

**COS DCE BOOT FSW v1.09 Component Test Results  
Requirement 5.2.3.3a Counter for All Commands**

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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 5.2.3.3 — Counters for All Commands.

### 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 requirement is to “send all non-hazardous commands sequentially separated by 0.9 seconds each. Verify that Commands Received and Commands Executed counters agree, and are equal to the number of commands sent.”

This test requirement cannot be met literally as stated for the following reasons:

1. Not all “non-hazardous” commands are accepted/executed in Boot State.
2. The "reset" commands **LFDRSTP** and **LFDRSTW** demolish the ongoing packet counts since they reset FSW variables.
3. The **LFDJMPCS** command takes FSW out of Boot State, hence leaves FSW in no condition to report success of the test in Boot State.
4. The **LFDNOOP** command is counted as neither “received” nor "executed" per software design.

Consequently, the script issues only the commands summarized in the following Table 1-1. After each command, the variables LFDCMDR and LFDCMDX are compared for equality with the hard-coded correct number of commands issued.

**Table 1-1: Commands Issues by stp5\_2\_3\_3a**

COMMAND	ARGUMENTS	COMMENT
LFDCOPY	SOURCE =0xC000 DEST =0xC100 NBYTES =16 BANK =0	<b>SOURCE</b> and <b>DEST</b> are locations in 8051 “scratch” memory.
LFDCRC	SOURCE =0xC000 NBYTES =16 CODE =0	<b>SOURCE</b> is a location in 8051 “scratch” memory.
LFDDIAGC		
LFDDNLOD	SOURCE =0xC000 NBYTES =16	<b>SOURCE</b> is a location in 8051 “scratch” memory.
LFDGOTO	ISR23 =0x0023	Location of interrupt service routine.
LFDHKREQ		
LFDMADDR	0 = <b>index</b> SOURCE =0xC000	0=index in <b>LFDMONS/LFDMADD</b> . <b>SOURCE</b> is a location in 8051 “scratch”

COMMAND	ARGUMENTS	COMMENT
	DATA =0	memory. <b>DATA</b> =external RAM.
LFDUPLD	DEST =0xC100 NBYTES =16 0 = <b>CRC</b>	<b>DEST</b> is a location in 8051 “scratch” memory. The third argument suppresses CRC checking.
LFDWDOG	1 = <b>enable</b>	Enable watchdog interrupts.

## 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\_2\_3\_3ac.tst**

Parameter	Meaning	Correct Argument for Version 1.09
#0	Absolute hex storage address of 8051 “scratch” area	C000
#1	Absolute hex storage address of another “scratch” area	C100
#2	Absolute hex storage address of unused ISR	0023

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 1.4). Indicate specific configuration:

EGSE			DCE		
<b>taiyo</b>	<b>shorty</b>	<b>ginger</b>	<b>ETU</b>	<b>DCE #1</b>	<b>DCE #2</b>
	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
<b>\disks\galex\users\galex\tcs\uniscrpt\</b>	<b>UniScript.pl</b>	<b>UniScript</b> interpreter
<b>\disks\galex\users\galex\tcs\uniscrpt\stp5_2_3_3a\</b>	<b>u</b>	Shell script for this procedure
Ditto	<b>stp5_2_3_3a.tst</b>	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-03-0027	<i>DCE FSW Test Procedure 5.2.3.3a</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> <b>telnet shorty.ssl.berkely.edu</b>	Establish connection to shorty via Telnet client program
2		Login: <b>tcs</b> Password:	Using telnet window, login as user <b>tcs</b>

## 4.1.4 Set Current Directory

Step	QA	Operator Entry/System Response	Description
3		tcs@shorty% <b>cd ~galex/tcs</b> tcs@shorty% <b>pwd</b> /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% <b>slogin -l eagcos</b> <b>shorty.ssl.berkeley.edu</b> 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 <b>eagcos</b> ; get password from SSL personnel

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## 4.1.6 Set Current Directory

Step	QA	Operator Entry/System Response	Description
5		eagcos:shorty% <b>cd</b> /disks/galex/users/galex/tcs/uniscript/stp5_2_3_3 <b>a</b> eagcos:shorty% <b>pwd</b> /disks/galex/users/galex/tcs/uniscript/stp5_2_3_3a	Change current directory as shown

