

FIXHDR HELP

Version: 2012.286

Category: PASSCAL software, common tools used in passive source data processing

Objective: Provide guidance on fixhdr usage

Fixhdr is a PASSCAL tool used to correct mseed header fields, to address timing issues, and change endianness. It can be used either as a graphical user interface or from the command line. The following text describes basic usage and functionality of **fixhdr**. Note that fixhdr searches the specified directory and all its subdirectories for mseed files.

1) Setting Network, Station, Location, and Channel Codes

Fixhdr allows one to set the network, station, location, and channel codes of the data header. The **fixhdr** GUI can be used to make simple changes, on the other hand, the command-line option allows for large scale, service-run-wide changes via a batch file. We recommend the use of the command line and batch file mode of operation when possible as it allows the use of a template. A template is a text file that maps the desired changes to the miniseed headers. A fixhdr template is particularly advantageous when several changes are needed to miniseed headers in your dataset, because it reduces the number of manual interactions required to affect these changes. Thus, effectively, it minimized the chances of human errors..

Templates can be imported (**Load Template**) and exported (**Save Template**). A quick and safe way to generate the template is by building the database of your traces, which will load the current headers of your files. Then go to the **Global Modify** tab and assign global modifications of the net, network code, channel and location code associated to sample rate. After setting modifications for the stations you may save your template and run **fixhdr** in batch mode from the command line or by **Modifying Headers** under the **Trace Headers** tab.

Below is an example of **fixhdr** in batch mode (note: no GUI will appear):

```
fixhdr -m batch_file /path/to/data
```

a. Using the command line and batch file options to modify headers

Header fields you will need to consider are: station name, channel name, location code (optional), and network code. Please refer to the SEED Format Definitions document in our appendices, or to the Standard for the Exchange of Earthquake Data, Reference Manual, SEED Format Version 2.4 (<http://www.iris.edu/manuals/>)

for channel naming conventions. Below is an example of a batch file built by saving the template with **fixhdr**:

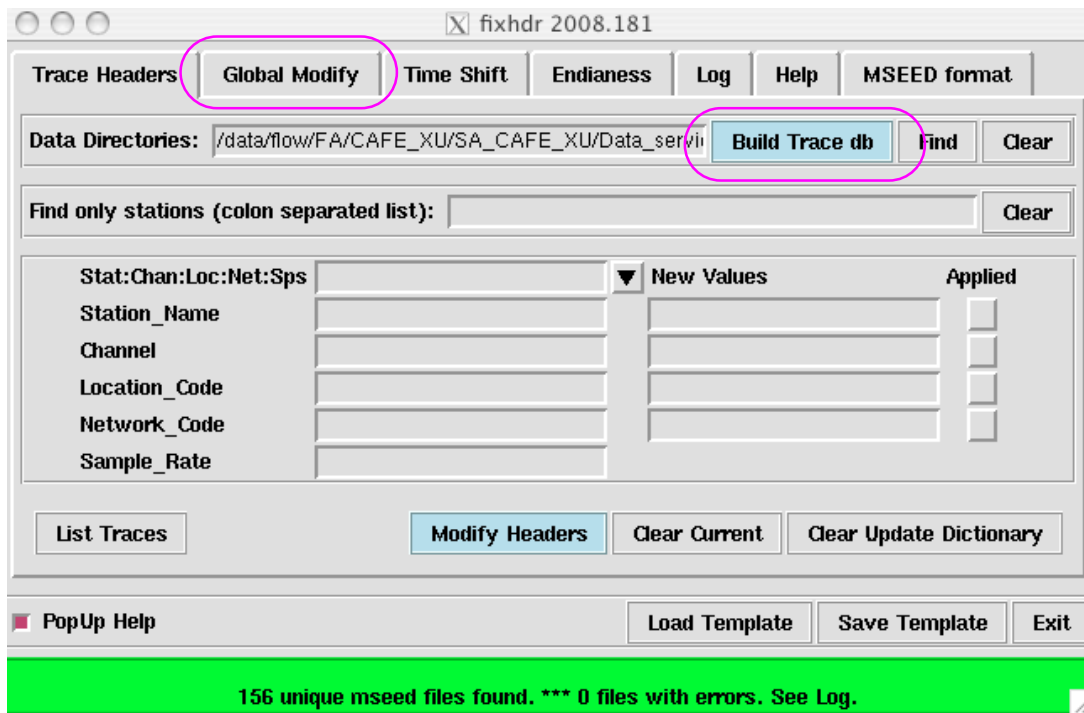
```
# Header Changes
hdrlist{
# stat:chan:loc:net:sps      new sta:chan:loc:net
0965D:1C1::XX:100.0        PA01:EHZ::YW
0965D:1C2::XX:100.0        PA01:EHN::YW
0965D:1C3::XX:100.0        PA01:EHE::YW
09511:1C1::XX:100.0        PA02:EHZ::YW
09511:1C2::XX:100.0        PA02:EHN::YW
09511:1C3::XX:100.0        PA02:EHE::YW
0969D:1C1::XX:100.0        PA03:EHZ::YW
}
```

