COMMAND PROCESSING CONFIDENCE TEST - EOC2

Background Information:

Planning and scheduling activities produce the detailed activity schedule that is used for command generation. An integrated schedule of activities for instruments and spacecraft subsystems is produced, and the ground scripts and command loads necessary to implement the scheduled activities are generated. FOS collects and validates the commands, software memory loads, table loads and instrument memory loads necessary to implement the instrument and spacecraft scheduled activities.

The command data is transmitted to EDOS for uplink to the spacecraft during each real-time contact. Command requests can be received from the ISTs in real-time by the operational staff or as preplanned command groups generated by the Command Management Service. Command execution on-board the spacecraft is verified via returned telemetry.

FOS maintains the current spacecraft memory image and performs memory dump compare operations, as requested.

Exhibit EOC2-1 illustrates the paths and associated rates for uplink from EOC to the EOS AM-1 spacecraft [based on ref 16 page 2000-3]. The three path rates from TDRS to EOS AM-1 will be verified in this test, the emergency path via GN/WOTS will be verified in test EGS2.

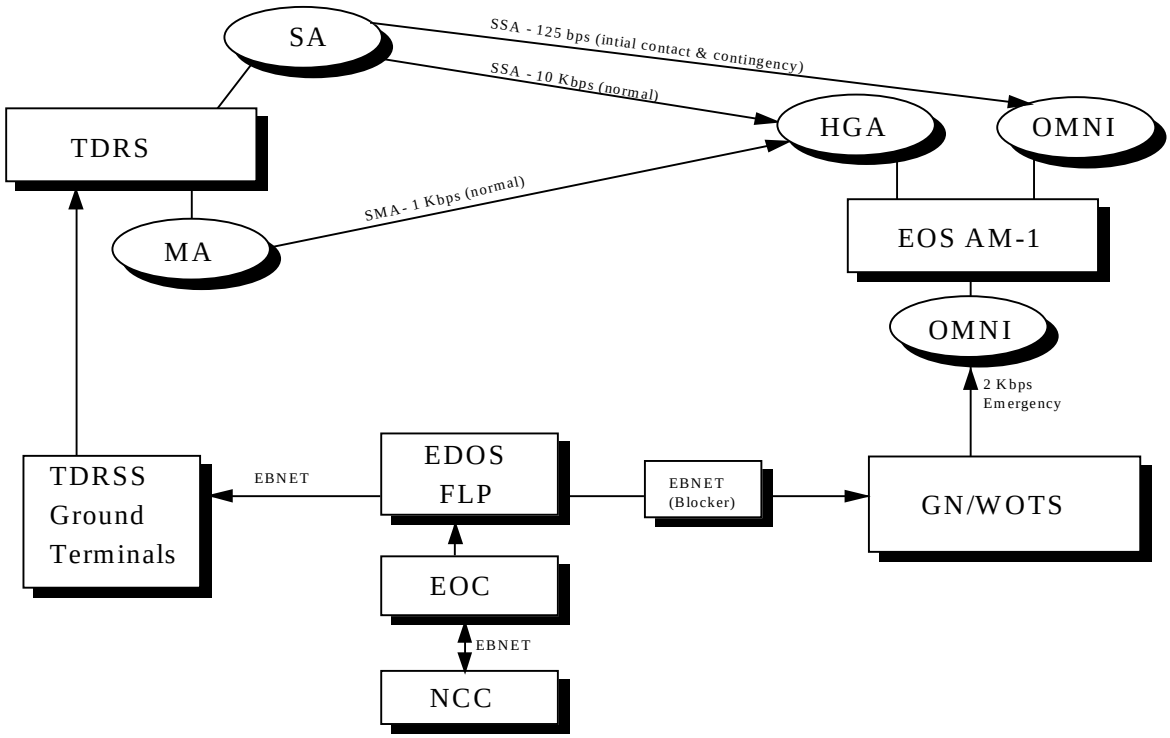

EXHIBIT EOC2-1: AM-1 Uplink Paths

Test Objectives:

The command processing confidence test will:

- perform real-time commanding and load uplinks at all rates and formats to the prime and back-up Command and Telemetry Interface Units(CTIU)
- verify proper implementation of CCSDS commanding protocols, and inhibition of critical and hazardous commanding
- verify ability to conduct Onboard Computer (OBC) load, dump, and compare sequences.

Test Configuration:

Exhibit EOC2-2 illustrates the Command Processing Test configuration with the ETS MPS being used to simulate EDOS and the spacecraft. The initial execution of EOC2 will utilize the simulator located at GSFC building 32. Exhibit EOC2-3 illustrates the next test configuration when EDOS is available. The ETS MPS will be used to simulate the spacecraft.

