Baler Downloading and Field Quality Assurance using EzBaler and PQL

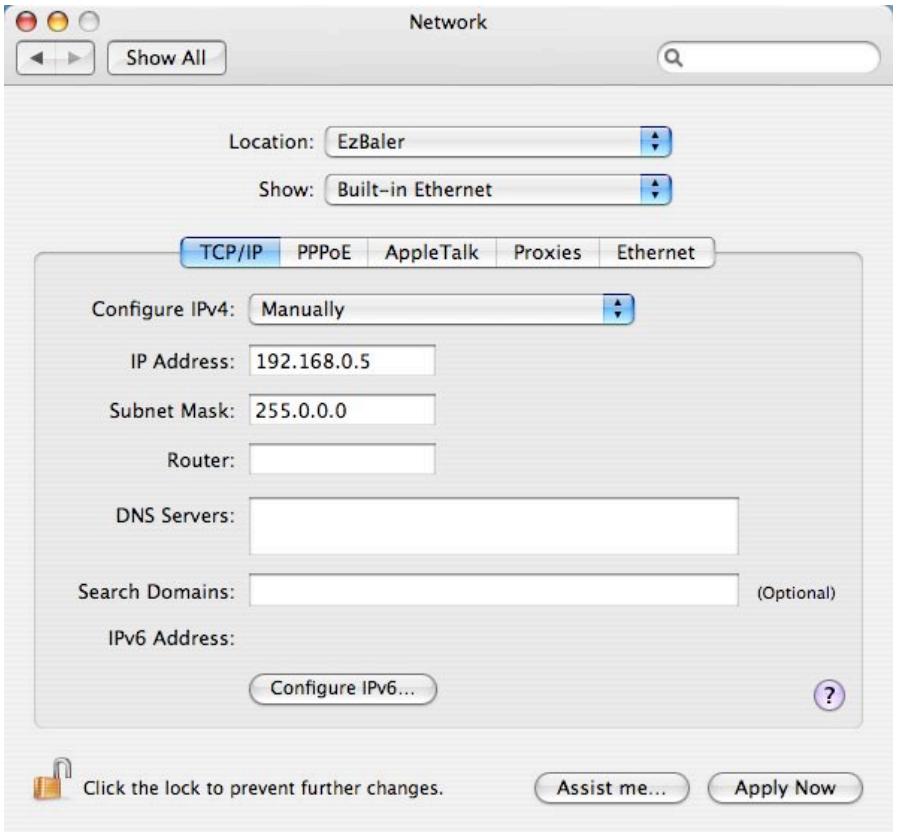
This document provides instructions for downloading Balers using the EzBaler program and reviewing the State of Health (SOH) data using PQL. EzBaler is still under development, but at this point it is the best option for downloading data from multiple Balers at one time. Known problems are that it will sometimes fail to connect to a Baler, and that it will hang up if it encounters corrupted data.

This document contains four sections

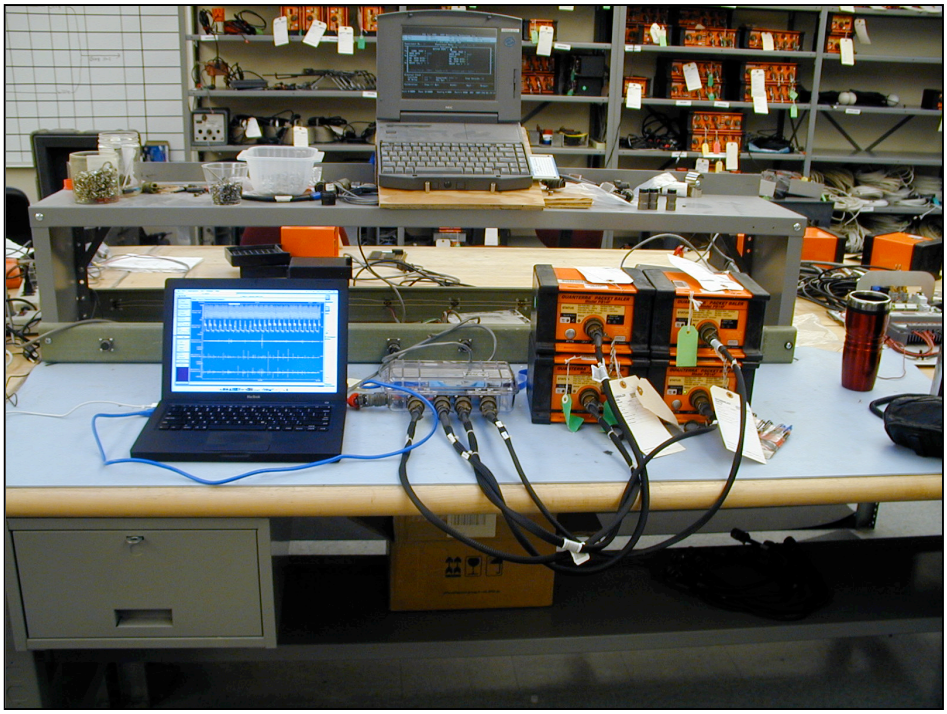
- Connecting to the Balers
- Downloading SOH data
- Downloading the full data set
- Reviewing SOH data

