Generation of

HRC Mission Planning Command Data Products

Project	HRC
RCS ID	$Revision$: 201
File	howto_GenHRCMPDP.tex
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Test Reference	
Test Date	
Test Conductor	

Contents

List of Figures

1   Introduction/Scope

This 'howto' document describes the steps required to generate the HRC mission planning review data products. To generate the HRC command products consist of the following steps:

- Import the FOT mission planning command data products from the the OCC LAN to the HRC archive computer.

- Generate the command state vector database.

- Generate a HRC selected command validation report.

- Generate a postscript validation report.

- Copy the HRC command validation products to the HEAD LAN for distribution and review.

- Review the HRC selected command validation report.

2   Input Mission Planning Command Data Products

1. Setup Mission Planning Command Data Products Directory

   1.1 Login on *hrc.harvard.edu* as user 'hrc'.

   1.2 Change directory to the incoming products directory.

```
$ cd /home/hrc/HRC/occ/mp/stage
```

   1.3 Remove any old FOT/MP products (*.tar.gz) files

```
$ rm *gz
```

   1.4 Ftp the FOT Mission Planning Command Data Products (MPDP).
On the OCC LAN, the MPDP are located in the '/home/SOT_Transfer' directory. Each release should have three files, a command, schedule, and a backstop compressed tar file. For HRC process verification, you need to copy all three files into the stage directory. In the following example, we retrieve the load products for APR2301C (ie. April, 23 2001, revision C).

```
$ ftp lucky.harvard.edu
ftp> cd /home/SOT_Transfer

ftp> ls APR2301C*
APR2301C_Commands.tar.gz
APR2301C_backstop.tar.gz
APR2301C_schedule.tar.gz
```

```
      226 Transfer complete.

      ftp> mget APR2301C*

      ftp> quit
```

2. Verify that you have the three compressed tar files: *_backstop.tar.gz, *_Commands.tar.gz, and *_Schedule.tar.gz

3 Auto-Generation of the HRC Command Load Verification Products

1. A script 'MakeHRCCmdDP.ksh', has been generated to assist the user in building the HRC Command Load Verification Products. To execute the interactive program and record the process to a log file:

```
$ MakeHRCCmdDP.ksh | tee Log
```

2. The first 3 of 5 steps of this script will:

   2.1 Generates the MD5 electronic checksums on the input products

   2.2 Generates a target directory that will contain the new data products. The name of the target directory has the following format:

   ```
   YYYY:DOY:R-mmmddyyr
   ```

   Where YYYY is the year, DOY is the day-of-year, R is the release revision ID, mmm is the month, dd is the day-of-month, yy is the year, and r is the release revision ID.

   2.3 Untar the input files and extract the required HRC input files (.or, .backstop, .tlr, and .dot). All other input files are removed.

3. Step 3 attempts to build the new HRC command continuity file. The 'bs2svrdb' (backstop to state vector RDB) program requires two files: the last HRC continuity file (in RDB format) and the new backstop file. The script attempts to *guess* the last HRC continuity file. The script will prompt the user for the continuity using the 'best-guess' file as a default. The program will then prompt the user for the current backstop file. The program lists the last build directories as a guide. The .svrdb file contains selected S/C and hrc commanded events in an RDB file format. This file is used to determine the expected commanded state of the HRC as a function of time

```
========================================================
--- Thu Apr 26 13:55:02 GMT 2001 - 988293302 - 6  ---
```

```
Processing Step: 3
Generate Command State Vector Files
Last 8 Command Builds:
../2001:111:A-APR2101A
../2001:111:B-APR2101B
../2001:112:A-APR2201A
../2001:113:A-APR2301A
../2001:113:B-APR2301B
../2001:113:C-APR2301C
../2001:120:A-APR3001A
../2001:120:B-APR3001B
Use SV Continuity File: [../2001:113:c-APR2301c/APR2301c.svrdb]:

Use Backstop File: [CR120:1001.backstop]:

Generate command state vector file: APR3001B.svrdb
bs2svrdb -b CR120:1001.backstop -s ../2001:113:c-APR2301C/APR2301C.svrdb > APR3001B.svrdb
```

4. Step 4 generates the HRC selected command review product by executing the 'Validate-OFLS_tlr'. In this example, the svrdb file (-s *.svrdb), backstop (-b *.backstop), timeline report (-t *.tlr), and the observing request (-o *.or) files are used to generate the HRC validation file. *ValidateOFLS_tlr* outputs are directed to STDOUT. In this example, the output is directed into the file 'APR3001B.hrcsel'.

The last step of process generate a postscript output of the validation report.

```
=========================================================
--- Thu Apr 26 13:55:09 GMT 2001 - 988293309 - 13   ---
Processing Step: 4
Generate HRC SELECT File
Generate HRC Select file: APR3001B.hrcsel
ValidateOFLS_tlr -b CR120:1001.backstop -t CR120:1001.tlr -s APR3001B.svrdb -o APR3

Generate Postscript HRC Select file: APR3001B.hrcsel.ps
prn8 -w APR3001B.hrcsel > APR3001B.hrcsel.ps
```

5. The remaining steps copies the hrcsel files to the distribution directory (/pool7/jhc) for review by the HRC team. Be sure to notify the reviewers that the new products are ready.

4   Manual Build of HRC Command Load Products

4.1   Input Mission Planning Command Data Products

1. Setup Mission Planning Command Data Products Directory

    1.1 Login on *hrc.harvard.edu* as user 'hrc'.

    1.2 Change directory to the occ/mp subdirectory:

    ```
    $ cd /home/hrc/HRC/occ/mp
    ```

    1.3 At this point, make a new directory to contain the released Mission Planning Command Data Products. The directory naming convention is YYYY:DOY:r-MMMDDYYr. Where YYYY is the year, DOY is the day-of-year, r is the release identifier (A-Z), MMM is the three letter (CAPS) month, DD is the month day, YY is the last two digits of the current year. and r is the release ID. For example, 2001:295:B-OCT2201B contains the data products for OCT 22, 2001 release b.

    ```
    $ mkdir 2001:295:B-OCT2201B
    ```

    1.4 Change directory to the incoming products directory.

    ```
    $ cd 2001:295:B-OCT2201B
    ```

    1.5 Ftp the FOT Mission Planning Command Data Products (MPDP).
    On the OCC LAN, the MPDP are located in the ftp:lucky.harvard.edu/home/SOT_Transfer directory. Each release should have three files, a command, schedule, and a backstop compressed tar file. For HRC process verification, you need to copy all three files into the stage directory. In the following example, we retrieve the load products for APR2301C (ie. April, 23 2001, revision C).

    ```
    $ ftp lucky.harvard.edu
    ftp> cd /home/SOT_Transfer

    ftp> ls APR2301C*
    APR2301C_Commands.tar.gz
    APR2301C_backstop.tar.gz
    APR2301C_schedule.tar.gz
    226 Transfer complete.

    ftp> mget APR2301C*

    ftp> quit
    ```

2. Untar each of the tar files and extract the following files: *.backstop, *.tlr, *.or, and *.dot.

```
$ tar -xvzf APR2301C_Commands.tar.gz
$ tar -xvzf APR2301C_backstop.tar.gz
$ tar -xvzf APR2301C_schedule.tar.gz
```

The .backstop and .tlr files are unpacked in the current directory.

The .or file can be found in the ./mps/or directory.

```
$ cp ./mps/or/*.or .
```

The .dot file can be found in the ./mps directory.

```
$ cp ./mps/*.dot .
```

3. Delete all unused files and directories:

```
$ rm -fr  CL* fot History log output mps  FOT* m[0-9]* C[0-9]*
```

4.2   Generate the Command State Vector Database

1. Find the Continuity State Vector File (SVRDB).
   Two input files are required to generate the new command state vector database, the last run SVRDB for continuity and the current 'backstop' command file. On the archive machine, search the occ/mp directory for the last processed command load subdirectory and get the path/name of the last generated .svrdb file.

2. Generate the new SVRDB file.
   The *bs2svrdb* program is run from the current data products directory. The SVRDB is generated with the *bs2svrdb* program:

```
$ bs2svrdb -s ../JAN0900B/JAN0900B.svrdb -b *.backstop > JAN1600C.svrdb
```

   In this example, the continuity svrdb file came from the JAN0900b data products directory. The current backstop file (*.backstop) is used. *bs2svrdb* outputs the new svrdb file to STDOUT. In this example, the output is directed into the file 'JAN1600c.svrdb'.

3. Generating Continuity Files for Command Load Breaks
   If the command load has been terminated abnormally due to a safe-mode or an SI-safing event, a new continuity file must be constructed.

   3.1 Copy the old continuity file to the current working directory with a '.cont' extension. In this example, the JAN0900b load was terminated.

```
$ cp ../JAN0900B/JAN0900B.svrdb JAN0900B.svrdb.cont
```

3.2 Edit this file and truncate all events (rows) past the time the load was terminated. The last event (row) should contain the last commanded HRC state before the safing action.

3.3 Generate the new SVRDB file.
The *bs2svrdb* program is run from the current data products directory. The SVRDB is generated with the truncated SVRDB file:

```
$ bs2svrdb -s JAN0900B.svrdb.cont -b *.backstop > JAN1600C.svrdb
```

In this example, the continuity svrdb file came from the JAN0900B data products directory. The current backstop file (*.backstop) is used. In this example, the output is directed into the file 'JAN1600C.svrdb'.

4.3 Validation of the HRC Commands

1. Validate the HRC Commands From the Command Time Line Report.
Four input files are required for the *ValidateOFLS_tlr* command validation program, the backstop (.backstop), time line report (.tlr), current state vector database (.svrdb), and the Observing request (.or) files. The *ValidateOFLS_tlr* program is run from the current data products directory. The HRC Command Validation report (.hrcsel) is generated with the *ValidateOFLS_tlr* program. Since the current working directory contains the required files, wild cards can be used in place of the actual file names.

```
$ ValidateOFLS_tlr -s *.svrdb  -o *.or -t *.tlr -b *.backstop > JAN1600C.hrcsel
```

In this example, the svrdb file (-s *.svrdb), backstop (-b *.backstop), timeline report (-t *.tlr), and the observing request (-o *.or) files are used to generate the HRC validation file. *ValidateOFLS_tlr* outputs are directed to STDOUT. In this example, the output is directed into the file 'JAN1600B.hrcsel'.

2. Generate a postscript output of the validation report.
To generate a postscript copy of the validation report:

```
$ prn8 -w JAN1600C.hrcsel > JAN1600C.hrcsel.ps
```

4.4 Copy the Data Products to other HEAD LAN for Distribution

1. Copy the three HRC generated products to the HEAD LAN.
From the same working directory, copy the files to pool space.

```
$ scp *.hrcsel*  cfa244:/pool7/jhc
```

2. Notify the reviewers by email that the new products are ready.

5 MVZ's semi-auto build of HRC Command Load Products

Semi-automatic Build of HRC Command Load Products

A manual build is necessary if there has been a command load interruption.
This can be caused by the activation of SCS107 or a safe-mode event, for example.

Let us assume that MAR1802C loads have been interrupted by SCS107 running at
2002:077:13:52:00 and new OFLS products for MAR1902A are currently available.

Login on hrc.harvard.edu as user 'hrc'.

