



Pegasus Data Processing

You've offloaded a service run and have data from each Pegasus. Follow the steps in this document to reorganize the data into station/channel/day volumes. Then, create a stationXML for your experiment using Nexus (see step 6) before submitting data to the EarthScope Primary Instrument Center (EPIC). **Unix commands (bold print) and any command line arguments are highlighted in yellow.**

Additional documentation can be found on the EPIC website:

<https://www.passcal.nmt.edu/content/passive-source-seed-archiving-documentation>

1. Create an organized directory structure for your data.

Start by creating a main directory for the project. Under your main project directory, make a first level directory named "SVC1" for service run number 1. For each subsequent service run, create a new directory, e.g. SVC2, SVC3. Create a directory within the "SVC1" directory for your raw data. For example: **mkdir RAW**

2. Copy your data.

Copy the data folder from each Pegasus into the RAW directory. Each Pegasus should have a separate folder in the RAW directory with subfolders.

3. Reorganize the miniSEED data into station/channel/day volumes.

dataselect is an IRIS DMC program that allows for the extracting and sorting of miniSEED data (<https://github.com/iris-edu/dataselect>). This will read data from the Pegasus folders in the RAW directory and reorganize them into day volumes with the required naming format. You will need to run **dataselect** twice, first to reorganize the waveform data, and second to reorganize selected SOH data.

The "Archive directory pattern" on the Pegasus and naming of the files are programmable. The example below is for an experiment with the "Archive directory pattern" set to "YEAR/NET/STA" under the station and, if applicable, SOH data type. Run the following commands to reorganize and rename your files to the accepted "STA.NET.LOC.CHAN.YEAR.JULDAY" naming convention:

For the waveform data:

```
dataselect -A DAYS/%s/%s.%n.%l.%c.%Y.%j RAW/*/20??/??/*/???D/*
```

For the SOH data:

```
dataselect -A DAYS/%s/%s.%n.%l.%c.%Y.%j RAW/*/20??/??/*/???D/*
```

The (-A) flag writes file names in the specified custom format. The format flags are (s) for station,

(n) for netcode, (l) for location, (c) for channel name, (Y) for year, and (j) for Julian date. See the help menu for more details on options (**dataselect -h**).

Depending on how much data you have, you may need to run **dataselect** in a loop that runs over the different days or stations in your experiment to avoid memory overflow errors. If you receive a message about “too many open files” you will need to run **dataselect** in a loop. A very simple example is given below.

*EXAMPLE: Run **dataselect** in a loop*

- a. Generate a list of miniSEED files using the following command:

```
ls -D $PWD/RAW/*/20??/???/* > mseed-file-list.txt
```

- b. Run **dataselect** in a loop with the following command:

```
cat mseed-file-list.txt | while read line; do dataselect -A DAYS/%s/%s.%n.%l.%c.%Y.%j  
$line; done
```

4. Confirm your station and channel names.

In the “DAYS” folder just created by **dataselect**, check to see if you have folders for each of your stations. The data should be organized into those folders in station/channel/day volumes named “STA.NET.LOC.CHAN.YEAR.JULDAY”. For example: BA01.XR..HHZ.2018.039 (The “..” after “XR” is where the location code would be if needed).

Since the station/channel names are programmed into the Pegasus, you should not need to modify any of the headers in the miniSEED files unless a mistake was made when programming the Pegasus at the site. To change any miniSEED headers to correct a station name, network code, etc., see the **fixhdr** doc on the EPIC website (see link on previous page). After you have modified the headers with **fixhdr**, rename the files so that the station-network-location-channel codes in the miniSEED file names match the corrected headers.

Note: Run **fixhdr** on the miniSEED files in “DAYS” directory.

Note: To rename the files after any changes to the headers, rerun **dataselect** by pointing it to the recently updated files: **dataselect -A DAYS_UPDATED/%s/%s.%n.%l.%c.%Y.%j DAYS/*/***

5. Perform quality control of waveforms and SOH.

Verify the data quality by reviewing the traces and SOH files using **sohviewer** and **SQLX** (or other waveform quality control software of your choice). Obvious signs of trouble include loss of GPS timing, overlaps, gaps, corrupted files, etc. Make a note of any problems. Use **fixhdr** to mark timing issues, and/or to convert the files to big endian if they are not already. For more information on how to use these tools, refer to the appropriate documentation on the EPIC website (see link on the previous page). Note: If you make any changes to endianness or mark timing issues using **fixhdr** but DO NOT alter any header values, you do not need to rerun **dataselect**.

6. Create metadata for your experiment.

Use Nexus to generate a stationXML file for your experiment metadata. See the “Metadata Generation with Nexus in a Nutshell” document on the EPIC website (see link on previous page). Note: The stationXML offloaded from the Pegasus cannot be used for archiving PASSCAL experiments as-is.

7. Send miniSEED data to PASSCAL.

Please drop a note, with your project name in the subject, to epic.data.group@earthscope.org before sending the data so that we can set up a receiving area. Attach the stationXML created with Nexus to this email unless it is larger than 5Mb. Use our tool **data2passcal** to send the data:

data2passcal DAYS/

data2passcal will scan all subdirectories of the DAYS folder and send any miniSEED files that have the correct file names. **data2passcal -h** displays all flag options.