How to Build a Batch File & Examples

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Category: Passive source, Antelope processing for SEED data
Objective: User tips for Antelope database construction

The batch file is the backbone of your database. It is the basis for **dbbuild** to construct the database. The batch file also serves as an historical record of your network configuration; therefore it should contain all of the changes and additions associated with every one of your stations. Below you can find detailed description of what each field in the batch file means, and examples of batch file contents.

1. Network code <net>: Two (2) alphanumeric characters assigned by DMC at start of deployment.

> Example: XN, YD, PI, 1F, Y6

> Make sure you have a network code. If not, and your experiment is a PASSCAL experiment, please request it from the mobilization and network code request form at http://www.passcal.nmt.edu/pihomepage.

2. Station name <sta>: Three (3) to five (5) alphanumeric characters; no special characters or lowercase letters allowed:

> Example: STA01, NP00, Y2CC

3. Location: Latitude, longitude and elevation – in kilometers:

> Example: -77.72237 162.27354 0.042

4. staname – A long, descriptive name for the station:

> Example: M-mountain Socorro, NM USA

5. Time Start configuration, in MM/DD/YYYY format - Make sure the starting time is exactly the same or earlier than the first trace sample for each station. It's better for it to be earlier than late, as this will cause problems later when constructing the dataless:

> Example: time 07/26/2004 21:00:00

6. Datalogger code –refers to the type of datalogger you used for the station:

> Example of datalogger line in batch file:
> datalogger Passcal_q330_linear 0984

> Note: The location of specific names of different types of digitizers and sensors depends on your version of Antelope.

> In Antelope 5.4 and older, go to $ANTELOPE/data/instruments/.

In Antelope 5.5 and newer these files have been moved to $ANTELOPE/contrib/data/instruments/. There you will find the different response files (and the correct names) to be added to the batch file. If the response file is not in the default directory, please let us know and we will work with you to build the required file. The file locations in the rest of this document use Antelope 5.5 and newer.

Example of sensors and dataloggers files: rt130, Passcal_q330_linear, cmg3t, cmg40t, cmg40t_1s, l22, cmg3esp, and sts2

7. serial number [dlsta] – serial number for the datalogger

Example: datalogger Passcal_q330_linear 0984
(from the example above)

8. Sensor – please select the type of sensor for each station.

The description used for digitizers and sensors will call the associated response file and description from the directories mentioned above.

Example of this line in the batch file:

In the batch file: sensor   l28   0   0001
What it means: sensor model-code   emplacement-depth   serial-number [loc]

code edepth serial-number [loc] : Amend the edepth, serial number, and/or loc code for the sensor code. **Note that this syntax does not provide for a case where multiple sensors of the same name are connected to a single datalogger**.

a. The code must be chosen from the filenames of the sensor parameter files in the dbbuild database. **Dbbuild** uses the corresponding parameter file to fill in other values and configure itself for the chosen sensor. The emplacement depth and serial number are also specified on this line, along with an optional location code.

Antelope has a set of responses for most common sensors and digitizers. However some sensors have specific features (sensitivity, poles and zeros, etc) so make sure the description you select truly describes the instruments at your station. Streckeisen sensor response is very uniform, but Guralp sensors may have some exceptions:

Example:
- Standard cmg3t – 120 seconds - Sensitivity 1500 V/m/sec

Other cmg3t descriptions:
$ANTELOPE/contrib/data/responses/cmg3t_30sec
$ANTELOPE/contrib/data/responses/cmg3t_360sec
$ANTELOPE/contrib/data/responses/cmg3t_60sec

– Standard 30 sec cmg40t; Sensitivity 800 V/m/sec
$ANTELOPE/contrib/data/responses/cmg40t :

Other cmg40t descriptions:
$ANTELOPE/contrib/data/responses/cmg40t_1 :
-    Guralp 40T-1 1 Hz sensor; sensitivity 2000 V/m/sec

$ANTELOPE/contrib/data/responses/cmg40t_1_hi
-    Guralp 40T-1 1 Hz sensor; sensitivity 4000 V/m/sec

If you are not sure about the description of your sensor, contact the PASSCAL Data Group at data_group@passcal.nmt.edu and we will help you determine the correct file.

b. The emplacement depth is normally 0 for deployments at the surface (vs. in boreholes)

c. Sensor serial number

d. Location code (optional, and not preferred)

The location code is merged with the SEED code to create the CSS 3.0 channel code. This is necessary in various situations. For example, if a borehole instrument and a surface instrument both use the same channel names.

10. Sensor Orientation - description from the man page for dbbuild_batch :

axis label hang vang [sens [lead [pgain [pstage]]]]

axis2 label hang vang [sens [dlgain [pgain [pstage [lead]]]]]

Default axes are specified in the sensor parameter file. However, instruments may be oriented differently in some circumstances, and it may be necessary to change the label (usually Z, E or N) and the corresponding orientation angles. In these cases the label in this command takes a different form:
    old->new

 For example, "E->1" to change from the default label "E" to the special label "1". Optionally, one may enter

- An individual sensitivity sens for this sensor axis
- An individual datalogger gain (dlgain) for this datalogger input lead
- An optional pre-amp gain pgain
- An optional pre-amp stage pstage (with corresponding response file)
- A lead code identifying which datalogger lead this axis is connected to. This is required when the datalogger gain is to be looked up in a separate serial-number specific parameter file.

