OGIP Calibration Memo CAL/GEN/92-015

How to Manage a Calibration Database

Lorraine Breedon

Code 668,
NASA/GSFC,
Greenbelt, MD 20771

Version: 1997 Jun 20

SUMMARY

This document describes the steps required to manage a local Calibration
Database (Caldb) system . The local Caldb can be an exact copy of the Caldb
at the HEASARC or a 'customised' caldb containing HEASARC supported
missions but with personal/locally produced datasets and/or non-HEASARC
supported missions.
Documentation on how to install a local Caldb is covered in OGIP Calibration
Memo "How to Install a Calibration Database" CAL/GEN/94-004.
NOTE: !!!!!!!!! THIS DOCUMENT IS IN PROGRESS !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

Contents

1 INTRODUCTION

This document is intended to provide instructions for 'local Caldb managers' wishing to manage their local Calibration database (Caldb). **What is meant by managing?** This basically means that (periodically) when new calibration files are made available, the 'local Caldb manager' needs to include these new files in their local Caldb and to update the associated caldb.indx files such that the new calibration files are indexed (and thus made accessible to the software). This is obviously necessary, whether the mission is HEASARC-supported or non-HEASARC-supported. It is expected however, that the great majority of sites/institutions will possess Caldb set-ups containing only missions/instruments which are HEASARC-supported.

At the HEASARC, scripts automatically produce compressed tar files of all the good quality calibration files and the appropriate caldb.indx file for a given mission/instrument (*i.e.,* **goodfiles_asca_sis.tar.Z** for the **asca sis**). **Upon the delivery of a new calibration file to the HEASARC Caldb by the various instrument teams, the latest calibration file and the updated caldb.indx file is automatically included in the HEASARC compressed tar file**. It is then obviously recommended that the 'local Caldb Manager' updates their local Caldb as soon as possible (by obtaining this new compressed tar file from the HEASARC, either by perl script or 'by hand', see **Sections 3 and 4**). For information as to how you, the astronomical community, are notified of new calibration file deliveries to the HEASARC, please see **Appendix II.**

It is assumed that the FTOOLS software package is already available at your site since you presumably already possess a Caldb which has been successfully installed and is operable. The FTOOLS package of course, contains the installation, management & access software for your local Caldb, and your Caldb is of little use without it. Details of the latest version of FTOOLS, are in **Section 6**.

If your Caldb contains only missions/instruments which are exact copies of the HEASARC, and you wish to manage your Caldb in the simplest and easiest way, you can use the Perl script (**manage_caldb_hcopy.perl**) available from ???? (SCRIPT IN PROGRESS). Since the script uses file transfer protocol to download files from the HEASARC, your system manager will also need to install the package **libnet-1.05_01.tar.gz** from the Comprehensive Perl Archive Network (CPAN). See **http://www.perl.com/CPAN**.
This package requires that **Perl 5.002 or better** be installed on your machine (**Perl 5.002** however, does not contain **libnet-1.05_01.tar.gz** as part of its default distribution). For additional instructions please **see APPENDIX I**.

If your Caldb contains missions/instruments which are HEASARC-supported, but personal/locally produced datasets have been added, to manage these missions you will require FTOOLS from the !NEXT! FTOOLS release version **4.1**. Furthermore, a perl script (**manage_caldb_local.perl**) is available from ????..SCRIPT IN PROGRESS.... which automates the management process (see above paragraph for installation procedures).

Advice on the management of non-HEASARC-supported missions/instruments is detailed in **Section 5**.

All questions, comments and suggestions should be directed to:
`caldbhelp@athena.gsfc.nasa.gov`
or to a member of Team Caldb listed at the URL:
`/docs/heasarc/caldb/caldb_team.html`

A postscript file of the latest version of this document can be obtained from the anonymous ftp account
on: `legacy.gsfc.nasa.gov` as
`/caldb/docs/manuals/management/management_guide.ps`

1.1   Overview of Management using Perl Script

- Run the script **manage_caldb_hcopy.perl** (for the missions in your Caldb which are exact copies of those at the HEASARC). You may also run this script to obtain HEASARC-supported missions not previously included in your Caldb.

and/or

- Run the script **manage_caldb_local.perl** (for the missions in your Caldb which are HEASARC-supported but which contain personal/locally produced datasets).

2   Diskspace Requirements for HEASARC-supported Missions

At the HEASARC, scripts are running which automatically produce :

- ASCII listings of the files deemed 'good quality' by the CALDB/GOF, along with diskspace requirements.