Change directory to the incoming products directory:

$ cd /home/hrc/HRC/occ/mp/stage

Remove any old FOT/MP products (*.tar.gz) files:

$ rm *gz

ftp the new FOT Mission Planning Command and Data Products (MPDP)

$ ftp lucky.harvard.edu

ftp> cd /home/SOT_Transfer

ftp>mget MAR1902A*

ftp> quit

Verify that you have the three compressed tar files: *_backstop.tar.gz, *_Commands.tar.g
and *_Schedule.tar.gz.

Execute the following script:

$ MakeHRCCmdDP.ksh | tee Log

When the program requests a password, Ctl-C out of the program.

Change the directory to the new data products directory (for our example, MAR1902A):

```
$ cd  /home/hrc/HRC/occ/mp/2002:078:A-MAR1902A
```

A new continuity file must be constructed.

Copy the state vector file of the interrupted load (for our example, MAR1802C.svrdb)
to the current working directory, adding the extension "cont":

```
$ cp /home/hrc/HRC/occ/mp/2002:077:C-MAR1802C/ MAR1802C.svrdb MAR1802C.svrdb.cont
```

Edit this file by deleting all events past the time of the interrupt
(in our example, past 2002:077:13:52:00).

Generate the new svrdb file:

```
$ bs2svrdb -s MAR1802C.svrdb.cont -b *.backstop > MAR1902A.svrdb
```

Next validate the HRC commands from the Command Time Line Report and generate the
hrcsel file.
Four input files are required for the command validation program:

```
    .backstop  (backstop )
    .tlr (timeline report)
    .svrdb (current state vector database)
    .or (observing request)
```

Verify their presence. Occasionally, the .or file will be missing
(recovery from SCS107 only requires maneuvers, for example).
In this case, copy a dummy (a previous) .or file into the working directory.

Issue the command (wild cards can be used, since the working directory contains
the required files)
to generate the HRC validation file:

```
$ ValidateOFLS_tlr -s *.svrdb -o *.or -t *.tlr -b *.backstop >  MAR1902A.hrcsel
```

Generate a postscript output of the validation report:

```
$ prn8 -w MAR1902A.hrcsel > MAR1902A.hrcsel.ps
```

Copy the data products to another HEAD LAN for Distribution:

>From the same working directory, copy the files to pool space

```
$ scp *.hrcsel* cfa244:/pool7/jhc
```

Notify the reviewers via e-mail that the new products are ready.

(a) The directory naming convention is YYYY:DOY:r-MMMDDYYr.
For example, 2001:295:B-OCT2201B contains the data products for OCT 22, 2001, release b.

A   Review Check List

The following is a reviewers checklist:

1. AT the Start of the review:

    1.1 Check the HRC continuity state.

    1.2

2. For Each non-HRC Observation

    2.1 Verify HRC commands have the correct HEX format.

    2.2 Verify the commanded RA,DEC matches the OR request.

3. For Each HRC Observation

    3.1 Check the HRC continuity state.

    3.2 Fmt 1 has been commanded

    3.3 All HRC commands have a one second pause between commands (ie. dvcdu > 3)

    3.4 Verify the commanded RA,DEC matches the OR request.

    3.5 HRC Dither Parameters are set before DITHER ENABLE command is issued

    3.6 Door opened 10000 steps

    3.7 SCS-105 is enabled

    3.8 Shields are commanded on and up to step 8

    3.9 if(I):

        3.9.1 TS commanded to -50504 (I)

        3.9.2 FA commanded to -716 (I)

        3.9.3 S HV off

        3.9.4 S HV steps set to 0

        3.9.5 A-side preamps commanded to I

        3.9.6 B-side preamps commanded to S

        3.9.7 All HRC-I commanded operating states and levels match the OR request:

            3.9.7.1 LLD

            3.9.7.2 ULD

        3.9.8 SCS-88 (HRC-S rampdown) and SCS-90 (HRC-S rampup) is disabled

        3.9.9 SCS-87 (HRC-I rampdown) and SCS-89 (HRC-I rampup) is enabled

        3.9.10 SCS-92 (HRC-I HV on) and SCS-91 (HRC Dither control) is activated

    3.10 if(S):

        3.10.1 TS commanded to -99616 (S)

        3.10.2 FA commanded to -991 w/grating in; -1059 wo/grating in; (S)

        3.10.3 I HV off

        3.10.4 I HV steps set to 0

        3.10.5 A-side preamps commanded to S

    3.10.6 B-side preamps commanded to I

    3.10.7 All HRC-S commanded operating states and levels match the OR request:

        3.10.7.1 LLD

        3.10.7.2 ULD

           SCS-88 (HRC-S rampdown) or SCS-87 (HRC-I rampdown) are activated.
           SCS-90 (HRC-S rampup) or SCS-89 (HRC-I rampup) are disables.

    3.10.8 SCS-87 (HRC-I rampdown) and SCS-89 (HRC-I rampup) is disabled

    3.10.9 SCS-88 (HRC-S rampdown) and SCS-90 (HRC-S rampup) is enabled

   3.10.10 SCS-93 (HRC-S HV on) and SCS-91 (HRC Dither control) is activated

  3.11 End of observation is indicated by PCAD SET TO NORMAL MANEUVER MODE

4. For Each Radiation Entry

  4.1 TS commanded to -99616

  4.2 Verify that the current selected HRC detector has the HV commanded to ramp down.
      SCS-88 (HRC-S rampdown) or SCS-87 (HRC-I rampdown) are activated.
      SCS-90 (HRC-S rampup) or SCS-89 (HRC-I rampup) are disables.

  4.3 SCS-91 (HRC dither control) has been terminated.

  4.4 The shield steps are commanded to 0 and the shield HV power supply has been commanded off.

  4.5 The HRC door is command 10000 steps toward closed.

  4.6 SCS-105 (part of instrument safing) is disabled (allow 2 min for the door to close)

  4.7 RADMON is disabled after the HRC HV is at 0 and off.

5. For Each Radiation Exit

  5.1 RADMON is enabled before the HRC HV is commanded on and up and before the shield power supply is commanded on and up.

  5.2 SCS is enabled for selected HRC detector HV rampup.

B Selected SCS Descriptions

Table 1: HRC Related SCS Table

SCS	Name	Usage	Action	Notes
28 TO	Bright Star Acq Trip	Xfr Orbit	No effect	
28 OO	Brt Star/Cmded Att Trip	On Orbit	Calls SCS 99 Terminates all ground SCS's	SCS 99 needed due to insufficent no of unused cmds in SCS 28. Req's post launch patch to FSW.
31	Safe Mode Reconfig	On Orbit	Calls SCS 85 Calls SCS 81 (Retract OTG's). Calls SCS 82 (Translate SIM to	Safe mode reconfig during Xfr Orbit is done by SCS 111.
41	HRC Shutdown	Eclipse	All HV off All steps to zero Both 5V A and B off	Called by SCS 32 if it is edited to include SCS 41
69	HRC Pwr Down	Eclipse	Turns on HRC in NIL mode No antico or MCP HV on	Called by SCS 33 if it is edited to include SCS 69.
79 TO	LAE Shut Down/Batt Connect	Xfr Orbit	No effect	
79 OO	NSM Transit	On Orbit	Terminates SCS 87 and 88 in case dithering was executing. Calls SCS 85 Calls SCS 81 (retract OTG's) Calls SCS 82 (Translate SIM to sun avoidance position)	
80 TO	Standby State Timeout	Xfr Orbit	No effect	
80 OO	Standby State Timeout	On Orbit	Calls SCS 85, Calls SCS 81 (retract OTG's), Calls SCS 82 (Translate SIM to sun avoidance position)	
85	HRC Rad Hi		All HV off, steps to zero Disables SCS 92 and 93 Disables itself	This SCS does not recycle - it must be activated for each use
86	HRC Rad Lo		No effect	Placeholder for future use.
87	HRC-I HV Ramp Down		Disables CL HV to 1/2 level (TP=42, BP=53) Enables CL	
88	HRC-S HV Ramp Down		Disables CL HV to 1/2 level (TP=43, BP=54) Enables CL	

Table 1: HRC Related SCS Table

SCS	Name	Usage	Action	Notes

89	HRC-I HV Ramp Up		Six cycles of CL DISA, set HV steps, CL ENAB
			BP Step TP Step
			   53 42
			   61 50
			   68 57
			   76 65
			   83 72
			   91 79
				Contains 30 second delay after each cycle.

90	HRC-S HV Ramp Up		Six cycles of CL DISA, set HV steps, CL ENAB
			BP Step TP Step
			   54 43
			   64 53
			   74 63
			   84 73
			   94 83
			   104 90
				Contains 30 second delay after each cycle.

91	HRC Dither Control		Dither true - Call SCS 89 and 90 Dither false - Call SCS 87 and 88	Only the two HV ramping SCS's for the active det are enabledThis SCS does not recycle - it must be activated for each use
92	HRC-I HV On		Steps to zero, disable CL, HV on, enable CL	
93	HRC-S HV On		Steps to zero, disable CL, HV on, enable CL	
95	EPHIN Failure		Calls SCS 85	
99	Safe Both SI's		Calls SCS 87 and 88	Only the SCS for the active det is enabled.
111	Autonomous Deploy/ Reconfig	Deploy and Xfr Orb	Calls SCS 85	Req's post launch patch to FSW.

C MakeHRCCmdDP.ksh Log File Output

```
===========================================================
 Title: Generating  Verification Products
 Cmdline: /d0/hrc/occ/bin/MakeHRCCmdDP.ksh
 Script Start Time: Thu Apr 26 13:54:53 GMT 2001
 Machine: netsi.harvard.edu
 Runtime Directory: /d0/hrc/occ/mp/stage
 Purpose:


===========================================================
 Identify Input Runtime System  and Executables:
   Program  -  Version
   -----------------------

   OS: Red Hat Linux release 6.2 (Zoot) Kernel 2.2.14-5.0 on an i686
   /bin/ksh: '@(#)PD KSH v5.2.14 99/07/13.2'
   /usr/bin/md5sum: 2.0e
   /d0/hrc/occ/bin/bs2svrdb: 1.13
   /d0/hrc/occ/bin/ValidateOFLS_tlr: 1.22
   /d0/hrc/occ/bin/MakeHRCCmdDP.ksh: 1.3




===========================================================
 Identify Input Runtime Files:
   -------------------------------
   File: APR3001B_Commands.tar.gz:
     ls:  -rw-r--r-- jhc.users 537526 Apr 26 12:34
    md5: 28115ec570d189c1016fe66bd21b880d

   -------------------------------
   File: APR3001B_Schedule.tar.gz:
     ls:  -rw-r--r-- jhc.users 3080290 Apr 26 12:46
    md5: 1e91c12778cb5b1a30305bff89f72e1e

   -------------------------------
   File: APR3001B_backstop.tar.gz:
     ls:  -rw-r--r-- jhc.users 130478 Apr 26 12:34
    md5: 53fd7bd400d6258462b2992791bbf6cb

===========================================================
 Begin Script Processing @: Thu Apr 26 13:54:56 GMT 2001


===========================================================
--- Thu Apr 26 13:54:56 GMT 2001 - 988293296 - 0  ---
Processing Step: 0
```

