

Portable Data Collection Centers

Version 3.0 beta

An Overview of Features

The Problem

```
#
#          ----- CHANNEL RESPONSE DATA -----
B050F03  Station:   NNA
B050F16  Network:   II
B052F03  Location:   00
B052F04  Channel:   BHE
B052F22  Start date: 2002,203,18:00:00.0
B052F23  End date:   No Ending Time
#
#          +-----+
#          +-----+
#          +-----+
#          +-----+
#          +-----+
#
#          Transfer function type:      B [Analog (Hz)]
B053F03  Stage sequence number:           1
B053F04  Response in units lookup:       M/S - Velocity in Meters Per
Second
B053F06  Response out units lookup:       V - Volts
B053F07  A0 normalization factor:         817.894
B053F08  Normalization frequency:         0.05
B053F09  Number of zeroes:                   5
```

- Numerous Stations and Channels
- Response values
- Lat/Lon/Elevation
- Instrument Configurations
- Comments
- Configurations change over time

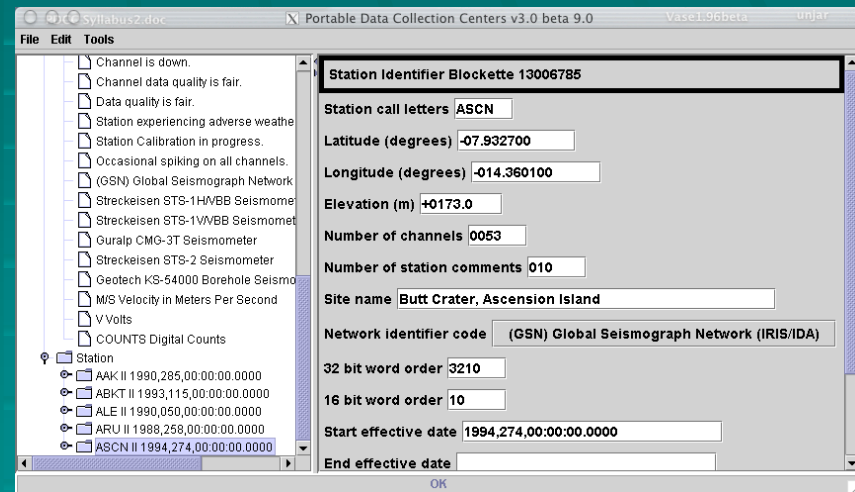
The Problem

```
type 030 len 0087 : CDSN Gain-Ranged Format~000100104M0~W2 D0-13 A-8191~
D14-15~P0:#0,1:#2,2:#4,3:#7~
type 033 len 0058 : 001(CDSN) China Digital Seis. Network (China/USGS)~
type 033 len 0041 : 002Streckeisen STS-1H Seismometer~
type 033 len 0041 : 003Streckeisen STS-1V Seismometer~
type 033 len 0060 : 004China Institute of Geophysics DJ-1 SP Seismometer
~
type 034 len 0041 : 001M~Earth Displacement in Meters~
type 034 len 0020 : 002A~Amperes~
type 034 len 0032 : 003COUNTS~Digital Counts~
type 032 len 0080 : 01Preliminary determination of epicenters (monthly l
isting).~u~USGS/NEIC~
logrec 3 type 'S '
~
type 050 len 0127 : KMI +25.123300+102.740000+1975.00009000Kunming, Yun
nan Province, China~0013210101986,159,00:00:00~1
: 996,108,00:00:00~NCD
type 052 len 0137 : BHE 002~001002+25.123300 +102.74000+1940.0035.0
090.0+00.00001122.0000E+012.0000E-030000~1986,15
: 9,00:00:00~1996,108,00:00:00~N
type 053 len 0622 : A01001003 4.76900E+09 1.00000E+00003 0.00000E+00 0.0
0000E+00 0.00000E+00 0.00000E+00 0.00000E+00 0.0
: 0000E+00 0.00000E+00 0.00000E+00 0.00000E+00 0.00000E+00 0.00000
```

- Need to build output files for others to use
- SEED format needed by IRIS DMC
- Need persistent storage of station information for later update and retrieval

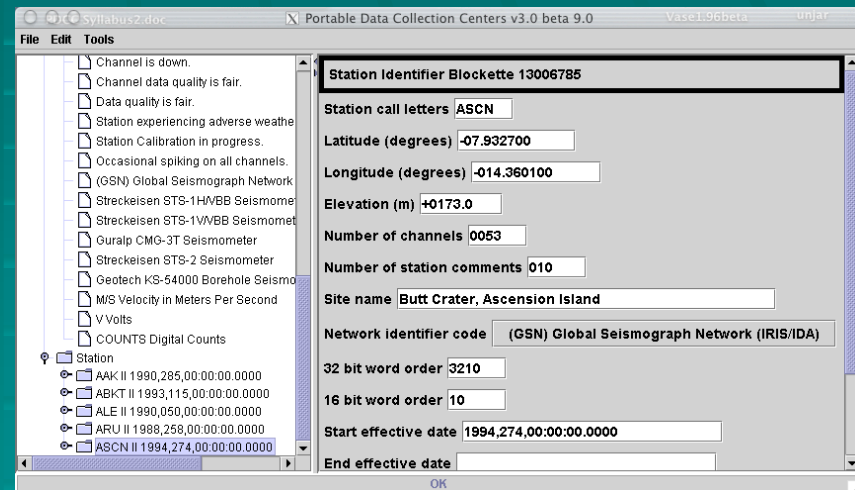
PDCC offers solution

- Access and edit station and channel information
- Response information
- Station and channel comments
- Reads and writes SEED format
- Persistent DB storage



PDCC offers solution

- Accessible GUI
- Platform independent
- Extensible software
- Written in Java
- Independent SQL database (MySQL)



Primary Functionality

- Read dataless SEED files
- Edit dataless SEED information
- Write dataless SEED files
- Store changes to database
- Retrieve and update database contents

- Overall: Manage network metadata

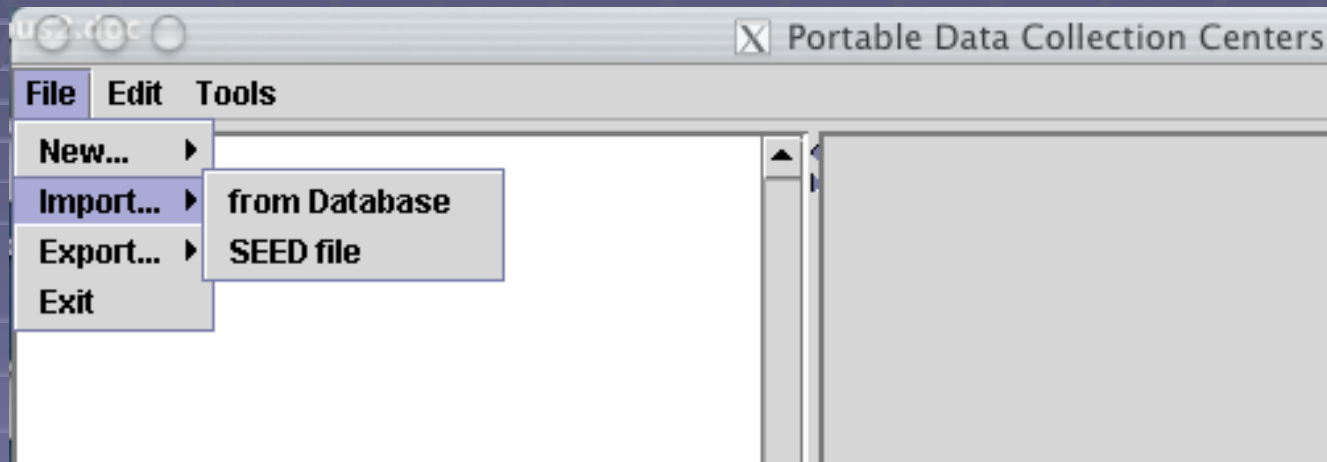
Example run of PDCC

The screenshot shows the PDCC software interface with the following fields and values:

- Station Identifier:** Blockette 13006785
- Station call letters:** ASCN
- Latitude (degrees):** -07.932700
- Longitude (degrees):** -014.360100
- Elevation (m):** +0173.0
- Number of channels:** 0053
- Number of station comments:** 010
- Site name:** Butt Crater, Ascension Island
- Network identifier code:** (GSN) Global Seismograph Network (IRIS/IDA)
- 32 bit word order:** 3210
- 16 bit word order:** 10
- Start effective date:** 1994,274,00:00:00.0000
- End effective date:** (empty)

The left sidebar shows a tree view of station folders, with 'ASCN II 1994,274,00:00:00.0000' selected. The top of the window shows the title bar with 'Portable Data Collection Centers v3.0 beta 9.0' and 'Vase1.96beta unjar'.

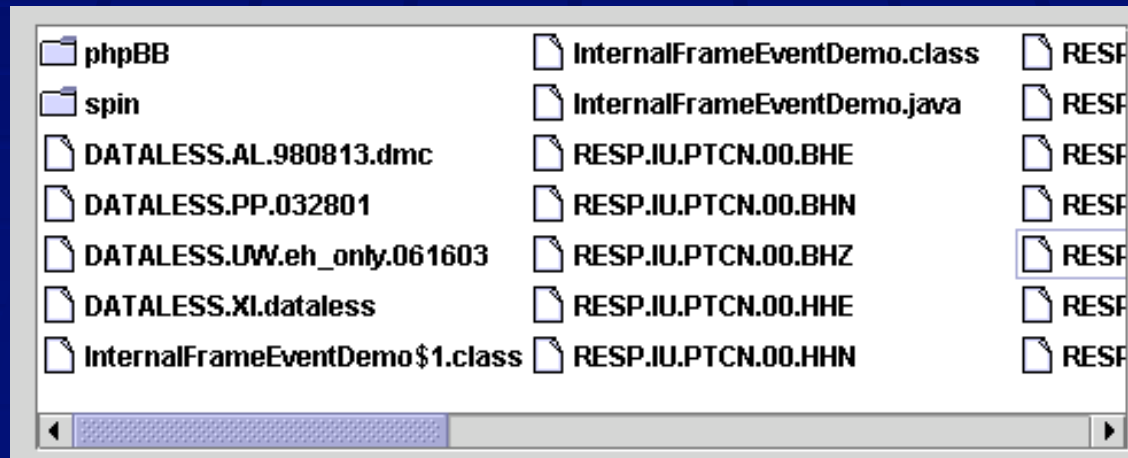
Start Up



- PDCC is currently 'menu' driven
- Button controls will be available in the future
- You generally start your session by *Importing* a file

Importing a SEED file

- When you import a SEED file, you are presented with a file selection tool
- Once selected, the selection tool will disappear and the file will begin loading



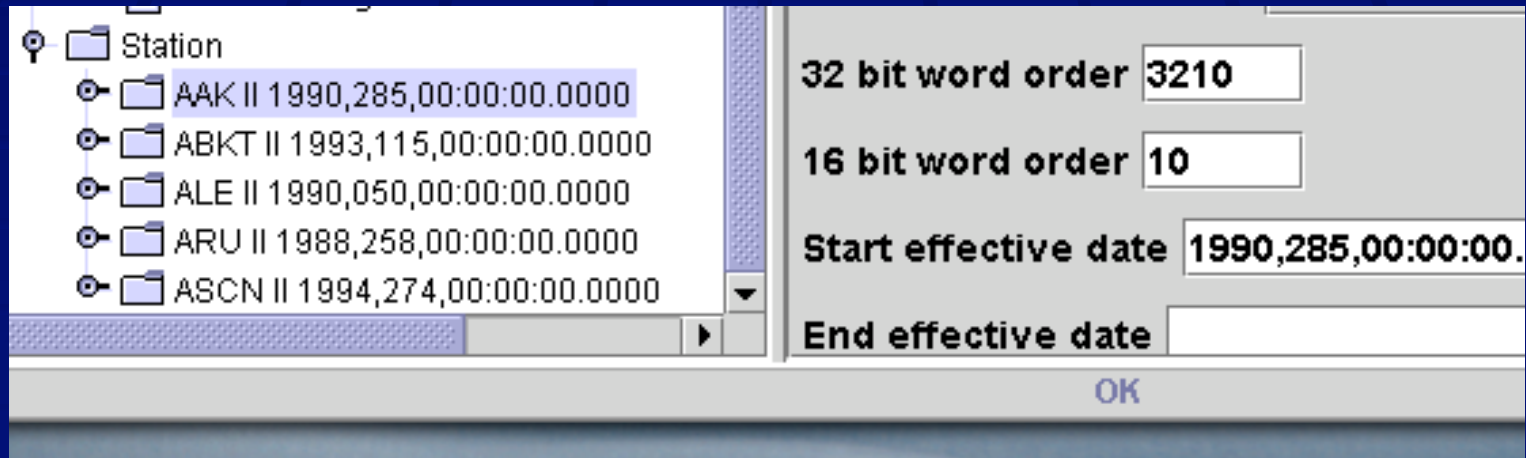
Importing a SEED file

- Reading SEED files can be a time consuming process (depending on file size)
- You can monitor the status of this operation with the status bar at the bottom

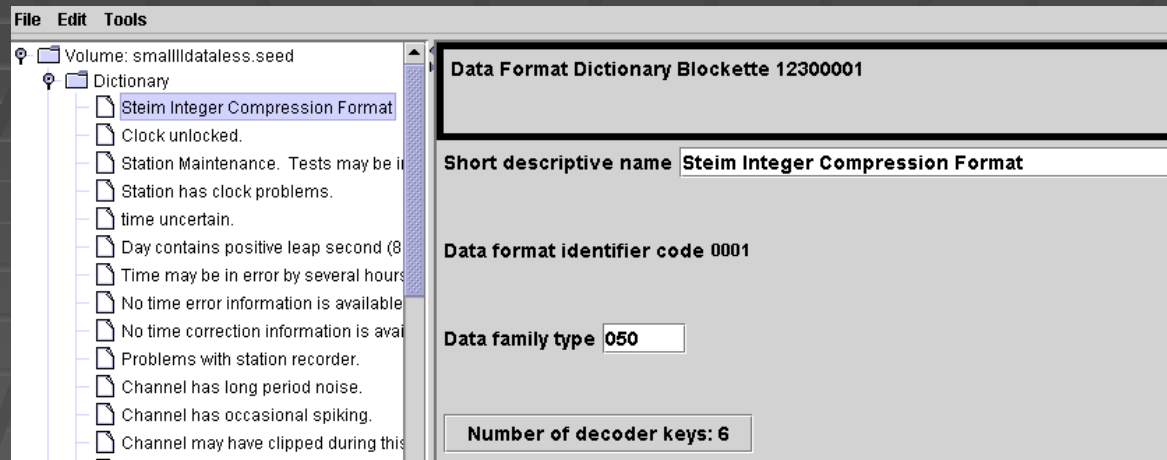


Importing a SEED file

- When the SEED file has been read in, PDCC renders the contents in the Tree Viewer on the left side.
- You will see on OK prompt at the bottom when this process is completed.



