



# **Robert C. Byrd Green Bank Telescope NRAO Green Bank**

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GBT SOFTWARE PROJECT NOTE 14.0

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## **GBT Optical Pointing Camera FITS File Specification**

HTML version Available<sup>1</sup>

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### **Abstract**

The FITS format structure is presented for the Optical Pointing Camera (OPC) scan data files. The scan data FITS files are permanently archived after each observation, and together with the scan data files from other devices provide the complete record of each observation.

The scan data FITS files contain one or more binary FITS images obtained by the OPC over the course of the observation.

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<sup>1</sup><http://www.gb.nrao.edu/GBT/MC/doc/dataproc/gbtOPCFits/gbtOPCFits/gbtOPCFITS.html>

## **History**

**5th December 2001** Initial version (Amy Shelton).

## 1 Background

All GBT scan data FITS files should conform to the standards specified in the GBT Software Project Note 4.0, “Device and Log FITS Files for the GBT.”

The OPC will be used for engineering observations related to the performance of the antenna. The principle use will be to combine positional information from the OPC images with that recorded in the antenna FITS file; it is likely that this will be performed with custom aips++ software rather than the standard filler. The details of the OPC FITS files are described in the following sections.

## 2 Primary HDU keywords

The OPC FITS keywords for the primary HDU conforms to the definition for common FITS headers as described in GBT Software Project Note 4.0 “Device and Log FITS Files for the GBT.” In fact, there are no additional keywords other than the keywords defined in GBT Software Project Note 4.0 “Device and Log FITS Files for the GBT.”

The primary header keywords for the OPC FITS file are as follows:

```

SIMPLE      =          T / file does conform to FITS standard
BITPIX      =          8 / number of bits per pixel
NAXIS       =          0 / number of data axes
EXTEND      =          T / FITS dataset may contain extensions
ORIGIN      = 'NRAO Green Bank' /
INSTRUME= 'Optical Pointing Camera' / device or program of origin
GBTCVER= '3.3.0' / telescope control software release
FITSVER = '1.1' / FITS definition version for this device
DATEBLD= 'Thu Jun 7 20:15:13 GMT 2001' / time program was linked
SIMULATE=          0 / Is the instrument in simulate mode?
DATE-OBS= '2000-10-25T13:57:17' / Manager parameter startTime
TIMESYS = 'UTC' / time scale specification for DATE-OBS
TELESCOP= 'NRAO_GBT' / Green Bank Telescope (Robert C. Byrd 100m)
OBJECT      = '0013+1527' / Manager parameter source
PROJID      = 'RMP_DCR' / Manager parameter projectId
OBSID       = 'test' / Manager parameter scanId
SCAN        =          3 / Manager parameter scanNumber
END

```

### 3 Binary Image

The OPC FITS file contains one or more binary images captured by the camera for the purpose of assisting in the determination of GBT pointing characteristics and possibly closed-loop measurement and control.

The header keywords for the binary images are as follows:

```
XTENSION= ' IMAGE '           / IMAGE extension
BITPIX   =                  -64 / number of bits per data pixel
NAXIS    =                   2 / number of data axes
NAXIS1   =                  479 / length of data axis 1
NAXIS2   =                  479 / length of data axis 2
PCOUNT   =                   0 / required keyword; must = 0
GCOUNT   =                   1 / required keyword; must = 1
END
```

## **4 SUMMARY**

The definition of FITS file keywords and table columns conforms to the standard for the GBT project as a whole. The images obtained by the OPC are recorded in the FITS file as binary images.