14

```
Untar distribution packages:
Installing Files in /d0/hrc/occ/mp/2001:120:B-APR3001B
tar -xvzf APR3001B_Commands.tar.gz
tar -xvzf APR3001B_Schedule.tar.gz
tar -xvzf APR3001B_backstop.tar.gz




========================================================
--- Thu Apr 26 13:55:01 GMT 2001 - 988293301 - 5  ---
Processing Step: 1
Extracting  Files in /d0/hrc/occ/mp/2001:120:B-APR3001B
   cp ./mps/md120:1015.dot tmp
   cp ./mps/or/APR3001_A.or tmp
   cp CR120:1001.backstop tmp
   cp CR120:1001.tlr tmp




========================================================
--- Thu Apr 26 13:55:01 GMT 2001 - 988293301 - 5  ---
Processing Step: 2
Clean Files
rm -fr output
rm -fr m120:1017
rm -fr mps
rm -fr log
rm -fr fot
rm -fr FOT_Load_Review_Checklist_APR3001B.txt
rm -fr CL120:1001.cld
rm -fr CL121:2101.cld
rm -fr CL123:0101.cld
rm -fr CL124:0901.cld
rm -fr CL125:1501.cld
rm -fr C120:1001
rm -fr CL120:1001.cld
rm -fr CL121:2101.cld
rm -fr CL123:0101.cld
rm -fr CL124:0901.cld
rm -fr CL125:1501.cld
rm -fr CR120:1001.backstop
rm -fr CR120:1001.tlr




========================================================
--- Thu Apr 26 13:55:02 GMT 2001 - 988293302 - 6  ---
Processing Step: 3
Generate Command State Vector Files
Last 8 Command Builds:
../2001:111:a-APR2101a
../2001:111:b-APR2101b
```

```
../2001:112:a-APR2201a
../2001:113:a-APR2301a
../2001:113:b-APR2301b
../2001:113:c-APR2301c
../2001:120:A-APR3001A
../2001:120:B-APR3001B
Use SV Continuity File: [../2001:113:c-APR2301c/APR2301c.svrdb]:
Use Backstop File: [CR120:1001.backstop]:
Generate command state vector file: APR3001B.svrdb
bs2svrdb -b CR120:1001.backstop -s ../2001:113:c-APR2301c/APR2301c.svrdb  > APR3001B.svrdb




=========================================================
--- Thu Apr 26 13:55:09 GMT 2001 - 988293309 - 13  ---
Processing Step: 4
Generate HRC SELECT File
Generate HRC Select file: APR3001B.hrcsel
ValidateOFLS_tlr -b CR120:1001.backstop -t CR120:1001.tlr -s APR3001B.svrdb -o APR3001_A.or  > APR3001B

Generate Postscript HRC Select file: APR3001B.hrcsel.ps
prn8 -w APR3001B.hrcsel > APR3001B.hrcsel.ps




=========================================================
--- Thu Apr 26 13:55:10 GMT 2001 - 988293310 - 14  ---
Processing Step: 5
Copy files to the distribution space
cp *hrcsel* /pool7/jhc




=========================================================
 Identify Output Files:
    -----------------------------
    File: APR3001B.svrdb:
      ls:  -rw-rw-r-- jhc.users 42261 Apr 26 13:55
     md5: c1a469e50a0f0d2a382065959ce24964

    -----------------------------
    File: APR3001B.hrcsel:
      ls:  -rw-rw-r-- jhc.users 59487 Apr 26 13:55
     md5: 769a3b6d256c98f50d4feaa3ab4858da




=========================================================
 Script End Time: Thu Apr 26 13:55:12 GMT 2001
```

```
Program Exits with: 0
```

D   Command State Vector RDB Header and Field Definitions

```
# Program: bs2svrdb - $Revision: 201 $
# Input Backstop File: /d0/hrc/occ/mp/2001:120:B-APR3001B/CR120:1001.backstop
# Input Continuity  svrdb File: ../2001:113:c-APR2301c/APR2301c.svrdb
# Output Generated: Thu Apr 26 13:55:08 GMT 2001
#
# --- Column Definitions ---
# gmt        - yyyy:doy:hh:mm:ss.sss
# vcdu       - minor frame counter
# FMT        - 1|2
# OBSID      - Observation ID
# SIMTA      - sim step translation position
# SIMFA      - sim step focus position
# RADMON     - en|dis
# LETG       - in|out
# HETG       - in|out
# XMITA      - transmitter A on|off
# XMITB      - transmitter B on|off
# DITHER     - en|dis
# DOOR       - HRC door open|close|mv2open|mv2close
# PREAMPA    - HRC preamp selection I|S
# HVI        - HRC HV-I status; off|on|1/2|up
# HVS        - HRC HV-S status; off|on|1/2|up
# SHLD2PWR   - HRC shield 2 power on|off
# SHLD2STEP  - HRC shield 2 HVstep
# RANGESET   - HRC Range switch setting
# CBu        - HRC Center Blank u - low
# CBU        - HRC Center Blank U - high
# CBv        - HRC Center Blank v - low
# CBV        - HRC Center Blank V - high
# DITHER_PAR- angP:angY:coefP:coefY:rateP:rateY (deg|deg/sec)
# TARGQUAT   - converted into ra:dec:roll
# SCS87      - act|term|enable|disable
# SCS88      - act|term|enable|disable
# SCS89      - act|term|enable|disable
# SCS90      - act|term|enable|disable
# SCS91      - act|term|enable|disable
# SCS92      - act|term|enable|disable
# SCS93      - act|term|enable|disable
```