Browsing the SEED file



- Navigation through a SEED file's contents is performed through the Tree Viewer
- The loaded file appears as a new *volume*
- Selecting a node in the tree will cause the contents to be displayed

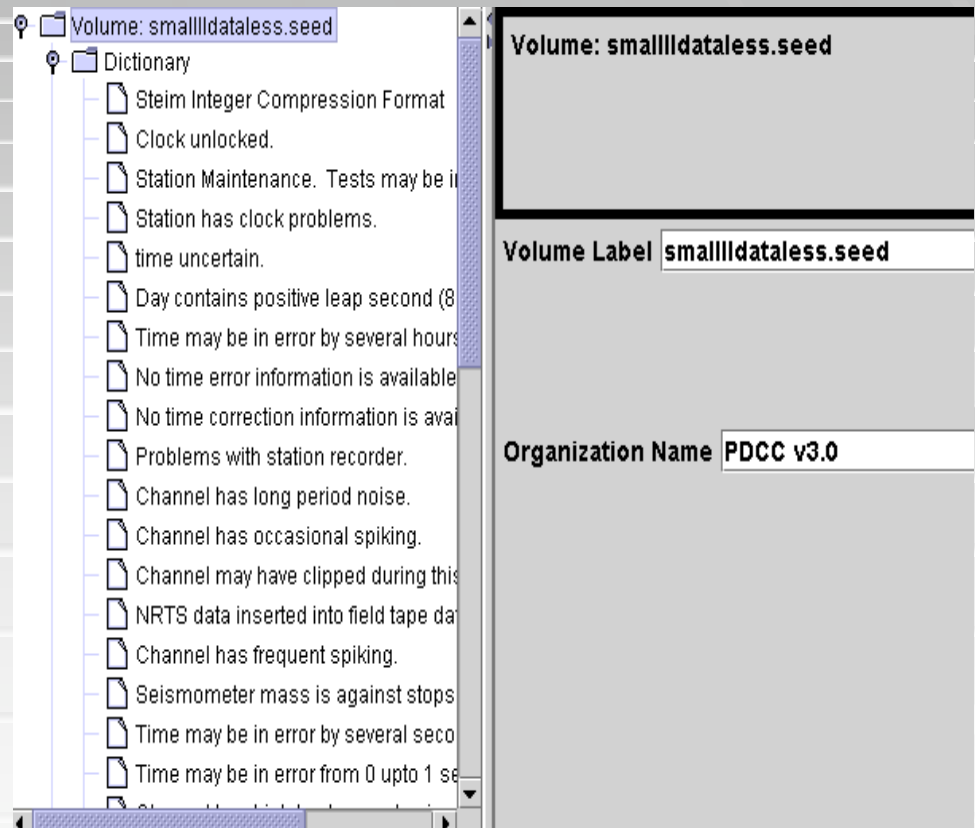
Three Kinds of Nodes

1. Volume Node
2. Category Node
3. Blockette Node

§ SEED data is composed of Blockettes

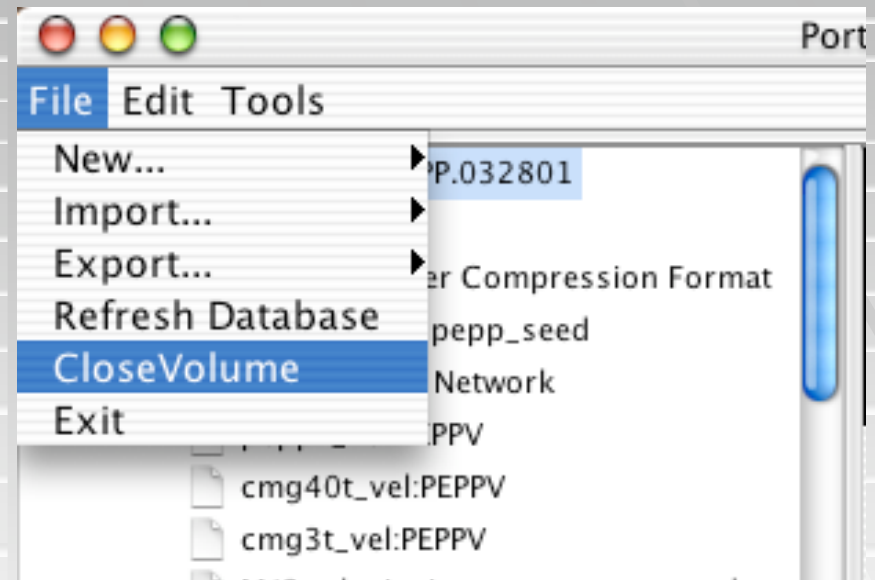
Volume Node Display

- Relates information regarding a *Volume* imported into PDCC
- A *Volume* is a collection of stations, channels, and response information that can be written to a file or exported to the database.

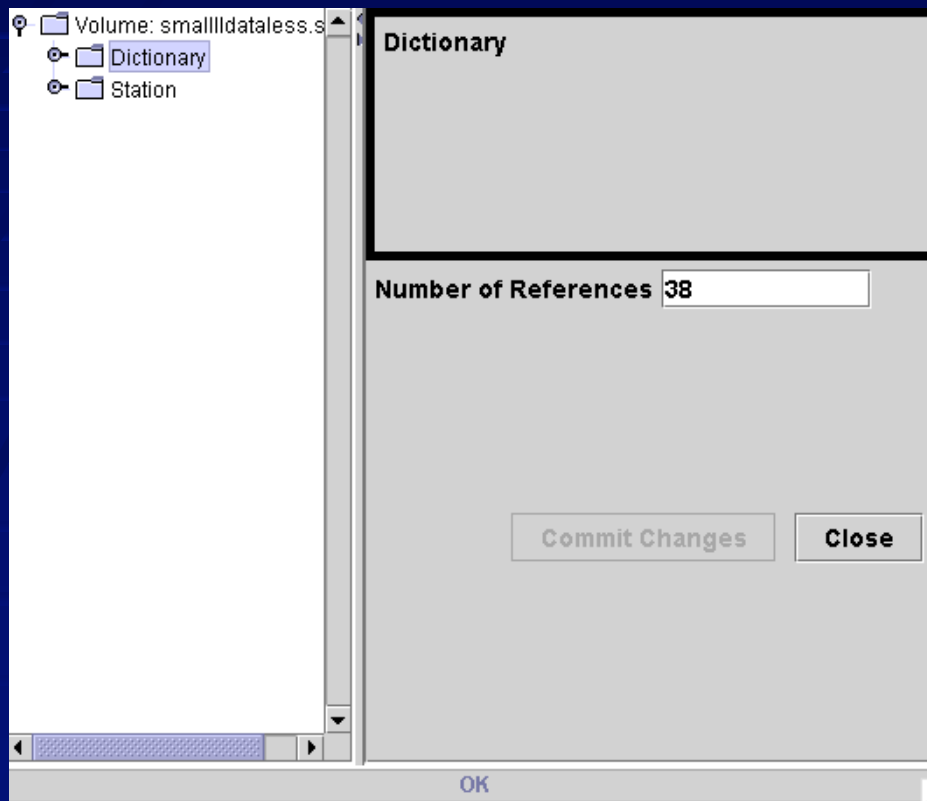


Volume Node Display

- Volumes can be removed from PDCC by using the Close Volume action in the File menu



