Chapter 5
FOC Data Structures

In This Chapter...

When newly-gathered HST data arrive at STScI, a system known as OPUS[1] immediately partitions the data into separate files, looks for discrepancies between the planned and executed observations, calibrates the data files, and deposits them in the HST Archive. The FOC data files you obtain from the Archive via the Internet or on a data tape will be in FITS format. Before you analyze these data, you will want to convert them to GEIS format. The names of the resulting GEIS files will consist of a nine-character rootname, whose syntax is explained in Appendix B, and a three-character suffix. Chapter 2 describes the GEIS and FITS file formats, and shows how to convert archival FITS files into GEIS files. This chapter describes how these FOC data files are organized, including:

- The contents of files corresponding to each three-letter suffix.
- The keywords contained in FOC file headers.
- The relationship between the data and the original Phase II proposal request.
- The paper products associated with each dataset.

5.1 File Suffixes

The name of each file in an FOC dataset, such as `x3l80101t.d0h`, has a three-character suffix, in this case the `d0h`, that uniquely identifies the file's content. When an FOC image comes down from the telescope, it is stored in files

1. OSS and PODPS Unified System (OPUS).

with suffixes .d0h/.d0d. The image is then automatically calibrated to produce the .c0h/.c0d and .c1h/.c1d files. The .c1h/.c1d files contain the final calibrated data, which are likely to be of greatest interest to observers. Table 5.1 gives the various file suffixes for the FOC and the corresponding file contents, listing all of the files that the pipeline can produce. Not all of the processing steps are performed for every observing mode, so only a subset of these files may be available.

In addition to the image files, the .trl or *trailer* file—which comes with each FOC observation—is an ASCII text file that describes the standard processing applied to the images by OPUS. The .pdq file reports any real-time activities associated with the observation, such as slews for an interactive acquisition, and any problems that might have occurred with the telescope, such as a guide star acquisition failure or guide star recenterings. The standard header packet (.shh and .shd files) contains information about the scheduling of the observation. The data quality files (.q0h and .q0d), in principle, would contain information on position of blemishes in FOC images. However, they are not used by the FOC because these positions vary with time, limiting the utility of these files. The unique data log files (.ulh and .uld) contain engineering information not generally of interest to most observers.

Table 5.1: FOC Dataset Suffixes

Suffixes	File Contents
Raw Data Files	
.d0h/.d0d	Raw science data
.q0h/.q0d	Data quality for raw science data
.shh/.shd	Standard header packet containing observation parameters
.ulh/.uld	Unique data log
Calibrated Data Files	
.c0h/.c0d	dezoomed, geometrically corrected data, with photometry
.c1h/.c1d	All of the above, plus flatfielded data
.trl	Trailer file
.pdq	Post Observation Summary and Data Quality Comment file

5.2 Header Keywords

FOC image headers contain numerous keywords specifying how an observation was taken and how the resulting data were calibrated. The following keywords in the .c1h header file describe the instrumental setup of the FOC during the observation:

- Configuration or optical relay (OPTCRLY): *f*/96 or *f*/48.
- Filters employed (FILTNAM*).
- Spectrographic mirror position (SMMMODE).
- Image size (SAMPPLN and LINEPFM).
- Position of starting pixel on photocathode (SAMPOFF and LINEOFF).
- Pixel size (PXFORMT): normal or zoomed.
- Reference pixel in the chosen format (CRPIX1 and CRPIX2).

For easy reference, Table 5.2 lists these header keywords, their definitions, and the possible keyword values for the commonly used FOC observing modes.

The quickest way to learn how each observation was actually performed is to use the **iminfo** task in the STSDAS **toolbox.headers** package. This task provides a user-friendly synopsis of the most relevant header information, extracted from the ASCII header and the group parameters in the binary data file. Figure 5.1 shows sample results of running **iminfo** on the final calibrated data file for an FOC image. Included in the listing are the target name, target RA and Dec, observation date, exposure time, basic image statistics, basic instrument configuration, basic observing mode, the calibration steps performed, and the number of groups in the image (only one for the FOC).