E   HrcSel File Output

```
=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=
 Generating  Command MP Validation Products
 Cmdline: ValidateOFLS_tlr
 Version: $Revision: 1.1 $
 OLFS Version: 8
 Run Time: 011017.111710


 Machine:directory ha0.harvard.edu:/mnt/netsi/d0/hrc/occ/mp/2001:295:B-OCT2201B

 Dep Progs:
   Version  - Location
   ------------------------------------------------------
   2.4.2-2 - Linux
    - /usr/bin/perl


=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=

 Using TLM file: CR295:0003.tlr
 Using OR  file: OCT2201_B.or
 Current Working Directory: /mnt/netsi/d0/hrc/occ/mp/2001:295:B-OCT2201B


 Reading OR file: OCT2201_B.or
 Reading SV file: OCT2201B.svrdb
   State Vector Parameters:
    # Program: bs2svrdb - $Revision: 1.1 $
    # Input Backstop File: /mnt/netsi/d0/hrc/occ/mp/2001:295:B-OCT2201B/CR295:0003.backstop
    # Input Continuity  svrdb File: ../2001:288:B-OCT1501B/OCT1501B.svrdb
    # Output Generated: Wed Oct 17 11:17:10 EDT 2001
    # --- Column Definitions ---
    # gmt       - yyyy:doy:hh:mm:ss.sss
    # vcdu      - minor frame counter
    # FMT       - 1|2
    # OBSID     - Observation ID
    # SIMTA     - sim step translation position
    # SIMFA     - sim step focus position
    # RADMON    - en|dis
    # LETG      - in|out
    # HETG      - in|out
    # XMITA     - transmitter A on|off
    # XMITB     - transmitter B on|off
    # DITHER    - en|dis
    # DOOR      - HRC door open|close|mv2open|mv2close
    # PREAMPA   - HRC preamp selection I|S
    # HVI       - HRC HV-I status; off|on|1/2|up
    # HVS       - HRC HV-S status; off|on|1/2|up
    # SHLD2PWR  - HRC shield 2 power on|off
    # SHLD2STEP - HRC shield 2 HVstep
    # RANGESET  - HRC Range switch setting
    # CBu       - HRC Center Blank u - low
    # CBU       - HRC Center Blank U - high
    # CBv       - HRC Center Blank v - low
    # CBV       - HRC Center Blank V - high
    # DITHER_PAR- angP:angY:coefP:coefY:rateP:rateY (deg|deg/sec)
    # TARGQUAT  - converted into ra:dec:roll
    # SCS87     - act|term|enable|disable
    # SCS88     - act|term|enable|disable
    # SCS89     - act|term|enable|disable
    # SCS90     - act|term|enable|disable
    # SCS91     - act|term|enable|disable
    # SCS92     - act|term|enable|disable
    # SCS93     - act|term|enable|disable
    # SCS105    - act|term|enable|disable
----------------------------------------------------------------------------------------------------
 Selecting  HRC Events from the Misson Timeline Report: CR295:0003.tlr
 Program Runtime: 19101290.111711.tm (10/17/101)
 $Header: /d0/hrc/doc/howto_GenHRCMPDP/RCS/OCT2201B.hrcsel,v 1.1 2002/10/29 20:54:18 jhc Exp $

 GMT               DTime      vcdu    mnem       Hex      Description
----------------------------------------------------------------------------------------------------

 Initial Command State Vector:===============================
   gmt = 2001:295:00:19:11.000
   vcdu = 5002985
   FMT = 2
   OBSID =  1949
   SIMTA = 75624
   SIMFA = -468
   RADMON = en
   LETG = out
   HETG = out
   XMITA = off
   XMITB = off
   DITHER = en
```

```
         DOOR = mv2close
         PREAMPA = S
         HVI = off
         HVS = 1/2
         SHLD2PWR = off
         SHLD2STEP = 0
         RANGESET = 125
         CBu = 69
         CBU = 74
         CBv = 0
         CBV = 255
         DITHER_PAR = 0.000000:0.000000:0.002222:0.002222:0.509102:0.360002
         TARGQUAT = 125.5219:-42.5985:88.0121
         SCS87 = dis
         SCS88 = act
         SCS89 = dis
         SCS90 = ena
         SCS91 = term
         SCS92 = na
         SCS93 = act
         SCS105 = dis

Initial OR Comments:=========================================
    BEGIN_COMMENT,ID=49999

    This is the OR list for the week beginning 15 October 2001
    Please mail all comments to John Grimes (jgrimes@head-cfa)

    Version list:
    _00 : as extracted 03 Oct 2001.
    _01 : added comments on 03 Oct 2001
    _02 : final list circulated on 08 Oct 2001


    Changes from version _01:

    ObsIDs 3357 and 3359 removed, as they were supposed to be done along with
    a third ObsID which is not yet visible.

    Offsets updated for 3203 and 3269, per M. Markevitch (now updated in ObsCat).

    SI_MODE inserted for 3395 per R. Buehler (now updated in ObsCat).

    Priorities in the list:
          5 lts bin with constraint
      6 lts bin
            9  pool targets


    Priority        # of Obs        Time (seconds)
    5               1                   30000.00
    6               12                 337200.00
    9               10                 151000.00

    HRC             2                   60000.00
    ACIS            21                 458200.00


    TOTAL           23                 518200.00


    Targets Not Yet Signed Off:
    --------------------------

    700400 02961      PSS 0902+1640         not signed off ***
     >> email signoff by S.Virani; ObsCat needs to be updated

    Signoff status at time of release of this list:
    -----------------------------------------------
    200079 00972            M17          TOWNSLEY ACIS-I NONE TE_002A4  swolk 08/14/00
    400129 01916  SAX J1806.5-2215        VERBUNT ACIS-S NONE TE_002A2  ybutt 06/19/01
    400148 01935  SAX J1747.0-2853      MARKWARDT ACIS-I NONE TE_002A4  ybutt 05/30/01
    500133 01956          SN1998BW   KOUVELIOTOU ACIS-S NONE TE_002A2 ekellogg 07/17/01
    500140 01963    1RXS J1708-4009         ISRAEL  HRC-I NONE rdonnelly 12/18/00
    500143 01966      PSR B0833-45        HELFAND  HRC-I NONE          mjuda 10/02/00
    500188 02011       PSR1813-36           SLANE ACIS-S NONE TE_002A2 plucinsk 04/06/01
    600169 02035    IRAS 17208-0014       HECKMAN ACIS-S NONE TE_002A2  ybutt 01/10/01
    700363 02173  2MASSJ222202+1952        WILKES ACIS-I NONE TE_00406 svirani  11/30/00
    700378 02188         NGC 7130       LEVENSON ACIS-S NONE TE_003BA svirani  01/19/01
    900080 02484          CHVC125        BREGMAN ACIS-S NONE TE_002AE  das 07/02/01
    500245 02795     RXJ0806.3+1527         ISRAEL ACIS-S NONE TE_00274 plucinsk 09/25/01
    700400 02961      PSS 0902+1640       HARRISON ACIS-S NONE TE_003AC  *** not signed off ***
    700457 03018        PSS0134+3307       PRIDDEY ACIS-S NONE TE_002A2 svirani  10/02/01
    700458 03019        HS0218+3707        PRIDDEY ACIS-S NONE TE_002A2 svirani  10/02/01
    700459 03020        HS0219+1452        PRIDDEY ACIS-S NONE TE_002A2 svirani  10/02/01
```

```
700471 03032  SDSS075618+410408            BRANDT ACIS-S NONE TE_002A2 svirani  09/27/01
700474 03035  SDSS094108+594725            BRANDT ACIS-S NONE TE_002A2 svirani  09/27/01
800197 03197  MACS-J0744.8+3927     VANSPEYBROECK ACIS-I NONE TE_0048A mmarkevitch 09/27/01
800203 03203       A168_OFFSET1      MARKEVITCH ACIS-I NONE TE_0048A mmarkevitch 10/05/01
800267 03267  MACSJ0257.6-2209            EBELING ACIS-I NONE TE_0048A mmarkevitch 09/27/01
800269 03269  MACSJ0404.6+1109            EBELING ACIS-I NONE TE_0048A mmarkevitch 10/05/01
700608 03395     MG J0414+0534           GARMIRE ACIS-S NONE TE_003F8 svirani  10/04/01


  ***OR QUICK LOOK START
     WARNING: Please do not modify anything between "QUICK LOOK START"
     and "QUICK LOOK END".  All data between these 2 keywords will be
     replaced whenever the file is saved using the mp_orf_gui!

  SeqNbr    ObsId    Target Name             Observer

  200079   00972    M17                     TOWNSLEY
  400129   01916    SAX J1806.5-2215        VERBUNT
  400148   01935    SAX J1747.0-2853        MARKWARDT
  500133   01956    SN1998BW                KOUVELIOTOU
  500140   01963    1RXS J1708-4009         ISRAEL
  500143   01966    PSR B0833-45            HELFAND
  500188   02011    PSR1813-36              SLANE
  500245   02795    RXJ0806.3+1527          ISRAEL
  600169   02035    IRAS 17208-0014         HECKMAN
  700363   02173    2MASSJ222202+1952       WILKES
  700378   02188    NGC 7130                LEVENSON
  700400   02961    PSS 0902+1640           HARRISON
  700457   03018    PSS0134+3307            PRIDDEY
  700458   03019    HS0218+3707             PRIDDEY
  700459   03020    HS0219+1452             PRIDDEY
  700471   03032    SDSS075618+410408       BRANDT
  700474   03035    SDSS094108+594725       BRANDT
  700608   03395    MG J0414+0534           GARMIRE
  800197   03197    MACS-J0744.8+3927       VANSPEYBROECK
  800203   03203    A168_OFFSET1            MARKEVITCH
  800267   03267    MACSJ0257.6-2209        EBELING
  800269   03269    MACSJ0404.6+1109        EBELING
  900080   02484    CHVC125                 BREGMAN
  ***OR QUICK LOOK END
  END_COMMENT


 ==============================================================
 2001:295:00:16:11.000 -> FIRST Command in Load

 2001:295:00:16:11.000 00:00:00 -> SCS Slot Change = 0 -> 130
 2001:295:00:19:11.000 00:03:00  5002985 AONMMODE         -> AONMMODE SET PCAD MODE NORMAL MANEUVER
 2001:295:00:19:15.357 00:00:04  5003002 AOUPTARQ   8132201 -> SET  TARGET QUATERIAN PARAMETERS
 2001:295:00:19:15.357 ->     Q1 = 3.305660e-01
 2001:295:00:19:15.357 ->     Q2 = 5.043872e-01
 2001:295:00:19:15.357 ->     Q3 = 7.671205e-01
 2001:295:00:19:15.357 ->     Q4 = 2.187370e-01
 -> RA,Dec,Roll(deg): 135.70614,   16.64922,   73.46688

 2001:295:00:19:21.251 00:00:06  5003025 AOMANUVR           -> AOMANUVR: SET ATTITUDE CMD MODE MANEUVER
 2001:295:00:19:22.276 00:00:01  5003029 COACTSX    8402600 -> ACTIVATE SCS 0x26 (38) ACA RESET


 ================================================================================================
 OBSID = 2961:
 ================================================================================================
 Observation Request INFO:---------------------------
  ID = 02961
  TARGET = (135.694583,16.666944,{PSS0902+1640})
  DURATION = (5200.0)
  PRIORITY = 6
  SI = ACIS-S
  GRATING = NONE
  SI_MODE = TE_003AC
  ACA_MODE = DEFAULT
  TARGET_OFFSET = (-0.005500)
  DITHER = (ON,0.002222,0.360000,0.000000,0.002222,0.509100,0.000000)
  WINDOW = (2001:295:00:00:00.000,2001:295:05:00:00.000)
  MIN_ACQ = 3
  MIN_GUIDE = 3

 Command State Vector:--------------
  gmt = 2001:295:00:22:11.000
  vcdu = 5003687
  FMT = 2
  OBSID =  2961
  SIMTA = 75624
```

```
      SIMFA = -468
      RADMON = en
      LETG = out
      HETG = out
      XMITA = off
      XMITB = off
      DITHER = en
      DOOR = mv2close
      PREAMPA = S
      HVI = off
      HVS = 1/2
      SHLD2PWR = off
      SHLD2STEP = 0
      RANGESET = 125
      CBu = 69
      CBU = 74
      CBv = 0
      CBV = 255
      DITHER_PAR = 0.000000:0.000000:0.002222:0.002222:0.509102:0.360002
      TARGQUAT = 135.7061:16.6492:73.4669
      SCS87 = dis
      SCS88 = act
      SCS89 = dis
      SCS90 = ena
      SCS91 = term
      SCS92 = na
      SCS93 = act
      SCS105 = dis

Selected HRC and S/C Events/Commands:--------------
 2001:295:00:22:11.000 00:02:49  5003687 COAOSQID   8111700 -> OBSID: [0x5003687] 2961
 2001:295:02:15:10.029 01:52:59  5030142 AONMMODE            -> AONMMODE SET PCAD MODE NORMAL MANEUVER
 2001:295:02:15:14.386 00:00:04  5030159 AOUPTARQ   8132201 -> SET  TARGET QUATERIAN PARAMETERS
 2001:295:02:15:14.386 ->        Q1 = 4.001057e-02
 2001:295:02:15:14.386 ->        Q2 = 7.091309e-01
 2001:295:02:15:14.386 ->        Q3 = 4.671135e-01
 2001:295:02:15:14.386 ->        Q4 = 5.266284e-01
-> RA,Dec,Roll(deg):  128.85881,  -45.19571,   90.72649

 2001:295:02:15:20.282 00:00:06  5030182 AOMANUVR            -> AOMANUVR: SET ATTITUDE CMD MODE MANEUVER
 2001:295:02:15:21.305 00:00:01  5030186 COACTSX    8402600 -> ACTIVATE SCS 0x26 (38) ACA RESET
 2001:295:02:18:09.529 00:02:48  5030842 2OBSVASL   6434000 == 6434000 sd1a00 observing mode select




================================================================================================
OBSID = 1966:
================================================================================================
Observation Request  COMMENTS:--------------------------
  BEGIN_COMMENT, ID=01966
  mp_remarks: remarks: IT WOULD BE
DESIRABLE FOR THE OBSERVATION TO TAKE PLACE EARLY IN AO-2 TO MAINTAIN THE
LOGARITHMIC SPACING OF THESE MONITORING OBSERVATIONS ( 3.5D, 35D, 350D)
ALTHOUGH, OWING TO THE THEORETICAL UNCERTAINTIES DISCUSSED IN THE TEXT, PRECISE
ADHERENCE TO THIS SCHEDULE IS NOT CRITICAL. IN ADDIT ION, IT WOULD BE DESIRABLE
TO SPLIT THE OBSERVATION INTO TWO 50 KSEC POINTINGS SEPARATED BY 0.5-2 MONTHS.
  END_COMMENT

Observation Request INFO:---------------------------
  ID = 01966
  TARGET = (128.836250,-45.176583,{PSRB0833-45})
  DURATION = (50000.00,50000.0,55000.0)
  PRIORITY = 6
  SI = HRC-I
  GRATING = NONE
  ACA_MODE = DEFAULT
  TARGET_OFFSET = (0.000000,0.000000)
  DITHER = (ON,0.005556,0.331200,0.000000,0.005556,0.468400,0.000000)
  PRECEDING = (02961)
  MIN_ACQ = 6

Command State Vector:--------------
  gmt = 2001:295:02:18:10.029
  vcdu = 5030844
  FMT = 2
  OBSID =  1966
  SIMTA = 75624
  SIMFA = -468
  RADMON = en
  LETG = out
  HETG = out
  XMITA = off
  XMITB = off
  DITHER = en
```

```
     DOOR = mv2close
     PREAMPA = S
     HVI = off
     HVS = 1/2
     SHLD2PWR = off
     SHLD2STEP = 0
     RANGESET = 125
     CBu = 69
     CBU = 74
     CBv = 0
     CBV = 255
     DITHER_PAR = 0.000000:0.000000:0.002222:0.002222:0.509102:0.360002
     TARGQUAT = 128.8588:-45.1957:90.7265
     SCS87 = dis
     SCS88 = act
     SCS89 = dis
     SCS90 = ena
     SCS91 = term
     SCS92 = na
     SCS93 = act
     SCS105 = dis
2001:295:02:18:10.029

Selected HRC and S/C Events/Commands:--------------
 2001:295:02:18:10.029 00:00:01  5030844 COAOSQID   8111700 -> OBSID: [0x5030844] 1966
 2001:295:02:18:10.029 00:00:00  5030844 CSELFMT1   7C40003 -> FORMAT 1
 2001:295:02:18:10.529 00:00:01  5030846 2FIFOAOF   648A000 == 648a000 sd4500 data fifo reset
 2001:295:02:18:11.529 00:00:01  5030850 2FIFOAON   648A020 == 648a020 sd4501 data fifo enable
 2001:295:02:35:12.012 00:17:00  5034832 3SIMHD     64DC061 -> SIM: Multipart Cmd (6e03) cksum: 6e; Num cmds:03
 2001:295:02:35:12.012         5034832 6440221 ->   SIM: 2011 -> TSC Enable
 2001:295:02:35:12.012         5034832 65CEAE1 ->   SIM: e757 -> TS  goto: [e757] -> -50504
 2001:295:02:35:12.012         5034832 6440001 ->   SIM: 2000 -> TSC Disable

 2001:295:02:35:56.178 -> DSN ACQUISITION E_DSS-34
 2001:295:02:35:57.178 -> DSN ACQUISITION E_DSS-46
 2001:295:02:36:34.743 00:01:23  5035155 2S2STHV    641C000 == 641c000 sd0e00 (0) shield b hv step
 2001:295:02:36:35.743 00:00:01  5035159 2S2HVON    641A020 == 641a020 sd0d01 shield b hv on
 2001:295:02:36:45.743 00:00:10  5035198 2S2STHV    641C080 == 641c080 sd0e04 (4) shield b hv step
 2001:295:02:36:55.743 00:00:10  5035237 2S2STHV    641C100 == 641c100 sd0e08 (8) shield b hv step
 2001:295:02:36:57.743 00:00:02  5035245 2MCMRASL   64DE020 XX 64de000 sd6f00 motion control mode reset
 2001:295:02:36:58.743 00:00:01  5035249 2DRMTASL   64E2000 == 64e2000 sd7100 door motor select
 2001:295:02:36:59.743 00:00:01  5035253 2STFLADI   64A8000 == 64a8000 sd5400 clear stop flags
 2001:295:02:37:00.743 00:00:01  5035257 2STFLAEN   64A8020 == 64a8020 sd5401 enable stop flags
 2001:295:02:37:01.743 00:00:01  5035261 2SMOIADI   6492000 == 6492000 sd4900 selected mtr overcurrent prot disable
 2001:295:02:37:02.743 00:00:01  5035265 2SMOTAEN   6494020 == 6494020 sd4a01 selected mtr overtemp prot enable
 2001:295:02:37:03.743 00:00:01  5035268 2CHPLADI   64A0000 == 64a0000 sd5000 clos/home primary limit sw disa  VCDU WARN: dvcdu: 3
 2001:295:02:37:04.743 00:00:01  5035272 2CHSLADI   64A2000 == 64a2000 sd5100 clos/home secondary lim sw disa
 2001:295:02:37:05.743 00:00:01  5035276 2OMPLAEN   64A4020 == 64a4020 sd5201 open/max primary limit sw enable
 2001:295:02:37:06.743 00:00:01  5035280 2OMSLAEN   64A6020 == 64a6020 sd5301 open/max secondary lim sw enable
 2001:295:02:37:07.743 00:00:01  5035284 2MDRVAEN   64D0020 == 64d0020 sd6801 motor drive enable
 2001:295:02:37:08.743 00:00:01  5035288 2PSHBALD   64304E0 == 64304e0 sd1827 (39) mot ctrl pos word hi byte load
 2001:295:02:37:09.743 00:00:01  5035292 2PSLBALD   6432200 == 6432200 sd1910 (16) mot ctrl pos word lo byte load
 2001:295:02:37:10.743 00:00:01  5035296 2NSTBAEX   64DA020 == 64da020 sd6d01 move n steps toward open/max ls
 2001:295:02:37:10.743 00:00:00  5035296 COENASX    8446900 -> ENABLE SCS 0x69 (105)
 2001:295:02:38:32.743 00:01:22  5035616 AODITPAR   8134401 -> SET DITHER PARAMETERS
 2001:295:02:38:32.743 ->   ANGP = 0.000000e+00 rad (0.000000e+00 deg)
 2001:295:02:38:32.743 ->   ANGY = 0.000000e+00 rad (0.000000e+00 deg)
 2001:295:02:38:32.743 ->   COEFP = 9.696999e-05 rad (5.555993e-03 deg)
 2001:295:02:38:32.743 ->   COEFY = 9.696999e-05 rad (5.555993e-03 deg)
 2001:295:02:38:32.743 ->   RATEP = 8.175120e-03 rad/sec (4.684017e-01 deg/sec)
 2001:295:02:38:32.743 ->   RATEY = 5.780529e-03 rad/sec (3.312012e-01 deg/sec)

 2001:295:02:38:33.743 00:00:01  5035620 AOENDITH   8034301 -> DITHER ENABLE
 2001:295:02:39:10.743 00:00:37  5035764 2MDRVADI   64D0000 == 64d0000 sd6800 motor drive disable
 2001:295:02:39:11.743 00:00:01  5035768 2ALMTADS   64E0000 == 64e0000 sd7000 all motors deselect
 2001:295:02:39:12.383 00:00:01  5035770 3SIMHD     646E061 -> SIM: Multipart Cmd (3703) cksum: 37; Num cmds:03
 2001:295:02:39:12.383         5035770 6440661 ->   SIM: 2033 -> FA Enable
 2001:295:02:39:12.383         5035770 65FA681 ->   SIM: fd34 -> FA  goto: [fd34] -> -716
 2001:295:02:39:12.383         5035770 6440441 ->   SIM: 2022 -> FA Disable

 2001:295:02:41:56.743 00:02:45  5036412 COTERMSX   8415B00 -> TERMINATE SCS 0x5B (91) HRC Dither Control
 2001:295:02:41:56.743 00:00:00  5036412 2SPHVOF    6402000 == 6402000 sd0100 spect det hv off
 2001:295:02:41:57.743 00:00:01  5036416 2IMHVOF    6412000 == 6412000 sd0900 imaging det hv off
 2001:295:02:41:58.743 00:00:01  5036420 2SPTTHV    6404000 == 6404000 sd0200 (0) spect top plate hv
 2001:295:02:41:59.743 00:00:01  5036424 2SPTBHV    6406000 == 6406000 sd0300 (0) spect bot plate hv
 2001:295:02:42:00.743 00:00:01  5036428 2IMTTHV    6414000 == 6414000 sd0a00 (0) imaging top plate hv
 2001:295:02:42:01.743 00:00:01  5036431 2IMTBHV    6416000 == 6416000 sd0b00 (0) imaging bot plate hv  VCDU WARN: dvcdu: 3
 2001:295:02:42:07.743 00:00:06  5036455 2PRBSSL    600007A == 600007a hlp7a SPECTR DETECTOR SELECT, PREAMP B
 2001:295:02:42:08.743 00:00:01  5036459 2PRAISL    600003A == 600003a hlp3a IMAGING DETECTOR SELECT, PREAMP A
 2001:295:02:42:09.743 00:00:01  5036467 2PSHBALD   6430000 == 6430000 sd1800 (0) mot ctrl pos word hi byte load
 2001:295:02:42:11.743 00:00:01  5036470 2PSLBALD   6432000 == 6432000 sd1900 (0) mot ctrl pos word lo byte load  VCDU WARN: dvcdu: 3
 2001:295:02:42:12.743 00:00:01  5036474 2SPNLASL   6436020 == 6436020 sd1b01 spect det in normal mode
 2001:295:02:42:13.743 00:00:01  5036478 2CALBAAM   6440000 == 6440000 sd2000 (0) cal pulse amplitude
 2001:295:02:42:14.743 00:00:01  5036482 2CLMDAOF   6442000 == 6442000 sd2100 cal mode off
```