## 4.1.7 Ensure that Proper Files are Present

Step	QA	Operator Entry/System Response	Description
6		eagcos@shorty% <b>ls -l</b> Total 12 -rw-r--r-- 1 tcs eag 1398 Oct 8 18:03 stp5_2_3_3a.tst -rw-r--r-- 1 tcs eag 62 Oct 9 17:44 u	List files; the <b>.tst</b> file and the shell script <b>u</b> should be present

## 4.2 OPERATION EXECUTION

## 4.2.1 Establish Initial Test Conditions

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

## 4.2.2 Execute the Script

Step	QA	Operator Entry/System Response	Description
8		eagcos:taiyo% <b>sh u</b> \$pstring=C000,C100,0023,0,0,0,0 Parameters are: Script File: stp5_2_3_3a #0: C000 #1: C100 #2: 0023 #3: 0 #4: 0 #5: 0 #6: 0 #7: 0	Shell to <b>u</b> . You should see the accompanying output as <b>UniScript</b> executes

Step	QA	Operator Entry/System Response	Description
		<p>Report file</p> <p>&gt;/disks/galex/users/galex/tcs/uniscript/stp5_2_3_3a /stp5_2_3_3a.rp1 successfully opened.</p> <p>Report file</p> <p>&gt;/disks/galex/users/galex/tcs/uniscript/stp5_2_3_3a /stp5_2_3_3a.rp2 successfully opened.</p> <p>Script file</p> <p>/disks/galex/users/galex/tcs/uniscript/stp5_2_3_3a/s tp5_2_3_3a.tst successfully opened at level 0.</p> <p>"Press Y when ready to conduct test 5.2.3.3a" Y Continuing. "Sending POR, collecting initial HK"</p> <p>LFDNOOP</p> <p>WAIT 0: HKV0=1; HKV1=135; wc=5</p> <p>LFDNOOP</p> <p>"Sending LFDCOPY"</p> <p>LFDCOPY SOURCE,DEST,NBYTES,BANK</p> <p>WAIT 0: HKV0=3; HKV1=1; wc=5 WAIT 1: HKV1=2; wc=4 WAIT 1: HKV1=3; wc=3 "Sending LFMCR"</p> <p>LFDCRC SOURCE,NBYTES,CODE</p> <p>WAIT 0: HKV0=6; HKV1=4; wc=5</p>	

Step	QA	Operator Entry/System Response	Description
		WAIT 1: HKV1=5; wc=4 WAIT 1: HKV1=6; wc=3 "Sending LFDDIAGC"  LFDDIAGC  WAIT 0: HKV0=9; HKV1=7; wc=5 WAIT 1: HKV1=8; wc=4 WAIT 1: HKV1=9; wc=3 "Sending LFDDNLOD"  LFDDNLOD SOURCE,NBYTES  WAIT 0: HKV0=12; HKV1=11; wc=5 WAIT 1: HKV1=11; wc=4 WAIT 1: HKV1=12; wc=3 "Sending LFDGOTO"  LFDGOTO ISR23  WAIT 0: HKV0=15; HKV1=13; wc=5 WAIT 1: HKV1=14; wc=4 WAIT 1: HKV1=15; wc=3 "Sending LFDHKREQ"  LFDHKREQ  WAIT 0: HKV0=18; HKV1=16; wc=5 WAIT 1: HKV1=17; wc=4 WAIT 1: HKV1=18; wc=3 "Sending LFDMADDR"  LFDMADDR 0,SOURCE,DATA  WAIT 0: HKV0=21; HKV1=19; wc=5 WAIT 1: HKV1=20; wc=4 WAIT 1: HKV1=21; wc=3 "Sending LFDUPL0D"	