Figure 5.1: FOC iminfo Output

```
Rootname            Instrument              Target Name
X2X10108T              FOC                  BPM16274

Program         = 2X1                 Obs Date        =  6/10/95
Observation set = 01                  Proposal ID     = 06160
Observation     = 08                  Exposure ID     = 01-023
Source          = Tape Recorded       Right ascension =   0:50:03.2
File Type       = SCI                 Declination     = -52:08:17
                                      Equinox         = J2000

Naxis1 = 256            Datamin = 0.                  Number of groups = 1
Naxis2 = 256            Datamax = 1454.249            Parameters/group = 18

Configuration   = f/96
Image format    = NORMAL                        Image orientation = -35.0
Shutter mode    = NOTUSED                       Exposure time     =  722.4
LED calibration = NOTUSED                       Sample begin      = 385
LED color       =                               Line begin        = 385
Coronographic apodizer = NOTUSED                Bits/data number  = 16
Spectrographic mirror  = NOTUSED                Calibration steps completed:
Filter names: F4ND, CLEAR2, CLEAR3, F253M           UNI  WAV  GEO
he>
```

To see the full list of header keywords, you can invoke the IRAF **imheader** task by typing, for example:

```
cl> imheader x2x10108t.c1h long+ | page
```

These additional keywords provide information on such things as the photometric transformation of the image, any interruptions of the exposure, and the guidance mode used during the observation. Some of the more critical keywords are listed in Table 5.2, grouped by the type of information they provide.

The values of the target keywords are extracted from the proposal prior to execution, with the orientation keyword ORIENTAT providing the angle between North and the image's *y* axis. The exposure keywords, on the other hand, describe the actual execution of the observation. For example, if a problem interrupted the exposure, the EXPFLAG keyword would report this condition. After the observation has been taken, standard processing supplies information on the filters, format, and optical relay used for the image. The PHOTMODE keyword concisely summarizes the image configuration, and the inverse sensitivity keyword PHOTFLAM gives the factor which converts count rates to flux units (see Chapter 3 for more on HST photometry keywords).

FOC images taken after mid-November 1993 contain the KX_DEPLOY keyword in their headers. This keyword has the value "T" if COSTAR is deployed and "F" otherwise. Before November 1993, the KX_DEPLOY keyword did not exist, but in most cases the name of the data file itself will tell you whether the image is aberrated. Rootnames of observations taken prior to the December 1993 servicing mission begin with `x0` or `x1`, while FOC images taken after the servicing mission begin with `x2`, `x3`, or `x4` and benefit from COSTAR correction. A small number of images were taken after the first servicing mission but before COSTAR deployment; however, these were generally uninteresting calibration images.

Images that begin with `x0` or `x1` are pre-COSTAR (i.e., the PSF is spherically aberrated).

Table 5.2: FOC Header Keywords

Keyword	Definition	Possible Values
	Image Format	
OPTCRLY	Optical relay used	F48 or F96
KX_DEPLOY	Was COSTAR deployed for FOC? (only for images taken after 11/20/93)	T or F
CAMMODE	Coronographic optical mode. This keyword indicates whether or not the coronographic apodizing optics are inserted in the *f*/96 beam. If so, the effective focal ratio becomes *f*/288. It applies only when OPTCRLY=F96.	NOTUSED (normal *f*/96 mode) or INBEAM (*f*/288 coronographic mode)
SMMMODE	Spectrograph mirror mechanism mode. This keyword indicates whether or not the spectrograph relay mirror is inserted into the *f*/48 beam to redirect the light to the grating. It applies only when OPTCRLY=F48.	NOTUSED (normal *f*/48 mode) or INBEAM (spectrographic mode)
SHTMODE	Shutter mode. Indicates whether the shutter is closed (as would be expected for dark exposures or LED flatfields).	NOTUSED (shutter open) or INBEAM (shutter closed)

Table 5.2: FOC Header Keywords (Continued)