1. Connecting to the Baler

First, turn off the laptop computer's wireless

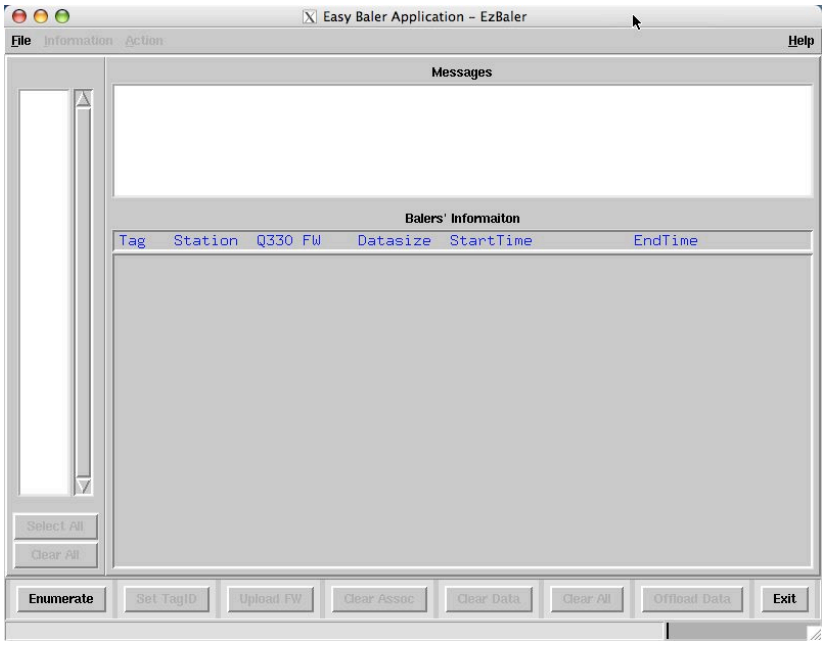


In the Mac network configuration make sure the location is set to EzBaler



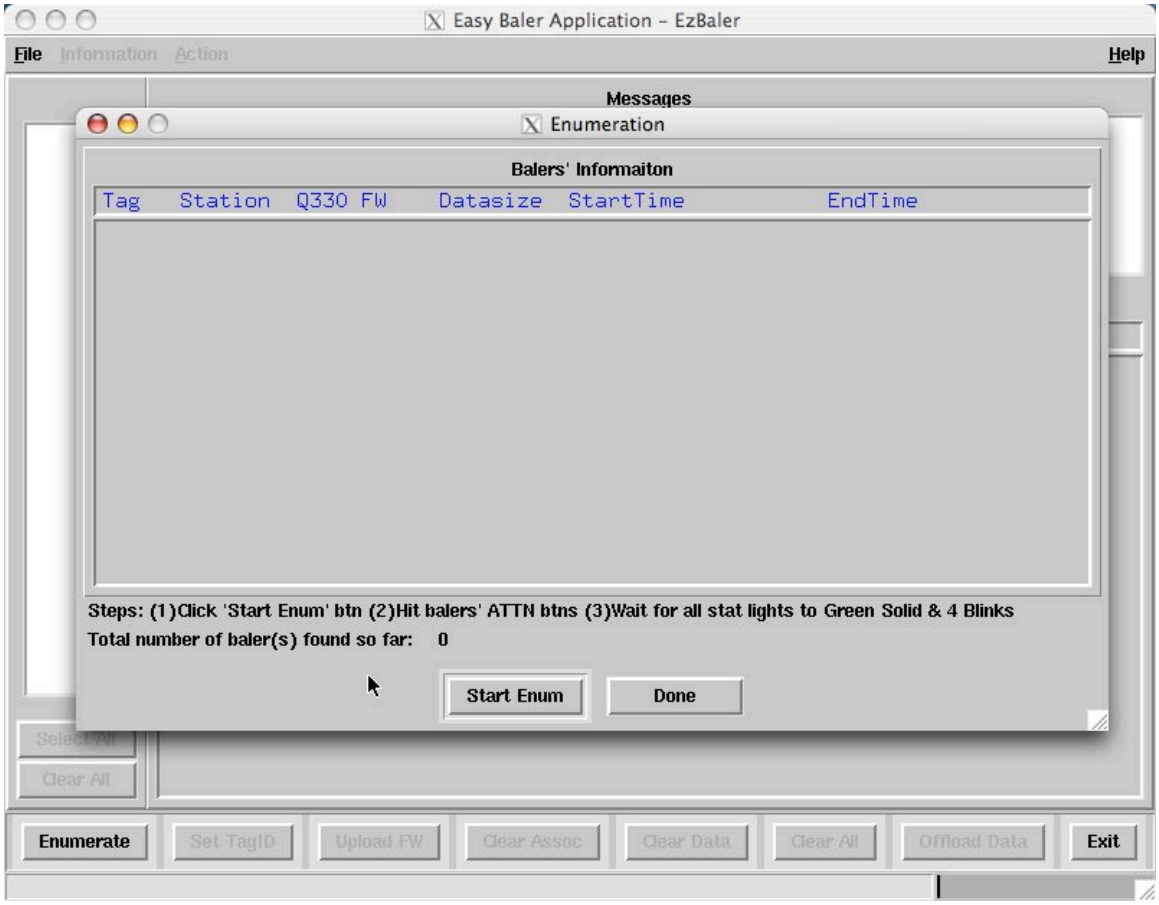
Connect the Balers to the download box and connect the download box to the laptop and power.

Select the ezb icon from the toolbar OR type ezb in a X-Terminal window's command line.



Select the Enumerate button on the bottom of the EzBaler screen.

Select Start Enum on the bottom of the Enumeration page.
Press the ATTN buttons on each of the Balers one at a time, waiting a few seconds between each one, so that they don't all come up at once.

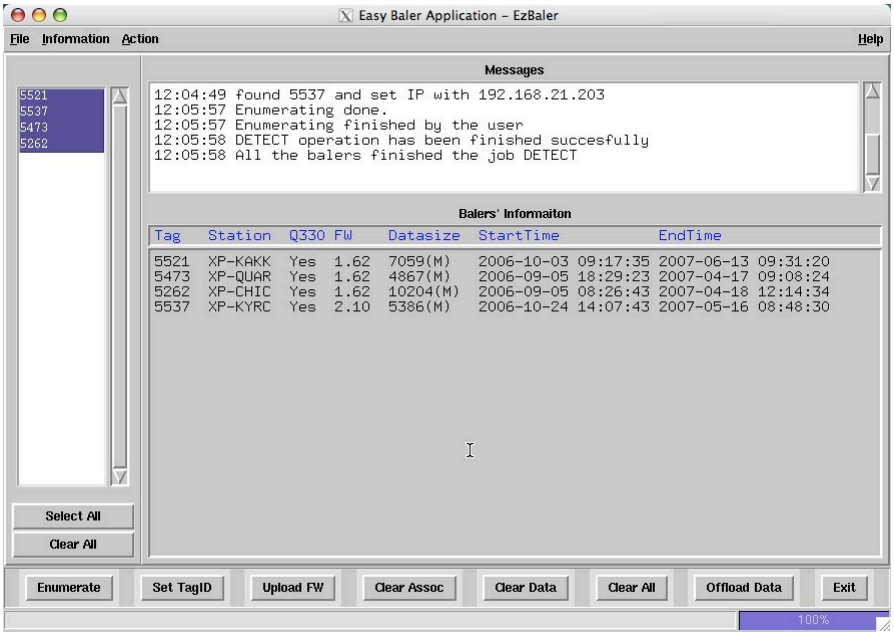


Wait patiently (or impatiently) while the Balers boot up. Eventually you should see all of the Balers listed on the Enumeration screen. If one or more of the Balers fails to appear on the enumeration screen then try the following in this order.

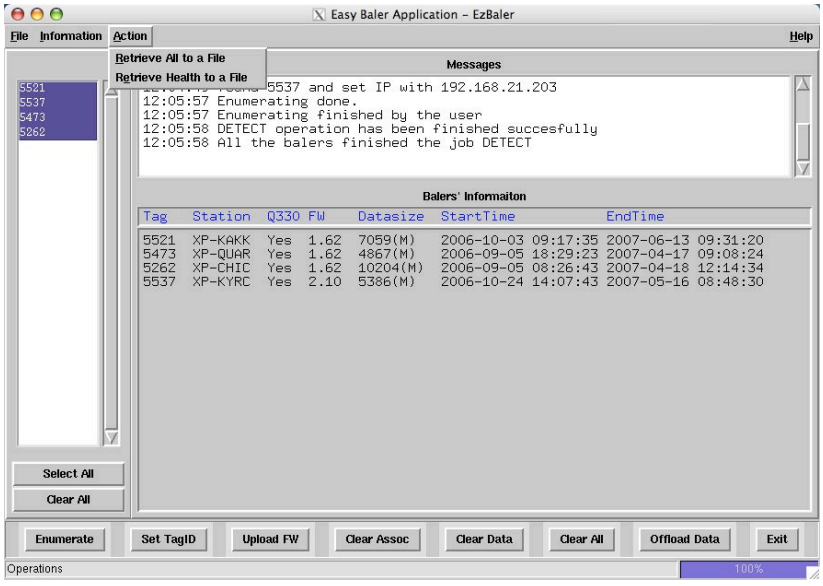
1. Select Done, then Select Enumerate, then select Start Enum, then reboot the problem Baler(s).
2. Close the EzBaler program and start over.
3. Close the EzBaler program, reboot the computer and start over.

Once all of the Balers have been enumerated select done.