Each axis statement specifies settings for the selected instrument and the axis with the currently specified label. To simply associate a sensor axis with a particular set of leads, as when the actual sensitivities and dataloggers gains will be looked up in a serial number specific parameter file, you might use an axis statement like this:

axis N - - - ch2

Example:

Standard Orientation	Non-standard					
axis Z 0 0 - 1 1	axis Z 0	0	-	1	32	
axis N 0 90 - 2 1	axis N->2	325	90	-	2	32
axis E 90 90 - 3 1	axis E->3	55	90	-	3	32

11. Sample rate – taken from the digitizer, this will determine the channel name according to SEED format. You can have more than one sample rate description for the same station. Please refer to the man page for dbbuild_batch if you would like more details.

Example: samplerate 1sps

12. Channel description: MSEED channel names are defined by the sample rate, instrument (i.e. sensor) type, and channel orientation. Please refer to the Seed Reference Manual V2.4 Appendix A for more detail.

In the batch file defined by a line like:

Example in the batch file: channel Z EPZ
What each field means: channel axis-label chan loc [dlchan]

Where :
channel: part of the template to defined the channel
Z   : Axis
EPZ   : Channel label (based on SEED convention)
Loc   : absent in this example, PASSCAL does not require location codes unless there is more than one sensor at the same station, or by PI preference.

13. add - Add the current configuration to the database

14. close time – When the experiment ends, or there is a need for changing the configuration in one or more of the stations in your network, you can use the following statements to define specific configurations during a time frame:

> close sta time: Turn off the station with code sta as of the specified time.
> close sensor sensor time: Turn off a particular sensor at the selected station
> close datalogger datalogger time: Turn off the datalogger at the selected station
> > Example: close NP00 12/31/2007 23:59:05

Note that it is very important to have a close statement for every station.

❖❖ IMPORTANT

When building your database in antelope, please take a moment to identify the response associated to your instrument.

1) If you are not sure about the response and you have a GURALP sensor, page 9 may help you to identify the response file you need to use when building your database. Please contact data_group@passcal.nmt.edu, we will help you if there is any question/doubt about which instruments you have on your experiment.

2) If you have an STS2 and you are uncertain which STS-2 generation you might have (there are three), use the sensor's serial number at this website for clarification:
http://www.passcal.nmt.edu/content/sts2-generations

3) If you have a sensor or digitizer that is not described on ANTELOPE, you will need to find these responses (poles and zeroes) and create the two necessary files in antelope, feel free to contact me at data_group@passcal.nmt.edu if you need any assistance. The two files that need to be created are under:

> Poles and zeros: $ANTELOPE/contrib/data/responses
> Descriptor file: $ANTELOPE/contrib/data/instruments/sensors

Suggested reading:
Man page for dbbuild_examples, dbbuild

Example batch file entries for various combinations of PASSCAL hardware

Notes:
- Industry sensors – geophone types l28, l22 or GS11V - are wired such that the **vertical axis** needs to be defined as follows.

  - axis Z 0 180 - 1 32   (see examples 4, 5, and 7)

- Location codes are notably absent from this document. We discourage the use of location codes. They are only necessary when multiple sensors are connected to the same datalogger, so that identical data streams can be distinguished from one another.

1. cmg3t + q330 (2 data streams)

    sta   ABC1   33.4312 -116.4275 0.756 Somewhere, USA
    time   07/27/2010   00:00:00
    datalogger Passcal_q330_linear 7753
    sensor cmg3t   0   T3K33
    samplerate 40sps
    axis Z 0 0 - 1 1
    axis N 0 90 - 2 1
    axis E 90 90 - 3 1
    channel Z BHZ
    channel N BHN
    channel E BHE
    samplerate 1sps
    channel Z LHZ
    channel N LHN
    channel E LHE
    add
    close ABC1 09/01/2010 23:59:59

cmg3t sensor

q330 datalogger

2. cmg40t + rt130

    sta   W03 44.991 -116.399 1.270 New Meadows-ID
    time   10/22/2006   00:00:00
    datalogger rt130 969B
    sensor cmg40t 0 T4476
    samplerate 20sps
    axis Z 0 0 - 1 1
    axis N 0 90 - 2 1
    axis E 90 90 - 3 1
    channel Z BHZ
    channel N BHN
    channel E BHE

cmg40t sensor

add
close W03 07/08/2008 23:59:59

3. sts2_g3 +rt130

rt130 datalogger

    sta A14 37.5978 95.2983 3.312 China
    time 04/28/2007 00:00:00
    datalogger rt130 9146
    sensor sts2_g3 0 40352
    samplerate 25sps
    axis Z 0 0 - 1 1
    axis N 0 90 - 2 1
    axis E 90 90 - 3 1
    channel Z BHZ
    channel N BHN
    channel E BHE
    add
    close A14 05/29/2009 23:59:59

sts2 sensor

Note: Please refer to the document STS-2_sn_response.pdf located under

 /opt/antelope/5.2-64/data/responses/ to identify the generation of STS-2 sensor based on
its serial number