Keyword	Definition	Possible Values
LEDMODE	LED mode. Indicates whether one of the internal calibration flatfield sources is on.	NOTUSED (LED off) or ACTIVE (LED on)
SAMPPLN	Number of pixels per scan line (number of pixels along *x* axis).	512, 256, 128, or 64
LINEPFM	Number of scan lines per frame (number of pixels along *y* axis).	1024, 512, 256, 128, or 64
SAMPOFF	*x* offset of 0,0 pixel in frame.	From 0 to 1023,75 in 0.25 increments
LINEOFF	*y* offset of 0,0 pixel in frame.	From 0 to 1023.75 in 0.25 increments
PXFORMT	Pixel format. NORMAL indicates square pixels, ZOOM indicates rectangular pixels (2x1).	NORMAL or ZOOM
DNFORMT	Number of bits per pixel.	8 or 16
	Exposure Information	
DATE-OBS	UT Calendar Date Observation was taken	DD/MM/YY
TIME-OBS	UT at start of observation	HH:MM:SS
EXPTIME	Exposure time	Duration of exposure in seconds
EXPFLAG	Flag to indicate whether the exposure was interrupted as a result of telescope problems	NORMAL (if no interruptions) or INTERRUPTED
FILTNAM1	Filter element name for wheel 1.	***f/96:*** CLEAR1, F600M, F630M, F2ND, F4ND, F6ND, F8ND, PRISM1, PRISM2, POL0, POL60, POL120 ***f/48:*** CLEAR1, F140W, F150W, F175W, F195W, F220W, F305LP, PRISM3
FILTNAM2	Filter element name for wheel 2	***f/96:*** CLEAR2, F140W, F175W, F220W, F275W, F320W, F342W, F430W, F370LP, F486N, F501N, F480LP ***f/48:*** CLEAR2, F275W, F130LP, F180LP, F342W, F430W, PRISM1, PRISM2
FILTNAM3	Filter element name for wheel 3	***f/96:*** CLEAR3, F120M, F130M, F140M, F152M, F165W, F170M, F195W, F190M, F210M, F231M, F1ND ***f/48:*** Left blank
FILTNAM4	Filter element name for wheel 4	f/96: CLEAR4, F253M, F278M, F307M, F130LP, F346M, F372M, F410M, F437M, F470M, F502M, F550M f/48: Left blank

Table 5.2: FOC Header Keywords (Continued)

Keyword	Definition	Possible Values
	Target Information	
TARGNAME	First 10 characters of the target name as given in proposal	
ORIENTAT	Image Orientation	-180 to 180 degrees
CRVAL1	Right Ascension of the reference pixel	(RA in degrees)
CRVAL2	Declination of the reference pixel	(Dec in degrees)
CRPIX1	*x* position of the reference pixel	468 in a 1024x1024 f/96 image 512 in a 1024X1024 f/48 image
CRPIX2	*y* position of the reference pixel	537 in a 1024X1024 f/96 image 512 in a 1024X1024 f/48 image
Photometry Keywords		
PHOTMODE	Observation mode specified by the relay used (OPTCRLY), the format, and the filters in place.	e.g., 'FOC F/96 COSTAR F220W X96N512'
PHOTFLAM	Inverse sensitivity; conversion factor from counts sec^{-1} to ergs cm^{-2} sec^{-1} $Å^{-1}$; a star with this flux would have a total of 1 count/sec within a 1" radius.	
PHOTZPT	Zero-point of the ST magnitude system	-21.10
Calibration Information (See Chapter XX for more details)		
GEOCORR	Describes whether the geometric correction has been applied	COMPLETE, OMIT
PXLCORR	Describes whether pixels were dezoomed	COMPLETE, OMIT
UNICORR	States whether the flatfield correction has been applied	COMPLETE, OMIT
WAVCORR	States whether the photometric conversion has been calculated	COMPLETE, OMIT
BACCORR	Specifies state of background subtraction	COMPLETE, OMIT
ITFCORR	Specifies state of format-dependent photometric correction	COMPLETE, OMIT
SDECORR	States whether the spectrographic detector efficiency correction was applied	COMPLETE, OMIT

An HST Keyword Dictionary is available via the world wide web at:

`http://archive.stsci.edu/keyword/`

The dictionary gives more complete definitions of all keywords and all file types (e.g., science data files, standard header packets, unique data logs) for each of the HST instruments.

5.3 Relationship to Proposed Observations

Observers should recognize that their observations do not necessarily execute in the order listed in their Phase II proposals, but rather are scheduled so that they maximize the overall efficiency of HST. The first step in understanding how your data files relate to your original request is to examine the header keywords using **iminfo** or **imheader**. For example, the **iminfo** listing in Figure 5.1 says that exposure `x2x10108t` was a 722.4 second exposure of target BPM16274 using filters F253M+F4ND with the 256 x 256 format of the *f*/96 camera. It also gives the Exposure ID as 01-023, meaning the exposure listed under Visit 1, Exposure Logsheet line 23 of the Phase II proposal.