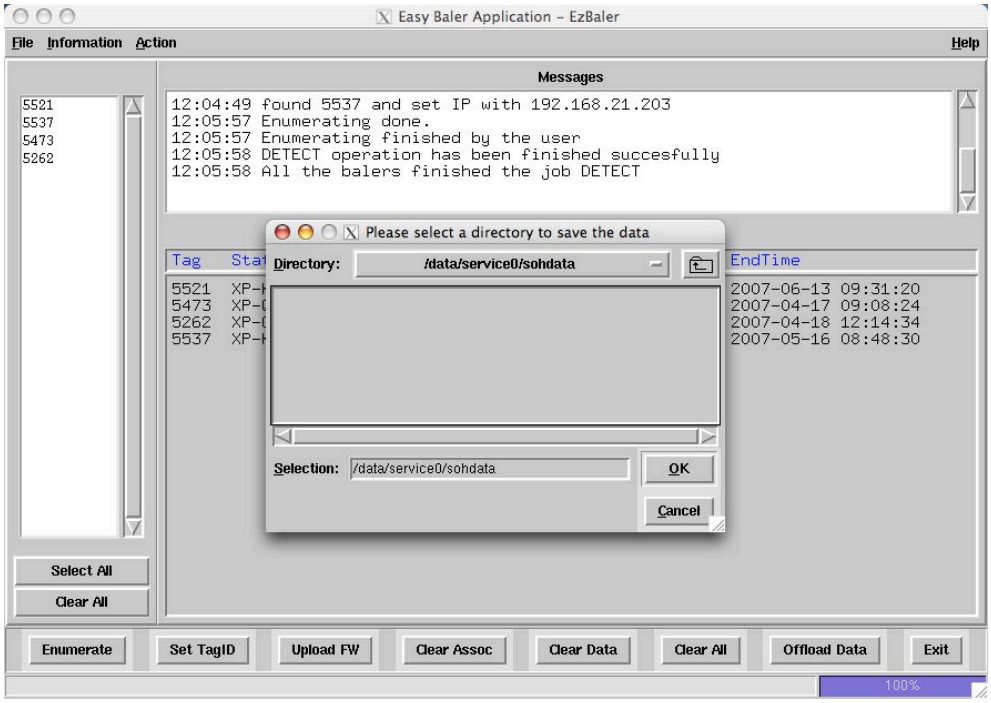
2. **Downloading SOH data**



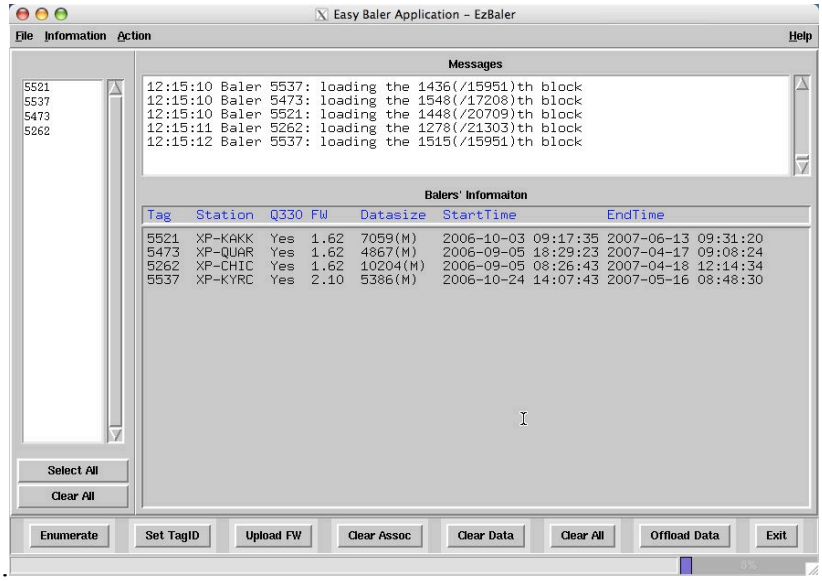
Record the Baler information on the service sheet, and then select the Balers to be downloaded from the list on the left.



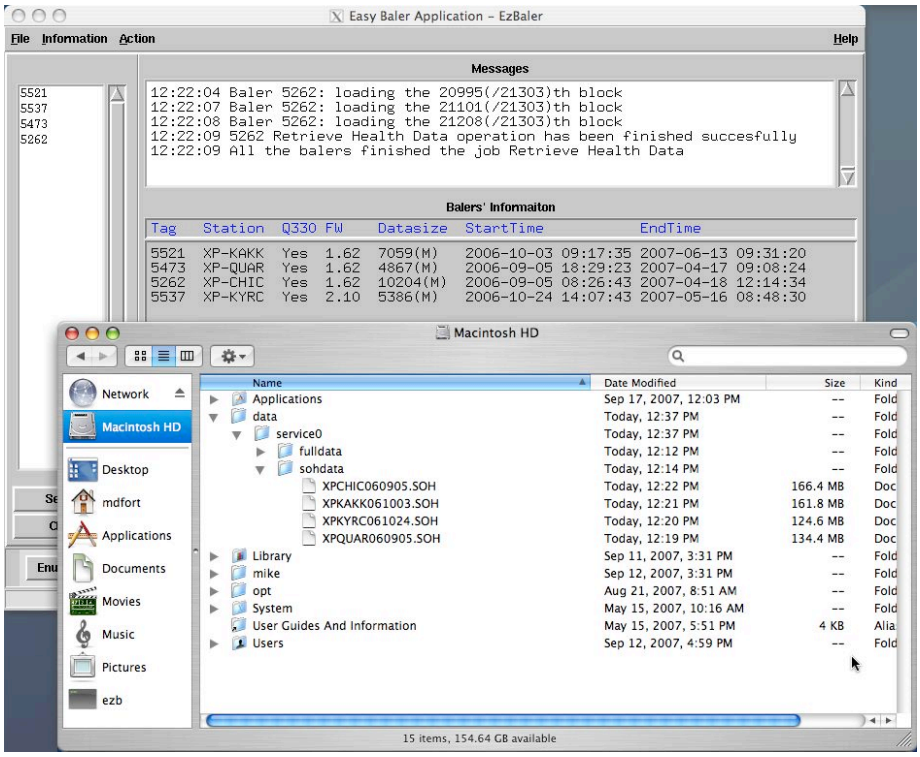
From the action menu select Retrieve Health to a File. This will download state of health information such as power and temperature and will also download the 1 sample per second seismic data (LH?).



Select the directory data are to be downloaded to, such as the sohdata directory for the current service run

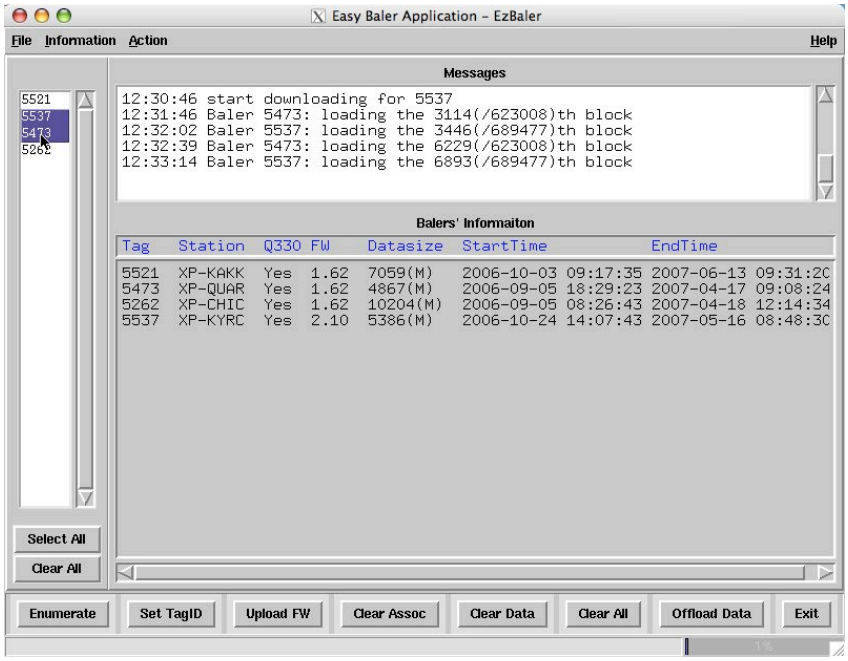


Verify, in the message box, that all of the Balers are downloading. The status bar in the lower right corner indicates the progress of the slowest Baler.