Step	QA	Operator Entry/System Response	Description
		<p>LFDUPLD DEST,NBYTES,0</p> <p>WAIT 0: HKV0=24; HKV1=22; wc=5</p> <p>WAIT 1: HKV1=23; wc=4</p> <p>WAIT 1: HKV1=24; wc=3</p> <p>"Sending LFDWDOG"</p> <p>LFDWDOG 1</p> <p>WAIT 0: HKV0=27; HKV1=25; wc=5</p> <p>WAIT 1: HKV1=26; wc=4</p> <p>WAIT 1: HKV1=27; wc=3</p> <p>WAIT 0: HKV0=27; HKV1=28; wc=5</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\_2\_3\_3a.tst**, **stp5\_2\_3\_3a.rp1**, and **stp5\_2\_3\_3a.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_2_3_3a "C000,C100,0023,0,0,0,0,0"  
cosnoopy&
```

Appendix B. Test Script stp5\_2\_3\_3a.tst

```

; *****
; *****
; **
; ** BBBB   OOO   OOO   TTTT   OOO   N   N   L   Y   Y   **
; ** B   B   O   O   O   O   T   O   O   N   N   L   Y   Y   **
; ** B   B   O   O   O   O   T   O   O   NN  N   L   Y   Y   **
; ** BBBB   O   O   O   O   T   O   O   N   N   L   Y   **
; ** B   B   O   O   O   O   T   O   O   N   NN  L   Y   **
; ** B   B   O   O   O   O   T   O   O   N   N   L   Y   **
; ** BBBB   OOO   OOO   T   OOO   N   N   LLLLL   Y   **
; **
; *****
; *****
; *****
; * STP 5.2.3.3a
; * -----
; * Send all non-hazardous commands sequentially separated by 0.9 seconds each.
; * Verify that Commands Received and Commands Executed counters agree, and are
; * equal to the number of commands sent.
; * -----
; * NOTE: This test requirement cannot be met literally as stated for the follow-
; * ing reasons:
; *
; * 1. Not all commands are accepted/executed in Boot State
; *
; * 2. The "reset" commands LFDRSTP and LFDRSTW demolish the ongoing packet counts
; * since they reset FSW variables.
; *
; * 3. The LFDJMPCS command takes FSW out of Boot State, hence leaves FSW in no
; * condition to report success of the test in Boot State.
; *
; * 4. The LFDNOOP command is not counted as "executed" per software design.
; * -----
; * Parameters:
; * #0 SOURCE ("scratch area")
; * #1 DEST   ("scratch area + 256")
; * #2 ISR23  (address of LFDNOOP command routine)
; *****
;
SYM   SOURCE =0x#0
SYM   DEST   =0x#1
SYM   ISR23  =0x#2
SYM   NBYTES =16
SYM   CODE   =0
SYM   ID     =0
SYM   SETTING =0
SYM   BANK   =0
SYM   RATE   =0
SYM   SEGMENT =0
SYM   DIR    =0
SYM   POWER  =0
SYM   STATE  =0
SYM   HIVOLT =0
SYM   LIMIT  =0
SYM   VOLTAGE =0
SYM   ACTUATOR=0
SYM   ABORT  =0
SYM   OVERRIDE=0
SYM   DOOR   =0
SYM   MOVE   =0
SYM   BANK   =0
SYM   DATA  =0
SYM   DELTA  =90
SYM   NSEC   =5
SYM   DIAG0031=0x0031
;
;LFDNOOP

```



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```
;LFDRSTP
;LFDRSTW
;
; *****
; * Wait until setup (if any) is complete *
; *****
;
WTOR          "Press Y when ready to conduct test 5.2.3.3a"
;
; *****
; * Force Boot State *
; *****
;
DTG           3,"(0) Sending POR, collecting initial HK"
WTO           "Sending POR, collecting initial HK"
POR
DELAY         DELTA
LFDNOOP
WAIT         NSEC,HK
LOG          1,LFCTIME,LFDCMDX,LFDCMDR
LFDNOOP
;
DELAY         DELTA
DTG           3,"(1) Sending LFDCOPY"
WTO           "Sending LFDCOPY"
LFDCOPY      SOURCE,DEST,NBYTES,BANK
WAIT         NSEC,HK
LOG          1,LFDCMDR,LFDCMDX
CHECK        1,($LFDCMDX == $LFDCMDR)
CHECK        1,($LFDCMDX == 1)
;
DELAY         DELTA
DTG           3,"(2) Sending LFDCRC"
WTO           "Sending LFDCRC"
LFDCRC      SOURCE,NBYTES,CODE
WAIT         NSEC,HK
LOG          1,LFDCMDR,LFDCMDX
CHECK        1,($LFDCMDX == $LFDCMDR)
CHECK        1,($LFDCMDX == 2)
;
DELAY         DELTA
DTG           3,"(3) Sending LFDDIAGC"
WTO           "Sending LFDDIAGC"
LFDDIAGC
WAIT         NSEC,HK
LOG          1,LFDCMDR,LFDCMDX
CHECK        1,($LFDCMDX == $LFDCMDR)
CHECK        1,($LFDCMDX == 3)
;
DELAY         DELTA
DTG           3,"(4) Sending LFDDNLOD"
WTO           "Sending LFDDNLOD"
LFDDNLOD    SOURCE,NBYTES
WAIT         NSEC,HK
LOG          1,LFDCMDR,LFDCMDX
CHECK        1,($LFDCMDX == $LFDCMDR)
CHECK        1,($LFDCMDX == 4)
;
DELAY         DELTA
DTG           3,"(5) Sending LFDGOTO"
WTO           "Sending LFDGOTO"
LFDGOTO     ISR23
WAIT         NSEC,HK
LOG          1,LFDCMDR,LFDCMDX
DIAG        1,ANY,DIAG0031
CHECK        1,($LFDCMDX == $LFDCMDR)
CHECK        1,($LFDCMDX == 5)
;
DELAY         DELTA
DTG           3,"(6) Sending LFDHKREQ"
```