To see how the actual observation compares with the corresponding request, you can retrieve recent proposals via the HST Proposal Information Page at:

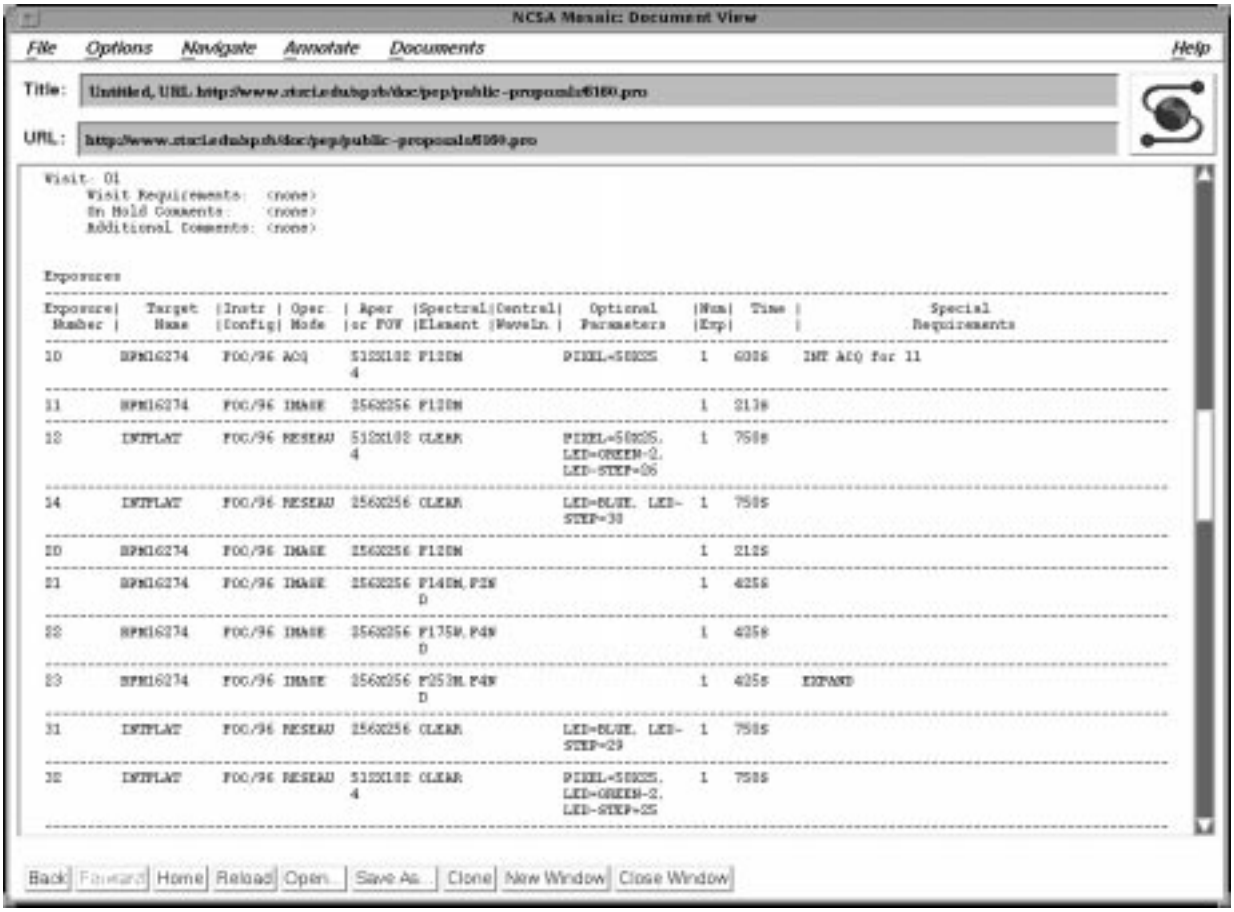
`http://presto.stsci.edu/public/propinfo.html`

Simply enter the Program ID (or proposal number; 6160 in the example above) into the box, click on the “Get Program Information” box and select either the full text or the formatted listing. Figure 5.2 shows an example of the formatted listing for the proposal at hand. Examination of this exposure logsheet shows that Line 23, Visit 1, requested one 423s exposure of BPM16274 using the F253M+F4ND filters and the 256 x 256 format of the *f*/96 camera. The EXPAND requirement increased the exposure time to fill the rest of the visibility period.