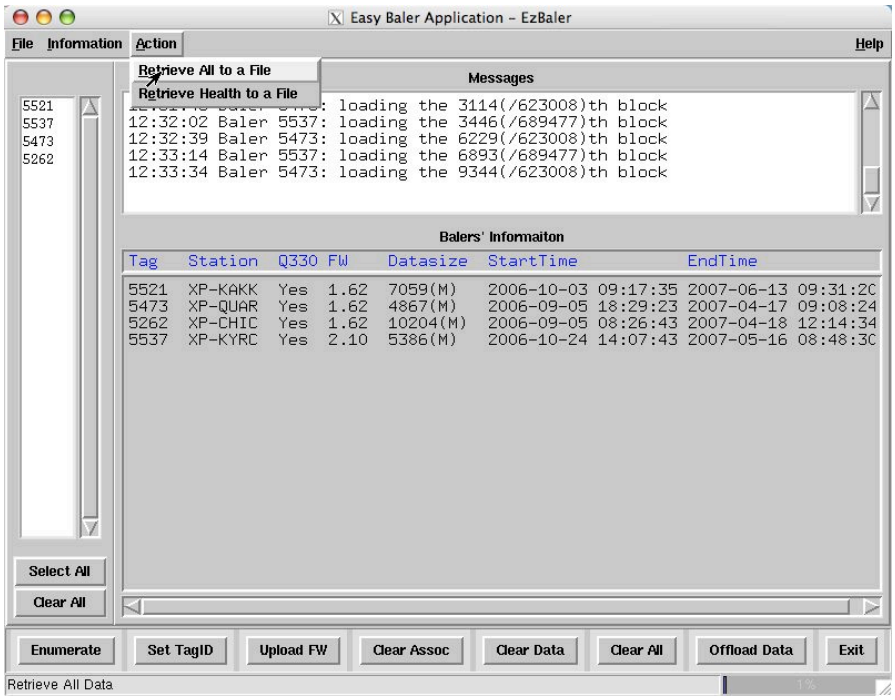


When all of the Balers have finished downloading verify in a finder window that all the files have been downloaded. The file sizes should be 30 to 60 times smaller than the full data set.

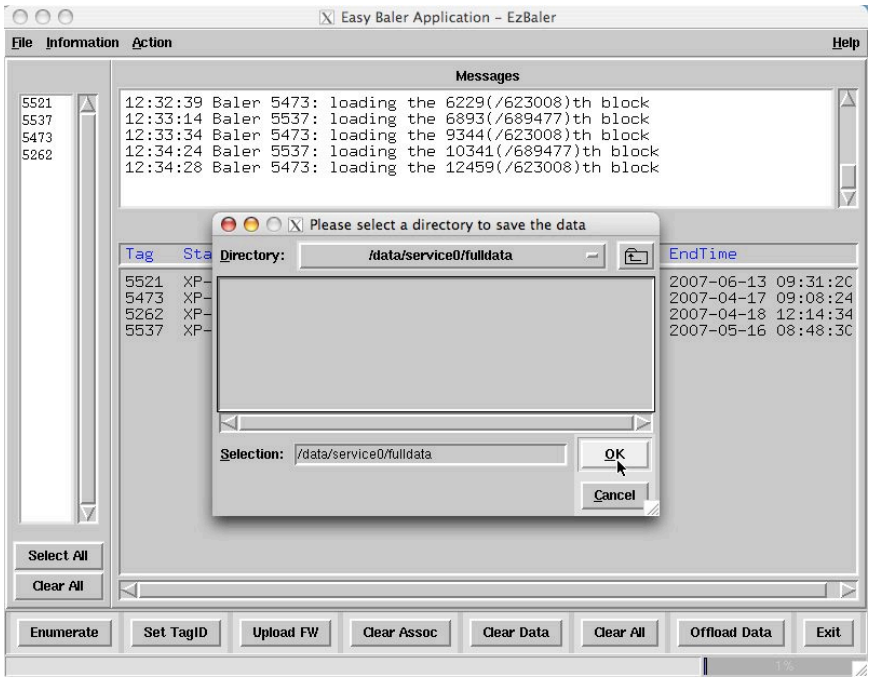
3. Downloading the Full Data set



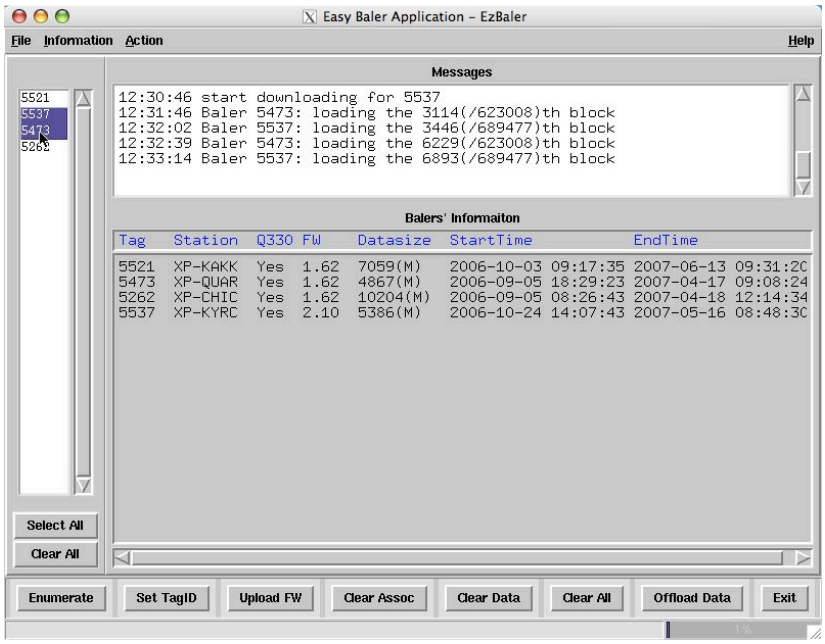
To download the full data set select the Balers to be downloaded from the list on the left.