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2001:295:02:42:15.743 00:00:01  5036486 2FCPUALV   6444000 == 6444000 sd2200 (0) forced coarse pos u
2001:295:02:42:16.743 00:00:01  5036490 2FCPVALV   6446000 == 6446000 sd2300 (0) forced coarse pos v
2001:295:02:42:17.743 00:00:01  5036494 2CBHUALV   6449FE0 == 6449fe0 sd24ff (255) cb hi channel, u axis
2001:295:02:42:18.743 00:00:01  5036498 2CBLUALV   644A000 == 644a000 sd2500 (0) cb lo channel, u axis
2001:295:02:42:19.743 00:00:01  5036502 2CBHVALV   644DFE0 == 644dfe0 sd26ff (255) cb hi channel, v axis
2001:295:02:42:20.743 00:00:01  5036506 2CBLVALV   644E000 == 644e000 sd2700 (0) cb lo channel, v axis
2001:295:02:42:21.743 00:00:01  5036509 2ULDIATH   6451FE0 == 6451fe0 sd28ff (255) upper lvl threshold  VCDU WARN: dvcdu: 3
2001:295:02:42:22.743 00:00:01  5036513 2LLDIATH   6452100 == 6452100 sd2908 (8) trigger lvl threshold
2001:295:02:42:23.743 00:00:01  5036517 2GRDVAAM   6456380 == 6456380 sd2b1c (28) grid bias voltage
2001:295:02:42:24.743 00:00:01  5036521 2WDTHATH   6458040 == 6458040 sd2c02 (2) coarse width threshold
2001:295:02:42:25.743 00:00:01  5036525 2RSRFAAM   645AE60 == 645ae60 sd2d73 (115) range switch setting
2001:295:02:42:26.743 00:00:01  5036529 2SHL1AEN   6480020 == 6480020 sd4001 shield antico enable
2001:295:02:42:27.743 00:00:01  5036533 2WDTHADI   6482000 == 6482000 sd4100 width disable
2001:295:02:42:28.743 00:00:01  5036537 2ULDIADI   6484000 == 6484000 sd4200 upper lvl disable
2001:295:02:42:29.743 00:00:01  5036541 2CBLKADI   6486000 == 6486000 sd4300 center blank disable
2001:295:02:42:30.743 00:00:01  5036545 2EBLKADI   6488000 == 6488000 sd4400 edge blank disable
2001:295:02:42:31.743 00:00:01  5036548 2SMOIAEN   6492020 == 6492020 sd4901 selected mtr overcurrent prot enable  VCDU WARN: dvcdu: 3
2001:295:02:42:32.743 00:00:01  5036552 2SMOTAEN   6494020 == 6494020 sd4a01 selected mtr overtemp prot enable
2001:295:02:42:33.743 00:00:01  5036556 2CHPLAEN   64A0020 == 64a0020 sd5001 clos/home primary limit sw enable
2001:295:02:42:34.743 00:00:01  5036560 2CHSLAEN   64A2020 == 64a2020 sd5101 clos/home secondary lim sw enable
2001:295:02:42:35.743 00:00:01  5036564 2OMPLAEN   64A4020 == 64a4020 sd5201 open/max primary limit sw enable
2001:295:02:42:36.743 00:00:01  5036568 2OMSLAEN   64A6020 == 64a6020 sd5301 open/max secondary lim sw enable
2001:295:02:42:37.743 00:00:01  5036572 2STFLAEN   64A8020 == 64a8020 sd5401 enable stop flags
2001:295:02:42:38.743 00:00:01  5036576 2FIFOAOF   648A000 == 648a000 sd4500 data fifo reset
2001:295:02:42:39.743 00:00:01  5036580 2FIFOAON   648A020 == 648a020 sd4501 data fifo enable
2001:295:02:43:07.743 00:00:28  5036689 CODISASX   8455800 -> DISABLE SCS 0x58 (88) HRC-S HV Ramp Down
2001:295:02:43:07.743 00:00:00  5036689 CODISASX   8455A00 -> DISABLE SCS 0x5A (90) HRC-S HV Ramp Up
2001:295:02:43:07.743 00:00:00  5036689 COENASX    8445700 -> ENABLE SCS 0x57 (87) HRC-I HV Ramp Down
2001:295:02:43:07.743 00:00:00  5036689 COENASX    8445900 -> ENABLE SCS 0x59 (89) HRC-I HV Ramp Up
2001:295:02:43:07.743 00:00:00  5036689 COACTSX    8405C00 -> ACTIVATE SCS 0x5C (92) HRC-I HV On
2001:295:02:43:48.743 00:00:41  5036849 COACTSX    8405B00 -> ACTIVATE SCS 0x5B (91) HRC Dither Control
2001:295:05:55:00.257 03:11:12  5081616 CTXBOF     780004C -> TRANSMITTER B OFF
2001:295:05:55:00.771 00:00:01  5081618 CTXAOF     780000C -> TRANSMITTER A OFF
2001:295:05:55:01.285 00:00:01  5081620 CTXAON     7800004 -> TRANSMITTER A ON
2001:295:07:25:01.285 01:30:00  5102693 CTXAOF     780000C -> TRANSMITTER A OFF
2001:295:07:25:01.542 00:00:00  5102694 CTXBOF     780004C -> TRANSMITTER B OFF
2001:295:07:48:22.146 -> DSN EXIT        X_DSS-27
2001:295:07:48:58.152 -> DSN EXIT        X_DSS-16
2001:295:07:48:58.249 -> DSN EXIT        X_DSS-24
2001:295:11:39:59.824 -> DSN ACQUISITION E_DSS-66
2001:295:11:40:01.099 -> DSN ACQUISITION E_DSS-54
2001:295:13:05:00.262 -> DSN EXIT        X_DSS-46
2001:295:13:05:01.395 -> DSN EXIT        X_DSS-34
2001:295:15:00:00.257 07:34:59  5209226 CTXBOF     780004C -> TRANSMITTER B OFF
2001:295:15:00:00.771 00:00:01  5209228 CTXAOF     780000C -> TRANSMITTER A OFF
2001:295:15:00:01.285 00:00:01  5209230 CTXAON     7800004 -> TRANSMITTER A ON
2001:295:17:17:29.436 02:17:28  5241418 AONMMODE            -> AONMMODE SET PCAD MODE NORMAL MANEUVER
2001:295:17:17:34.436 00:00:05  5241437 3SIMHD     6502061 -> SIM: Multipart Cmd (8103) cksum: 81; Num cmds:03
2001:295:17:17:34.436  5241437 6440221 ->   SIM: 2011 -> TSC Enable
2001:295:17:17:34.436  5241437 659EB81 ->   SIM: cf5c -> TS  goto: [cf5c] -> -99616
2001:295:17:17:34.436  5241437 6440001 ->   SIM: 2000 -> TSC Disable