Note in this example we are not using the location code. If you decide to use location code (let's say you use 00) it should look something like:

```
# Header Changes
hdrlist{
# stat:chan:loc:net:sps      new sta:chan:loc:net
0965D:1C1:00:XX:100.0        PA:01:EHZ:00:YW
}
```

b. Using the GUI to modify headers

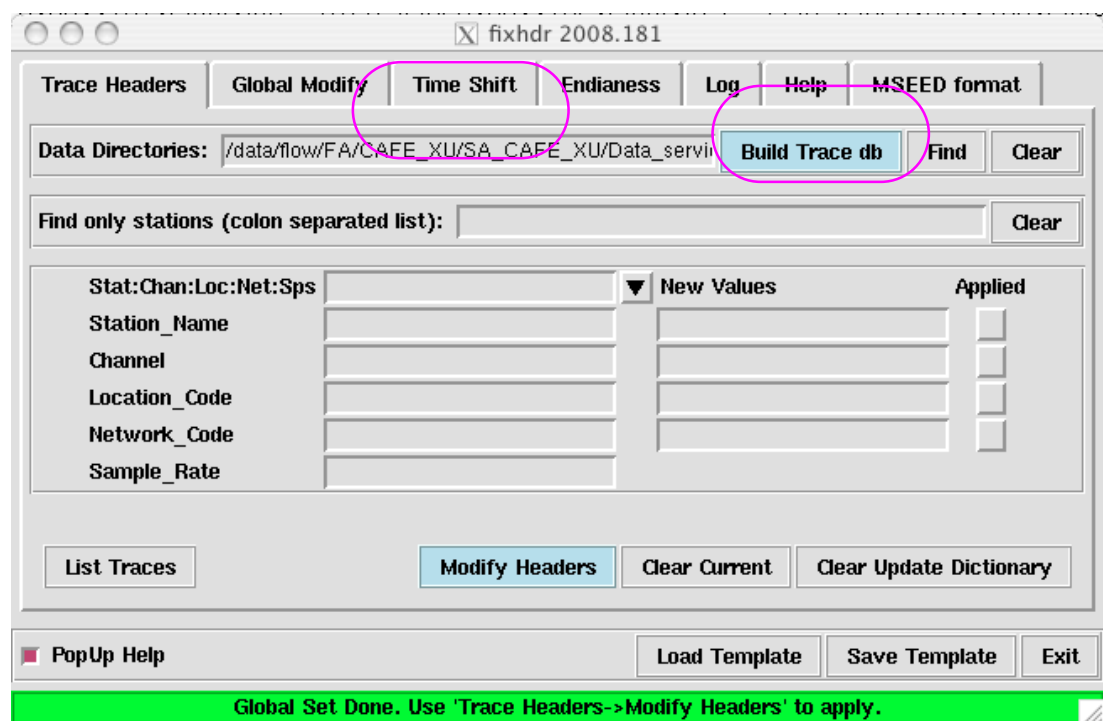
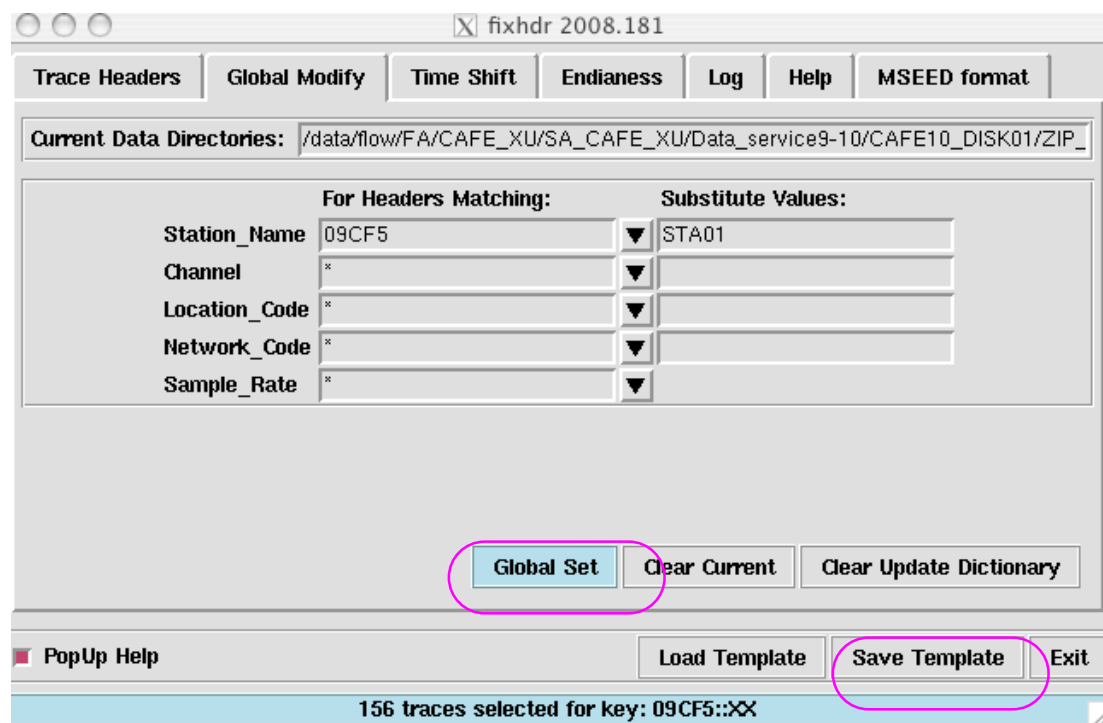
To modify the headers with the GUI, first build the trace database. Locate the directory with your traces and then click **Build Trace db**. This may take a while, depending on the number and size of files. You'll have the option to locate the traces once it is running. Launching the program in the directory where your traces are located will simplify your setup.



Once you have built your trace database, select **Global Modify** and assign global modifications for station name, channel, location code, network code, and sample rate as necessary. After each global modification, select **Global Set**. When all of the desired header changes are complete, select **Modify Headers** (under the **Trace Headers** tab) to implement the changes to the headers. This process may take some time depending on the number of headers in need of modifications. To ensure that the headers have been properly fixed rebuild your trace db by selecting **Build Trace db**. (under the **Trace Headers** tab) and click the drop down bar under Stat:Chan:Loc:Net:Sps to view the corrected headers.

Alternatively, you can save the modifications in a template file (as a batch) for later use, saving the desired modifications to a template is recommended.

To build the template via the GUI, select **Global Set** followed by **Save Template** to build and save your template. Now select **Modify Headers** (under the **Trace Headers** tab) to implement the changes to the headers. (See next page).



Templates may be imported via **Load Template** then used to operate on the files in the trace database. After loading the template, select **Modify Headers** to globally change the headers.