Category Node Display



- Relates information regarding a family or category of nodes
- There are currently two kinds of category nodes:
 1. Dictionary
 2. Station
- Other categories such as **Waveform** are forthcoming

Blockette Node Display

- Primary data object is the *Blockette*
- Blockettes are identified by a *type* number
- Blockettes also have a *name*
- The top of the display identifies the blockette

The screenshot shows a software window titled 'Station Identifier Blockette 13000000'. The window has a menu bar with 'File', 'Edit', and 'Tools'. On the left, there is a tree view showing a folder structure: 'Volume: smallldataless.s', 'Dictionary', and 'Station'. Under 'Station', several sub-folders are listed: 'AAK II 1990,285,00', 'ABKT II 1993,115,00', 'ALE II 1990,050,00', 'ARU II 1988,258,00', and 'ASCN II 1994,274,00'. The main area of the window contains a form with the following fields:

Station call letters	AAK
Latitude (degrees)	+42.639000
Longitude (degrees)	+074.494000
Elevation (m)	+1645.0
Number of channels	0084
Number of station comments	343
Site name	Ala Archa, Kyrgyzstan
Network identifier code	(GSN) Global Seis
32 bit word order	3210
16 bit word order	10
Start effective date	1990,285,00:00:00.0000

At the bottom of the window, there is an 'OK' button.

Blockette Node Display

- Along with the name is also a unique *ID number*
- No two blockettes have the same ID number
- What follows are the *Fields* of the Blockette, indicated with their field name and value.

The screenshot shows a software window titled 'Station Identifier Blockette 13000000'. The window has a menu bar with 'File', 'Edit', and 'Tools'. On the left, there is a tree view showing a folder structure: 'Volume: smallllldataless.s', 'Dictionary', and 'Station'. Under 'Station', several sub-folders are listed, including 'AAK II 1990,285,00', 'ABKT II 1993,115,0', 'ALE II 1990,050,00', 'ARU II 1988,258,00', and 'ASCN II 1994,274,0'. The main area of the window is a form with the following fields and values:

Station call letters	AAK
Latitude (degrees)	+42.639000
Longitude (degrees)	+074.494000
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At the bottom of the window, there is an 'OK' button.

Blockette Node Display

- Most of the fields are *Text Fields*, and can be edited by clicking in the box
- Some of the fields are *Expanding Fields* and present a button to be clicked
- Clicking the button results in a popup display

The screenshot displays a software window titled 'Station Identifier Blockette 13000000'. On the left, a tree view shows a folder structure: 'Volume: smallldataless.s', 'Dictionary', and 'Station'. Under 'Station', several sub-folders are listed with their respective coordinates and dates: 'AAK II 1990,285,00', 'ABKT II 1993,115,00', 'ALE II 1990,050,00', 'ARU II 1988,258,00', and 'ASCN II 1994,274,00'. The main area of the window is a form with the following fields:

Station call letters	AAK
Latitude (degrees)	+42.639000
Longitude (degrees)	+074.494000
Elevation (m)	+1645.0
Number of channels	0084
Number of station comments	343
Site name	Ala Archa, Kyrgyzstan
Network identifier code	(GSN) Global Seis
32 bit word order	3210
16 bit word order	10
Start effective date	1990,285,00:00:00.0000

An 'OK' button is visible at the bottom of the form.

Popup Display

Volume: smallldataless.s

Dictionary

Station

Station name: Blockette 1000000

Station call letters

Latitude (degrees)

Generic Abbreviation Blockette 12330001

Abbreviation lookup code

Abbreviation description

Network identifier code

32 bit word order

16 bit word order

Start effective date

End effective date

OK

- The popup display is used to show additional information that relates to a given field.
- Sometimes this is *dictionary reference* information
- Sometimes this is *tabular* information.

Dictionary Display

- Blockettes many times refer to information in other blockettes
- Such blockettes are called *Dictionary Blockettes*
- The dictionary display shows the referenced Dictionary Blockette and allows you to edit its contents

The screenshot displays a software window titled "Station Member Blockette 1000000". The window is divided into two main sections. The top section, titled "Generic Abbreviation Blockette 12330001", contains the following fields:

- Station call letters: AAK
- Latitude (degrees): 42.639000
- Abbreviation lookup code: (GSN) Global Seismograph Network (IRIS/IDA)
- Abbreviation description: (GSN) Global Seismograph Network (IRIS/IDA)

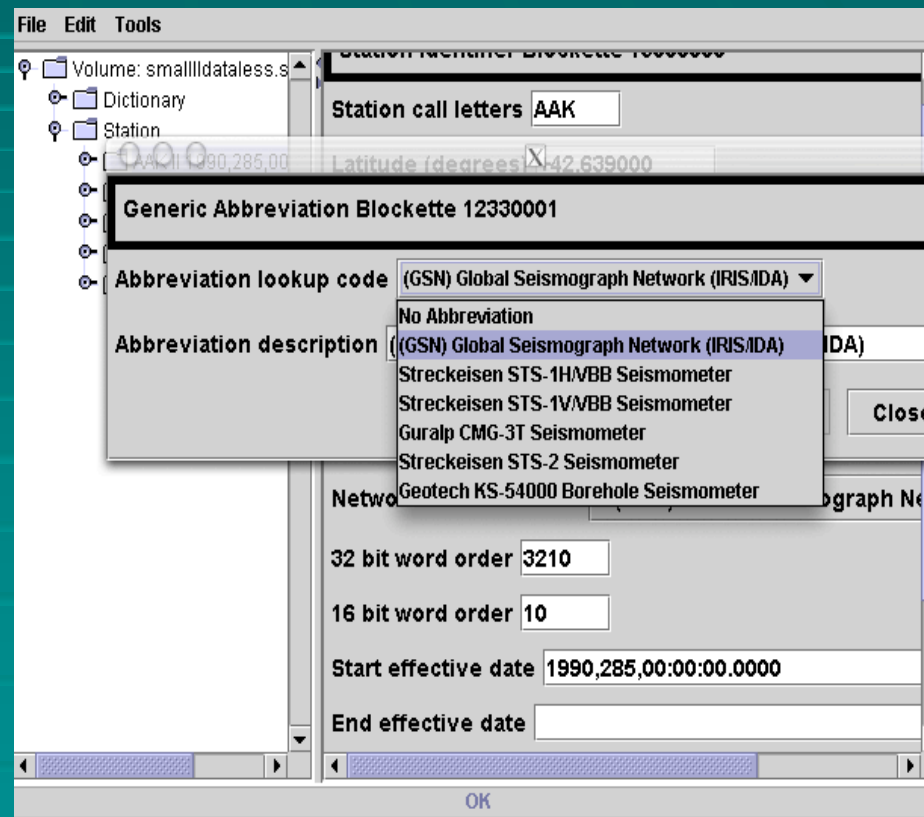
Buttons for "Commit Changes" and "Close" are located at the bottom right of this section. The bottom section contains:

- Network identifier code: (GSN) Global Seismograph Ne
- 32 bit word order: 3210
- 16 bit word order: 10
- Start effective date: 1990,285,00:00:00.0000
- End effective date: (empty field)

An "OK" button is located at the bottom center of the window. A file explorer on the left shows a tree structure with "Volume: smallldataless.s", "Dictionary", and "Station".