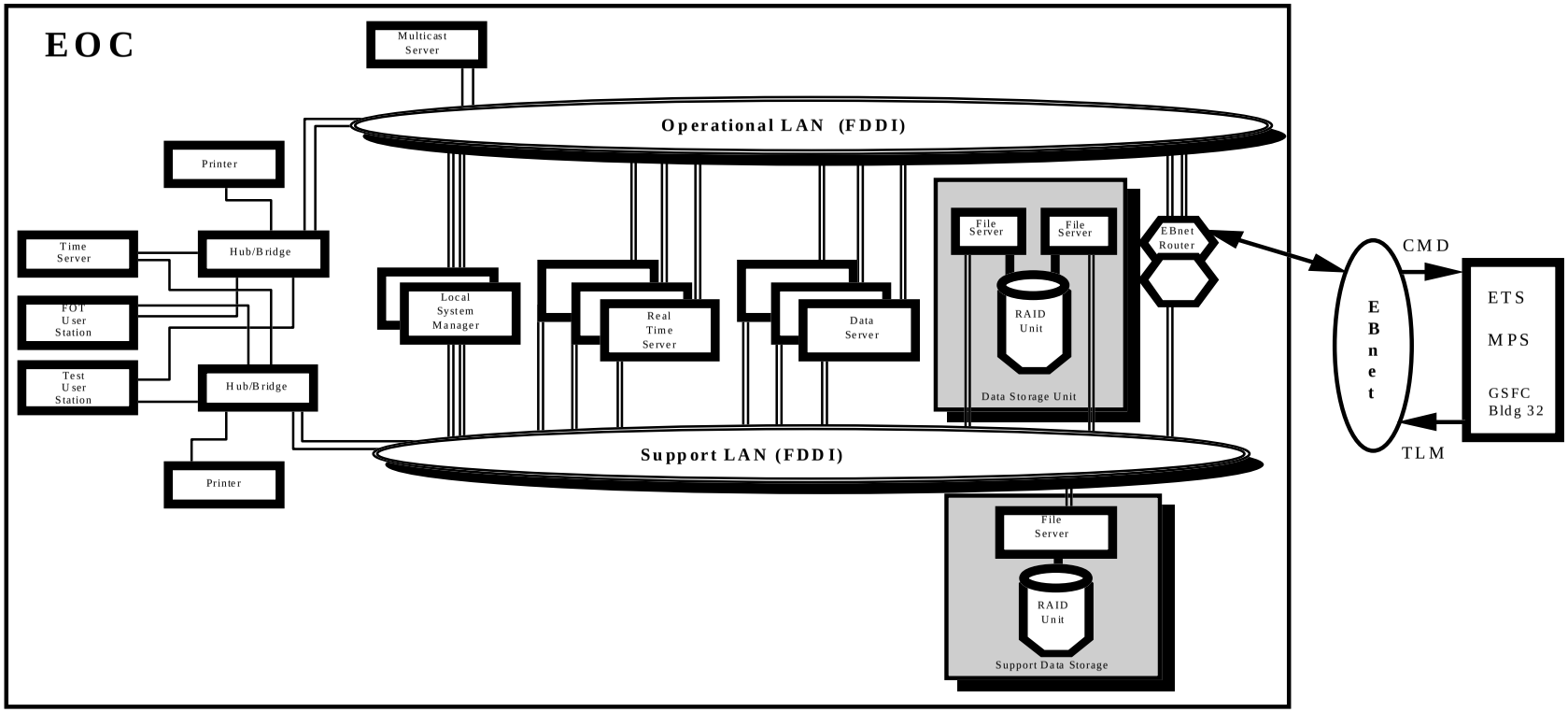

EXHIBIT EOC2-2: AM-1 Command Processing Confidence Test Configuration (ETS)

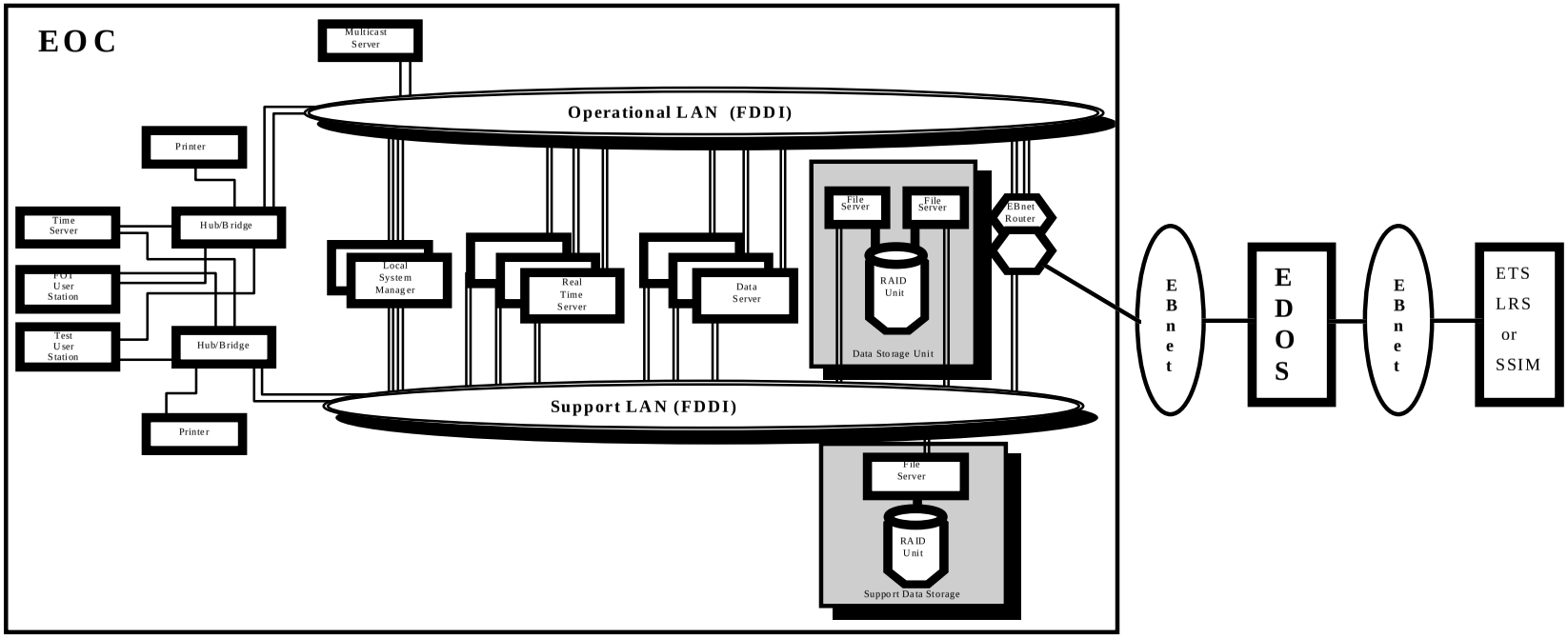

EXHIBIT EOC2-3: AM-1 Command Processing Confidence Test Configuration (EDOS)

Participants and Support Requirements:

Participants:

EDOS LZPF M&O
I&T Test Conductor
ETS MPS Operator

Communications:

1. Voice:
   Telephone
   NASCOM SCAMA -
   CCL Circuits -

2. Data:
   EBnet
   NSI

Equipment and Software:

Hardware:

Real-Time Server
Data Server
Data Storage Unit
Command Activity Controller w/s
Ground Controller w/s

Software:

PAS
CMD
CMS
DMS
UIS
RCM
RMS

Test Tools:

ETS - MPS

Test Data:

Description/Characteristics	Source	File/Script Name & Location
Proc with 5 commands (See Exhibit 2-4)	SI&T pretest generation	EOC23_5CMDS

EXHIBIT EOC2-4: Commands for EOC23_5CMDS PROCs

CMD_MNEM	CMD_PID	CMD_TYPE	RT_NAME	*
EOC23_5CMDS				
CDH_GET_CT1_TBL_CRC CRC_VALUE=0 SEGMENT_OFFSET=4294967295 TABLE_ID=65536 WORD_COUNT=4294967295	2407	ERT Serial	CTIU1	8VS
MIS_SET_SAFE_MODE	2135	ERT Serial	MISR (sub_add - SAFE MODE COMMAND)	1FH
FSW_INITIATE_ATCSCC1 LOAD_DESCR_HIGH=0000000065535 LOAD_DESCR_LOW=0000000000000 START_HIGH=0000000065535 START_LOW=0000000000000 WORD_COUNT_HIGH=0000000065535 WORD_COUNT_LOW=0000000000000 CRC_HIGH=0000000065535 CRC_LOW=0000000000000	99999	ERT Load Init	SCC1 (sub_add - Memory Load)	8VS
GNC_SET_POSSENSA XM_SENSOR=15.0 ???????????	2802	BDU Serial CMD	GN&C BDU	2FS
TCS_DISABLE_REAV01HB	41	BDU Relay Pulse	PROP BDU	1FS

*last column is: word_cnt, word_type, safety_level

Test Case Descriptions:

There are three test cases; one for each SN transmission rate (i.e. 125 bps, 1 Kbps, and 10 Kbps). The three test cases are designed along similar scenarios (ECL commands, ECL procedures, Ground Script execution), but the elements are incorporated in differing ways in each test case (varying commands, instruments, size and type of load data, etc). Each test case scenario employs a selection of the commanding types illustrated in Exhibit EOC2-4 [based on ref 13, page 3-57]. For Release A only test case 2.3 will be executed.

