

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0446FFFC 04440003 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			
0446FFFB 04440004	04427F7F 04408080			

Ver 01.13 Tue Jan 16 13:04:22 2001 "(3) Uploading 0602"

U P L O A D P A C K E T

00400206

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

PARM4	PARM3	PARM2	PARM1	PARM0
045AFFFF 04580000	0456FFFF 04540000	04526814 045097EB	044EFFFF 044C0002	044ADA9D 04482562
SN	OPCODE			
0446FFFA 04440005	04425252 0440ADAD			

Ver 01.13 Tue Jan 16 13:04:23 2001 "(4) Downloading it to make sure it got to PCEND"

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 044C0002	044ADA9D 04482562
SN	OPCODE			
0446FFF9 04440006	04425151 0440AEAE			

Ver 01.13 Tue Jan 16 13:04:25 2001 "(5) Sending POR"

P O R P A C K E T

80000000

Ver 01.13 Tue Jan 16 13:04:26 2001 "(6) Downloading PCEND to verify it's 05 01 after 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 044C0002	044ADA9D 04482562
SN	OPCODE			
0446FFF8 04440007	04425151 0440AEAE			

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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
0446FFF7 04440008 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
0446FFF6 04440009 04427F7F 04408080
-----

```

```

Ver 01.13 Tue Jan 16 13:04:29 2001 "(7) Test 5_1_1_4a completed successfully"
Ver 01.13 Tue Jan 16 13:04:29 2001 "(10) Generating 06 02"
Ver 01.13 Tue Jan 16 13:04:29 2001 "(11) Sending LFDRSTP to assure 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
0446FFF5 0444000A 04420F0F 0440F0F0
-----

```

```

Ver 01.13 Tue Jan 16 13:04:30 2001 "(12) Downloading PCEND, checking for 05 01"
-----

```

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 044C0002 044ADA9D 04482562
-----
          SN          OPCODE
0446FFF4 0444000B 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
0446FFF3 0444000C 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
0446FFF2 0444000D 04427F7F 04408080
-----

```

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Ver 01.13 Tue Jan 16 13:04:34 2001 "(13) Uploading 06 02"

U P L O A D P A C K E T

00400206

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

PARM4	PARM3	PARM2	PARM1	PARM0
045AFFFF 04580000	0456FFFF 04540000	04526814 045097EB	044EFFFF 044C0002	044ADA9D 04482562
SN	OPCODE			
0446FFF1 0444000E	04425252 0440ADAD			

Ver 01.13 Tue Jan 16 13:04:35 2001 "(14) Downloading it to make sure it got to PCEND"

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 044C0002	044ADA9D 04482562
SN	OPCODE			
0446FFF0 0444000F	04425151 0440AEAE			

Ver 01.13 Tue Jan 16 13:04:37 2001 "(15) Sending LFDRSTW"

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	044AFFFE 04480001
SN	OPCODE			
0446FFEF 04440010	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			
0446FFEE 04440011	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			
0446FFED 04440012	04427F7F 04408080			

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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
0446FFEC 04440013 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
0446FFEB 04440014 04427F7F 04408080
-----

```

Ver 01.13 Tue Jan 16 13:04:42 2001 "(16) Downloading PCEND to verify it's not reset after WDR"

```

-----
                          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 044C0002 044ADA9D 04482562
          SN              OPCODE
0446FFEA 04440015 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
0446FFE9 04440016 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
0446FFE8 04440017 04427F7F 04408080
-----

```

Ver 01.13 Tue Jan 16 13:04:46 2001 "(17) Test 5_1_1_4b terminated successfully"