Dictionary Display

- The topmost field contains a list selector
- In this selector, you can choose different dictionary blockettes to be referenced, such as changing a unit type or data compression type



Tabular Display

Response (Poles & Zeros) Blockette 13000345

Row	Real pole	Imaginary pole	Real pole error	Imaginary pole error
1	-2.01502E-03	+1.87491E-03	+0.00000E+00	+0.00000E+00
2	-2.01502E-03	-1.87491E-03	+0.00000E+00	+0.00000E+00
3	-2.43649E-02	+9.12128E-04	+0.00000E+00	+0.00000E+00
4	-2.43649E-02	-9.12128E-04	+0.00000E+00	+0.00000E+00
5	-6.37525E+00	+7.70430E+00	+0.00000E+00	+0.00000E+00
6	-6.37525E+00	-7.70430E+00	+0.00000E+00	+0.00000E+00
7	-4.83000E+01	+1.29271E+01	+0.00000E+00	+0.00000E+00
8	-4.83000E+01	-1.29271E+01	+0.00000E+00	+0.00000E+00
9	-3.53554E+01	+3.53553E+01	+0.00000E+00	+0.00000E+00
10	-3.53554E+01	-3.53553E+01	+0.00000E+00	+0.00000E+00
11	-1.29400E+01	+4.82965E+01	+0.00000E+00	+0.00000E+00
12	-1.29400E+01	-4.82965E+01	+0.00000E+00	+0.00000E+00

Commit Changes Close

Some information in a Blockette comes in tabular format, such as response coefficients

Each cell in a row can be edited in place

A row can be inserted by pressing the button at the head of that row

Tabular Display

Response (Poles & Zeros) Blockette 13000345

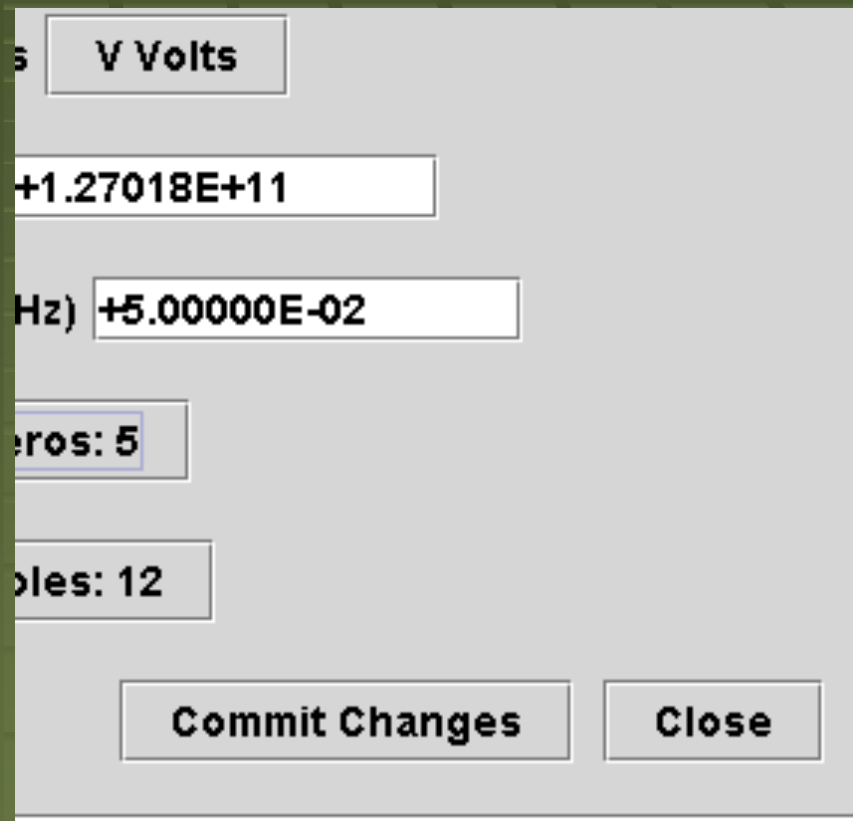
Row	Real pole	Imaginary pole	Real pole error	Imaginary pole error
1	-2.01502E-03	+1.87491E-03	+0.00000E+00	+0.00000E+00
2	-2.01502E-03	-1.87491E-03	+0.00000E+00	+0.00000E+00
3	-2.43649E-02	+9.12128E-04	+0.00000E+00	+0.00000E+00
4	-2.43649E-02	-9.12128E-04	+0.00000E+00	+0.00000E+00
5	-6.37525E+00	+7.70430E+00	+0.00000E+00	+0.00000E+00
6	-6.37525E+00	-7.70430E+00	+0.00000E+00	+0.00000E+00
7	-4.83000E+01	+1.29271E+01	+0.00000E+00	+0.00000E+00
8	-4.83000E+01	-1.29271E+01	+0.00000E+00	+0.00000E+00
9	-3.53554E+01	+3.53553E+01	+0.00000E+00	+0.00000E+00
10	-3.53554E+01	-3.53553E+01	+0.00000E+00	+0.00000E+00
11	-1.29400E+01	+4.82965E+01	+0.00000E+00	+0.00000E+00
12	-1.29400E+01	-4.82965E+01	+0.00000E+00	+0.00000E+00

Commit Changes Close

- You can also delete a row by holding down the SHIFT key before pressing the row button
- When there are no rows present, a button is displayed to allow you to add your first row

Two Important Buttons

- **Close**: closes the current displayed node
- **Restore**: undo changes to the current edit window
- Changes are committed automatically once you select a different node or Close the current edit window



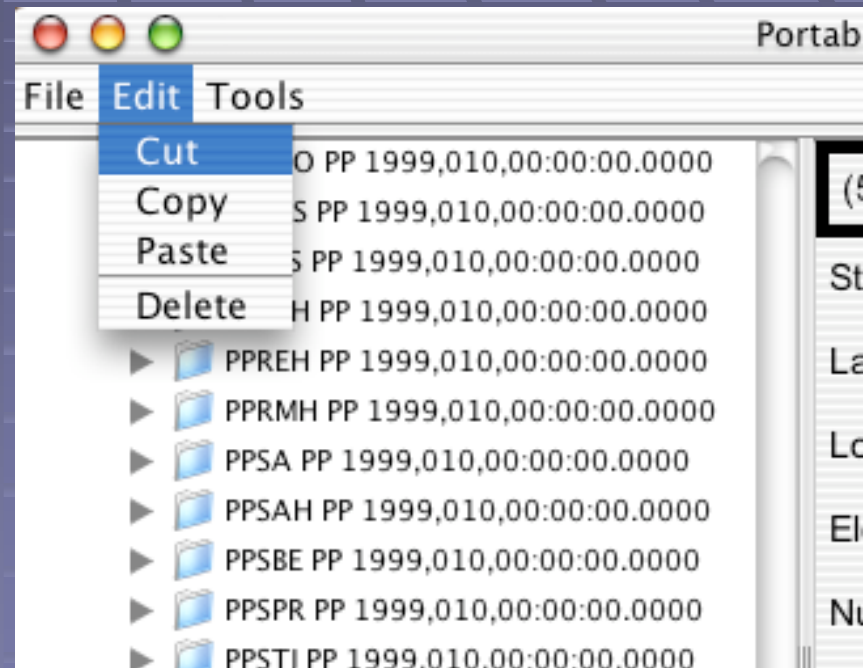
Field Validation

- If the values entered are different than the original, the value entered is *validated* for correct formatting and length
 - An invalid format results in a notification to the user, and value in question is highlighted
 - Entries that are too long are *truncated*

A screenshot of a data entry form with several input fields. The fields are labeled as follows: 'V Volts', '+1.27018E+11', 'Hz) +5.00000E-02', 'eros: 5', and 'ples: 12'. The 'V Volts' field is highlighted in blue, indicating a validation error. The 'Hz) +5.00000E-02' field is also highlighted in blue. At the bottom of the form, there are two buttons: 'Commit Changes' and 'Close'.