2001:295:17:17:40.712 00:00:06  5241462 COACTSX    8402600 -> ACTIVATE SCS 0x26 (38) ACA RESET
2001:295:17:24:08.436 00:06:28  5242975 COACTSX    8405700 -> ACTIVATE SCS 0x57 (87) HRC-I HV Ramp Down
2001:295:17:24:08.436 00:00:00  5242975 CODISASX   8455900 -> DISABLE SCS 0x59 (89) HRC-I HV Ramp Up
2001:295:17:24:08.436 00:00:00  5242975 COTERMSX   8415B00 -> TERMINATE SCS 0x5B (91) HRC Dither Control
2001:295:17:25:08.436 00:01:00  5243209 2S1HVOF    640A000 == 640a000 sd0500 shield a hv off
2001:295:17:25:09.436 00:00:01  5243213 2S2HVOF    641A000 == 641a000 sd0d00 shield b hv off
2001:295:17:25:10.436 00:00:01  5243217 2S1STHV    640C000 == 640c000 sd0600 (0) shield a hv step
2001:295:17:25:11.436 00:00:01  5243220 2S2STHV    641C000 == 641c000 sd0e00 (0) shield b hv step  VCDU WARN: dvcdu: 3
2001:295:17:25:13.436 00:00:02  5243228 2MCMRASL   64DE020 XX 64de000 sd6f00 motion control mode reset
2001:295:17:25:14.436 00:00:01  5243232 2DRMTASL   64E2000 == 64e2000 sd7100 door motor select
2001:295:17:25:15.436 00:00:01  5243236 2STFLADI   64A8000 == 64a8000 sd5400 clear stop flags
2001:295:17:25:16.436 00:00:01  5243240 2STFLAEN   64A8020 == 64a8020 sd5401 enable stop flags
2001:295:17:25:17.436 00:00:01  5243244 2SMOIADI   6492000 == 6492000 sd4900 selected mtr overcurrent prot disable
2001:295:17:25:18.436 00:00:01  5243248 2SMOTAEN   6494020 == 6494020 sd4a01 selected mtr overtemp prot enable
2001:295:17:25:19.436 00:00:01  5243252 2CHPLADI   64A0000 == 64a0000 sd5000 clos/home primary limit sw disa
2001:295:17:25:20.436 00:00:01  5243256 2CHSLAEN   64A2020 == 64a2020 sd5101 clos/home secondary lim sw enable
2001:295:17:25:21.436 00:00:01  5243259 2OMPLADI   64A4000 == 64a4000 sd5200 open/max primary limit sw disa  VCDU WARN: dvcdu: 3
2001:295:17:25:22.436 00:00:01  5243263 2OMSLADI   64A6000 == 64a6000 sd5300 open/max secondary lim sw disa
2001:295:17:25:23.436 00:00:01  5243267 2MDRVAEN   64D0020 == 64d0020 sd6801 motor drive enable
2001:295:17:25:24.436 00:00:01  5243271 2PSHBALD   64304E0 == 64304e0 sd1827 (39) mot ctrl pos word hi byte load
2001:295:17:25:25.436 00:00:01  5243275 2PSLBALD   6432200 == 6432200 sd1910 (16) mot ctrl pos word lo byte load
2001:295:17:25:26.436 00:00:01  5243279 2NSTAAEX   64D8020 == 64d8020 sd6c01 move n steps toward clos/home ls
2001:295:17:25:26.436 00:00:00  5243279 CODISASX   8456900 -> DISABLE SCS 0x69 (105)
2001:295:17:27:26.436 00:02:00  5243747 2MDRVADI   64D0000 == 64d0000 sd6800 motor drive disable
2001:295:17:27:27.436 00:00:01  5243751 2ALMTADS   64E0000 == 64e0000 sd7000 all motors deselect
2001:295:17:27:29.436 00:00:02 -> Radmon Disable
2001:295:17:30:01.285 00:02:32  5244352 CTXAOF     780000C -> TRANSMITTER A OFF
2001:295:17:30:01.542 00:00:00  5244353 CTXBOF     780004C -> TRANSMITTER B OFF
2001:295:17:32:28.936 00:02:27  5244928 2NXILASL   6434020 == 6434020 sd1a01 next in line mode select
2001:295:17:32:29.436 00:00:00  5244930 CSELFMT2   7C40023 -> FORMAT 2
2001:295:17:32:29.436 00:00:00  5244930 AONMMODE            -> AONMMODE SET PCAD MODE NORMAL MANEUVER
2001:295:17:32:29.936 00:00:01  5244932 2FIFOAOF   648A000 == 648a000 sd4500 data fifo reset
```

```
 2001:295:17:32:30.936 00:00:01  5244936 2FIFOAON   648A020 == 648a020 sd4501 data fifo enable
 2001:295:17:32:33.793 00:00:03  5244947 AOUPTARQ   8132201 -> SET  TARGET QUATERIAN PARAMETERS
 2001:295:17:32:33.793 ->     Q1 = -2.916761e-01
 2001:295:17:32:33.793 ->     Q2 = 5.554152e-01
 2001:295:17:32:33.793 ->     Q3 = 1.675105e-03
 2001:295:17:32:33.793 ->     Q4 = 7.787401e-01
-> RA,Dec,Roll(deg):  320.00000,  -59.99999,  295.19852

 2001:295:17:32:39.687 00:00:06  5244970 AOMANUVR            -> AOMANUVR: SET ATTITUDE CMD MODE MANEUVER
 2001:295:17:32:40.712 00:00:01  5244974 COACTSX    8402600 -> ACTIVATE SCS 0x26 (38) ACA RESET



=====================================================================================================
OBSID = 61431:
=====================================================================================================

Command State Vector:-------------
  gmt = 2001:295:17:35:29.436
  vcdu = 5245632
  FMT = 2
  OBSID =  61431
  SIMTA = -99616
  SIMFA = -716
  RADMON = ds
  LETG = out
  HETG = out
  XMITA = off
  XMITB = off
  DITHER = en
  DOOR = mv2close
  PREAMPA = I
  HVI = 1/2
  HVS = off
  SHLD2PWR = off
  SHLD2STEP = 0
  RANGESET = 115
  CBu = 0
  CBU = 255
  CBv = 0
  CBV = 255
  DITHER_PAR = 0.000000:0.000000:0.005556:0.005556:0.468402:0.331201
  TARGQUAT = 320.0000:-60.0000:295.1985
  SCS87 = act
  SCS88 = dis
  SCS89 = dis
  SCS90 = dis
  SCS91 = term
  SCS92 = act
  SCS93 = act
  SCS105 = dis

Selected HRC and S/C Events/Commands:-------------
 2001:295:17:35:29.436 00:02:49  5245632 COAOSQID   8111700 -> OBSID: [0x5245632] 61431
 2001:295:17:58:09.119 00:22:40  5250938 AODITPAR   8134401 -> SET DITHER PARAMETERS
 2001:295:17:58:09.119 ->   ANGP = 0.000000e+00 rad (0.000000e+00 deg)
 2001:295:17:58:09.119 ->   ANGY = 0.000000e+00 rad (0.000000e+00 deg)
 2001:295:17:58:09.119 ->  COEFP = 3.878000e-05 rad (2.221939e-03 deg)
 2001:295:17:58:09.119 ->  COEFY = 3.878000e-05 rad (2.221939e-03 deg)
 2001:295:17:58:09.119 ->  RATEP = 8.885469e-03 rad/sec (5.091018e-01 deg/sec)
 2001:295:17:58:09.119 ->  RATEY = 6.283189e-03 rad/sec (3.600016e-01 deg/sec)

 2001:295:17:58:10.119 00:00:01  5250942 AOENDITH   8034301 -> DITHER ENABLE
 2001:295:20:14:09.436 -> Electron 1 RADIATION ENTRY
 2001:295:20:20:59.658 02:22:50  5284384 AONMMODE            -> AONMMODE SET PCAD MODE NORMAL MANEUVER
 2001:295:20:21:04.015 00:00:04  5284401 AOUPTARQ   8132201 -> SET  TARGET QUATERIAN PARAMETERS
 2001:295:20:21:04.015 ->     Q1 = -1.522667e-01
 2001:295:20:21:04.015 ->     Q2 = 1.051090e-01
 2001:295:20:21:04.015 ->     Q3 = 1.665890e-01
 2001:295:20:21:04.015 ->     Q4 = 9.685118e-01
-> RA,Dec,Roll(deg):   17.49129,  -14.73391,  344.40941

 2001:295:20:21:09.909 00:00:06  5284424 AOMANUVR            -> AOMANUVR: SET ATTITUDE CMD MODE MANEUVER
 2001:295:20:21:10.934 00:00:01  5284428 COACTSX    8402600 -> ACTIVATE SCS 0x26 (38) ACA RESET
 2001:295:20:21:12.984 00:00:02  5284436 COENASX    8446200 -> ENABLE SCS 0x62 (98)



=====================================================================================================
OBSID = 61430:
=====================================================================================================

Command State Vector:-------------
  gmt = 2001:295:20:23:59.658
```

```
   vcdu = 5285087
   FMT = 2
   OBSID =  61430
   SIMTA = -99616
   SIMFA = -716
   RADMON = ds
   LETG = out
   HETG = out
   XMITA = off
   XMITB = off
   DITHER = en
   DOOR = mv2close
   PREAMPA = I
   HVI = 1/2
   HVS = off
   SHLD2PWR = off
   SHLD2STEP = 0
   RANGESET = 115
   CBu = 0
   CBU = 255
   CBv = 0
   CBV = 255
   DITHER_PAR = 0.000000:0.000000:0.002222:0.002222:0.509102:0.360002
   TARGQUAT = 17.4913:-14.7339:344.4094
   SCS87 = act
   SCS88 = dis
   SCS89 = dis
   SCS90 = dis
   SCS91 = term
   SCS92 = act
   SCS93 = act
   SCS105 = dis

