

**COS DCE BOOT FSW v1.09 Component Test Results
Requirement 5.1.1.3 Commands to Re-boot DCE FSW**

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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 5.1.1.3 — Commands to Re-Boot DCE FSW.

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 issues two **PORS**, followed by one-second **WAITS**, to ensure that FSW is operating in Boot State with empty diagnostic stack (**LFDDIAGS**) and that EGSE buffers no longer contain HK data from preceding commands. After this initialization, the script issues an **LFDRSTP** and verifies that the code 001B is present in **LFDDIAGS**. The script then issues **LFDRSTW** and verifies that the code 001C is present in **LFDDIAGS**.

1.6 TEST SCRIPT IMPLEMENTATION

1.6.1 Test Script Arguments

The script is not parameterized.

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 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_3\	u	Shell script for this procedure
Ditto	stp5_1_1_3.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-03-0011	<i>DCE FSW Test Procedure 5.1.1.3</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].

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: tcs 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		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	slogin as eagcos ; get password from SSL personnel

4.1.6 Set Current Directory

Step	QA	Operator Entry/System Response	Description
5		eagcos:shorty% cd /disks/galex/users/galex/tcs/uniscript/stp5_1_1_3 eagcos:shorty% pwd /disks/galex/users/galex/tcs/uniscript/stp5_1_1_3	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_3.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>eagcos:shorty% sh u \$estring=0,0,0,0,0,0,0,0 Parameters are: Script File: stp5_1_1_3 #0: 0 #1: 0 #2: 0 #3: 0 #4: 0 #5: 0 #6: 0 #7: 0 Report file >/disks/galex/users/galex/tcs/uniscript/stp5_1_1_3/ stp5_1_1_3.rp1 successfully opened. Report file >/disks/galex/users/galex/tcs/uniscript/stp5_1_1_3/ stp5_1_1_3.rp2</pre>	Shell to u . You should see the accompanying output as UniScript executes

Step	QA	Operator Entry/System Response	Description
		<p>successfully opened. Script file</p> <p>/disks/galex/users/galex/tcs/uniscript/stp5_1_1_3/stp5_1_1_3.tst successfully opened at level 0.</p> <p>"Sending two PORs. WAITING 1sec twice" "Sending LFDRSTP followed by WAIT for HK data"</p> <p>LFDRSTP</p> <p>gnxtser 0: NEXTSEQ=1 WAIT 0: HKV0=1; HKV1=0; wc=5 gnxtser 0: NEXTSEQ=2 WAIT 1: HKV1=0; wc=4 gnxtser 0: NEXTSEQ=3 WAIT 1: HKV1=0; wc=3 gnxtser 0: NEXTSEQ=4 WAIT 1: HKV1=2; wc=2 "DIAG001B successfully detected after LFDRSTP" "Sending LFDRSTW followed by WAIT for HK data"</p> <p>LFDRSTW</p> <p>gnxtser 0: NEXTSEQ=5 WAIT 0: HKV0=5; HKV1=3; wc=5 gnxtser 0: NEXTSEQ=6 WAIT 1: HKV1=4; wc=4 gnxtser 0: NEXTSEQ=7 WAIT 1: HKV1=0; wc=3 gnxtser 0: NEXTSEQ=8 WAIT 1: HKV1=7; wc=2 "DIAG001C successfully detected after LFDRSTW" "Test 5_1_1_3 completed successfully" eagcos:shorty% sh u</p>	

Step	QA	Operator Entry/System Response	Description
		<pre> \$psstring=0,0,0,0,0,0,0,0 Parameters are: Script File: stp5_1_1_3 #0: 0 #1: 0 #2: 0 #3: 0 #4: 0 #5: 0 #6: 0 #7: 0 Report file >/disks/galex/users/galex/tcs/uniscript/stp5_1_1_3/ stp5_1_1_3.rp1 successfully opened. Report file >/disks/galex/users/galex/tcs/uniscript/stp5_1_1_3/ stp5_1_1_3.rp2 successfully opened. Script file /disks/galex/users/galex/tcs/uniscript/stp5_1_1_3/st p5_1_1_3.tst successfully opened at level 0. "Sending two PORs. WAITING 1sec twice" "Sending LFDRSTP followed by WAIT for HK data" LFDRSTP gnxtser 0: NEXTSEQ=1 WAIT 0: HKV0=1; HKV1=0; wc=5 gnxtser 0: NEXTSEQ=2 WAIT 1: HKV1=0; wc=4 gnxtser 0: NEXTSEQ=3 WAIT 1: HKV1=0; wc=3 gnxtser 0: NEXTSEQ=4 </pre>	