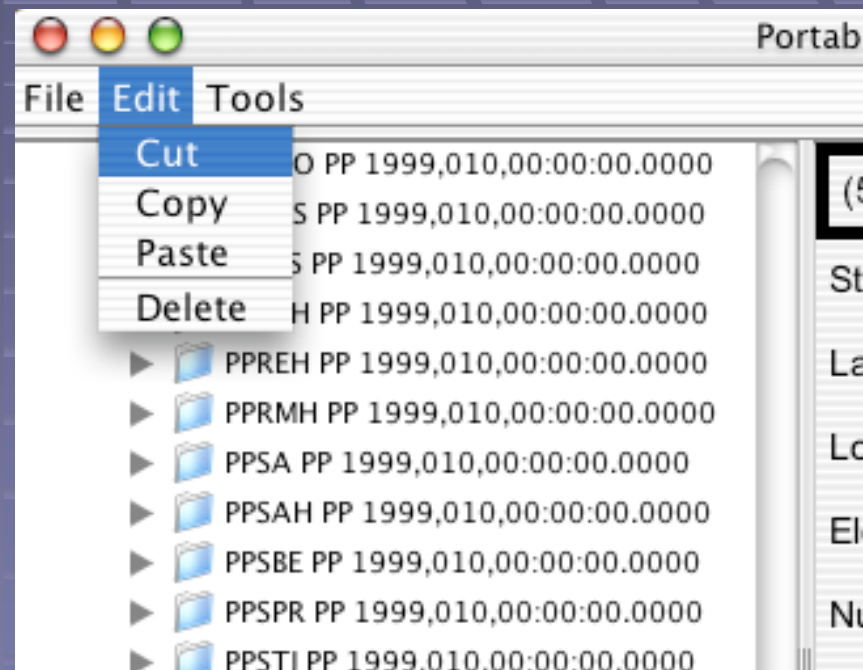
Editing functions

- You can **Copy** and **Paste** nodes in the Tree View
- Copying marks the node to be copied
- Pasting performs a write of a new node in the tree
- All child nodes are pasted recursively



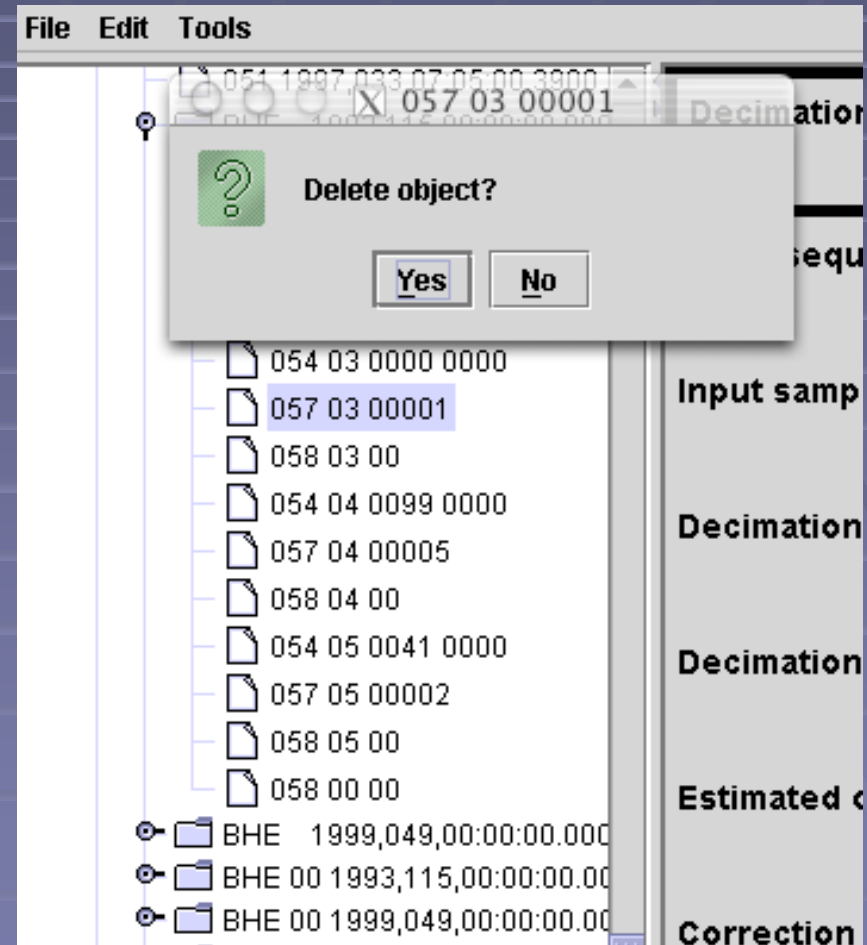
Editing functions

- The **Cut** function removes the node from its place in the navigation tree
- You can **Paste** a **Cut** node, just as you would with **Copy**
- If you **Copy** or **Cut** another node, the first node copy is lost

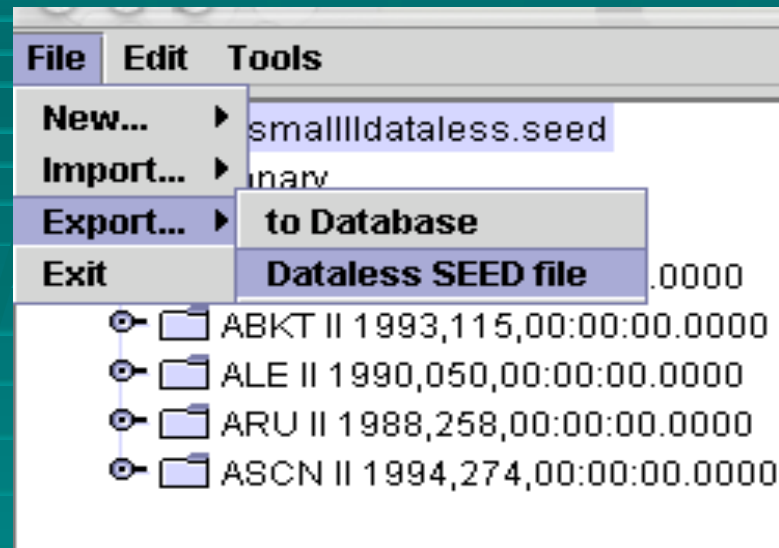


Editing functions

- The **Delete** function deletes a node entirely
- The user is asked to confirm the deletion
- All children of the deleted node are removed from memory
- Volume nodes and category nodes cannot be removed this way