Selected HRC and S/C Events/Commands:--------------
 2001:295:20:23:59.658 00:02:47  5285087 COAOSQID    8111700 -> OBSID: [0x5285087] 61430
 2001:295:20:46:05.961 00:22:06  5290262 AONMMODE            -> AONMMODE SET PCAD MODE NORMAL MANEUVER
 2001:295:20:46:10.318 00:00:04  5290279 AOUPTARQ    8132201 -> SET  TARGET QUATERIAN PARAMETERS
 2001:295:20:46:10.318 ->     Q1 = -5.649305e-01
 2001:295:20:46:10.318 ->     Q2 = -6.013532e-02
 2001:295:20:46:10.318 ->     Q3 = 2.735385e-02
 2001:295:20:46:10.318 ->     Q4 = 8.224896e-01
-> RA,Dec,Roll(deg):   6.50000,    3.90000,  290.81168

 2001:295:20:46:16.212 00:00:06  5290302 AOMANUVR            -> AOMANUVR: SET ATTITUDE CMD MODE MANEUVER
 2001:295:20:46:17.237 00:00:01  5290306 COACTSX     8402600 -> ACTIVATE SCS 0x26 (38) ACA RESET
 2001:295:22:15:00.257 01:28:43  5311079 CTXBOF      780004C -> TRANSMITTER B OFF
 2001:295:22:15:00.771 00:00:01  5311081 CTXAOF      780000C -> TRANSMITTER A OFF
 2001:295:22:15:01.285 00:00:01  5311083 CTXAON      7800004 -> TRANSMITTER A ON
 2001:295:23:45:01.285 01:30:00  5332156 CTXAOF      780000C -> TRANSMITTER A OFF
 2001:295:23:45:01.542 00:00:00  5332157 CTXBOF      780004C -> TRANSMITTER B OFF
 2001:296:00:38:54.429 -> DSN EXIT        X_DSS-66
 2001:296:00:38:56.494 -> DSN EXIT        X_DSS-54
 2001:296:02:52:00.437 -> DSN ACQUISITION E_DSS-54
 2001:296:02:52:01.385 -> DSN ACQUISITION E_DSS-66
 2001:296:06:21:33.888 06:36:33  5425006 AONMMODE            -> AONMMODE SET PCAD MODE NORMAL MANEUVER
 2001:296:06:21:38.245 00:00:04  5425023 AOUPTARQ    8132201 -> SET  TARGET QUATERIAN PARAMETERS
 2001:296:06:21:38.245 ->     Q1 = -4.866409e-01
 2001:296:06:21:38.245 ->     Q2 = 4.026803e-01
 2001:296:06:21:38.245 ->     Q3 = -2.882278e-01
 2001:296:06:21:38.245 ->     Q4 = 7.196901e-01
-> RA,Dec,Roll(deg): 302.27537,  -17.40254,  282.22498

 2001:296:06:21:44.139 00:00:06  5425046 AOMANUVR            -> AOMANUVR: SET ATTITUDE CMD MODE MANEUVER
 2001:296:06:21:45.164 00:00:01  5425050 COACTSX     8402600 -> ACTIVATE SCS 0x26 (38) ACA RESET



=====================================================================================================
OBSID = 61429:
=====================================================================================================

Command State Vector:--------------
   gmt = 2001:296:06:24:33.888
   vcdu = 5425708
   FMT = 2
   OBSID =  61429
   SIMTA = -99616
   SIMFA = -716
   RADMON = ds
   LETG = out
   HETG = out
   XMITA = off
   XMITB = off
   DITHER = en
```

```
      DOOR = mv2close
      PREAMPA = I
      HVI = 1/2
      HVS = off
      SHLD2PWR = off
      SHLD2STEP = 0
      RANGESET = 115
      CBu = 0
      CBU = 255
      CBv = 0
      CBV = 255
      DITHER_PAR = 0.000000:0.000000:0.002222:0.002222:0.509102:0.360002
      TARGQUAT = 302.2754:-17.4025:282.2250
      SCS87 = act
      SCS88 = dis
      SCS89 = dis
      SCS90 = dis
      SCS91 = term
      SCS92 = act
      SCS93 = act
      SCS105 = dis

Selected HRC and S/C Events/Commands:--------------
 2001:296:06:24:33.888 00:02:49  5425708 COAOSQID    8111700 -> OBSID: [0x5425708] 61429
 2001:296:06:47:44.809 00:23:11  5431136 AONMMODE            -> AONMMODE SET PCAD MODE NORMAL MANEUVER
 2001:296:06:47:49.166 00:00:04  5431153 AOUPTARQ    8132201 -> SET  TARGET QUATERIAN PARAMETERS
 2001:296:06:47:49.166 ->        Q1 = -2.944255e-01
 2001:296:06:47:49.166 ->        Q2 = 5.554059e-01
 2001:296:06:47:49.166 ->        Q3 = 3.637317e-03
 2001:296:06:47:49.166 ->        Q4 = 7.777048e-01
-> RA,Dec,Roll(deg):  320.00000,  -59.99999,  294.79368

 2001:296:06:47:55.060 00:00:06  5431176 AOMANUVR            -> AOMANUVR: SET ATTITUDE CMD MODE MANEUVER
 2001:296:06:47:56.085 00:00:01  5431180 COACTSX     8402600 -> ACTIVATE SCS 0x26 (38) ACA RESET
 2001:296:06:47:58.134 00:00:02  5431188 CODISASX    8456200 -> DISABLE SCS 0x62 (98)
 2001:296:06:50:00.257 00:02:02  5431665 CTXBOF      780004C -> TRANSMITTER B OFF
 2001:296:06:50:00.771 00:00:01  5431667 CTXAOF      780000C -> TRANSMITTER A OFF
 2001:296:06:50:01.285 00:00:01  5431669 CTXAON      7800004 -> TRANSMITTER A ON
 2001:296:07:18:09.436 -> Electron 1 RADIATION EXIT
 2001:296:08:20:01.285 01:30:00  5452742 CTXAOF      780000C -> TRANSMITTER A OFF
 2001:296:08:20:01.542 00:00:00  5452743 CTXBOF      780004C -> TRANSMITTER B OFF
 2001:296:10:04:49.436 01:44:48 -> Radmon Enable
 2001:296:10:04:49.436 00:00:00  5477281 AONMMODE            -> AONMMODE SET PCAD MODE NORMAL MANEUVER
 2001:296:10:04:53.793 00:00:04  5477298 AOUPTARQ    8132201 -> SET  TARGET QUATERIAN PARAMETERS
 2001:296:10:04:53.793 ->        Q1 = -3.227606e-01
 2001:296:10:04:53.793 ->        Q2 = 7.226085e-01
 2001:296:10:04:53.793 ->        Q3 = -2.502675e-01
 2001:296:10:04:53.793 ->        Q4 = 5.576995e-01
-> RA,Dec,Roll(deg):  257.18569,  -40.12399,  250.70425

 2001:296:10:04:59.687 00:00:06  5477321 AOMANUVR            -> AOMANUVR: SET ATTITUDE CMD MODE MANEUVER
 2001:296:10:05:00.712 00:00:01  5477325 COACTSX     8402600 -> ACTIVATE SCS 0x26 (38) ACA RESET
 2001:296:10:05:10.436 00:00:10  5477363 COENASX     8445900 -> ENABLE SCS 0x59 (89) HRC-I HV Ramp Up
 2001:296:10:05:14.436 00:00:04  5477378 3SIMHD      64DC061 -> SIM: Multipart Cmd (6e03) cksum: 6e; Num cmds:03
 2001:296:10:05:14.436          5477378 6440221 ->   SIM: 2011 -> TSC Enable
 2001:296:10:05:14.436          5477378 65CEAE1 ->   SIM: e757 -> TS  goto: [e757] -> -50504
 2001:296:10:05:14.436          5477378 6440001 ->   SIM: 2000 -> TSC Disable

 2001:296:10:07:48.936 00:02:35  5477981 2OBSVASL    6434000 == 6434000 sd1a00 observing mode select


=================================================================================================
OBSID = 1963:
=================================================================================================
Observation Request INFO:----------------------------
  ID = 01963
  TARGET = (257.196667,-40.147417,{1RXSJ1708-4009})
  DURATION = (10000.000000)
  PRIORITY = 6
  SI = HRC-I
  GRATING = NONE
  ACA_MODE = DEFAULT
  TARGET_OFFSET = (0.000000)
  DITHER = (ON,0.005556,0.331200,0.000000,0.005556,0.468400,0.000000)
  PRECEDING = (T_X06)

Command State Vector:--------------
  gmt = 2001:296:10:07:49.436
  vcdu = 5477983
  FMT = 2
  OBSID =  1963
  SIMTA = -50504
  SIMFA = -716
```

```
        RADMON = en
        LETG = out
        HETG = out
        XMITA = off
        XMITB = off
        DITHER = en
        DOOR = mv2close
        PREAMPA = I
        HVI = 1/2
        HVS = off
        SHLD2PWR = off
        SHLD2STEP = 0
        RANGESET = 115
        CBu = 0
        CBU = 255
        CBv = 0
        CBV = 255
        DITHER_PAR = 0.000000:0.000000:0.002222:0.002222:0.509102:0.360002
        TARGQUAT = 257.1857:-40.1240:250.7043
        SCS87 = act
        SCS88 = dis
        SCS89 = ena
        SCS90 = dis
        SCS91 = term
        SCS92 = act
        SCS93 = act
        SCS105 = dis
2001:296:10:07:49.436