Test EOC2 performs each type of commanding, as well as, each data rate and uplink path (exhibit EOC2-1), except for the emergency path via GN/WOTS, at 2 Kbps, which will be verified in test EGS2.

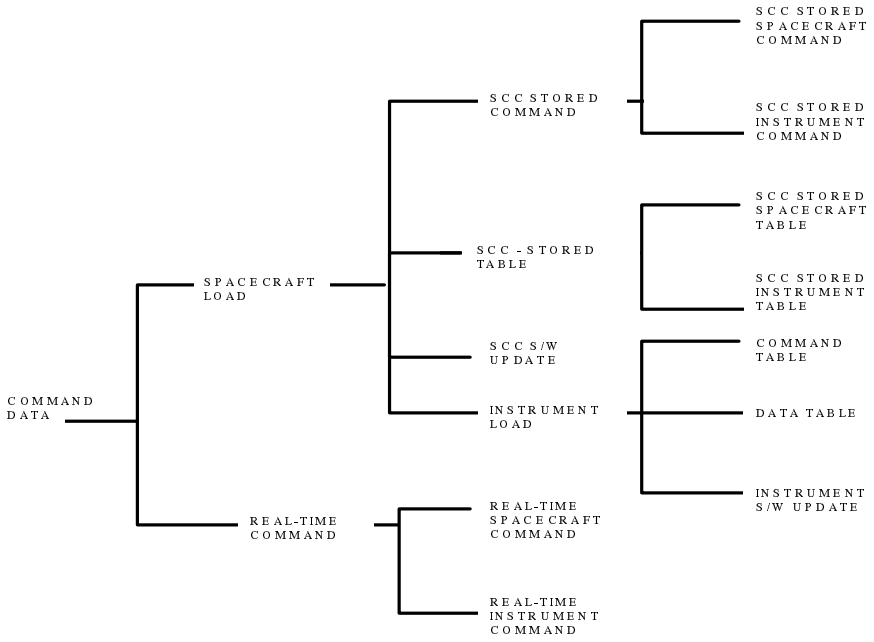

EXHIBIT EOC2-6: Command Data Set Composition

EOC2.3 - 10 Kbps SSA Uplink

This test case incorporates the following features:

- Spacecraft and instrument commanding via SSA at 10 Kbps.
- The Command Activity Controller (CAC) enters real-time commands in the form of ECL directives. Included in the commands are valid, invalid and critical commands.
- The CAC executes ground scripts. Included in the ground scripts are critical commands, command table loads, data table loads, and software updates.
- Transmit SCC-Stored instrument and spacecraft commands and tables.
- Transmit absolute time commands and relative time commands.
- Transmit a combination of spacecraft bus and instrument commands to AM-1 instruments.
- Use spacecraft load commands to verify SCC Software Updates and Instrument Loads (Command Table, Data Table, and Instrument S/W Updates). A memory dump of the "load area" is requested and compared to the master ground image
- The CAC examines the returned CLCWs to verify command receipt on the spacecraft.
- Proper transmission, processing, and execution of the commands is verified.

<u>Verified Requirements:</u>
EOC-3238#A
EOC-4005#A
EOC-4008#A
EOC-4010#A
EOC-4015#A
EOC-4018#A
EOC-4100#A
EOC-4140#A
EOC-4200#A
EOC-6110#A
EOC-8130#A
EOC-9025#A
EDOS-4.1.1.2#A
EDOS-4.2.1.5#A
EDOS-4.6.1.3#A
EOC-0040#A
EOC-3080#A
EOC-9080#A
EOC-4020#A
EOC-9110#A

Procedures:

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
1.001	EOC	If the Data Server (DS) and Real Time Server (RTS) are running, skip to step 21 to start a User Work Station (UWS).				3/12/97
1.002	EOC	Log onto an EOC console (msseoc2) as IVVTEST.Enter password.	UNIX Terminal window(s) open.Preferably bring up the Data Server and Real Time Server on a console that will not be used as a user workstation during the test.Note: Startup and shutdown procedures can be found in the Operations Tools Manual page 4-3.Use of msseoc2 is for consistency; operationally it will be used for LSM not as a Userstation.			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
			check Netscape for a bookmark. If no bookmark enter the url:http://198.118.199.20/FosDbHome.html			
1.005	EOC	Verify no endpoints exist:Click on Nameserver DatabaseClick on Clear FormClick on Submit.	"Total matches = 0".Note: If any endpoints exist watch for live processes/endpoints on the Data Server, Real Time Server, and on User Stations in the following steps. They must all be removed/killed prior to system startup.			3/12/97
1.006	EOC	Open SUN workstation room 3 (of 4).Click on button labeled Three.	UNIX Terminal window(s) open.Note: Use of 2nd & 3rd rooms are for organizational purposes only, it is not a required configuration. Also, Data Server and Real Time Server may be started from different consoles.	Open two UNIX terminal windows if none open.		3/12/97
1.007	DS	Remote login to the Data Server (foseoc7):rlogin foseoc7enter your "password" (used in step 1)	Successful login to Data Server.			3/12/97
1.008	DS	Change directory and check for live processes.test	Current processes will be displayed along with	Path may be aliased as "test"		3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		(or cd /fos/test/am1/scripts/setup) ps -ef	owner. Note: "ps -ef" truncates the process path/name. Use "ps -ax" to see process name			
1.009	DS	Kill all undesirable processes - Processes with a /fos/test/am1/bin/... prefix and owner is not "root" (there may be others).Initially, as process owner, use MyKill to shutdown the process. If processes are still active use kill -USR1 "pid" for each active process, then use kill -9 "pid" for each undesirable process.Type ps -ef again to verify.	Notes: "kill -USR1" saves data created since the Data Server was brought up. Use "kill -9" only after "kill -USR" on the Data Server or Real Time Server; or data may be lost.The user may need to be logged in as the owner of the processes in order to kill them.			3/12/97
1.010	RTS	From the 2nd UNIX window in room 3, remote login to the Real Time Server (foseoc6):rlogin foseoc6enter your "password" (same as in step 1)	Successful login to Real Time Server.			3/12/97
1.011	RTS	Change directory and check for live processes.test (or cd /fos/test/am1/scripts/setup) ps -ef	Current processes will be displayed along with owner and process id.			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
1.012	RTS	Kill all undesirable processes - Processes with a /fos/test/am1/bin/... prefixInitially, as process owner, use MyKill to shutdown the process. If processes are still active use kill -USR1 "pid" for each active process, then use kill -9 "pid" for each undesirable process.Type ps -ef again to verify.				3/12/97
1.013	DS	At the Data Server (foseoc7), source the A2_DataServerStartup shell script from directory: /fos/test/am1/scripts/setup.source A2_DataServerStartup	The script will take 1- 5 minutes to complete.			3/12/97
1.014	DS	Observe in the UNIX window:"Successful installation of signal handler FpLqSigHand", and repeating "Waiting for activity"	If this message is not displayed, first wait a little longer, while waiting check the number of processes on the Data Server via netscape (next step). Most likely cause of failure is the presence of processes/endpoints prior to startup of Data Server. If unsuccessful startup,			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
			type MyKill, in Data Server's UNIX window, recheck for processes on all servers, and restart.			
1.015	EOC	From Netscape in SUN workstation room 2, verify that 14 endpoints are now found by submitting a blank form.BackSubmit	The number of endpoints found is 14.Using "ps -ax" 18 processes are active.If the number of endpoints does not equal 14, be sure startup has completed, if so, use MyKill to clean out all processes. Restart from step 4.			3/12/97
1.016	RTS	At the Real Time Server (foseoc6) in SUN workstation room 3, source the A2_RealTimeServerStartup shell script from directory: /fos/test/am1/scripts/setup.source A2_RealTimeServerStartup	The script will take 2- 5 minutes to complete.			3/12/97
1.017	RTS	Observe in the UNIX window:"DECOM IS READY TO RECEIVE I CHANNEL PACKETS..." and "DECOM IS READY TO RECEIVE Q CHANNEL PACKETS..."	Note: The DECOM messages will appear several times, wait until they appear on two consecutive lines.There should not be any 'FORMAT Problem: xxx - socket error'. This is an			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
			indication that endpoints existed prior to startup.			
1.018	EOC	From Netscape in the SUN workstation room 2, verify that 49 endpoints are now found by submitting a blank form.BackSubmit	The number of endpoints found is 49.If the number of endpoints does not equal 49, be sure startup has completed, if so, use MyKill to clean out all Real Time Server (RTS) processes. Use Netscape with "foseoc6" in the "Entry ID" field to verify 0 endpoints on RTS. Use "ps -ef" to check for undesirable processes. Restart RTS.			3/12/97
1.019	EOC	Leave Data Server and Real Time Server windows open to view statuses.				3/12/97
1.020	EOC	If the console will be used as a User workstation, close Netscape.	Warning: Netscape and the Event_Display window can not be open at the same time (12/05/96).			3/12/97
1.021	UWS	Log onto an EOC User Work Station (preferably non-msseoc2).Enter your user name.Enter your password.	UNIX Terminal window(s) open.Note: The User station can be brought up at the same time as the Real Time Server. However this makes the endpoint count via Netscape a bit more			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
			difficult for use to double-check proper startup. Patience is a virtue.			
1.022	UWS	Change directory and check for live processes.test (or cd /fos/test/am1/scripts/setup) ps -ax	Current processes will be displayed along with owner. There should be no undesirable processes. If so, run MyKill as owner of processes. 'Kill -9' is a last resort.Use "ps -ax" on SUN.			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
			console name in "Entry ID" field. Correct number of user station endpoints is 8 ?)If unsuccessful startup, type MyKill, in user Station's UNIX window, kill undesirable processes, and restart user station only. If still unsuccessful call for help, you'll probably perform a complete shutdown and restart!			
1.025	UWS	Bring up Event_Display window.Click on "Tools..." button in Control Window,select Event_Display, and OK.	Event_Display may take a few minutes to appear.			3/12/97