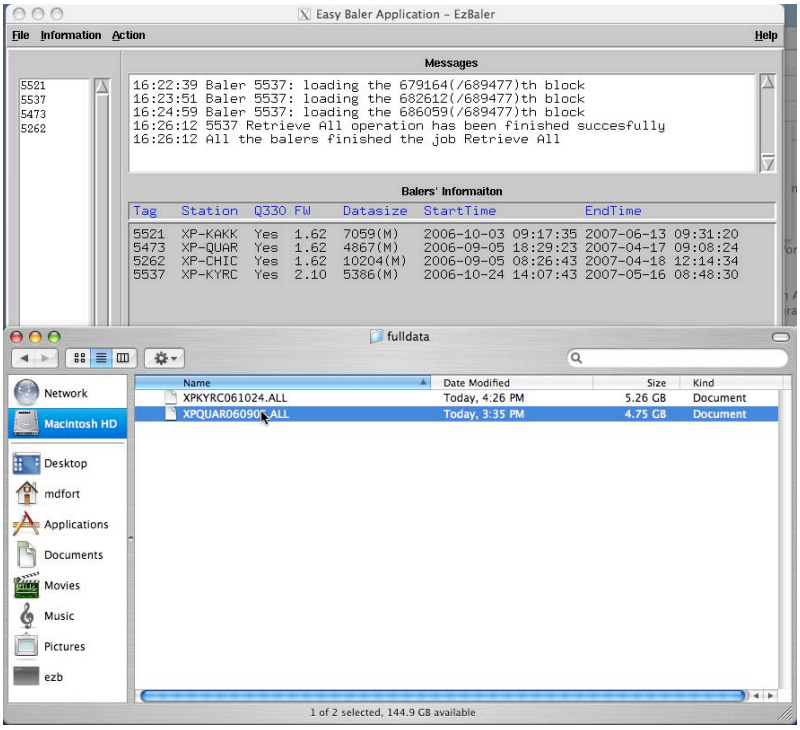
In the Action menu select Retrieve All to a File.



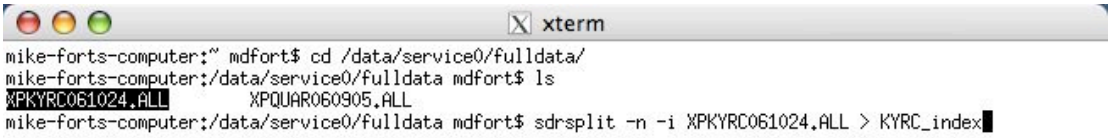
Create and Select the fulldata directory for the current service run.



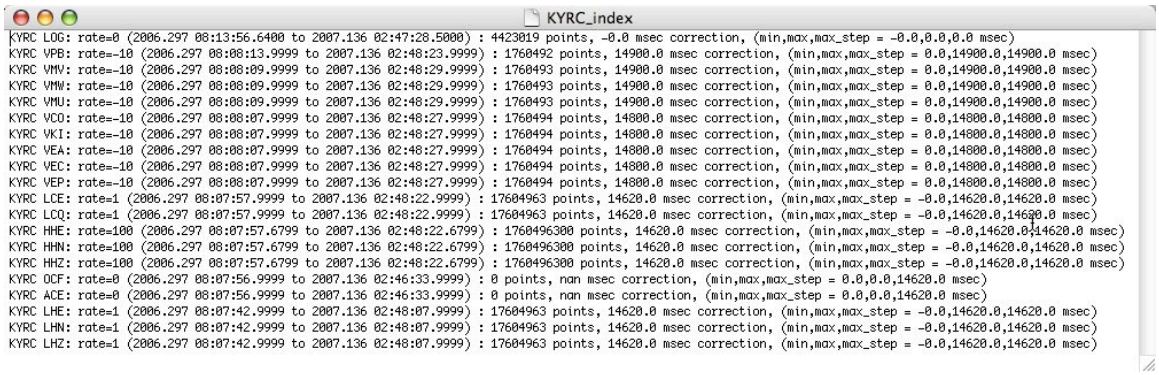
In the message box verify that all the selected Balers are downloading.



After the download is complete verify that the sizes of the downloaded files are about the same as the Datasize shown in EzBaler

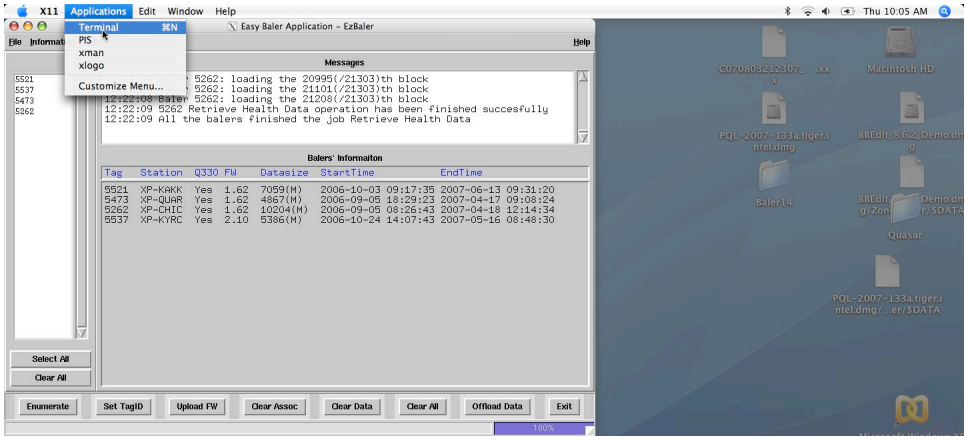


Open an Xterm terminal window and run sdrsplit on each of the data files using the –n option (no data files created), and the –i option (output an index). Redirect the output of sdrsplit to an index file for that station.

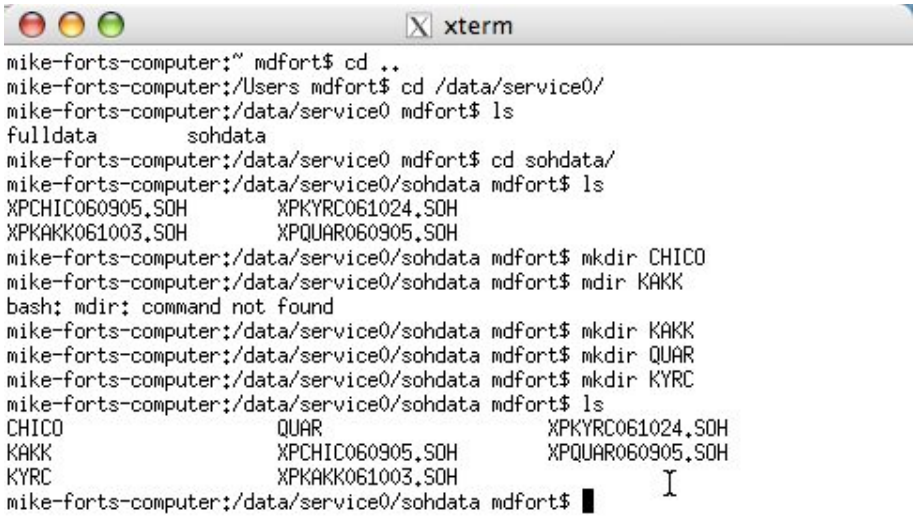


Open the index file in a text editor and verify that all the channels are present and that they have expected time span.