After completing the modification of the traces, you can take a look at the log file via

the **Log** tab. It is recommended that you save the log file for your reference via the **Save Log File**. As before, rebuild the trace db (under the **Trace Headers** tab) to make sure all the changes were applied as expected.

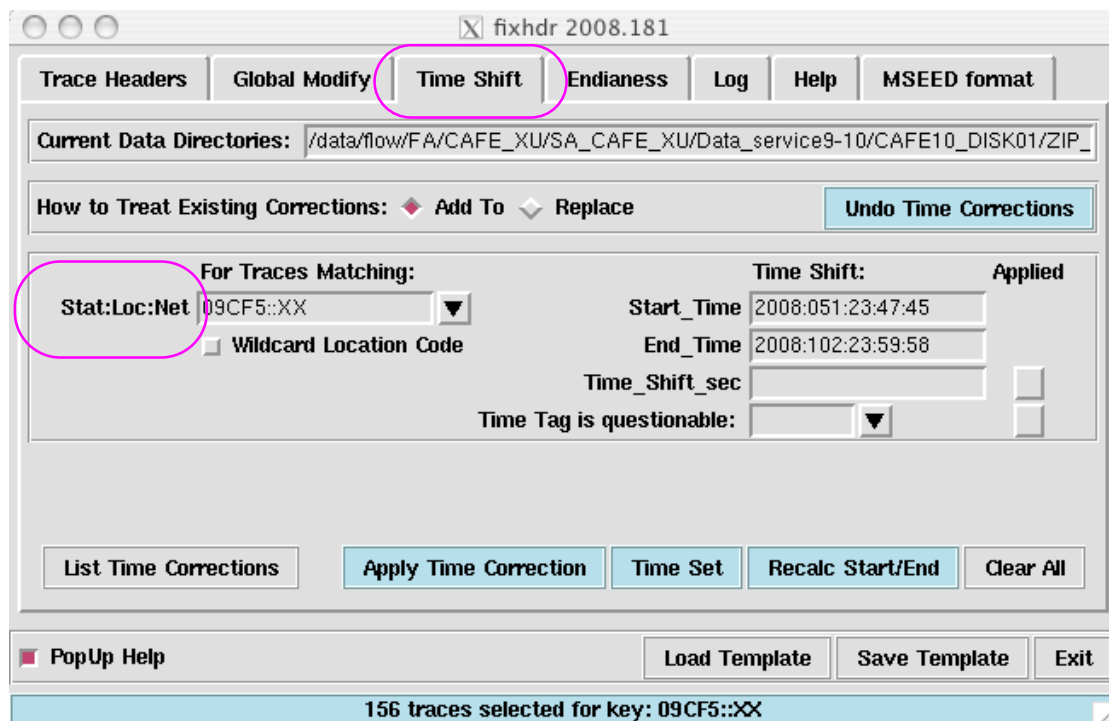
2) Timing shifts and Flagging questionable timing

Fixhdr has the capability to apply bulk shift timing corrections. Before beginning you need to know:

- 1) sta:loc:net code of the station
- 2) time shift to apply
- 3) time range for which the time shift is necessary.

Launch **fixhdr** by typing it on the command line. Build the trace database as described earlier in section 1b, "Using the GUI to modify headers".

Select the **Time Shift** tab, then select the Stat:Loc:Net of the traces you need to correct.



Once you select a Stat:Loc:Net, fixhdr will calculate the start and end time that encompasses all of the traces it found when you executed **Build Trace db**. Adjust these start times to reflect the necessary timing corrections.