1.026	UWS	Issue the ECL directive to connect to string 100:STRING CONNECT STRING=100 TLMTY PE=ALL CONFIG=MIRROR	Event message: "Successfully connected to String 100."Approximately a 7 minute wait.			3/12/97
1.027	UWS	From a UNIX window, different from the window used for User startup, run the SI&T userstation configuration recording script: /home/ivvtest3/scripts/tconf	This can be done while waiting for the string to connect!Creates a file called testconfig.			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		ig.scr				
1.028	UWS	Record the system configuration on the execution cover sheet.	System configuration recorded (while waiting for the string to connect).			3/12/97
1.029	UWS	Enable telemetry data archiving.Note: Release A: Archiving is already enabled. Release B: The ECL directive ARCHIVE will control the archiving modes: ARCHIVE TLM =ENABLE <tlm TYPE>	For Release A, no event message is expected. For Release B, an event message stating that telemetry archiving is enabled.			3/12/97
2.001	EOC	In a UNIX terminal other than where user station was started, cd /fos/test/am1/reportsll -atr	The list of report files includes:cdb.dat and cdb.nrz.			3/12/97
2.002	EOC	"Clear out" the two report files: cdb.dat and cdb.nrz. If cdb.dat file size is not zero (i.e. commands have been sent prior to this test), the Real Time Server must be brought down and restarted. Follow directions in the Startup procedures.	For post test analysis, only want commands from this test.	Per Debra: 1/8/97 Must bring down RTS to clear cdb.dat file.		3/12/97
2.003	CAC	Configure the control center for SN SSA service via the AM1 HGA antenna. In the Control Window's	Path configuration accepted.Event_Display status message reflects change.	Release B.10 Kbps default for Release A.EOC4200AM-1 GSCID:(CTIU-		3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		ECL command line, enter:CMDCFG PREREQUISITE=ENABLEPLOP=1 ANT=HGA CHAN=SSA PRIM=1		1)=A9000010101001(CTIU-2)=AA000010101010		
2.004	~	Make a Detailed Activity Schedule (DAS), to run in approximately 45 minutes.	DAS times modified to run approximately 45 minutes from current time.			3/12/97
2.005	EOC	Restore the Timeline window, click on File menu item,select Open.	Open Plan window is displayed			3/12/97
2.006	EOC	Select the Master Plan, enter current time for Start time. Enter current time + 2 hours for Stop time. Format is: 1997/"DOY" 00:00:00 Click OK	Timeline for the 1997 time range selected is displayed	DOY=Day Of Year		3/12/97
2.007	EOC	In the Timeline window:select User Setup,select Resources,highlight AM1 Guidance Nav & Control,click Add,click Apply,Click OK.	Adds AM! Guidance Nav & Control to Timeline resources.			3/12/97
2.008	EOC	In the Timeline window:select User Setup,select Resources,In Viewed Resources, highlight AM1 MISR,click the "up" arrow to the top	The first 3 groups in the timeline are MISR, MOPITT, and Guidance & Nav Control.			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		of the page,highlight MOPITT,click the "up" arrow to underneath MISR,highlight Guidance Nav & Control,click the "up" arrow to underneath MOPITT,click OK.				
2.009	EOC	Open the General Scheduler window,select AM1 MISR,highlight EOC3_MISR_ACT_1_FR. From the Open Plans List select Master Plan.Enter current time + 45 minutes for Start time. Enter current time + 55 minutes for Stop time. Format is: 1997/"DOY" 00:00:00.		DOY=Day of Year		3/12/97
2.010	EOC	In the General Scheduler window, ensure Impact icon selected,click on Schedule icon.	MISR schedule appears on timeline.			3/12/97
2.011	EOC	In the General Scheduler window,select AM1 MOPITT,highlight EOC3_MOPITT_ACT_1_FR.From the Open Plans List select Master Plan.Enter current time + 60 minutes for Start time.		DOY=Day of Year		3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		Enter current time + 65 minutes for Stop time. Format is: 1997/"DOY" 00:00:00.				
2.012	EOC	In the General Scheduler window, ensure Impact icon present,click on Schedule icon.	MOPITT schedule appears on timeline.			3/12/97
2.013	EOC	In the General Scheduler window,select AM1 Guidance Nav & Control,highlight EOC3_GNC_ACT_1_FR.From the Open Plans List select Master Plan.Enter current time + 70 minutes for Start time. Enter current time + 80 minutes for Stop time. Format is: 1997/"DOY" 00:00:00.		DOY=Day of Year		3/12/97
2.014	EOC	In the General Scheduler window, ensure Impact icon present,click on Schedule icon.	Guidance Nav & Control schedule appears on timeline.			3/12/97
2.015	EOC	Iconize the General Scheduler and Timeline windows.	Windows iconized.			3/12/97
2.016	EOC	Restore the Load_Generator window.Enter a DAS ID of	Event_Display message of: Complete SUCCESSFUL processing of DAS#"DOY"			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		today's DOY,enter DAS Start time of today at 5 minutes prior to start of MISR time.enter DAS Stop time of today at 5 minutes after end of Guidance Nav & Control time.enter Uplink Start and Stop time of yesterday from 00:00:00 to 01:00:00Click OK.				
2.017	EOC	Iconize Load_Generator window.				3/12/97
2.018	CAC	Take command authority.TAKE COMMAND STRING=100	In Event_Display observe message that command authority has been assigned.			3/12/97
2.019	CAC	Click on Tools... button	Tools menu displayed.			3/12/97
2.020	CAC	Double-click on Command Control line.	CCW/CMW window is displayed			3/12/97
2.021	CAC	In the CCW/CMW window enter:100 for String ID,AM1 for Spacecraft ID.Click OK.	Command Control Window (CCW) is displayed, not Command Monitor Window.			3/12/97
2.022	CAC	Resize the Command Control Window. Lengthen the Status field.	Statuses in the STATUS field can be seen when script is resumed.			3/12/97
2.023	CAC	Set Mode to Auto:In the CCW menu, click on Config,Click the Auto button	On CCW upper status bar:Status of Mode is Auto (default)			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
2.024	~	Execute, in real time, an existing ground script.				3/12/97
2.025	CAC	Under the File option, select Open.	Pair Time Selector window opens.			3/12/97
2.026	CAC	Enter the same start date and time, and stop date and time as the DAS. Press enter after each field entry.	New start/stop date and time displayed by the "Absolute Start Time:" and"Absolute Stop Time".	The script is defined to run within the next half hour.		3/12/97
2.027	CAC	In the Pair Time Selector window:Click OK.Click OK at the Warning Dialog box.	Ground script ready for execution. Verify ground script configured and commands are specified as desired.	Specifics		3/12/97
2.028	CAC	For Release A, turn off CV and TV.In the CCW menu, click on Config,Click the Cmd Verification button Click on Config,Click the Tlm Verification button.	On CCW upper status bar:Status of CV is Off,Status of TV is Off	Release A only.(Dry Run 1/8/97 must turn off via CCW CMD line.)		3/12/97
2.029	CAC	Print the ground script.In the menu bar select File, select Print.	The ground script is printed on the printer.			3/12/97
2.030	CAC	Print the CCW.Type snapframe in a UNIX window, and click in the CCW.	The CCW is printed.			3/12/97