4. l28 + rt130

    sta CL07 48.07004 -122.96667 0.109 Cat Lake, WA USA
    time 06/17/2009 00:00:00
    datalogger rt130 9699
    sensor l28 0 17
    axis Z 0 180 - 1 32
    axis N 0 90 - 2 32
    axis E 90 90 - 3 32
    samplerate 50sps
    channel Z SLZ
    channel N SLN
    channel E SLE
    add
    close CL07 06/30/2009 23:59:59

l28 sensor

5. GS11V + texan

rt125 "texan" datalogger

sta BH51 48.00744 -123.08723 0.686 Burnt Hill, WA USA
time 06/18/2009 22:26:00
datalogger rt125 2833
sensor GS11V 0 1
axis Z 0 180 - 1 32
samplerate 100sps
channel Z EHZ
channel N off
channel E off
add
close BH51 07/13/2009 23:59:59

GS11V sensor

6. hs10 + rt130 (note - 3 sensors, one for each axis)

sta PK02 -36.261301 174.768395 1.0 Pakiri, NZ
time 01/01/2010 01:00:00
datalogger rt130 9EB3
sensor hs10_n 0.0 sn1004 # HS-10
samplerate 250sps
sensor hs10_vert 0.0 sn1005 # HS-10
samplerate 250sps
sensor hs10_e 0.0 sn1006 # HS-10
samplerate 250sps
axis Z 0 0 - 1 1
axis N 0 90 - 2 1
axis E 90 90 - 3 1
channel Z EHZ
channel N EHN
channel E EHE
add
close PK02 01/07/2010 23:59:59

hs10 sensor

7. l22 + rt130

sta A002 47.153510 -123.112197 0.1249 A002
time 05/23/2009 19:00:00
datalogger rt130 994E
sensor l22 0.0 482L
axis Z   0 180 - 1 32
axis N   0   90 - 2 32
axis E   90 90 - 3 32
samplerate 100sps

```
        channel  Z  EHZ
        channel  N  EHN
        channel  E  EHE
        add
        close A002 07/10/2009 20:00:00
```

8. Non-standard sensor orientation (example shows horizontals on sts-2 + q330, but can apply to any sensor and datalogger combination)

```
        sta SOEG 68.20328 -31.37700 0.179 Sodalen, Greenland
        time 07/27/2011 00:00:00
        datalogger Passcal_q330_linear 3679
        sensor sts2_g3 0 50944
        axis Z 0 0 - 1 1
        axis N 22 90 - 2 1
        axis E 112 90 - 3 1
        samplerate 1sps
        channel Z LHZ
        channel N LH2
        channel E LH3
        samplerate 20sps
        channel Z BHZ
        channel N BH2
        channel E BH3
        add
    close SOEG 12/31/2500 23:59:59
```

See also:

- o Appendix PASSCAL recommended SEED Channel Names
- o Long documents for RT130 and Q330 processing also have a batch file example
- o Manual page for dbbuild_examples – for tips on how to describe changes to station hardware.
- o Other files: Under $ANTELOPE/contrib/data/responses/ there are several pdf files with specifics about instrumentation, responses, etc.

$ANTELOPE/contrib/data/responses/GS30_GS32_CT_Geophone_Element.pdf
$ANTELOPE/contrib/data/responses/Lennartz_LE-3D_20s_Technical_data.pdf
$ANTELOPE/contrib/data/responses/Q330_Description.pdf
$ANTELOPE/contrib/data/responses/q330decim.pdf
$ANTELOPE/contrib/data/responses/Q330S+.pdf
$ANTELOPE/contrib/data/responses/README_CMG-DM24_mk2_2011_04_21.pdf
$ANTELOPE/contrib/data/responses/README_CMG-DM24_mk3_2011_04_21.pdf
$ANTELOPE/contrib/data/responses/README_guralp_fir_2001_03_23.pdf
$ANTELOPE/contrib/data/responses/README_Guralp_Poles_and_Zeros_2011_04_24.pdf
$ANTELOPE/contrib/data/responses/README_KMI_appnote39D.pdf
$ANTELOPE/contrib/data/responses/STS-2.5-HF-Zeroes-Poles.pdf
$ANTELOPE/contrib/data/responses/STS-2_sn_response.pdf
$ANTELOPE/contrib/data/responses/Taurus_UserGuide_15148R7.pdf
$ANTELOPE/contrib/data/responses/Trillium120P-PA_UserGuide_15149R6.pdf
$ANTELOPE/contrib/data/responses/Trillium240_UserGuide_15672R6.pdf
$ANTELOPE/contrib/data/responses/Trillium40_UserGuide_13912R11.pdf

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