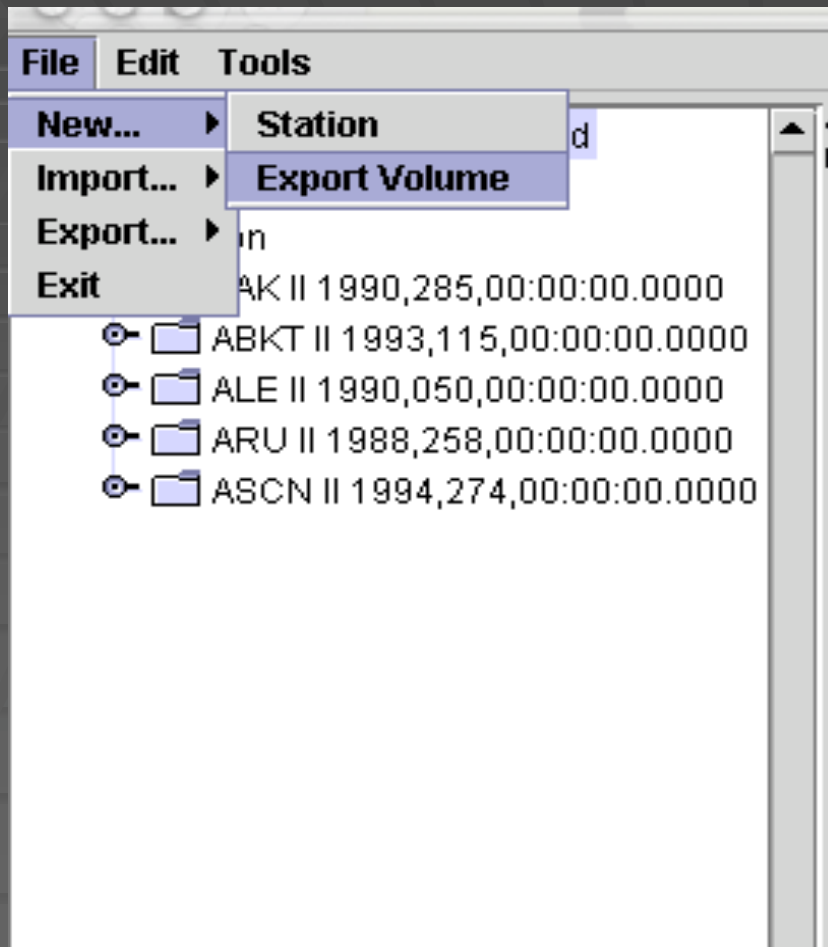


Exporting a Volume



- Once a volume is ready for writing to a file, the *Export* operation is selected
- Currently, only dataless SEED format can be exported to a file
- The user is prompted for a filename

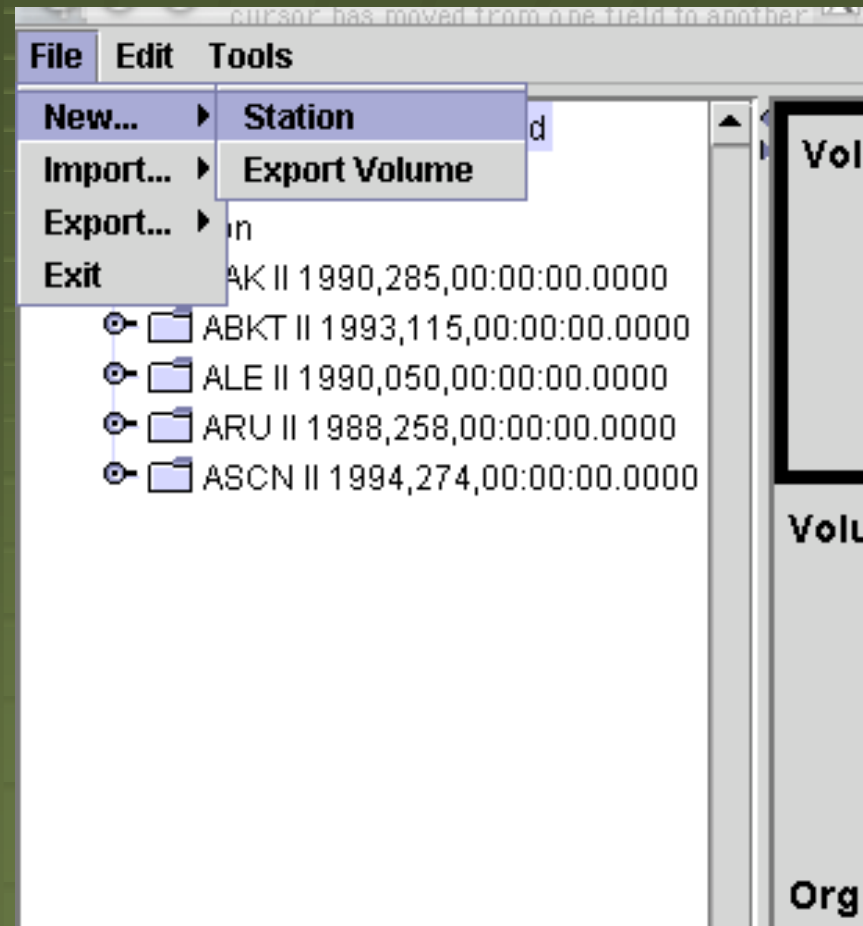
Create a new volume



- Many times, a user needs to create a new volume instead of editing an old one
- In the File menu, there is the New option that allows you to create a new blank volume
- The user is prompted for a volume name

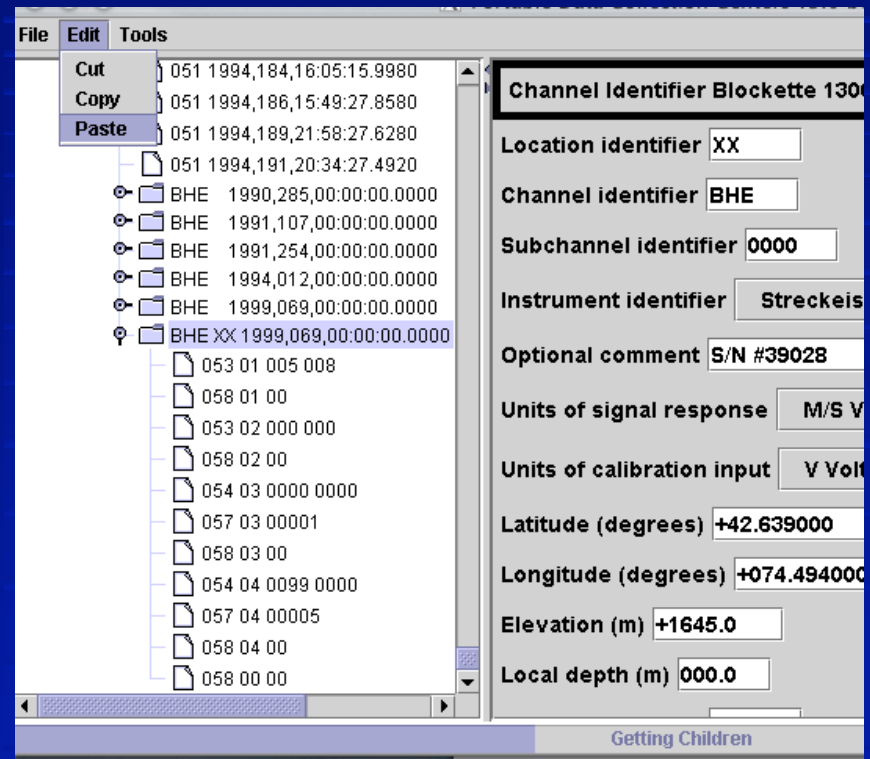
Adding content

- There are two ways to add new content to a volume
 1. Create a New node of the appropriate type
 2. Copy and paste from existing nodes, then modify them



