Q330 Data Processing

You've offloaded a service run using **bline** and have data from each Q330. 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 the data to the EarthScope Primary Instrument Center (EPIC). **Unix commands (bold print)** and any command line arguments are highlighted in yellow. Input files are denoted by <*filename*>.

Additional documentation can be found on the EPIC website:
https://epic.earthscope.org/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 "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. If you used B14 balers, copy the .sdr folders created by **bline** in to the RAW directory. Also copy the .msg and .txt files.

If you used B44 balers, copy the BALER44 directory from the USB drive to your RAW directory and rename it to reflect your station name.
cp -rp /Volumes/BALER44 service1_RAW/<*stationName*>
(The -p preserves the timestamp on the files). If your data used more than one USB drive you could call the second folder <*stationName*>2.

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 the data from the .sdr or B44 folders and reorganize them into day volumes with the required naming format.

For B14 balers:
dataselect -A DAYS/%s/%s.%n.%l.%c.%Y.%j RAW/*.sdr/*

For B44 balers:
dataselect -A DAYS/%s/%s.%n.%l.%c.%Y.%j RAW/<*stationName*>*/data*/*
(the '*' after station-name is a wildcard to grab data from both USB drives)

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.

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 Q330, you should not need to modify any of the headers in the miniSEED files unless a mistake was made when programming the Q330 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.

5. Perform quality control of waveforms and SOH. Verify the data quality by reviewing the traces and SOH files (with **qpeek** and **pql**). 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 and the Q330 State of Health (SOH) channels, refer to the appropriate documentation on the EPIC website (see link on previous page).

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).

7. Send miniSEED data to EPIC. Please drop a note, with your EarthScope project name in the subject, to epic.data.group@earthscope.org before sending the data to EPIC 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.