For Cycle 4 and earlier programs, the Exposure ID field reflected the use of RPSS instead of RPS2 for proposal submission. Entries in these Exposure ID fields look something like 23.000000, which means the exposure that corresponds to Exposure Logsheet Line 23. Where several exposures come from the same Exposure Logsheet line (e.g., if a spatial scan is used, or the Number_of_Iterations keyword is more than 1), the Exposure ID field contains a number like 23.0000000#001, to signify the first exposure corresponding to Exposure Logsheet line 23.

You may notice that the requested and actual exposure times differ for external FOC observations, even when no EXPAND requirement is specified. This disparity arises because the flight software that controls the FOC contains a bug that shortens the length of an exposure by approximately 3.5–4.5 seconds. Because typical FOC exposures last much longer than 4 seconds and the science header reports the correct exposure time, rewriting the software to correct the bug was deemed unnecessary.

Figure 5.2: Exposure Logsheet Via World Wide Web



Having matched the exposure logsheet lines to the data received, you then need to determine whether the exposure proceeded normally. The most important resource for assessing potential problems is the PDQ file (see Chapter 2), a text file created by OPUS that records information about the state of the observatory during the observation, along with any processing abnormalities. It reports ptoential problems in the free-form comment fields QUALITY, QUALCOM1, QUALCOM2, and QUALCOM 3, as well at the end of the file. Figure 5.3 gives an example of such a report.

Figure 5.3: PDQ File for an FOC Exposure

xterm

```
---------- Post Observation Summary and Data Quality Comments (PDQ) ----------

DATASET = 'X2X10108T'
Proposal Id: 06160                                                  dd/mm/yy
Principal Investigator  : JEDRZEJEWSKI, ROBERT                Date: 06/10/95

Target Name    : BPM16274
Target RA (hms):   0 50  3.180         Target Dec (dms): -52  8 17.400

Actual Start Time of Observation : 6/10/95  08:18:54 UT
Calib. Type (Int/Ext/ ):                 Calibration Flag (Y/N) : Y
Operating Mode : IMAGE                   Aperture : XK96N256

-------------------------- Data Quality Evaluation: --------------------------
QUALITY = 'POOR'
QUALCOM1= 'BPM16274, target star near center of image'
QUALCOM2= 'guide star acquisition failed to single star fine lock'
QUALDATE= ' 7-OCT-1995 00:49'

----------------------- Observation Characteristics: -------------------------

  -- PLANNED characteristics of FOC   exposure from SHH file --
Filters 1 2 3 4 : 7              0              0              8
Optical Relay   : F96                     Image Format        : NORMAL
Spectrographic Mirror Mechanism: NOTUSED    Shutter Mode        : NOTUSED
LED Calibration Status         : NOTUSED    Coronogr. Apod. Mask: NOTUSED
Sample offset                  :  384.00    Line offset         :  384.00
Commanded exposure duration (sec) :    726.00

   -- ACTUAL characteristics of FOC   exposure from D0H file --
Filter names    : F4ND          CLEAR2        CLEAR3        F253M
Filters 1 2 3 4 : 7              0              0              8
Optical Relay   : F96                     Image Format        : NORMAL
Spectrographic Mirror Mechanism: NOTUSED    Shutter Mode        : NOTUSED
LED Calibration Status         : NOTUSED    Coronogr. Apod. Mask: NOTUSED
Sample offset                  :  384.00    Line offset         :  384.00
Actual exposure duration (sec) :       722.38

---------------------------- D0H Data Structure: ----------------------------
D0H File Group Count: 1              DCF fill: 0         Axis 1 length: 256
                                   PODPS fill: 0         Axis 2 length: 256

------------------------- Observation Statistics: ---------------------------

           ####################  PODPS IMAGE STATISTICS  ###################
> #               IMAGE      NPIX      MEAN     STDDEV     MIDPT       MIN
MAX
    x2x10108t.c0h[1]     65536    0.6888     10.43     0.623        0.     1454
.
> #               IMAGE      NPIX      MEAN     STDDEV     MIDPT       MIN
MAX
    x2x10108t.c1h[1]     65536    0.6789     10.43    0.6173        0.     1454
.


------------------------------- Extracted OMS Keywords: ----------------------

GUIDECMD= 'FINE LOCK           '/ Commanded Guiding mode
GUIDEACT= 'FINE LOCK/GYRO      '/ Actual Guiding mode at end of GS acquisition
NLOSSES =                    0 / Number of loss of lock events
LOCKLOSS=                  0.0 / Total loss of lock time (sec)
NRECENT =                    0 / Number of recentering events
RECENTR =                  0.0 / Total recentering time (sec)
V2_RMS  =                  2.0 / V2 Axis RMS (milli-arcsec)
V2_P2P  =                 14.8 / V2 Axis peak to peak (milli-arcsec)
V3_RMS  =                  2.7 / V3 Axis RMS (milli-arcsec)
V3_P2P  =                 53.2 / V3 Axis peak to peak (milli-arcsec)
GSFAIL  = '            DEGRADED'/ Guide star acquisition failure!

-------------------------------  Additional Comments: ------------------------

The guide star acquisition at 04:32 failed to single-star fine lock with FGS 1
(HSTAR 5326). As a result there could be some roll about the guide star in
FGS 1, but a comparison of the first and last images of the target after the
offsets were uplinked, shows that the motion was no more than about 0.05
arcsec. Observation X2X10102 was taken before the offsets could be uplinked,
and as a result is blank. The offsets of dV2= -4.1, dV3= -1.7 were uplinked
at 06:33. Observations X2X10104-0A were taken after the maneuver. The TM_GAP
keyword in the JIH file is wrong for internal exposures 03, 04, 09, and 0A.
It should be 0 seconds.

he>
```

