COS DCE BOOT FSW v1.13 Component Test Results
Requirement 5.2.3.3a Counters for All Commands

Date:	February 13, 2001
Document Number:	COS-03-0059
Revision:	Initial Release
Contract No.:	NAS5-98043
CDRL No.:	N/A

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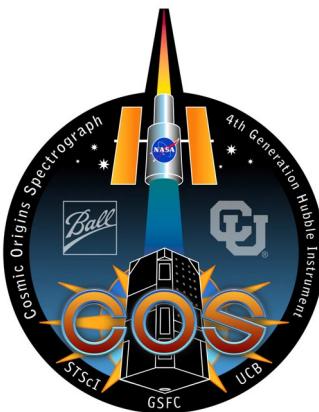
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REVISIONS						
Letter	ECO No.	Description		Check	Approved	Date
-		Initial Release				

Original Release			**THE UNIVERSITY OF COLORADO**			
Name		Date	At Boulder			
Drawn: K. Brownsberger		2-13-01	**The Center for Astrophysics and Space Astronomy**			
Reviewed:						
Approved:			COS DCE BOOT FSW v1.13 Component Test Results			
			Requirement 5.2.3.3a Counters for All Commands			

Size	Code Indent No.	Document No.	Rev
A		COS-03-0059	**-**
Scale: N/A			

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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	**SOURCE** and **DEST** are locations in 8051 "scratch" memory.
LFDCRC	SOURCE =0xC000 NBYTES =16 CODE =0	**SOURCE** is a location in 8051 "scratch" memory.
LFDDIAGC		
LFDDNLOD	SOURCE =0xC000 NBYTES =16	**SOURCE** is a location in 8051 "scratch" memory.
LFDGOTO	ISR23 =0x0023	Location of interrupt service routine.
LFDHKREQ		
LFDMADDR	0 =**index** SOURCE =0xC000	0=index in **LFDMONS/LFDMADD**. **SOURCE** is a location in 8051 "scratch"

COMMAND	ARGUMENTS		COMMENT
	DATA	=0	memory. **DATA**=external RAM.
LFDUPLOD	DEST	=0xC100	**DEST** is a location in 8051 "scratch"
	NBYTES	=16	memory. The third argument suppresses
	0	=**CRC**	CRC checking.
LFDWDOG	1	=**enable**	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 1.13
#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**

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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\uniscript	**UniScript.pl**	**UniScript** interpreter
\disks\galex\users\galex\tcs\uniscript\stp5_2_3_3a	**u**	Shell script for this procedure
Ditto	**stp5_2_3_3a.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)	*NASA Basic Safety Manual*
2	COS-03-0059	*DCE FSW Test Procedure 5.2.3.3a* (this document)
3	UCB-COS-008	*COS FUV Detector Software Test Plan*
4	UCB-COS-DOC-1118	*COS EGSE Startup Procedure*

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		tcs@shorty% **slogin –l eagcos shorty.ssl.berkeley.edu** eagcos@shorty.ssl.berkeley.edu's password: *(get from SSL personnel)* 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_2_3_3 a** eagcos:shorty% **pwd** /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% **ls –l** 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 **.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		eagcos:shorty% **set path=($path ~dbb/scripts/bin)**	Set path as shown to enable access to hks tools

4.2.2   Execute the Script

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

Step	QA	Operator Entry/System Response	Description
		#7: 0 Report file >/disks/galex/users/galex/tcs/ver_1_13/stp5_2_3_3 a/stp5_2_3_3a.rp1 successfully opened. Report file >/disks/galex/users/galex/tcs/ver_1_13/stp5_2_3_3 a/stp5_2_3_3a.rp2 successfully opened. Script file /disks/galex/users/galex/tcs/ver_1_13/stp5_2_3_3a/ stp5_2_3_3a.tst successfully opened at level 0. "Press Y when ready to conduct test 5.2.3.3a" y Continuing. "Sending POR, collecting initial HK" LFDNOOP WAIT 0: HKV0=1; HKV1=197; wc=5 LFDNOOP "Sending LFDCOPY" LFDCOPY SOURCE,DEST,NBYTES,BANK WAIT 0: HKV0=3; HKV1=1; wc=5 WAIT 1: HKV1=2; wc=4 WAIT 1: HKV1=3; wc=3 "Sending LFMCRC" LFDCRC SOURCE,NBYTES,CODE	

Step	QA	Operator Entry/System Response	Description
		WAIT 0: HKV0=6; HKV1=4; wc=5 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 LFDUPLOD"	

Step	QA	Operator Entry/System Response	Description
		LFDUPLOD DEST,NBYTES,0 WAIT 0: HKV0=24; HKV1=22; wc=5 WAIT 1: HKV1=23; wc=4 WAIT 1: HKV1=24; wc=3 "Sending LFDWDOG" LFDWDOG 1 WAIT 0: HKV0=27; HKV1=25; wc=5 WAIT 1: HKV1=26; wc=4 WAIT 1: HKV1=27; wc=3 WAIT 0: HKV0=27; HKV1=28; wc=5 eagcos:shorty%	

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.