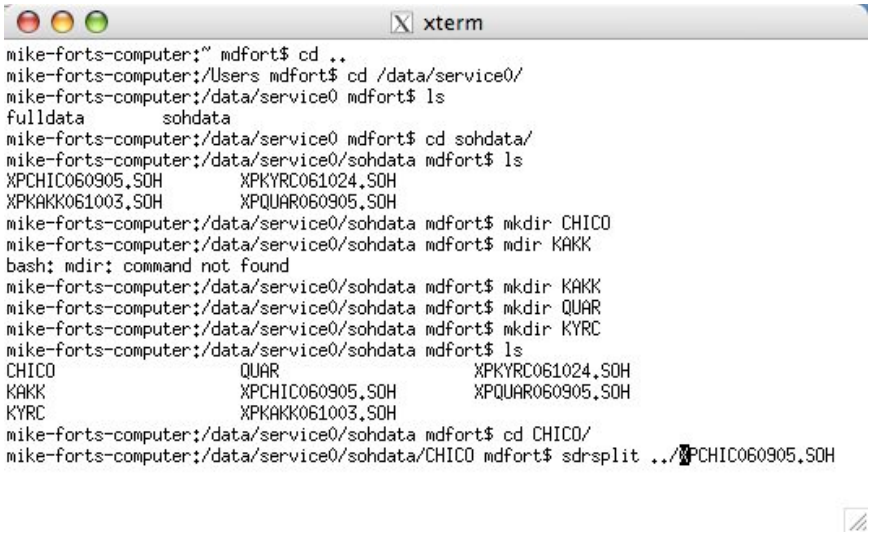
4. **Reviewing SOH data**



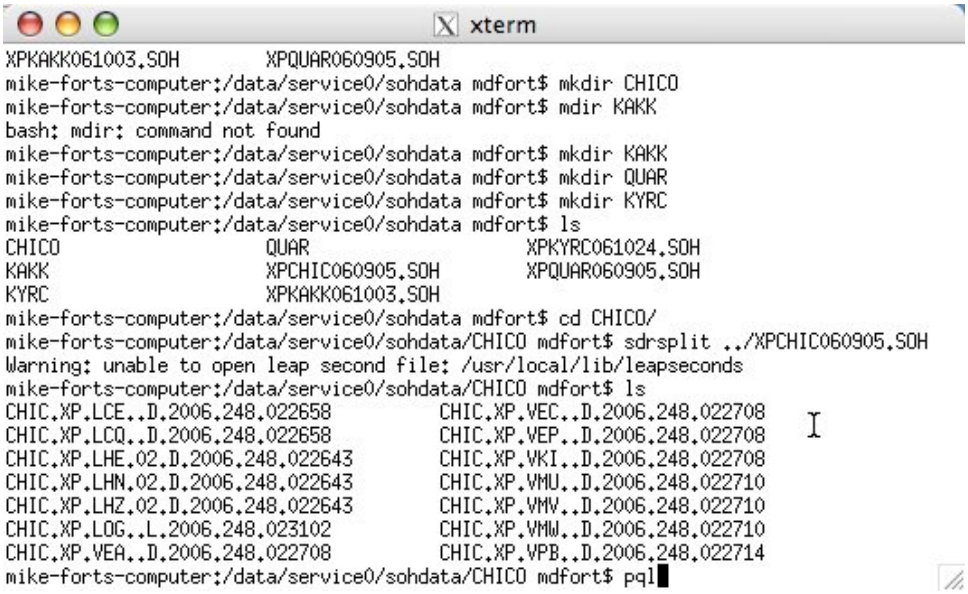
Open an Xterm terminal window.



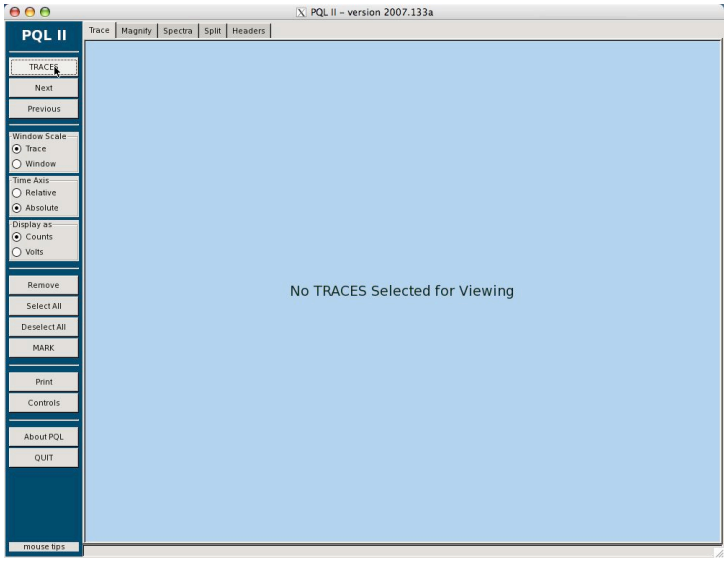
In the sohdata directory make a directory for each of the stations that were downloaded.



Change directories to one of the station directories created in the previous step. Run sdrsplit on the .SOH file for the station that corresponds to the current directory. Repeat this for each of the stations downloaded.

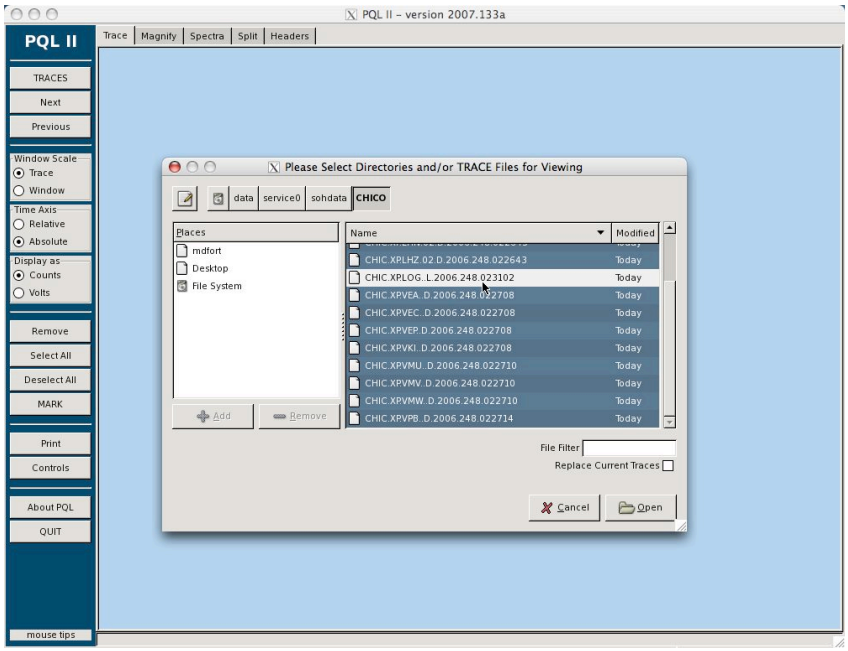


Sdrsplit will split the file into the individual channels, one file per channel per station. Start the program pql (either type pql in the command line or click on a pql icon on the dock).

