



Good Time Intervals (GTI) and the Mission Timeline (MTL)

Data Products Guide

Level	Instrum	Data product	<u>Content</u>	Pipeline	Filename template
L1	ACIS	<u>ACIS Good Time Interval</u>	GTI	ACIS1	flt1.fits
L1	ACIS	<u>ACIS Mission Timeline</u>	MTL	ACIS1	mtl1.fits
L1	HRC	<u>HRC Good Time Interval</u>	GTI	HRC1	stdflt1.fits
L1	HRC	<u>HRC Mission Timeline</u>	MTL	HRC1	mtl1.fits

ACIS Good Time Interval (GTI)

Level	Instrum	Data product	<u>Content</u>	Pipeline	Filename template
L1	ACIS	<u>ACIS Good Time Interval</u>	GTI	ACIS1	flt1.fits

description:

This file contains the start and stop times of all accepted time intervals over the observation. This L1 product is used to filter the L1 events at the start of L2 in order to determine the standard set of photons for the observation. It is the photons that pass this time filter that are further processed in L2. When the event file is filtered, the GTI filter is also merged with the time subsection extension of the event list as a dynamic record of the current set of time filters applied to the data.

The "good times", between TSTART and TSTOP, are periods when observing conditions were good. The two principal causes of bad observing period are: (1) bad aspect solution, and (2) high background. Users may wish to create a more restrictive set of GTIs if they require a very low background (e.g. for extended source analysis). The tool [dmgti](#) can be used for this. See the [CIAO threads page](#) for more information.

file name:

GTI information is typically contained in the MTL or event files. It is not distributed as an independent data product. Look for GTI blocks (one per chip) in files whose names contain: 'evt', 'mtl1', 'img2', or 'flt1'.

creator pipeline:

ACIS L1

creator tool:

dmgti – GTIs are built on a 'per chip' basis. The GTI blocks are then attached to certain other data products, as noted above.

useful links:

- [GTI entry](#) in the CIAO Dictionary.

GTI specific columns:

Column Name	Units	Description
START	seconds	Good time interval start time
STOP	seconds	Good time interval stoptime

ACIS Mission Timeline (MTL)

Level	Instrum	Data product	<u>Content</u>	Pipeline	Filename template
L1	ACIS	ACIS Mission Timeline	MTL	ACIS1	mtl1.fits

description:

This file contains the telescope's housekeeping and configuration information. The contents of the MTL are specified by a lookup table which is determined by science input. The MTL also defines good observing times, which is used (in part) to create the GTIs.

Important parameters include: pointing relative to the sun's limb, particle flux, aspection solution status, grating position, etc.

file name:

*_mtl1.fits

creator pipeline:

acis_L1

creator tool:*mtl_build_table***MTL specific columns:**

Column Name	Units	Description
time	seconds	–
Point_SunLimbAng	degrees	Pointing angle from Solar Limb
Point_MoonLimbAng	degrees	Pointing angle from Lunar Limb
Point_EarthLimbAng	degrees	Pointing angle from Earth Limb
Point_RamVectorAng	degrees	Pointing–Ram angle
Dist_SatEarth	meters	Satellite–Earth distance (from Earth center)
SCP4	Hz/cm**2/sr	Sci coincidence counter P4 rate
SCP8	Hz/cm**2/sr	Sci coincidence counter P8 rate
SCH4	Hz/cm**2/sr	Sci coincidence counter H4 rate
SCH8	Hz/cm**2/sr	Sci coincidence counter H8 rate
SCE150	Hz/cm**2/sr	Sci coincidence counter E150 rate
SCE300	Hz/cm**2/sr	Sci coincidence counter E300 rate
SCE1300	Hz/cm**2/sr	Sci coincidence counter E1300 rate
SCE3000	Hz/cm**2/sr	Sci coincidence counter E3000 rate
SCINT	Hz/cm**2/sr	Sci coincidence counter INT rate
SCP25	Hz/cm**2/sr	Sci coincidence counter P25 rate
SCP41	Hz/cm**2/sr	Sci coincidence counter P41 rate
SCH25	Hz/cm**2/sr	Sci coincidence counter H25 rate
SCH41	Hz/cm**2/sr	Sci coincidence counter H41 rate
HRMA_CAPGRAD0	K	–
HRMA_CAPGRAD1	K	–
HRMA_CAPTEMP	K	–

creator tool:

HRMA_FRWDTEMP	K	–
HRMA_AFTTEMP	K	–
HRMA_TEMP	K	–
OBA_PERIGRAD0	K	–
OBA_PERIGRAD1	K	–
THR_PIX	–	–
EVTSENT	–	–
DETNAM	–	–
DATAMODE	–	–
READMODE	–	–
FP_TEMP	–	–
GRATING	–	–

HRC Good Time Interval (GTI)

Level	Instrum	Data product	<u>Content</u>	Pipeline	Filename template
L1	HRC	<u>HRC Good Time Interval</u>	GTI	HRC1	stdflt1.fits

For more detailed information, see the [ACIS GTI section](#).

creator pipeline:

HRC L1

creator tool:

dmgti – GTIs are built on a 'per chip' basis. The GTI blocks are then attached to certain other data products, noted above.

GTI specific columns:

Column Name	Units	Description
START	seconds	Good time interval start time
STOP	seconds	Good time interval stoptime

HRC Mission Timeline (MTL)

Level	Instrum	Data product	<u>Content</u>	Pipeline	Filename template
L1	HRC	<u>HRC Mission Timeline</u>	MTL	HRC1	mtl1.fits

For more detailed information, see the [ACIS MTL section](#).

description:

The HRC MTL file contains nearly identical information to the ACIS MTL file. HRC-specific parameters include: voltage monitors and image diagnostics.

file name:

*_mtl1.fits

creator pipeline:

HRC L1

creator tool:

mtl_build_table

MTL specific columns:

Column Name	Units	Description
time	seconds	–
Point_SunLimbAng	degrees	Pointing angle from Solar Limb
Point_MoonLimbAng	degrees	Pointing angle from Lunar Limb
Point_EarthLimbAng	degrees	Pointing angle from Earth Limb
Point_RamVectorAng	degrees	Pointing–Ram angle
Dist_SatEarth	meters	Satellite–Earth distance (from Earth center)
SCP4	Hz/cm**2/sr	Sci coincidence counter P4 rate
SCP8	Hz/cm**2/sr	Sci coincidence counter P8 rate
SCH4	Hz/cm**2/sr	Sci coincidence counter H4 rate

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SCH8	Hz/cm**2/sr	Sci coincidence counter H8 rate
SCE150	Hz/cm**2/sr	Sci coincidence counter E150 rate
SCE300	Hz/cm**2/sr	Sci coincidence counter E300 rate
SCE1300	Hz/cm**2/sr	Sci coincidence counter E1300 rate
SCE3000	Hz/cm**2/sr	Sci coincidence counter E3000 rate
SCINT	Hz/cm**2/sr	Sci coincidence counter INT rate
SCP25	Hz/cm**2/sr	Sci coincidence counter P25 rate
SCP41	Hz/cm**2/sr	Sci coincidence counter P41 rate
SCH25	Hz/cm**2/sr	Sci coincidence counter H25 rate
SCH41	Hz/cm**2/sr	Sci coincidence counter H41 rate
IMHVLV	–	Imaging Bot MCP HV Monitor
IMHBLV	–	Imaging Bot & TOP MCP HV Monitor
SPHVLV	–	Spect Bot MCP HV Monitor
SPHBLV	–	Spect Bot & Top MCP HV Monitor
img_diam_rms	arcsec	Aspect image RMS diameter
img_roll_rms	arcsec	Aspect image RMS roll err
target_offset	arcsec	Target offset from nominal
rw_speed_bad	–	Reaction wheel speed bad
asp_sol_status	–	Aspect solution quality
HRMA_CAPGRAD0	K	–
HRMA_CAPGRAD1	K	–
HRMA_CAPTEMP	K	–
HRMA_FRWDTEMP	K	–
HRMA_AFTTEMP	K	–
HRMA_TEMP	K	–
OBA_PERIGRAD0	K	–

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OBA_PERIGRAD1	K	–
GRATING	–	–
DETNAM	–	HRC detector name
DET_HV	–	High Voltage ON or OFF
DATAMODE	–	–
MOVING	–	–
STATUS	–	–
DTF	–	–
AOFF_GAP	–	Aspect offset gap? 0=no 1=gap
ASPTYPE	–	Solution method
RATE	count/second	Count Rate

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URL:
http://cxc.harvard.edu/ciao3.4/data_products_guide/gti_descrip.html
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