- Compressed tar files (*.tar.Z) of all the good quality calibration files and the appropriate caldb.indx file for each mission/instrument

Such information is held on :
goodfiles_$_{miss\_inst}$**_size.new** and
goodfiles_$_{miss\_inst}$**.tar.Z**

available from the HEASARC via either the WWW at the URL:
`/docs/heasarc/caldb/caldb_goodsize.html`
or
anonymous ftp from `heasarc.gsfc.nasa.gov` in the directory **/caldb/data/**$_{miss}$/$_{inst}$
i.e. **/caldb/data/asca/gis**

The mission/instruments currently available at the HEASARC are:

TABLE I

Mission	Instrument	Approx diskspace requirement (Mbytes)
ASCA	GIS	98
	SIS	85
	XRT	4
ROSAT	HRI	1
	PSPC	11
	XRT	0.2
XTE	PCA	14

However for the most up-to-date diskspace requirements please examine:
goodfiles_*miss_inst*_size.new

3   MANAGING HEASARC-SUPPORTED MISSIONS - exact copies

3.1   Using Perl Script

N.B. If you don't have Perl on your machine, please see **Appendix I**.

- Run the script **manage_caldb_hcopy.perl**
  i.e., **manage_caldb_hcopy.perl** (dspace_check)
  – The parameter "dspace_check" is optional (can simply type "d"); if included the user will be engaged in INTERACTIVE checking of available diskspace prior to the uncompression and untarring of each data file. If omitted the script will just go ahead and attempt to uncompress and untar the files NON-INTERACTIVELY.

The script will prompt you for the following information :

1. The name of the top-level directory to your Caldb *i.e. /abc/def/caldbtop*

2. Confirmation that the full path given to your Caldb *i.e. /abc/def/caldbtop* is the correct one
   – If **YES** the program will continue
   – If **NO** the program will terminate

3. The mission and instruments for which you wish to update calibration information *and/or* those which you now wish to include in your Caldb.

Self-explanatory messages are issued to the screen to indicate the success/failure of each stage of your Caldb update.

What happens if manage_caldb_hcopy.perl informs that:
"Some requested *.tar.Z files have NOT been successfully un-tarred ... please see */abc/def/caldbtop/*caldb_err.log."

This message will be undoubtedly due to disk space problems. Simply
(*i*) Consult your systems manager regarding the aquisition of more diskspace.
(*ii*) Examine */abc/def/caldbtop/*caldb_err.log to determine which mission/instrument(s) failed.
i.e. **goodfiles_rosat_pspc.tar.Z**
(*iii*) Run **manage_caldb_hcopy.perl** again, requesting the tar.Z file for the appropriate mission and instrument
i.e., **rosat pspc**.

What does the manage_caldb_hcopy.perl script actually do?

(*i*) Checks the full path given to your Caldb *i.e. dirtop = /abc/def/caldbtop* already exists. Also checks that your Caldb actually exists.
(*ii*) Changes the current working directory to *dirtop*
(*iii*) Obtains compressed tar files for the selected mission and instruments via anonymous ftp from `heasarc.gsfc.nasa.gov`.
(*iv*) Uncompresses and untars the files.
(*v*) Creates the appropriate directory structures (if necessary)
(*vi*) Populates the directory tree with calibration files
(*vii*) If the calibration information for a given mission/instrument is being updated, the local copy of the caldb.indx is replaced with the HEASARC copy. If the mission/instrument is being included in the Caldb for the first time the HEASARC copy of the caldb.indx is placed in */dirtop/***data**/*missn/instr*.

What happens if Perl version 5.002 or better is not installed on my system?

Unfortunately you will have to resort to the more long-winded installation method given below :

3.2 NOT Using Perl Script

1. **Set the current working directory** to the top-level directory to your Caldb *i.e. /abc/def/caldbtop*

2. Obtain the compressed tar files **goodfiles_***miss_inst***.tar.Z** for the mission and instruments in which you are interested :
   i.e. **goodfiles_asca_gis.tar.Z**

   available from the HEASARC via either the WWW at the URL:
   `/docs/heasarc/caldb/caldb_goodsize.html`

or

anonymous ftp from `heasarc.gsfc.nasa.gov` in the directory **/caldb/data/***miss***/***inst* *i.e.* **/caldb/data/asca/gis**

*** Then for *each* compressed tar file *** :

3. Uncompress the file (*i.e.* uncompress *.tar.Z)

4. Untar the file (*i.e.* tar xvf *.tar)
   – thus creating the same directory structure as at HEASARC Calibration Database **and** populating your local Caldb file-system.

5. Delete the tar file

6. You must index the calibration data files for the given mission/instrument :
   i.e. if the tar file was **goodfiles_asca_gis.tar** then
   mv the file **data/tarredcif** to **data/asca/gis/caldb.indx**.
   Thus replacing your local copy of **data/asca/gis/caldb.indx** with the new HEASARC copy.