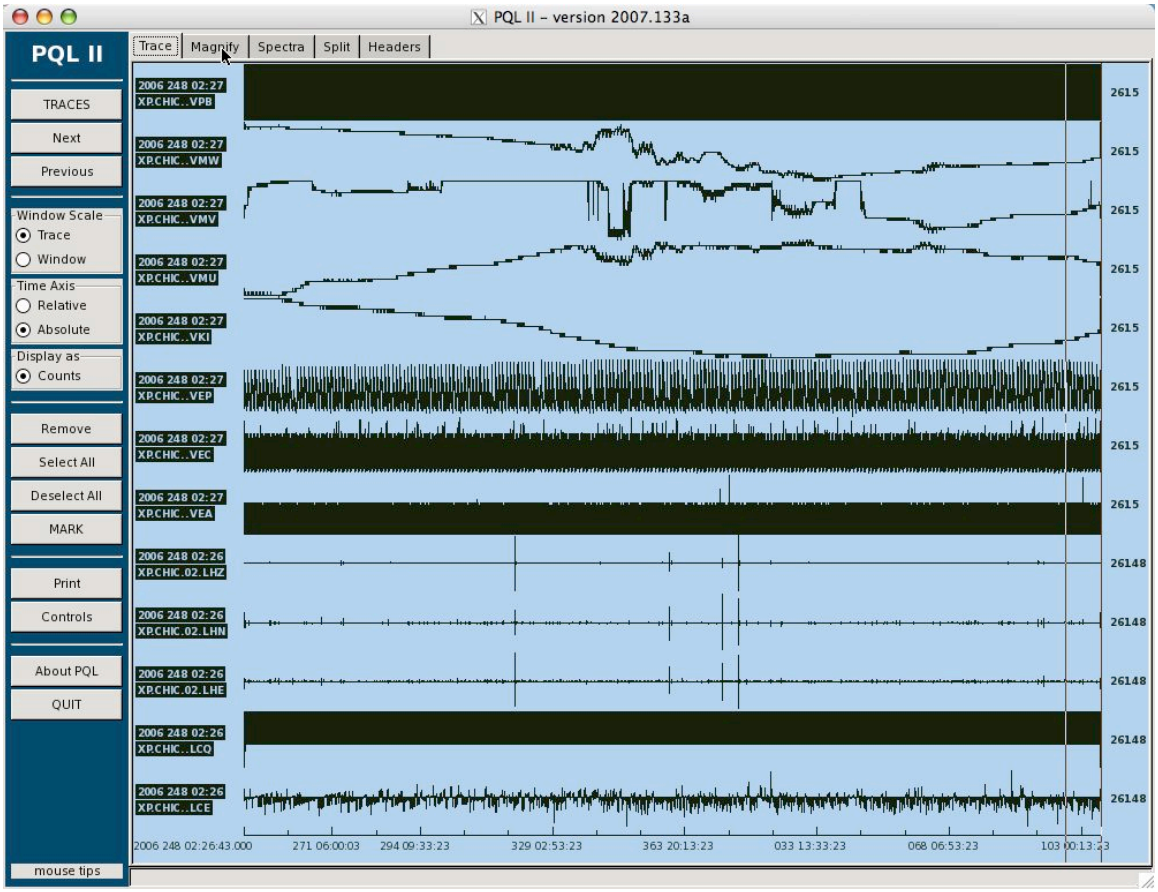


For help in PQL refer to the mouse tips or select Controls and refer to the help for each of the tabs in controls.

In pql select the traces button.



In the pql trace selection screen select the directory containing the SOH data to be viewed and then select all the files except the log file, and then select open.

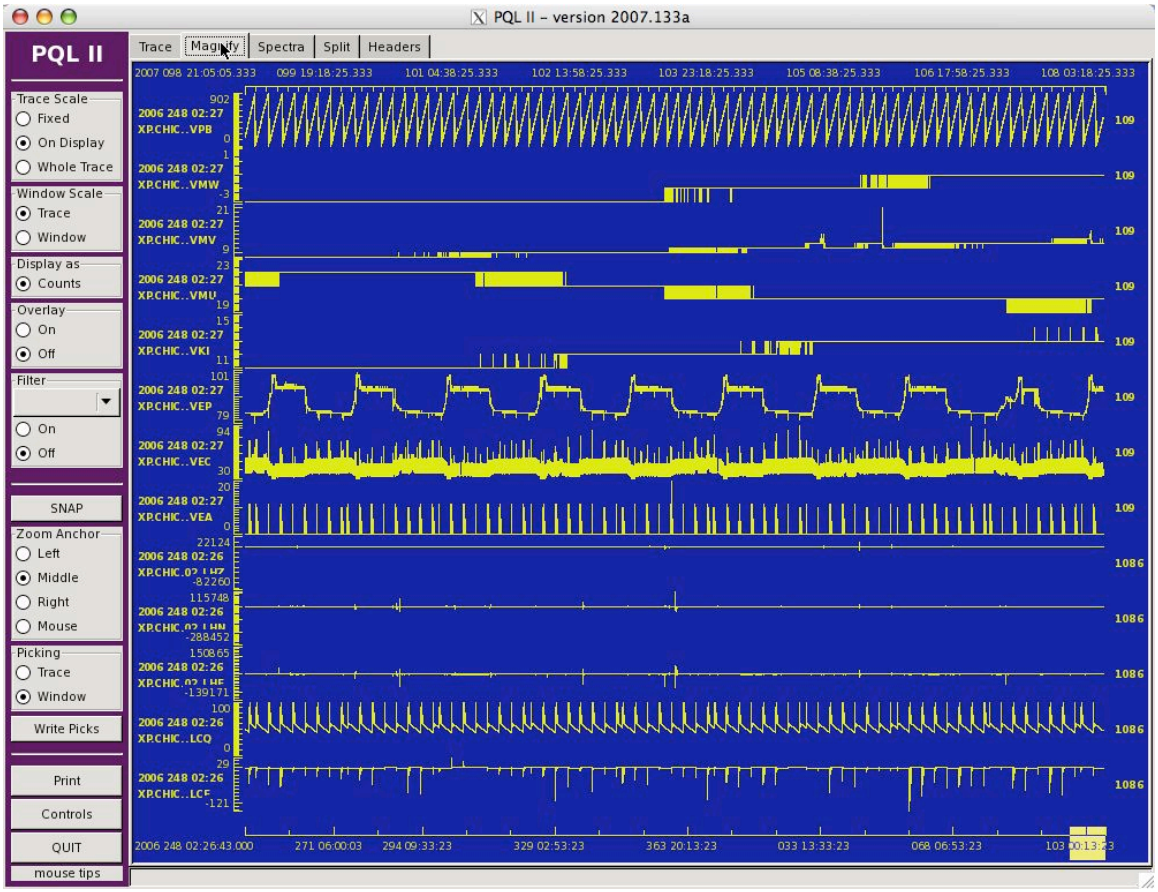


For descriptions of the state of health channels refer to DescriptionSOHChannels_v2.pdf.

Look for anomalies in the SOH data. In particular look at the following.

Packet buffer (VPB) should appear to be an almost solid bar with no gaps.
Mass positions (VM?) should be fairly smooth curves
System voltage (VEP) should be a regular saw tooth pattern.
Seismic signals (LH?) should show some signal. If there are any large spikes in the seismic signal the rest of the trace may appear flat.
Clock quality (LCQ) If the GPS is set for cycled power this should appear as a solid bar with no gaps. If the GPS is set for continuous power this appear as flat line with no dips.

Select all the traces and magnify a small portion at the right side of the screen (most recent data)



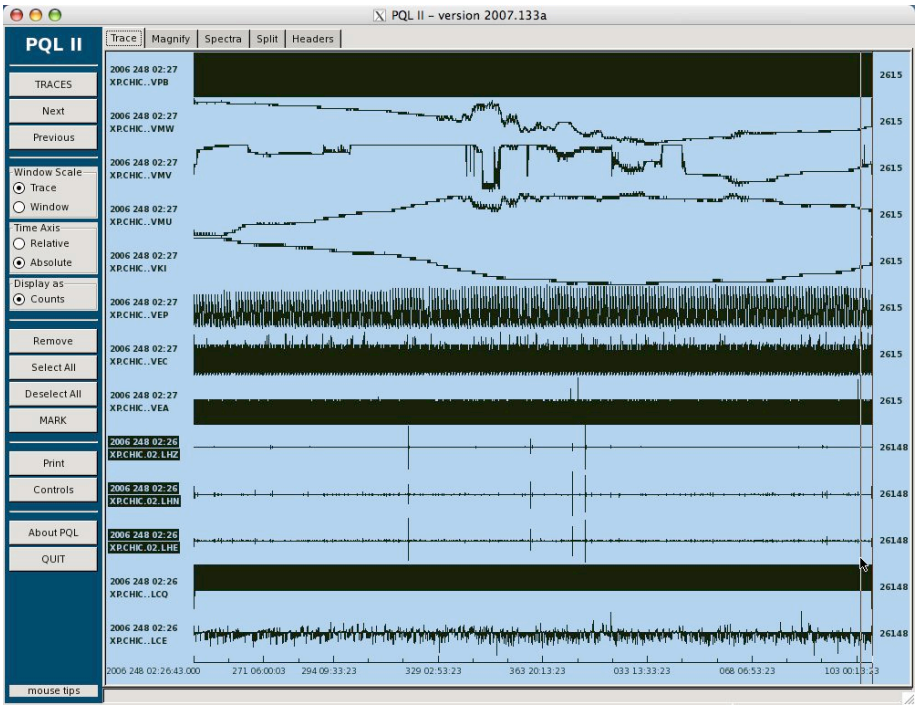
In the magnify window.