You have two options regarding how to treat previously existing timing corrections:

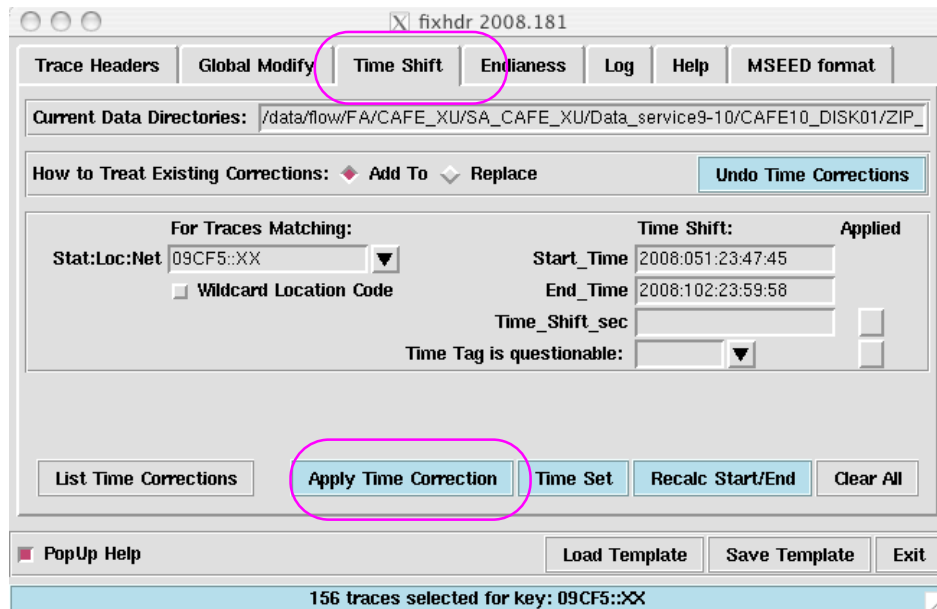
The first (default) is **to add your correction or shift to any correction currently recorded in the mseed header**

There are three cases that **fixhdr** recognizes:

- 1) An old shift exists and has been applied.
 - a. New shift is applied to record start time
 - b. New shift is added to time correction field
- 2) An old shift exists but has not been applied
 - a. New shift is added to old shift. Sum is applied to record start time
 - b. Sum is entered in time correction field
 - c. Activity flag Bit 1 is set
- 3) No old shift exists
 - a. New shift is applied to record start time
 - b. New shift is entered in time correction field
 - c. Activity flag Bit 1 is set

The second option is **to replace any existing time correction** . Again there are three cases:

- 1) An old shift exists and has been applied.
 - a. Old shift is removed and new shift is applied to record start time
 - b. New shift replaces old shift in time correction field
- 2) An old shift exists but has not been applied
 - a. New shift is applied to record start time
 - b. New shift is entered in time correction field
 - c. Activity flag Bit 1 is set
- 3) No old shift exists
 - a. New shift is applied to record start time
 - b. New shift is entered in time correction field
 - c. Activity flag Bit 1 is set



Once you've selected the Stat:Loc:Net, entered start and end times, and selected to add or replace the time shift, you need to enter the time shift in the appropriate field. Then hit **Apply Time Correction**. You may also set the **Time Tag is questionable** flag for a time period when timing quality is suspect. These time corrections may take a while if you have a large number files or large files. Note that if you only need to set the **Time tag is questionable** flag it is necessary to put the **Time_shift_sec** as 0.0 in order to make the necessary corrections.

All of your applied corrections will be summarized under the **Log** tab. The **Help** tab further describes the use of this program. To view that the mseed headers have the necessary timing corrections you can use a program called **mseedpeek**. In addition to this, as in Section 1b, you may simply rebuild the trace db by selecting **Build Trace db**, then click on the **Time Shift** tab. To view a list of the implemented timing corrections, click on **List Time Corrections** to ensure that the appropriate changes have been made.

3) Modifying endianness on your files

For archiving purposes we require the mseed day volumes be in big endian byte order. You can accomplish this task by building your trace db as described previously, then select **Convert to Big** (if any Little Endian files were found) under the **Endianness** tab.

In order the appropriate changes have been made, as before, rebuild your trace db by selecting **Build Trace db** (under the **Trace Headers** tab). Next click on the **Endianness** tab to confirm that all of the files changed from little endian to big endian.