4 MANAGING HEASARC-SUPPORTED MISSIONS - but with personal/locally produced datasets added

If you are updating this mission in your Caldb for the first time : whether you are including new calibration files from the HEASARC or new calibration files produced locally, you must intially

– run the FTOOL **cifcadd** (to add an extra column, CAL_ORIGIN, to the caldb.indx file, whilst retaining all the caldb.indx information therein).

– run the FTOOL **caldbflag** (to flag all the **locally produced calibration files** as 'LOCAL' in the CAL_ORIGIN column of the caldb.indx file)

4.1 Inclusion of New Datasets from the HEASARC (Using Perl Script)

N.B. If you don't have Perl on your machine, please see **Appendix I**.

- Run the script **manage_caldb_local.perl**
  i.e., **manage_caldb_local.perl** (dspace_check)
  – The parameter "dspace_check" is optional (can simply type "d"); if included the user will be engaged in INTERACTIVE checking of available diskspace prior to the uncompression and untarring of each data file. If omitted the script will just go ahead and attempt to uncompress and untar the files NON-INTERACTIVELY.

The script will prompt you for the following information :

1. The name of the top-level directory to your Caldb *i.e. /abc/def/caldbtop*

2. Confirmation that the full path given to your Caldb *i.e. /abc/def/caldbtop* is the correct one
   – If **YES** the program will continue
   – If **NO** the program will terminate

3. The mission and instruments for which you wish to update calibration information.

Self-explanatory messages are issued to the screen to indicate the success/failure of each stage of your Caldb update.

What happens if manage_caldb_local.perl informs that:
"Some requested *.tar.Z files have NOT been successfully un-tarred ... please see */abc/def/caldbtop/*caldb_err.log."

This message will be undoubtedly due to disk space problems. Simply
(*i*) Consult your systems manager regarding the aquisition of more diskspace.
(*ii*) Examine */abc/def/caldbtop/*caldb_err.log to determine which mission/instrument(s) failed.
i.e. **goodfiles_rosat_pspc.tar.Z**
(*iii*) Run **manage_caldb_local.perl** again, requesting the tar.Z file for the appropriate mission and instrument
i.e., **rosat pspc**.

What does the manage_caldb_local.perl script actually do?

(*i*) Checks the full path given to your Caldb *i.e. dirtop = /abc/def/caldbtop* already exists. Also checks that your Caldb actually exists.
(*ii*) Changes the current working directory to *dirtop*
(*iii*) Obtains compressed tar files for the selected mission and instruments via anonymous ftp from `heasarc.gsfc.nasa.gov`.
(*iv*) Uncompresses and untars the files.
(*v*) Creates the appropriate directory structures (if necessary)
(*vi*) Populates the directory tree with calibration files
(*vii*) Updates the local copy of the caldb.indx for a given mission/instrument using the FTOOL **mudcif** (Many Updates to a Caldb.Indx File). **mudcif** indexes the (new) calibration files provided by the HEASARC appropriately, and flags the older versions of the new datasets as 'bad' (whilst **ignoring personal/locally produced datasets**, hence ensuring these datasets are still accessible to the s/w).

What happens if Perl version 5.002 or better is not installed on my system?

Unfortunately you will have to resort to the more long-winded installation method given below :

4.2   Inclusion of New Datasets from the HEASARC (NOT Using Perl Script)

1. **Set the current working directory** to the top-level directory to your Caldb *i.e. /abc/def/caldbtop*

2. Obtain the compressed tar files **goodfiles_***miss_inst***.tar.Z** for the mission and instruments in which you are interested :
   i.e. **goodfiles_asca_gis.tar.Z**

   available from the HEASARC via either the WWW at the URL:
   `/docs/heasarc/caldb/caldb_goodsize.html`
   or
   anonymous ftp from `heasarc.gsfc.nasa.gov` in the directory **/caldb/data/***miss***/***inst*
   i.e. **/caldb/data/asca/gis**

   *** Then for *each* **compressed tar file ***** :

3. Uncompress the file (*i.e.* uncompress *.tar.Z)

4. Untar the file (*i.e.* tar xvf *.tar)
   – thus creating the same directory structure as at HEASARC Calibration Database **and** populating your local Caldb file-system.

5. Delete the tar file

6. You must index the calibration data files for the given mission/instrument :
   i.e. run the FTOOL **mudcif** (Many Updates to a Caldb.Indx File), with the file
   */abc/def/caldbtop/***data/input.ASCII** as input. **mudcif** indexes the (new) calibration files provided by the HEASARC appropriately, and flags the older versions of the new datasets as 'bad' (whilst **ignoring personal/locally produced datasets**, hence ensuring these datasets are still accessible to the s/w).