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```
WTO          "Sending LFDHKREQ"
LFDHKREQ
WAIT         NSEC,HK
LOG          1,LFDCMDR,LFDCMDX
CHECK        1,($LFDCMDX == $LFDCMDR)
CHECK        1,($LFDCMDX == 6)
;
DELAY        DELTA
DTG          3,"(7) Sending LFDMADDR"
WTO          "Sending LFDMADDR"
LFDMADDR     0,SOURCE,DATA
WAIT         NSEC,HK
LOG          1,LFDCMDR,LFDCMDX
CHECK        1,($LFDCMDX == $LFDCMDR)
CHECK        1,($LFDCMDX == 7)
;
DELAY        DELTA
DTG          3,"(8) Sending LFDUPLD"
WTO          "Sending LFDUPLD"
LFDUPLD     DEST,NBYTES,0
WAIT         NSEC,HK
LOG          1,LFDCMDR,LFDCMDX
CHECK        1,($LFDCMDX == $LFDCMDR)
CHECK        1,($LFDCMDX == 8)
;
DELAY        DELTA
DTG          3,"(9) Sending LFDWDOG"
WTO          "Sending LFDWDOG"
LFDWDOG     1
WAIT         NSEC,HK
LOG          1,LFDCMDR,LFDCMDX
CHECK        1,($LFDCMDX == $LFDCMDR)
CHECK        1,($LFDCMDX == 9)
;
;DELAY        DELTA
;DTG          3,"(10) Sending LFDJMPCS"
;WTO          "Sending LFDJMPCS"
;LFDJMPCS    0
;-----
;LRGBWK      SETTING,SEGMENT,0
;LFGWK       SETTING,SEGMENT,0
;LFGLOT      SETTING,SEGMENT
;LFGSHFT     SETTING,SEGMENT,0
;LFGSTIM     RATE,SEGMENT
;LFGSTR      SETTING,SEGMENT,0
;LFGTT       SETTING,SEGMENT,DIR
;LFGUQT      SETTING,SEGMENT
;LFHQPWR     0
;LFHRAMPT    RATE
;LFHSTATE    STATE
;LFHVENA     HIVOLT
;LFHVILIM    LIMIT
;LFHVLOW     VOLTAGE,SEGMENT
;LFHVMAX     VOLTAGE,SEGMENT
;LFHVNOM     VOLTAGE,SEGMENT
;LFHVPWR     POWER
;LFHVSET     VOLTAGE,0
;LFPGRP      INTERVAL,SEGMENT,COUNT
;LFRACT1     POWER
;LFRACT2     POWER
;LFRACTEN    ACTUATOR
;LFRACTRS    0
;LFRAXPWR    POWER
;LFRILIM     LIMIT
;LFRSOVD     OVERRIDE
;LFRMDIR     DIR
;LFRMENA     DOOR
;LFRMPWR     MOVE
;
WAIT         NSEC,HK
```

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---