Step	QA	Operator Entry/System Response	Description
		WAIT 1: HKV1=2; wc=2 "DIAG001B successfully detected after LFDRSTP" "Sending LFDRSTW followed by WAIT for HK data" LFDRSTW gnxtser 0: NEXTSEQ=5 WAIT 0: HKV0=5; HKV1=3; wc=5 gnxtser 0: NEXTSEQ=6 WAIT 1: HKV1=4; wc=4 gnxtser 0: NEXTSEQ=7 WAIT 1: HKV1=0; wc=3 gnxtser 0: NEXTSEQ=8 WAIT 1: HKV1=6; wc=2 "DIAG001C successfully detected after LFDRSTW" "Test 5_1_1_3 completed successfully"	

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_3.tst**, **stp5_1_1_3.rp1**, and **stp5_1_1_3.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  
kill cosnoopy  
perl ../UniScript.pl stp5_1_1_3 "0,0,0,0,0,0,0,0"  
cosnoopy&
```

Appendix B. Test Script stp5_1_1_3.tst

```
; *****  
; * DCE FSW Requirement 5.1.1.3 -- Commands to Re-boot DCE FSW *  
; *****  
; * Verify that appropriate diagnostic (DIAG001B) is produced after LFDRSTP Command *  
; * ----- *  
; * Verify that appropriate diagnostic (DIAG001C) is produced after LFDRSTW Command *  
; *****  
;  
SYM          DIAG001B=0x001B  
SYM          DIAG001C=0x001C  
SYM          NSEC          =5  
;  
ECHO         2  
;  
; *****  
; * 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  
;  
DTG          3,"(2) Sending LFDRSTP followed by WAIT for HK data"  
WTO          "Sending LFDRSTP followed by WAIT for HK data"  
LFDRSTP  
WAIT        NSEC,HK  
DIAG        1,ANY,DIAG001B  
DTG          3,"(3) DIAG001B successfully detected after LFDRSTP"  
WTO          "DIAG001B successfully detected after LFDRSTP"  
;  
DTG          3,"(4) Sending LFDRSTW followed by WAIT for HK data"  
WTO          "Sending LFDRSTW followed by WAIT for HK data"  
LFDRSTW  
WAIT        NSEC,HK  
DIAG        1,ANY,DIAG001C  
DTG          3,"(5) DIAG001C successfully detected after LFDRSTW"  
WTO          "DIAG001C successfully detected after LFDRSTW"  
DTG          3,"(6) Test 5_1_1_3 completed successfully"  
WTO          "Test 5_1_1_3 completed successfully"
```

Appendix C. Test Report stp5_1_1_3.rp1

```
55555 1 1 333
5 11 11 3 3
ssss tttt pppp 555 1 1 1 3 3
s t p p 5 1 1 1 3 3
sssss t pppp 5 1 1 1 3 3
s t p 5 5 1 1 3 3
ssss t p 555 111 111 333
```

Ver 01.09 Thu Nov 16 03:19:25 2000 "(1) Sending two PORs. WAITING 1sec twice"

Ver 01.09 Thu Nov 16 03:19:27 2000 "(2) Sending LFDRSTP followed by WAIT for HK data"

LFDRSTP

DIAG 1,ANY,DIAG001B
Found: DIAG001B == 27.

S U C C E S S

Ver 01.09 Thu Nov 16 03:19:30 2000 "(3) DIAG001B successfully detected after LFDRSTP"

Ver 01.09 Thu Nov 16 03:19:30 2000 "(4) Sending LFDRSTW followed by WAIT for HK data"

LFDRSTW

DIAG 1,ANY,DIAG001C
Found: DIAG001C == 28.

S U C C E S S

Ver 01.09 Thu Nov 16 03:19:33 2000 "(5) DIAG001C successfully detected after LFDRSTW"

Ver 01.09 Thu Nov 16 03:19:33 2000 "(6) Test 5_1_1_3 completed successfully"

Appendix D. Test Report stp5_1_1_3.rp2

```

333          55555          1          1
3          5          11          11          3
3          ssss ttttt pppp 555          1          1
3          s          t          p          p          5          1          1
3          sssss          t          pppp          5          1          1
3          s          t          p          5          5          1          1          3
3          ssss          t          p          555          111          111
333

```

Ver 01.09 Thu Nov 16 03:19:25 2000 "(1) Sending two PORs. WAITING 1sec twice"

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

80000000

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

80000000

Ver 01.09 Thu Nov 16 03:19:27 2000 "(2) Sending LFDRSTP followed by WAIT for HK data"

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

```

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 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
0446FFFC 04440003 04427F7F 04408080

```

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Ver 01.09 Thu Nov 16 03:19:30 2000 "(3) DIAG001B successfully detected after LFDRSTP"
Ver 01.09 Thu Nov 16 03:19:30 2000 "(4) Sending LFDRSTW followed by WAIT for HK data"

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 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
0446FFFA 04440005 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
0446FFF9 04440006 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
0446FFF8 04440007 04427F7F 04408080

Ver 01.09 Thu Nov 16 03:19:33 2000 "(5) DIAG001C successfully detected after LFDRSTW"
Ver 01.09 Thu Nov 16 03:19:33 2000 "(6) Test 5_1_1_3 completed successfully"