Items to look for are:

1. Was the FGS guiding mode the same as was requested?

   The default guide mode for FOC observations is fine lock. If the guide star acquisition fails, it is possible to default to single-star guiding. In most cases, the effect on data quality is so small as to be unnoticeable. In the extracted OMS keywords section at the end of the PDQ file the keywords GUIDECMD and GUIDEACT should both be set to “FINE LOC”.

2. Were there any losses of lock or recenterings?

   These glitches can degrade an observation slightly, although again the effect is small. Look at the OMS keywords NLOSSES and NRECENT.

3. Were there any data dropouts?

   The DCF fill and PODPS fill parameters in the `.d0h` data structure section should both be zero.

4. Were there any instrument anomalies?

   If the OPUS examination of the data detected any suspicious artifacts that might signify an instrumental problem, a comment will appear in one of the QUALCOM keywords, perhaps with some expansion in the “Additional Comments” section at the end.

5. Were there any small-angle maneuvers executed by the telescope?

   Such would be the case if an exposure were preceded by an Interactive Acquisition. If so, there will generally be an observer comments (`.ocx`) file giving the details of any such moves, and OPUS staff usually record the moves in the comments section at the end of every affected observation

5.4 Paper Products

All HST observers currently receive a set of Paper Products shortly after a given observation executes. These documents provide a quick first look at the data, summarize the image statistics, and point out potential problems with the data, drawing on information in the PDQ file. All observers, including Archive users, can run the **pp_dads** task in STSDAS to obtain a set of paper products for any FOC dataset. To receive a full report, you will need the following files: `.d0h/.d0d`, `.c0h/.c0d`, `.c1h/.c1d`, `.shh/.shd`, `.jih/.jit`, `.pdq`. See the STSDAS on-line help for details (type `help pp_dads`).

The FOC paper products were recently redesigned to enhance their clarity and usefulness. The first several pages provide a general description of the visit, and each individual exposure generates two additional pages of information. One displays a greyscale plot of the image and its orientation, along with the exposure time and basic instrument configuration. The other summarizes the spacecraft performance during the observation, the calibration status, and any anomalies flagged in the PDQ file. (See Figure 5.4 through Figure 5.8 for examples.)

Figure 5.4: Explanatory Notes

FOC

Description of Visit Summaries

Target List

The Target List contains the target name, the coordinates for the target as calculated by the ground system based on the target information taken from the proposal, and the text description of the target given in the proposal. Note that the coordinates listed represent the predicted position of the target in the sky and do not give the pointing of HST at the time of the observation.