```
LOG          1,LFCTIME,LFDCMDX,LFDCMDR
CHECK        1,(( $LFDCMDR==$LFDCMDX) && ($LFDCMDX==9))
;
DTG          1, "(10) Test stp5.2.3.3a completed successfully"
```

Appendix C. Test Report stp5\_2\_3\_3a.rp1

```

                    55555      222      333      333
                    5        2  2      3  3      3  3
          ssss  ttttt  pppp  555      2      3      3
aaa
          s      t  p  p    5        2      3      3
a  a
          sssss  t    pppp   5        2      3      3
aaaaa
          s      t  p    5  5      2      3  3      3  3
a  a
          ssss   t    p    555  _____ 22222  _____ 333  _____ 333
a  a
    
```

Ver 01.09 Fri Dec 1 00:52:52 2000 "(0) Sending POR, collecting initial HK"

LFDNOOP

Addr	Addr	HK-Name	Value
1680-1683	LFCTIME		00000149
170C-170D	LFDCMDX		0001
1718-1719	LFDCMDR		0001

LFDNOOP

Ver 01.09 Fri Dec 1 00:52:54 2000 "(1) Sending LFDCCOPY"

LFDCCOPY SOURCE,DEST,NBYTES,BANK

Addr	Addr	HK-Name	Value
1718-1719	LFDCMDR		0001
170C-170D	LFDCMDX		0001

CHECK: (\$LFDCMDX == \$LFDCMDR)  
 eval: (0001 == 0001)

S U C C E S S

CHECK: (\$LFDCMDX == 1)  
 eval: (0001 == 1)

S U C C E S S

Ver 01.09 Fri Dec 1 00:52:57 2000 "(2) Sending LFDRCR"

LFDRCR SOURCE,NBYTES, CODE

Addr	Addr	HK-Name	Value
1718-1719	LFDCMDR		0002
170C-170D	LFDCMDX		0002

CHECK: (\$LFDCMDX == \$LFDCMDR)  
 eval: (0002 == 0002)

S U C C E S S

CHECK: (\$LFDCMDX == 2)  
 eval: (0002 == 2)

S U C C E S S

Ver 01.09 Fri Dec 1 00:53:01 2000 "(3) Sending LFDIAGC"

LFDIAGC

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```

Addr Addr HK-Name      Value
-----
1718-1719 LFDCCMDR      0003
170C-170D LFDCCMDX      0003
    
```

```

CHECK: ($LFDCCMDX == $LFDCCMDR)
eval:  (0003 == 0003)
    
```

S U C C E S S

```

CHECK: ($LFDCCMDX == 3)
eval:  (0003 == 3)
    
```

S U C C E S S

Ver 01.09 Fri Dec 1 00:53:04 2000 "(4) Sending LFDNLOD"

LFDNLOD SOURCE,NBYTES

```

Addr Addr HK-Name      Value
-----
1718-1719 LFDCCMDR      0004
170C-170D LFDCCMDX      0004
    
```

```

CHECK: ($LFDCCMDX == $LFDCCMDR)
eval:  (0004 == 0004)
    
```

S U C C E S S

```

CHECK: ($LFDCCMDX == 4)
eval:  (0004 == 4)
    
```

S U C C E S S

Ver 01.09 Fri Dec 1 00:53:07 2000 "(5) Sending LFDGOTO"

LFDGOTO ISR23

```

Addr Addr HK-Name      Value
-----
1718-1719 LFDCCMDR      0005
170C-170D LFDCCMDX      0005
    
```

```

DIAG          1,ANY,DIAG0031
Found: DIAG0031 == 49.
    
```