VPB should be a regular triangular saw tooth.

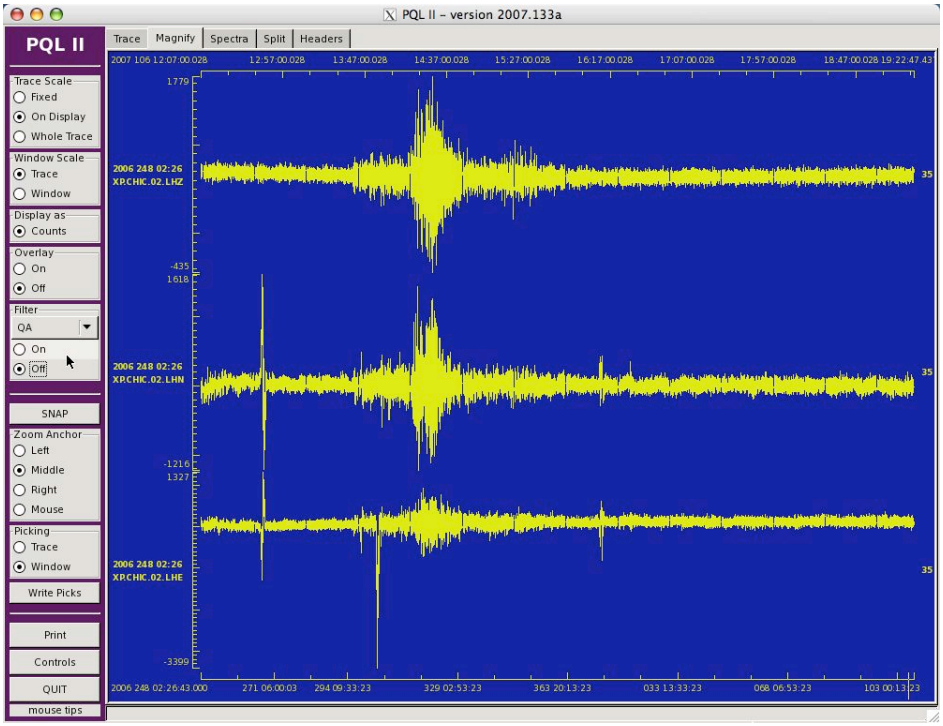
VEP, on a daily basis, should rise briefly to approximately 100 (bulk charge), then drop to approximately 90 (trickle charge) for a longer period, and then drop down and have a steady decay (night time discharge). The night time discharge should not drop below 80. If the bulk charge portion is not reaching close to 100 on a regular basis, check that the solar panel is clean and properly oriented and then check the battery with it disconnected from the solar. If daytime charging appears normal but the night time discharge is dropping below 80, check the battery with it disconnected from the solar.

LCQ If the GPS is set to continuous power the clock quality should spike to 100 every 2 hours. If the GPS is set for continuous power this should be a flat line with a value of 100. If this is not correct then check the GPS antenna and cable.

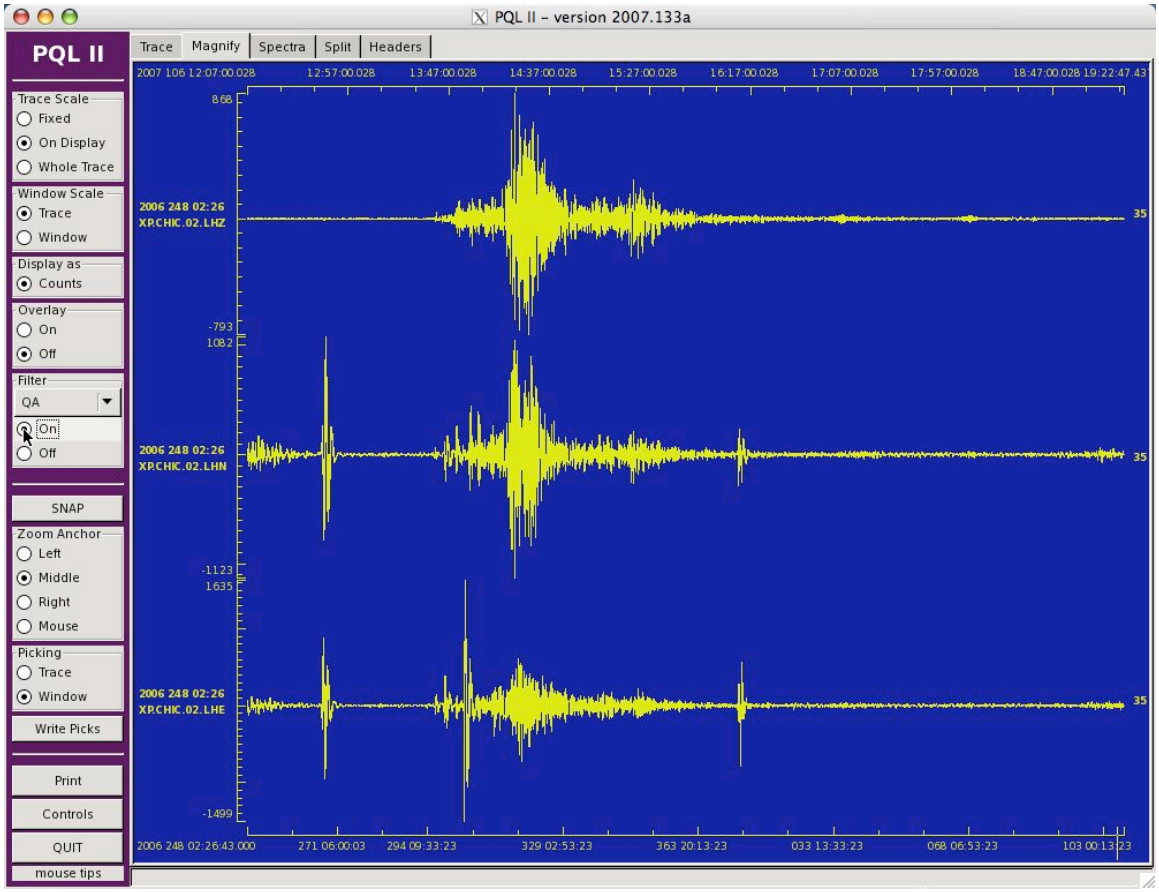
Scroll backward through the traces looking for irregularities.



Return to the Trace page, select only the LH? Channels and magnify a small section of at the end of the data.



Continue to magnify, avoiding spikes in the data, until you can clearly see signals. On a good signal all three channels should show response. Scroll backward through the data.



You can use a filter to remove some of the background noise. The QA filter is a band pass filter from 0.008 Hz to 0.08 Hz.