Observation List with Data Quality Flags

The Observation List contains information that uniquely identifies individual exposures as specified in the observing proposal. Additionally, the status of the spacecraft and ground-system performance during the execution of the observation are summarized by the Procedural Quality Flags:

OBS	Status of the performance of HST.
PROC	Status of the pipeline processing of the observations.
CAL	Status of the reference data used in calibration.

Symbols used to indicate the status of the Procedural Quality are:

○	OK.
●	Not OK-Refer to the Data Quality Summary for details.
Blank	Status unknown.

Observation Statistics

The Observation Statistics sections contains information about the modal count and count rate (determined by a 3-sigma clipping algorithm), and the maximum count and count rate.

Description of Exposure Summaries

Plots for Each Exposure

Plots are created for each exposure. Gray-scale or line plots are produced as appropriate for the instrument configuration and observing mode for each exposure. Exposure information taken from the headers of the data files is also provided.

HST Spacecraft Performance Summary for Each Exposure

The Data Quality Summary contains details of problems flagged by the Data Quality flags. Exposure information taken from the headers of the data files is also provided.

Pipeline Processing and Calibration Data Quality Summary for Each Exposure

The calibration summary gives detailed information about the calibration of the observations. Individual calibration steps are listed with completion status. Reference files used are listed by name and information about the pedigree of the calibration data is provided.

Need Help?

Send e-mail to your contact scientist or help@stsci.edu

Space Telescope Science Institute, Fri 14:22:42 12-Sep-97

Figure 5.5: Target and Observation Lists

Visit: 01 **Proposal: 06930** *FOC*

Target List

Target Name	R.A. (J2000)	Dec. (J2000)	Description
NGC5139	13:26:45.90	-47:28:36.7	Calibration
INTFLAT	0:00:00.00	0:00:00.0	(N/A)
DARK	0:00:00.00	0:00:00.0	(N/A)

Observation List

Logsheet Line#	Rootname	Target Name	Config.	Image Format	Filters	Exposure (sec)	Quality Flags Obs	Proc	Cal
1.010	X3YU0101M	NGC5139	FOC/96	512X512	F2ND,F470M	1097.12	○		○
1.020	X3YU0102M	NGC5139	FOC/96	512X512	F1ND,F470M	1282.12	○		○
1.025	X3YU0103M	INTFLAT	FOC/96	512X1024z	CLEAR	600.00	○		
1.026	X3YU0104M	DARK	FOC/96	512X512	F470M	600.00	○		
1.030	X3YU0105M	NGC5139	FOC/96	512X512	F470M	597.12	○		
1.040	X3YU0106N	NGC5139	FOC/96	512X512	F4ND,F470M	2094.12	○		
1.045	X3YU0107N	INTFLAT	FOC/96	512X1024z	CLEAR	600.00	○		
1.046	X3YU0108N	DARK	FOC/96	512X512	F6ND,F470M	600.00	○		
1.050	X3YU0109N	NGC5139	FOC/96	512X512	F6ND,F470M	2877.12	○		

Quality flags: ○ = OK ● = Not OK Blank = Unknown or file missing

Figure 5.6: Observation Statistics

Visit: 01 **Proposal: 06930** *FOC*

Observation Statistics

Logsheet Line#	Rootname	Target Name	Image Format	Exposure (sec)	Backgd.	Backgd. Count Rate x 10^{-3}	Max Count	Max Count Rate
1.010	X3YU0101M	NGC5139	512X512	1097.12	1.21	1.10	3373.63	3.07
1.020	X3YU0102M	NGC5139	512X512	1282.12	2.18	1.70	4881.63	3.81
1.025	X3YU0103M	INTFLAT	512X1024z	600.00	23.25	38.74	48.00	0.08
1.026	X3YU0104M	DARK	512X512	600.00	1.48	2.47	8.00	0.01
1.030	X3YU0105M	NGC5139	512X512	597.12	2.64	4.42	2198.00	3.68
1.040	X3YU0106N	NGC5139	512X512	2094.12	1.98	0.94	1223.00	0.58
1.045	X3YU0107N	INTFLAT	512X1024z	600.00	46.90	78.16	89.00	0.15
1.046	X3YU0108N	DARK	512X512	600.00	1.45	2.41	8.00	0.01
1.050	X3YU0109N	NGC5139	512X512	2877.12	2.24	0.78	157.00	0.05