4.3   Inclusion of New Personal/Local Datasets

1. Populate the appropriate sub-directories with your new local/personal calibration files.
   *i.e. /caldb_topdirectory/***data/xte/pca/cpf/responses/95apr03/***local.rmf*

2. Index your cal files in the caldb.indx *i.e. /caldb_topdirectory/***data/xte/pca/caldb.indx** by running the FTOOL **udcif**. Run **udcif** from the sub-directory which contains the cal file since the tool looks at the cwd to determine the path to the file and then writes the path to the CAL_DIR column in the caldb.indx and the filename to the CAL_FILE column.
   – input calibration filename
   – input name (& location) of the index file
   – input quality value of dataset being entered (0 ..for 'good' quality hopefully!)

3. Run **caldbflag** (to flag all the **new locally produced calibration files** as 'LOCAL' in the CAL_ORIGIN column of the caldb.indx file).

4. Perform an **fdump** on the caldb.indx to check the files have been indexed correctly

5 MANAGING NON-HEASARC-SUPPORTED MISSIONS and/or INSTRUMENTS

Upon delivery of a new calibration file by the (non-HEASARC) mission/instrument teams to the 'local' Caldb, you will need to intially examine the file to check that it conforms to OGIP-approved standards, and then (if correct), index the file into your Caldb. Overall, you will need to perform :

1. **fverify** *non_heasarc_stuff.rmf* (to check that the header and data in the primary array and in every extension conform to the FITS format standard).

2. **fchecksum** *non_heasarc_stuff.rmf* (to verify or update the CHECKSUM and DATASUM keywords in each HDU of the input FITS file).

   *** If the above FTOOLS reveal problems with the file, you should contact the instrument team who should then rectify them as necessary. Once the file is checked as 'correct', you may continue with the following : *******

3. Move *non_heasarc_stuff.rmf* to the correct Caldb sub-directory
   i.e. mv *non_heasarc_stuff.rmf /caldbtop_directory/***data/***mission/instr/matrices*

4. Index *non_heasarc_stuff.rmf* into the appropriate caldb.indx file
   *i.e. /caldbtop_directory/***data/***mission/instr/***caldb.indx** by running the FTOOL **udcif**. Run **udcif** from the sub-directory which contains the cal file since the tool looks at the cwd to determine the path to the file and then writes the path to the CAL_DIR column in the caldb.indx and the filename to the CAL_FILE column.
   – input filename
   – input name (& location) of the index file to be updated
   – input quality value of dataset being entered (0 ..for 'good' quality hopefully!)

5. Perform an **fdump** on the caldb.indx to check the files have been indexed correctly

6 How do I get FTOOLS?

The latest FTOOLS software package is available from the HEASARC via either the WWW at the URL:
`/docs/software/ftools/ftools_release.html`

or anonymous ftp from `heasarc.gsfc.nasa.gov` in the directory
`software/ftools/release`
Both areas contain the necessary release notes and the installation instructions.

7   IF ALL ELSE FAILS ...

Send e-mail to:
`caldbhelp@athena.gsfc.nasa.gov`
or contact a member of Team Caldb listed at the URL:
`/docs/heasarc/caldb/caldb_team.html`

8   APPENDIX I

Since the Caldb management scripts **manage_caldb_*.perl** use file transfer protocol to download files
from the HEASARC, your system manager will need to install the package **libnet-1.05_01.tar.gz**
from the Comprehensive Perl Archive Network (CPAN). See **http://www.perl.com/CPAN**.
This package requires that **Perl 5.002 or better** be installed on your machine (**Perl 5.002** however,
does not contain **libnet-1.05_01.tar.gz** as part of its default distribution).

Your system manager should then replace the 1st line of the perl script

#!/usr1/local/bin/perl5

with the location of perl on your system. For example if perl is located in /usr/local/bin/perl
then the 1st line should of the perl script should read

#!/usr/local/bin/perl

9   APPENDIX II

You will be notified that new calibration files are available through an e-mail distribution list. Three
such distribution lists are currently available for the ASCA, ROSAT and XTE missions. They are
called ascacaldb, rosatcaldb and xtecaldb respectively. You can subscribe to these lists by sending a
one-line e-mail message to listserv@athena.gsfc.nasa.gov. The body of the message should be:

`subscribe <list> <your name>`

where `<list>` is either `ascacaldb` or rosatcaldb or xtecaldb and `<your name>` is your surname.

also on the web !!