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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   TTTTT        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 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
```

```
            ;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 LFMCRC"
            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 LFDUPLOD"
WTO            "Sending LFDUPLOD"
LFDUPLOD       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
; -------------------------------------------------------------------------
;LFGBWK         SETTING,SEGMENT,0
;LFGEWK         SETTING,SEGMENT,0
;LFGLQT         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
;LFPCRP         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
```

```
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 01.13  Wed Jan 17 17:10:36 2001    "(0) Sending POR, collecting initial HK"

LFDNOOP

Addr Addr HK-Name         Value
---- ---- -------------- -----
1680-1683 LFCTIME        000001DE
170C-170D LFDCMDX        0000
1718-1719 LFDCMDR        0000

LFDNOOP

Ver 01.13  Wed Jan 17 17:10:38 2001    "(1) Sending LFDCOPY"

LFDCOPY        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 01.13  Wed Jan 17 17:10:42 2001    "(2) Sending LFDCRC"

LFDCRC         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 01.13  Wed Jan 17 17:10:45 2001    "(3) Sending LFDDIAGC"

LFDDIAGC
```

```
Addr Addr HK-Name        Value
---- ---- -------------- -----
1718-1719 LFDCMDR        0003
170C-170D LFDCMDX        0003

CHECK:   ($LFDCMDX == $LFDCMDR)
eval:    (0003 == 0003)

S U C C E S S

CHECK:   ($LFDCMDX == 3)
eval:    (0003 == 3)

S U C C E S S

Ver 01.13  Wed Jan 17 17:10:49 2001    "(4) Sending LFDDNLOD"

LFDDNLOD      SOURCE,NBYTES

Addr Addr HK-Name        Value
---- ---- -------------- -----
1718-1719 LFDCMDR        0004
170C-170D LFDCMDX        0004

CHECK:   ($LFDCMDX == $LFDCMDR)
eval:    (0004 == 0004)

S U C C E S S

CHECK:   ($LFDCMDX == 4)
eval:    (0004 == 4)

S U C C E S S

Ver 01.13  Wed Jan 17 17:10:53 2001    "(5) Sending LFDGOTO"

LFDGOTO       ISR23

Addr Addr HK-Name        Value
---- ---- -------------- -----
1718-1719 LFDCMDR        0005
170C-170D LFDCMDX        0005

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

S U C C E S S

CHECK:   ($LFDCMDX == $LFDCMDR)
eval:    (0005 == 0005)

S U C C E S S

CHECK:   ($LFDCMDX == 5)
eval:    (0005 == 5)

S U C C E S S

Ver 01.13  Wed Jan 17 17:10:56 2001    "(6) Sending LFDHKREQ"

LFDHKREQ

Addr Addr HK-Name        Value
---- ---- -------------- -----
1718-1719 LFDCMDR        0006
170C-170D LFDCMDX        0006

CHECK:   ($LFDCMDX == $LFDCMDR)
eval:    (0006 == 0006)
```

```
S U C C E S S

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

S U C C E S S

Ver 01.13  Wed Jan 17 17:11:00 2001    "(7) Sending LFDMADDR"

LFDMADDR      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 01.13  Wed Jan 17 17:11:04 2001    "(8) Sending LFDUPLOD"

LFDUPLOD      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 01.13  Wed Jan 17 17:11:07 2001    "(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        00000020
170C-170D LFDCMDX        0009
1718-1719 LFDCMDR        0009
```

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

S U C C E S S

Ver 01.13  Wed Jan 17 17:11:10 2001    "(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   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 01.13  Wed Jan 17 17:10:36 2001    "(0) Sending POR, collecting initial HK"

Ver 01.13  Wed Jan 17 17:10:38 2001    "(1) Sending LFDCOPY"

Ver 01.13  Wed Jan 17 17:10:42 2001    "(2) Sending LFDCRC"

Ver 01.13  Wed Jan 17 17:10:45 2001    "(3) Sending LFDDIAGC"

Ver 01.13  Wed Jan 17 17:10:49 2001    "(4) Sending LFDDNLOD"

Ver 01.13  Wed Jan 17 17:10:53 2001    "(5) Sending LFDGOTO"

Ver 01.13  Wed Jan 17 17:10:56 2001    "(6) Sending LFDHKREQ"

Ver 01.13  Wed Jan 17 17:11:00 2001    "(7) Sending LFDMADDR"

Ver 01.13  Wed Jan 17 17:11:04 2001    "(8) Sending LFDUPLOD"

Ver 01.13  Wed Jan 17 17:11:07 2001    "(9) Sending LFDWDOG"
```