S U C C E S S

```

CHECK: ($LFDCCMDX == $LFDCCMDR)
eval:  (0005 == 0005)
    
```

S U C C E S S

```

CHECK: ($LFDCCMDX == 5)
eval:  (0005 == 5)
    
```

S U C C E S S

Ver 01.09 Fri Dec 1 00:53:10 2000 "(6) Sending LFDHKREQ"

LFDHKREQ

```

Addr Addr HK-Name      Value
-----
1718-1719 LFDCCMDR      0006
170C-170D LFDCCMDX      0006
    
```

```

CHECK: ($LFDCCMDX == $LFDCCMDR)
eval:  (0006 == 0006)
    
```

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---

S U C C E S S

CHECK: (\$LFDCMDX == 6)  
eval: (0006 == 6)

S U C C E S S

Ver 01.09 Fri Dec 1 00:53:13 2000 "(7) Sending LFDMAADR"

LFDMAADR 0,SOURCE,DATA

Addr	Addr	HK-Name	Value
1718-1719	LFDCMDR		0007
170C-170D	LFDCMDX		0007

CHECK: (\$LFDCMDX == \$LFDCMDR)  
eval: (0007 == 0007)

S U C C E S S

CHECK: (\$LFDCMDX == 7)  
eval: (0007 == 7)

S U C C E S S

Ver 01.09 Fri Dec 1 00:53:16 2000 "(8) Sending LFDUPLD"

LFDUPLD DEST,NBYTES,0

Addr	Addr	HK-Name	Value
1718-1719	LFDCMDR		0008
170C-170D	LFDCMDX		0008

CHECK: (\$LFDCMDX == \$LFDCMDR)  
eval: (0008 == 0008)

S U C C E S S

CHECK: (\$LFDCMDX == 8)  
eval: (0008 == 8)

S U C C E S S

Ver 01.09 Fri Dec 1 00:53:20 2000 "(9) Sending LFDWDOG"

LFDWDOG 1

Addr	Addr	HK-Name	Value
1718-1719	LFDCMDR		0009
170C-170D	LFDCMDX		0009

CHECK: (\$LFDCMDX == \$LFDCMDR)  
eval: (0009 == 0009)

S U C C E S S

CHECK: (\$LFDCMDX == 9)  
eval: (0009 == 9)

S U C C E S S

Addr	Addr	HK-Name	Value
1680-1683	LFCTIME		0000001C
170C-170D	LFDCMDX		0009
1718-1719	LFDCMDR		0009

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---

```
CHECK: (($LFDCMDR==$LFDCMDX) && ($LFDCMDX==9))  
eval: ((0009==0009) && (0009==9))
```

S U C C E S S

Ver 01.09 Fri Dec 1 00:53:22 2000 "(10) Test stp5.2.3.3a completed successfully"

### Appendix D. Test Report stp5\_2\_3\_3a.rp2

				55555		222		333		333
				5		2	2	3	3	3
aaa		ssss	ttttt	pppp	555		2		3	3
							2		3	3
a a		s	t	p p	5		2		3	3
aaaaa		sssss	t	pppp	5		2		3	3
a a		s	t	p	5 5		2		3 3	3 3
a a		ssss	t	p	555	_____	22222	_____	333	_____ 333

  

Ver 01.09	Fri Dec	1 00:52:52	2000	"(0) Sending POR, collecting initial HK"
Ver 01.09	Fri Dec	1 00:52:54	2000	"(1) Sending LFDCCOPY"
Ver 01.09	Fri Dec	1 00:52:57	2000	"(2) Sending LFDRCR"
Ver 01.09	Fri Dec	1 00:53:01	2000	"(3) Sending LFDIAGC"
Ver 01.09	Fri Dec	1 00:53:04	2000	"(4) Sending LFDNLOD"
Ver 01.09	Fri Dec	1 00:53:07	2000	"(5) Sending LFDGOTO"
Ver 01.09	Fri Dec	1 00:53:10	2000	"(6) Sending LFDHKREQ"
Ver 01.09	Fri Dec	1 00:53:13	2000	"(7) Sending LFDMADDR"
Ver 01.09	Fri Dec	1 00:53:16	2000	"(8) Sending LFDUPLD"
Ver 01.09	Fri Dec	1 00:53:20	2000	"(9) Sending LFDWDOG"