Figure 5.7: Image and Orientation

Logsheet Line# 1.020 **Observation: X3YU0102M.C1H** **Proposal: 06930** *FOC*

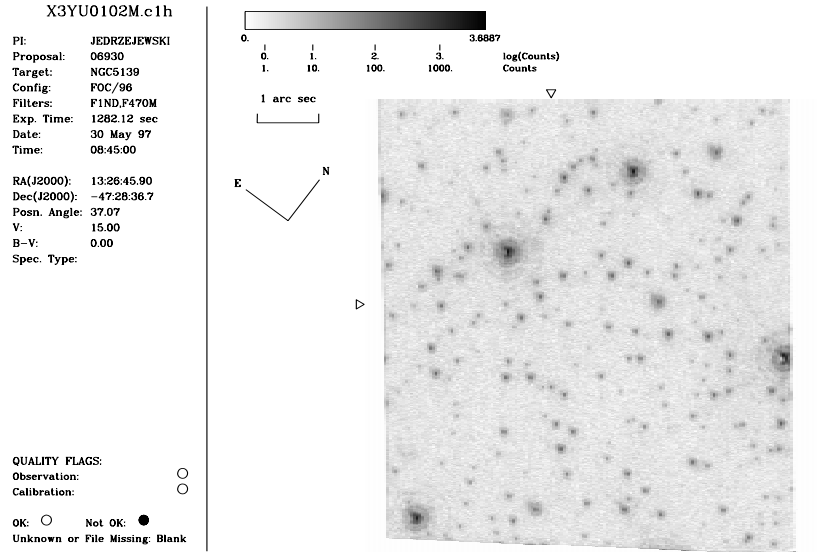


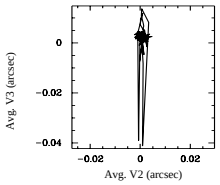
Figure 5.8: Performance and Exposure Summaries

Logsheet Line# 1.020 **Observation: X3YU0102M** **Proposal: 06930** *FOC*

HST Spacecraft Performance Summary

# Recenterings:	0	# Losses of Locks:	0
V2 Jitter (RMS):	3.0	V2 Jitter (PP):	72.1
V3 Jitter (RMS):	4.4	V3 Jitter (PP):	108.4

No apparent problems



Exposure Summary

Target Name:	NGC5139
RA (J2000):	13:26:45.90
Dec (J2000):	-47:28:36.7
V:	15.00
B–V:	0.00
Spec. Type:	
Detector:	FOC/96
Filters:	F1ND,F470M
Aperture:	512X512
Exp Time (sec):	1282.1
Rootname:	X3YU0102M
Date:	30 May 97
Time:	08:45:00
Proposal:	06930
PI:	JEDRZEJEWSKI

Pipeline Processing and Calibration Data Quality Summary

The following throughput tables were used: crotacomp$hst_ota_005.tab, crfoccomp$foc_96_m1m2_001.tab, crfoccomp$foc_96_rflpri_002.tab, crfoccomp$foc_96_rflsec_002.tab, crfoccomp$foc_96_f1nd_002.tab, crfoccomp$foc_96_f470m_002.tab, crfoccomp$foc_96_rffocus_002.tab, crfoccomp$foc_96_n512_001.tab, crfoccomp$foc_96_dqe_004.tab

No Anomalies.

Calibration Status Summary

Switches and Flags

Keyword	Value	Calibration Step
BACCORR	OMIT	Background Subtraction
ITFCORR	OMIT	ITF Correction
PXLCORR	OMIT	Split Zoom Format Pixels
UNICORR	COMPLETE	Uniform DE Correction
WAVCORR	COMPLETE	Compute Photometric Par.
GEOCORR	COMPLETE	Geometric Correction
SDECORR	OMIT	Spectrograph DE Correction
		Blemish Correction

Reference Files and Tables

Keyword	filename	Pedigree
BACHFILE	xref$91b1313sx.r0h	
ITFFILE		
UNIHFILE	xref$f3716029x.r2h	INFLIGHT 1/11/1990 - 4/11/1990
GEOHFILE	xref$f371529ex.r5h	INFLIGHT 11/11/1994
SDEHFILE	N/A	
BLMHFILE	xref$d8i0905hx.r7h	