Selected HRC and S/C Events/Commands:--------------
  2001:296:10:07:49.436 00:00:01  5477983 COAOSQID   8111700 -> OBSID: [0x5477983] 1963
  2001:296:10:07:49.436 00:00:00  5477983 CSELFMT1   7C40003 -> FORMAT 1
  2001:296:10:07:49.936 00:00:01  5477985 2FIFOAOF   648A000 == 648a000 sd4500 data fifo reset
  2001:296:10:07:50.936 00:00:01  5477989 2FIFOAON   648A020 == 648a020 sd4501 data fifo enable
  2001:296:10:21:30.215 00:13:39  5481186 2S2STHV    641C000 == 641c000 sd0e00 (0) shield b hv step
  2001:296:10:21:31.215 00:00:01  5481190 2S2HVON    641A020 == 641a020 sd0d01 shield b hv on
  2001:296:10:21:41.215 00:00:10  5481229 2S2STHV    641C080 == 641c080 sd0e04 (4) shield b hv step
  2001:296:10:21:51.215 00:00:10  5481268 2S2STHV    641C100 == 641c100 sd0e08 (8) shield b hv step
  2001:296:10:21:53.215 00:00:02  5481276 2MCMRASL   64DE020 XX 64de000 sd6f00 motion control mode reset
  2001:296:10:21:54.215 00:00:01  5481280 2DRMTASL   64E2000 == 64e2000 sd7100 door motor select
  2001:296:10:21:55.215 00:00:01  5481284 2STFLADI   64A8000 == 64a8000 sd5400 clear stop flags
  2001:296:10:21:56.215 00:00:01  5481288 2STFLAEN   64A8020 == 64a8020 sd5401 enable stop flags
  2001:296:10:21:57.215 00:00:01  5481292 2SMOIADI   6492000 == 6492000 sd4900 selected mtr overcurrent prot disable
  2001:296:10:21:58.215 00:00:01  5481296 2SMOTAEN   6494020 == 6494020 sd4a01 selected mtr overtemp prot enable
  2001:296:10:21:59.215 00:00:01  5481300 2CHPLADI   64A0000 == 64a0000 sd5000 clos/home primary limit sw disa
  2001:296:10:22:00.215 00:00:01  5481303 2CHSLADI   64A2000 == 64a2000 sd5100 clos/home secondary lim sw disa  VCDU WARN: dvcdu: 3
  2001:296:10:22:01.215 00:00:01  5481307 2OMPLAEN   64A4020 == 64a4020 sd5201 open/max primary limit sw enable
  2001:296:10:22:02.215 00:00:01  5481311 2OMSLAEN   64A6020 == 64a6020 sd5301 open/max secondary lim sw enable
  2001:296:10:22:03.215 00:00:01  5481315 2MDRVAEN   64D0020 == 64d0020 sd6801 motor drive enable
  2001:296:10:22:04.215 00:00:01  5481319 2PSHBALD   64304E0 == 64304e0 sd1827 (39) mot ctrl pos word hi byte load
  2001:296:10:22:05.215 00:00:01  5481323 2PSLBALD   6432200 == 6432200 sd1910 (16) mot ctrl pos word lo byte load
  2001:296:10:22:06.215 00:00:01  5481327 2NSTBAEX   64DA020 == 64da020 sd6d01 move n steps toward open/max ls
  2001:296:10:22:06.215 00:00:00  5481327 COENASX    8446900 -> ENABLE SCS 0x69 (105)
  2001:296:10:23:28.215 00:01:22  5481647 AODITPAR   8134401 -> SET DITHER PARAMETERS
  2001:296:10:23:28.215 ->    ANGP = 0.000000e+00 rad (0.000000e+00 deg)
  2001:296:10:23:28.215 ->    ANGY = 0.000000e+00 rad (0.000000e+00 deg)
  2001:296:10:23:28.215 ->   COEFP = 9.696999e-05 rad (5.555993e-03 deg)
  2001:296:10:23:28.215 ->   COEFY = 9.696999e-05 rad (5.555993e-03 deg)
  2001:296:10:23:28.215 ->   RATEP = 8.175120e-03 rad/sec (4.684017e-01 deg/sec)
  2001:296:10:23:28.215 ->   RATEY = 5.780529e-03 rad/sec (3.312012e-01 deg/sec)

  2001:296:10:23:29.215 00:00:01  5481651 AOENDITH   8034301 -> DITHER ENABLE
  2001:296:10:24:06.215 00:00:37  5481795 2MDRVADI   64D0000 == 64d0000 sd6800 motor drive disable
  2001:296:10:24:07.215 00:00:01  5481799 2ALMTADS   64E0000 == 64e0000 sd7000 all motors deselect
  2001:296:10:26:53.215 00:02:46  5482447 COACTSX    8405B00 -> ACTIVATE SCS 0x5B (91) HRC Dither Control
  2001:296:13:06:03.174 -> DSN ACQUISITION E_DSS-16
  2001:296:13:06:04.253 -> DSN ACQUISITION E_DSS-24
  2001:296:13:06:15.672 -> DSN ACQUISITION E_DSS-27
  2001:296:13:13:39.215 02:46:46 -> SCS Slot Change = 130 -> 128
  2001:296:13:16:38.715 02:49:45  5522195 2NXILASL   6434020 == 6434020 sd1a01 next in line mode select
  2001:296:13:16:39.215 00:00:01  5522197 CSELFMT2   7C40023 -> FORMAT 2
  2001:296:13:16:39.215 00:00:00  5522197 AONMMODE            -> AONMMODE SET PCAD MODE NORMAL MANEUVER
  2001:296:13:16:39.715 00:00:01  5522199 2FIFOAOF   648A000 == 648a000 sd4500 data fifo reset
  2001:296:13:16:40.715 00:00:01  5522203 2FIFOAON   648A020 == 648a020 sd4501 data fifo enable
  2001:296:13:16:43.572 00:00:03  5522214 AOUPTARQ   8132201 -> SET  TARGET QUATERIAN PARAMETERS
  2001:296:13:16:43.572 ->     Q1 = -4.055383e-01
  2001:296:13:16:43.572 ->     Q2 = 3.868408e-01
  2001:296:13:16:43.572 ->     Q3 = -8.007702e-02
  2001:296:13:16:43.572 ->     Q4 = 8.243061e-01
-> RA,Dec,Roll(deg):  327.05531,  -34.94583,  296.97275

  2001:296:13:16:49.466 00:00:06  5522237 AOMANUVR            -> AOMANUVR: SET ATTITUDE CMD MODE MANEUVER
  2001:296:13:16:50.491 00:00:01  5522241 COACTSX    8402600 -> ACTIVATE SCS 0x26 (38) ACA RESET
```

```
===============================================================================================
OBSID = 2188:
===============================================================================================
Observation Request INFO:---------------------------
  ID = 02188
  TARGET = (327.080000,-34.951056,{NGC7130})
  DURATION = (39300.000000)
  PRIORITY = 6
  SI = ACIS-S
  GRATING = NONE
  SI_MODE = TE_003BA
  ACA_MODE = DEFAULT
  TARGET_OFFSET = (-0.005500)
  DITHER = (ON,0.002222,0.360000,0.000000,0.002222,0.509100,0.000000)
  PRECEDING = (01963)

Command State Vector:-------------
  gmt = 2001:296:13:19:39.215
  vcdu = 5522900
  FMT = 2
  OBSID =  2188
  SIMTA = -50504
  SIMFA = -716
  RADMON = en
  LETG = out
  HETG = out
  XMITA = off
  XMITB = off
  DITHER = en
  DOOR = mv2open
  PREAMPA = I
  HVI = up
  HVS = off
  SHLD2PWR = on
  SHLD2STEP = 8
  RANGESET = 115
  CBu = 0
  CBU = 255
  CBv = 0
  CBV = 255
  DITHER_PAR = 0.000000:0.000000:0.005556:0.005556:0.468402:0.331201
  TARGQUAT = 327.0553:-34.9458:296.9728
  SCS87 = act
  SCS88 = dis
  SCS89 = ena
  SCS90 = dis
  SCS91 = term
  SCS92 = act
  SCS93 = act
  SCS105 = ena

Selected HRC and S/C Events/Commands:-------------
2001:296:13:19:39.215 00:02:49  5522900 COAOSQID    8111700 -> OBSID: [0x5522900] 2188
2001:296:13:33:01.853 00:13:23  5526032 3SIMHD      6436061 -> SIM: Multipart Cmd (1b03) cksum: 1b; Num cmds:03
2001:296:13:33:01.853          5526032 6440221 ->   SIM: 2011 -> TSC Enable
2001:296:13:33:01.853          5526032 6549DA1 ->   SIM: a4ed -> TS  goto: [a4ed] -> 75624
2001:296:13:33:01.853          5526032 6440001 ->   SIM: 2000 -> TSC Disable

2001:296:13:37:02.224 00:04:00  5526970 3SIMHD      6418061 -> SIM: Multipart Cmd (0c03) cksum: 0c; Num cmds:03
2001:296:13:37:02.224          5526970 6440661 ->   SIM: 2033 -> FA  Enable
2001:296:13:37:02.224          5526970 65FCBC1 ->   SIM: fe5e -> FA  goto: [fe5e] -> -418
2001:296:13:37:02.224          5526970 6440441 ->   SIM: 2022 -> FA  Disable

2001:296:13:37:40.985 00:00:39  5527121 AODITPAR    8134401 -> SET DITHER PARAMETERS
2001:296:13:37:40.985 ->    ANGP = 0.000000e+00 rad (0.000000e+00 deg)
2001:296:13:37:40.985 ->    ANGY = 0.000000e+00 rad (0.000000e+00 deg)
2001:296:13:37:40.985 ->   COEFP = 3.878000e-05 rad (2.221939e-03 deg)
2001:296:13:37:40.985 ->   COEFY = 3.878000e-05 rad (2.221939e-03 deg)
2001:296:13:37:40.985 ->   RATEP = 8.885469e-03 rad/sec (5.091018e-01 deg/sec)
2001:296:13:37:40.985 ->   RATEY = 6.283189e-03 rad/sec (3.600016e-01 deg/sec)

2001:296:13:37:41.985 00:00:01  5527125 AOENDITH    8034301 -> DITHER ENABLE
2001:296:13:38:24.584 00:00:43  5527291 3SIMHD      647C061 -> SIM: Multipart Cmd (3e03) cksum: 3e; Num cmds:03
2001:296:13:38:24.584          5527291 6440661 ->   SIM: 2033 -> FA  Enable
2001:296:13:38:24.584          5527291 65FC581 ->   SIM: fe2c -> FA  goto: [fe2c] -> -468
2001:296:13:38:24.584          5527291 6440441 ->   SIM: 2022 -> FA  Disable

2001:296:17:55:00.257 04:16:36  5587372 CTXBOF      780004C -> TRANSMITTER B OFF
2001:296:17:55:00.771 00:00:01  5587374 CTXAOF      780000C -> TRANSMITTER A OFF
2001:296:17:55:01.285 00:00:01  5587376 CTXAON      7800004 -> TRANSMITTER A ON
2001:296:20:25:01.285 02:30:00  5622498 CTXAOF      780000C -> TRANSMITTER A OFF
2001:296:20:25:01.542 00:00:00  5622499 CTXBOF      780004C -> TRANSMITTER B OFF
```

```
2001:296:23:18:04.779 -> DSN EXIT        X_DSS-54
2001:296:23:18:05.601 -> DSN EXIT        X_DSS-66
2001:297:00:39:39.215 04:14:38  5682119 AONMMODE           -> AONMMODE SET PCAD MODE NORMAL MANEUVER
2001:297:00:39:43.572 00:00:04  5682136 AOUPTARQ   8132201 -> SET  TARGET QUATERIAN PARAMETERS
2001:297:00:39:43.572 ->       Q1 = -3.689276e-01
2001:297:00:39:43.572 ->       Q2 = 6.302482e-01
2001:297:00:39:43.572 ->       Q3 = -2.699543e-01
2001:297:00:39:43.572 ->       Q4 = 6.275383e-01
-> RA,Dec,Roll(deg):  274.25622,  -36.28644,  265.25773

2001:297:00:39:49.466 00:00:06  5682159 AOMANUVR           -> AOMANUVR: SET ATTITUDE CMD MODE MANEUVER
2001:297:00:39:50.491 00:00:01  5682163 COACTSX    8402600 -> ACTIVATE SCS 0x26 (38) ACA RESET



Last Command State Vector:--------------
  gmt = 2001:301:00:38:01.904
  vcdu = 7030422
  FMT = 2
  OBSID =  61423
  SIMTA = -99616
  SIMFA = -468
  RADMON = ds
  LETG = out
  HETG = out
  XMITA = off
  XMITB = off
  DITHER = en
  DOOR = mv2close
  PREAMPA = I
  HVI = 1/2
  HVS = off
  SHLD2PWR = off
  SHLD2STEP = 0
  RANGESET = 115
  CBu = 0
  CBU = 255
  CBv = 0
  CBV = 255
  DITHER_PAR = 0.000000:0.000000:0.002222:0.002222:0.509102:0.360002
  TARGQUAT = 321.0000:-60.0000:292.5368
  SCS87 = act
  SCS88 = dis
  SCS89 = dis
  SCS90 = dis
  SCS91 = term
  SCS92 = act
  SCS93 = act
  SCS105 = dis


2001:301:03:22:52.807 -> LAST Command in Load
```