2.031	CAC	Click on Resume button to start ground script execution.	Ground script begins execution; status is "Active".			3/12/97
2.032	CAC	Monitor the ground script	Commands are activated at			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		as commands are transmitted.	correct times.			
2.033	CAC	At critical command confirmation, click Allow button.	Critical command is transmitted after operator "allows" it.	EOC4100		3/12/97
2.034	CAC	Observe command uplink message event messages.	Event messages reflect critical command sent.	EOC4140		3/12/97
2.035	CAC	Upon detecting an imaginary predefined emergency/contingency situation (MSG indication), click on Suspend button	Ground script status is "Suspended".			3/12/97
2.036	CAC	Enter a valid critical ECL command in the CCW./TCS_SET_PBATP WMB DUTYCYCLE=108 HTRGROUP=2Press enterClick ResumeClick SendClick Allow.	Command transmitted within 1 minute of detection of predefined emergency/ contingency situation. Message displayed indicating command sent.	EOC-3238#A1/28/97 Note: Use CEF_SET_INSTR_RESET next time. pid 1254, 32FH		3/12/97
2.037	CAC	Enter an invalid critical ECL in the CCW and press enter (use zeros vice Os). /EAS_ARM_HGA_B00M A	Message displayed indicating command error.	cmd_pid 605		3/12/97
2.038	CAC	Click OK.Click on Resume button to restart ground script execution.	Ground script begins execution; status is "Active".			3/12/97
2.039	~	Provide the ICCs with instrument command notification messages for	Notification received at ICC.Phone?	Release B		3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		emergency commands. eoc4168, see lvl4 does not encompass entire scope of rbr				
2.040	CAC	Upon message to the operator indicating a prerequisite state failure, click the Cancel button.	Command is canceled, not transmitted.			3/12/97
2.041	CAC	Upon message to the operator indicating a second prerequisite state failure, click the Override then the Resume buttons.	Command is transmitted.			3/12/97
2.042	CAC	Observe ground script execution completion.	Status display indicates all commands processed.			3/12/97
2.043	ETS	Verify command transmitted by EOC and received by 'EDOS'. "Save" command(s) as transmitted in a file for post-test analysis.	Commands received in proper format and transmission rate =10 Kbps.	Off-line analysis to verify CCSDS conformance.		3/12/97
2.044	~	Set processing mode to Step, send 3 individual valid commands; confirm receipt. eoc9040 ?				3/12/97
2.045	CAC	Set Mode to Step:In the CCW menu, click on Config,Click the Step button	On CCW upper status bar:Status of Mode is Step.			3/12/97
2.046	CAC	Suspend execution of the	Resume button is enabled.			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		ground script.Click Suspend.				
2.047	CAC	Enter the following single valid spacecraft command on the ECL command line:/CDH_DISABLE_CT1 LVIFPress Enter.	Text displayed in DIRECTIVE area of CCW.	Cmd type: #2281ERT Serial/ CTIU1		3/12/97
2.048	CAC	Enter the following single valid spacecraft command on the ECL command line:/MOD_SET_SR_MTR _GRP GR=61200 SL=0 WH=5Press Enter.	Text displayed in DIRECTIVE area of CCW.	Cmd type: #1475ERT Serial MODIS		3/12/97
2.049	CAC	Enter the following single valid spacecraft command on the ECL command line:/EPS_SET_ADEA_RA TEADJ ADJUSTMENT=-255 Press Enter.	Text displayed in DIRECTIVE area of CCW.	Cmd type: #1552BDU Serial CMD C&DH/COMM BDU		3/12/97
2.050	CAC	Click Resume.	"Send/Cancel" displayed in STATUS field of first command. STATUS field flashes.			3/12/97
2.051	CAC	Click Send	/CDH_DISABLE_CT1LVI F is processed.Event_Display messages reflect correct command and sequence number.			3/12/97
2.052	CAC	After first command is	/MOD_SET_SR_MTR_G			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		processed:Click Send	RP GR=61200 SL=0 WH=5 is processed. Event_Display messages reflect correct command and sequence number.			
2.053	CAC	After second command is processed:Click Send	/EPS_SET_ADEA_RATE ADJ ADJUSTMENT=-255 is processed. Event_Display messages reflect correct command and sequence number.			3/12/97
2.054	EDOS	Verify commands transmitted by EOC and transferred by EDOS to spacecraft.	Transmission rate =10 Kbps (per EDOS analyzer - BERT). Command received in proper format.	Off-line analysis to verify CCSDS conformance.		3/12/97
2.055	EOC	Verify CLCW received indicating valid command received by spacecraft. EOC4120 Only AD cmds verified thru COP-1 processing. see lvl4 for effect of verftn ckg on/off	CLCW counter increments (Report Value), appropriate fields reflect receipt of valid command (Retransmit Flag=0).	Release B		3/12/97
2.056	~	Verify via telemetry command execution on-board the spacecraft (604p3-2)eoc4125		Release B End-item-verifierEOC4125		3/12/97
2.057	~	Execute an ECL procedure to send 5 valid commands (s/c & instr), confirm transmission. eoc9040 ?				3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
2.058	CAC	Suspend the Ground Script execution:In the CCW lower selection bar,click Suspend.	Resume is highlighted.			3/12/97
2.059		Execute the existing ECL procedure EOC23_5CMDS.START EOC23_5CMDSPress Enter	EOC23_5CMDS is displayed in DIRECTIVE area of CCW.			3/12/97
2.060	CAC	Click Resume.	"Send/Cancel" displayed in STATUS field of PROC name. STATUS field flashes.			3/12/97
2.061	CAC	For the PROC, click Send	PROC text is loaded into ground script field and displayed in DIRECTIVE area of CCW."Send/Cancel" displayed in STATUS field of first command.			3/12/97
2.062	CAC	For each command - click Send	Command processed.Event_Display messages reflect correct command and sequence number.			3/12/97
2.063	CAC	If necessary, click override for any Prerequisite State Check failures.	Command processed.Event_Display messages reflect correct command and sequence number.	Release A pb		3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
2.064	CAC	At critical command confirmation, click Allow.	Critical command is transmitted after operator "allows" it.			3/12/97
2.065	CAC	Observe command uplink message event messages.	Event messages reflect command activity.	EOC4140		3/12/97
2.066	EDOS	Verify command transmitted by EOC and received by EDOS.	Transmission rate =10 Kbps (per EDOS analyzer - BERT). Command received in proper format.	Off-line analysis to verify CCSDS conformance. SPECIFICS ??Post test analysis?		3/12/97
2.067	CAC	Save Event_Display data in ivvtest4 directory. (fill in current "date") In Event_Display menu:Select File,select Save As,enter /home/ivvtest4/ EOC23_EVTDIS_"date".STEP67	File saved in ivvtest4 directory.			3/12/97
2.068	EOC	In a UNIX terminal other than where user station was started, cd /fos/test/am1/reportsll -atr	The list of log files includes:cbd.dat and cdb.nrz.			3/12/97
2.069	EOC	Perform a hex dump to analyze files.od -x cdb.dat | lp	cdb.dat file is printed in hex.	Something like that.		3/12/97
2.070	EOC	Copy command archive files for future reference. (fill in current "date")cp cdb.dat /home/ivvtest4/ EOC23_CDBDAT_"date". STEP70cp cdb.nrz	cdb.dat copied to ivvtest4 directory.cdb.nrz copied to ivvtest4 directory.			3/12/97

		/home/ivvtest4/ EOC23_CDBNRZ_"date". STEP70				
2.071	~	Verify via telemetry the receipt of the 5 commands by the s/c and instruments. EOC4120 Only AD cmds verified thru COP-1 processing. see lvl4 for effect of verftn ckg on/off	CLCW counter increments (Report Value), appropriate fields reflect receipt of valid command (Retransmit Flag=0).	Release B - CLCW processing		3/12/97
2.072	~	Verify via telemetry s/c and instrument command execution on-board the spacecraft (604p3-2)eoc4125		Release B End-item-verifierEOC4125		3/12/97
2.073	~	Execute an ECL procedure to send 5 sets of 64 valid commands (s/c & instr) in quick succession, confirm transmission. eoc9040 ?				3/12/97
2.074		Execute the existing ECL procedure EOC23_5X64CMDS.START EOC23_5X64CMDSPress Enter	EOC23_5X64CMDS is			

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
2.076	CAC	For the PROC, click Send	PROC text is loaded into ground script field and displayed in DIRECTIVE area of CCW."Send/Cancel" displayed in STATUS field of first command.			3/12/97
2.077	CAC	For the first 10 commands - click Send	Command processed.Event_Display messages reflect correct command and sequence number.			3/12/97
2.078	CAC	Suspend ground script and set Mode to Auto:Click Suspend.In the CCW CMD line enter: MODE AUTO.Press EnterClick Resume.	On CCW upper status bar:Status of Mode is Auto.Commands in Ground script process automatically, without Send/Cancel prompt.			3/12/97
2.079	CAC	At any critical command confirmation, click Allow.	Critical command is transmitted after operator "allows" it.			3/12/97
2.080	CAC	Observe command uplink message event messages.	Event messages reflect command activity.	EOC4140		3/12/97
2.081	EDOS	Verify command transmitted by EOC and received by EDOS.	Transmission rate =10 Kbps (per EDOS analyzer - BERT). Command received in proper format.	Off-line analysis to verify CCSDS conformance.		3/12/97
2.082	~	Verify via telemetry the receipt of the 5x64 commands by the s/c and	CLCW counter increments (Report Value), appropriate fields reflect	Release B - CLCW processing		3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		instruments. EOC4120 Only AD cmds verified thru COP-1 processing. see lvl4 for effect of verftn ckg on/off	receipt of valid command (Retransmit Flag=0).			
2.083	~	Verify via telemetry s/c and instrument command execution on-board the spacecraft (604p3-2)eoc4125		Release B End-item-verifierEOC4125		3/12/97
2.084	~	Execute an ECL procedure to send 80 valid commands of varying types, confirm transmission. eoc9040 ?		20 Critical,20 PSC,20 Exec Verifictn,20 w/submnemon		3/12/97
2.085	ETS	Initiate Housekeeping telemetry to EOC. Only need I have pages to monitor pstate commands and end-item-verifiersw	Telemetry being received by EOC.			3/12/97
2.086		Execute the existing ECL procedure EOC23_4X20CMDS.START EOC23_4X20CMDSPress Enter	EOC23_4X20CMDS is displayed in DIRECTIVE area of CCW.			3/12/97
2.087	CAC	Click Resume.	"Send/Cancel" displayed in STATUS field of PROC name. STATUS field flashes.			3/12/97
2.088	CAC	For the PROC, click Send	PROC text is loaded into			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
			ground script field and displayed in DIRECTIVE area of CCW."Send/Cancel" displayed in STATUS field of first command.			
2.089	CAC	At each critical command confirmation, click Allow.	Critical command is transmitted after operator "allows" it. Event_Display messages reflect correct command and sequence number.			3/12/97
2.090	CAC	Observe command uplink message event messages.	Event messages reflect command activity.	EOC4140		3/12/97
2.091	CAC	At each WAIT, click GO.	Ground Script waits at each WAIT, then continues and selecting GO.			3/12/97
2.092	EDOS	Verify command transmitted by EOC and received by EDOS. Save command as transmitted in a file for post-test analysis.	Transmission rate =10 Kbps (per EDOS analyzer - BERT). Command received in proper format.	Off-line analysis to verify CCSDS conformance.		3/12/97
2.093	~	Verify via telemetry the receipt of the 5 commands by the s/c and instruments. EOC4120 Only AD cmds verified thru COP-1 processing. see lvl4 for effect of verftn ckg on/off	CLCW counter increments (Report Value), appropriate fields reflect receipt of valid command (Retransmit Flag=0).	Release B - CLCW processing		3/12/97
2.094	~	Verify via telemetry s/c and		Release B End-item-		3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		instrument command execution on-board the spacecraft (604p3-2)eoc4125		verifierEOC4125		
2.095	~	Attempt to send a variety of invalid commands (s/c & instr), confirm detection of error.		Verify command validatn process'g (604p3-2)		3/12/97
2.096	CAC	On the ECL command line enter the following command with misspelled mnemonic:/GNC_DISABLE_STICALIPPress Enter.	Error message indicates correct cause of command failure and provides information to the operator for diagnosing error.	cmd_pid 2061ST1CALIP		3/12/97
2.097	CAC	On the ECL command line enter the following command with misspelled submnemonic:/TCS_SET_PBATPWMB DUTYCYCLE=255 NTRGROUP=0 Press Enter.	Command displayed in Ground script. Is this right?? Are submnemonics only checked after "Send: command??	cmd_pid 1657HTRGROUP		3/12/97
2.098	CAC	Attempt to send command with invalid submnemonic.Click Resume.click Send	Error message indicates correct cause of command failure and provides information to the operator for diagnosing error.Ground script is suspended.	Iper spec to suspend GS?		3/12/97
2.099	CAC	Resume ground script.Click Resume.	Suspend button is enabled.			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
2.100	CAC	On the ECL command line enter the following command with submnemonic above max_value (positive value):/MOD_SET_FR_RAM_XFER TO=606178 Press Enter.	Command displayed in Ground script.	cmd_pid 1377max is 606176.0		3/12/97
2.101	CAC	Attempt to send command with invalid submnemonic.Click Resume.click Send	Error message indicates correct cause of command failure and provides information to the operator for diagnosing error.			3/12/97
2.102	CAC	Resume ground script.Click Resume.	Suspend button is enabled.			3/12/97
2.103	CAC	On the ECL command line enter the following command with submnemonic below min_value (positive value):/CDH_DUMP_CT1 GATHER RTNAME=544 Press Enter.	Command displayed in Ground script.	cmd_pid 2327min is 545.0 CK CMD USAGE !!!!		3/12/97
2.104	CAC	Attempt to send command with invalid submnemonic.Click Resume.click Send	Error message indicates correct cause of command failure and provides information to the operator for diagnosing error.			3/12/97
2.105	CAC	Resume ground script.Click Resume.	Suspend button is enabled.			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
2.106	CAC	On the ECL command line enter the following command with submnemonic above max_value (negative value):/	None defined in Release A	Release B if defined		3/12/97
2.107	CAC	On the ECL command line enter the following command with submnemonic below min_value (negative value):/GNC_SET_ST2FIELDSRCH YRATE=-128 Press Enter.	Error message indicates correct cause of command failure and provides information to the operator for diagnosing error.	cmd_pid 1883min is -127(max is 128)		3/12/97
2.108	CAC	Attempt to send command with invalid submnemonic.Click Resume.click Send	Error message indicates correct cause of command failure and provides information to the operator for diagnosing error.			3/12/97
2.109	CAC	Resume ground script.Click Resume.	Suspend button is enabled.			3/12/97
2.110	CAC	On the ECL command line enter the following command with submnemonic negative value (absolute value would be within range):/MOD_SET_PVVIS_ECAL TO=-0.1 Press Enter.	Error message indicates correct cause of command failure and provides information to the operator for diagnosing error.	cmd_pid 1369valid 0 - 1 CK CMD USAGE !!!!		3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
2.111	CAC	Attempt to send command with invalid submnemonic.Click Resume.click Send	Error message indicates correct cause of command failure and provides information to the operator for diagnosing error.			3/12/97
2.112	CAC	Resume ground script.Click Resume.	Suspend button is enabled.			3/12/97
2.113	CAC	On the ECL command line enter the following command with valid submnemonic values, but no submnemonic names:/CDH_SET_CT2_CLK 32768 67108864 512 Press Enter.	Error message indicates correct cause of command failure and provides information to the operator for diagnosing error.	cmd_pid 2514		3/12/97
2.114	CAC	On the ECL command line enter the following command missing a required submnemonic :/	None defined in Release A(All submnemonics have default values.)	Release B if defined.		3/12/97
2.115	CAC	On the ECL command line enter the following command missing a non-required submnemonic:/AST_SET_S_PULSE PULSE=128 Press Enter.	Event display indicates command transmitted with default submnemonic value.	cmd_pid 1940submnemonics:PARITYPULSE		3/12/97
2.116	CAC	Attempt to send command with invalid submnemonic.Click Resume.click Send	Error message indicates correct cause of command failure and provides information to the operator			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
			for diagnosing error.			
2.117	CAC	Verify Command was sent with correct submnemonics	PARITY=default, PULSE=128	Offline analysis.		3/12/97
2.118	CAC	Clear out Ground Script commands.Click Suspend,click Kill,click OK.	Ground script is cleared out.			3/12/97
2.119	CAC	Close out CCW.Click File,select Quit,click OK.	Command Control Window closes.			3/12/97
2.120	CAC	Save Event_Display data in ivvtest4 directory. (fill in current "date") In Event_Display menu:Select File,select Save As,enter /home/ivvtest4/evtdis."date"_eoc23	File saved in ivvtest4 directory.			3/12/97
2.121	EOC	In a UNIX terminal other than where user station was started, cd /fos/test/am1/reportsll -atr	The list of log files includes:cbd.dat and cdb.nrz.			3/12/97
2.122	EOC	Perform a hex dump to analyze files.od -x cdb.dat | lp	cdb.dat file is printed in hex.	Something like that.		3/12/97
2.123	EOC	Copy command archive files for future reference. (fill in current "date")cp cdb.dat /home/ivvtest4/cdbdat."date"_eoc23cp cdb.nrz /home/ivvtest4/cdbnrz."dat	cdb.dat copied to ivvtest4 directory.cdb.nrz copied to ivvtest4 directory.			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		e"_eoc23				
2.124	~	Verify via telemetry that only the valid command was received by the s/c or instruments. EOC4120 Only AD cmds verified thru COP-1 processing. see lvl4 for effect of verftn ckg on/off		Release B - CLCWEOC4120		3/12/97
2.125	~	Evaluate command transmission status from EDOS. eoc4130		Release BEOC4130		3/12/97
2.126	~	Provide the ICC with instrument uplink status for both successful and unsuccessful uplinks. eoc4166, see lvl4 for status variations		Release BEOC4166		3/12/97
2.127	~	Save the record of s/c and instrument uplink statuses to a file for post test analysis. eoc4160,lvl4states tlm verified, no mention of a "record".	The record correctly reflects data uplinked.	Release B.Post test analysis EOC-4160		3/12/97
2.128	~	Verify uplink data conforms to CCSDS Telecommand Standard. eoc4010	Data in complete conformance with CCSDS standards.	Post test analysis		3/12/97
2.129	~	Observe visual and audible				3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		event and alarm notifications. eoc9025				
2.130	~	Generate operational reports, verify completeness and accuracy. eoc3160				3/12/97
3.001	UWS	Collect all necessary screen snaps, dumps, etc. needed for post-test analysis and verification..				3/12/97
3.002	UWS	Bring down User Work Stations (UWS). In the UNIX window where the user station was initiated, enter:MyKill				3/12/97
3.003	UWS	After UWS killed, check for undesirable processes. ps -ax				3/12/97
3.004	UWS	Open any iconized processes, or pages that didn't close. Close the windows.Under the File menu heading select Quit.	Window closes.			3/12/97
3.005	UWS	Kill all undesirable processes - Processes with a /fos/test/am1/bin/... prefix and owner is not "root" (there may be others).Initially, as process owner, use MyKill to	Notes: The user may need to be logged in as the owner of the processes in order to kill them.			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		shutdown the process. If processes are still active use kill "pid" for each undesirable process.Type ps -ef again to verify.				
3.006	UWS	Bring up the FOS Homepage on Netscape(May be already open in mss2eoc SUN room 2):netscape	FOS Database Access Page displayed. If not automatically displayed, check Netscape's bookmarks. If no bookmark enter the url:http://198.118.199.20/FosDbHome.html			3/12/97
3.007	UWS	Verify no endpoints exist on UWS:Click on Nameserver DatabaseClick on Clear FormIn EntryID field enter: fose#oe (where # is UWS number)Click on Submit.	"Total matches = 0".Note: If any endpoints exist recheck for live processes/endpoints on the UWS using ps -ax . They must all be removed/killed prior to system startup. As a last resort use Kill -9 "pid".			3/12/97
3.008	RTS	Bring down Real Time Server (foseoc6). In the UNIX window where the RTS was initiated, enter:MyKill	Wait 1-5 minutes			3/12/97
3.009	RTS	After RTS killed, check for undesirable processes. ps -ef				3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
3.010	RTS	Kill all undesirable processes - Processes with a /fos/test/am1/bin/... prefix and owner is not "root" (there may be others).Initially, as process owner, use MyKill to shutdown the process. If processes are still active use kill "pid" for each undesirable process.Type ps -ef again to verify.	Notes: The user may need to be logged in as the owner of the processes in order to kill them.			3/12/97
3.011	RTS	Bring up the FOS Homepage on Netscape(May be already open in mss2eoc SUN room 2):netscape	FOS Database Access Page displayed. If not automatically displayed, check Netscape's bookmarks. If no bookmark enter the url:http://198.118.199.20/FosDbHome.html			3/12/97
3.012	RTS	Verify no endpoints exist on RTS:Click on Nameserver DatabaseClick on Clear FormIn EntryID field enter: foseoc6Click on Submit.	"Total matches = 0".Note: If any endpoints exist recheck for live processes/endpoints on the Real Time Server using ps -ef . They must all be removed/killed prior to system startup. As a last resort use Kill -9 "pid".			3/12/97
3.013	DS	Bring down Data Server	Wait 1-5 minutes.			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		(foseoc7). In the UNIX window where the RTS was initiated, enter:MyKill				
3.014	DS	After DS killed, check for undesirable processes. ps -ef				3/12/97
3.015	DS	Kill all undesirable processes - Processes with a /fos/test/am1/bin/... prefix and owner is not "root" (there may be others).Initially, as process owner, use MyKill to shutdown the process. If processes are still active use kill -USR1 "pid" for each active process, then use kill -9 "pid" for each undesirable process.Type ps -ef again to verify.	Notes: "kill -USR1" saves data created since the Data Server was brought up. Use "kill -9" only after "kill -USR" on the Data Server or Real Time Server; or data may be lost.The user may need to be logged in as the owner of the processes in order to kill them.			3/12/97
3.016	DS	Bring up the FOS Homepage on Netscape(May be already open in mss2eoc SUN room 2):netscape	FOS Database Access Page displayed. If not automatically displayed, check Netscape's bookmarks. If no bookmark enter the url:http://198.118.199.20/FosDbHome.html			3/12/97
3.017	DS	Verify no endpoints exist on DS:Click on	"Total matches = 0".Note: If any endpoints exist			3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
		Nameserver DatabaseClick on Clear FormIn EntryID field enter: foseoc7Click on Submit.	recheck for live processes/endpoints on the Data Server using ps -ef . They must all be removed/killed prior to next system startup.			
3.018	EOC	Verify no endpoints exist on FOS:Click on Nameserver DatabaseClick on Clear FormClick on Submit.	"Total matches = 0".Note: If any endpoints exist recheck for live processes/endpoints on the User Work Stations, Real Time Server, and Data Server using ps -ef or ps -ax. All processes must be removed/killed prior to system startup.			3/12/97
4.001		Verify EDOS-4.1.1.2#A			EDOS-4.1.1.2#A,	3/12/97
4.002		Verify EDOS-4.2.1.5#A			EDOS-4.2.1.5#A,	3/12/97
4.003		Verify EDOS-4.6.1.3#A			EDOS-4.6.1.3#A,	3/12/97
4.004		Verify EOC-0040#A			EOC-0040#A,	3/12/97
4.005		Verify EOC-3080#A			EOC-3080#A,	3/12/97
4.006		Verify EOC-3238#A			EOC-3238#A,	3/12/97
4.007		Verify EOC-4005#A			EOC-4005#A,	3/12/97

Step ID	Station	Actions	Results	Comments	Verified Reqs.	Last Modified
4.008		Verify EOC-4008#A			EOC-4008#A,	3/12/97
4.009		Verify EOC-4010#A			EOC-4010#A,	3/12/97
4.010		Verify EOC-4015#A			EOC-4015#A,	3/12/97
4.011		Verify EOC-4018#A			EOC-4018#A,	3/12/97
4.012		Verify EOC-4020#A			EOC-4020#A	3/12/97
4.013		Verify EOC-4100#A			EOC-4100#A,	3/12/97
4.014		Verify EOC-4140#A			EOC-4140#A,	3/12/97
4.015		Verify EOC-4200#A			EOC-4200#A,	3/12/97
4.016		Verify EOC-6110#A			EOC-6110#A,	3/12/97
4.017		Verify EOC-8130#A			EOC-8130#A,	3/12/97
4.018		Verify EOC-9025#A			EOC-9025#A,	3/12/97
4.019		Verify EOC-9080#A			EOC-9080#A,	3/12/97
4.020		Verify EOC-9110#A			EOC-9110#A,	3/12/97