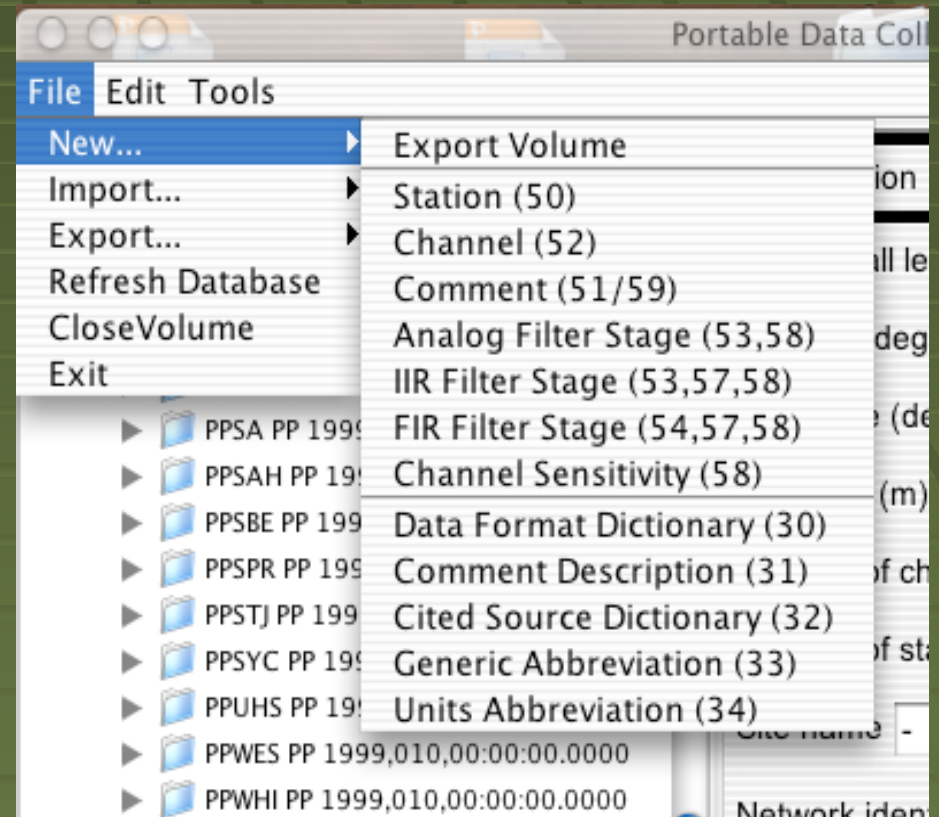
Moving content

- Currently no *drag-n-drop* method to move nodes in the tree
- Current method is to *Cut, Copy, and Paste* between locations
- Drag-n-drop capability will be explored for a future release



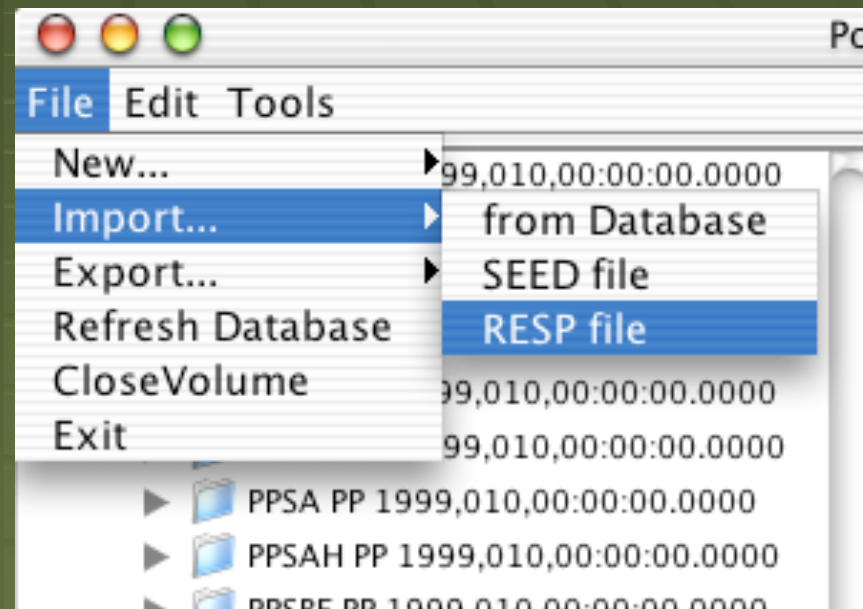
Adding content

- New, blank Blockettes can be generated from the File menu
- This can serve as a starting point for generating new station information



Adding content

- Response files are a new addition to PDCC for adding content
- Response files are Imported, just like SEED files
- Response files are mostly used to provide response blockettes

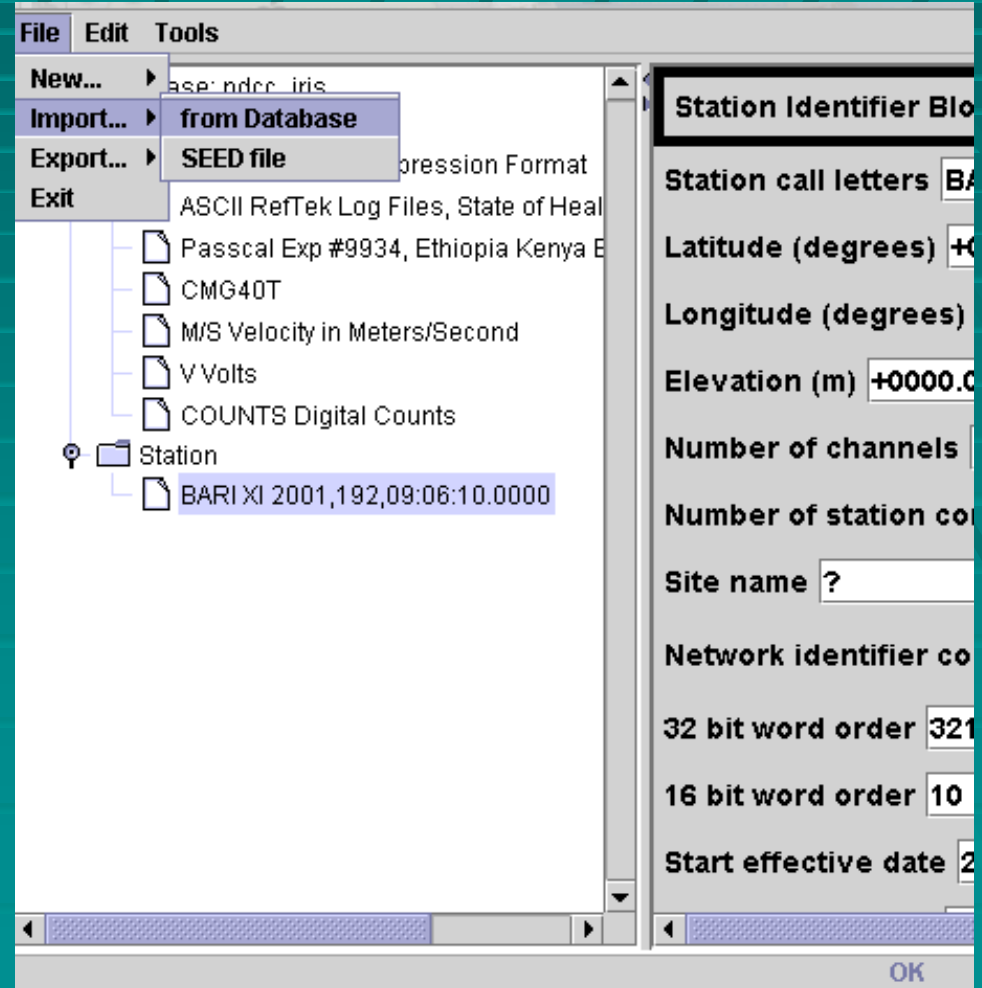


Database operations

- A MySQL database is used for long-term persistent storage
- The database is *optional* for PDCC
- PDCC can build the necessary database tables from the GUI
- The user currently has to manually configure MySQL to run with PDCC

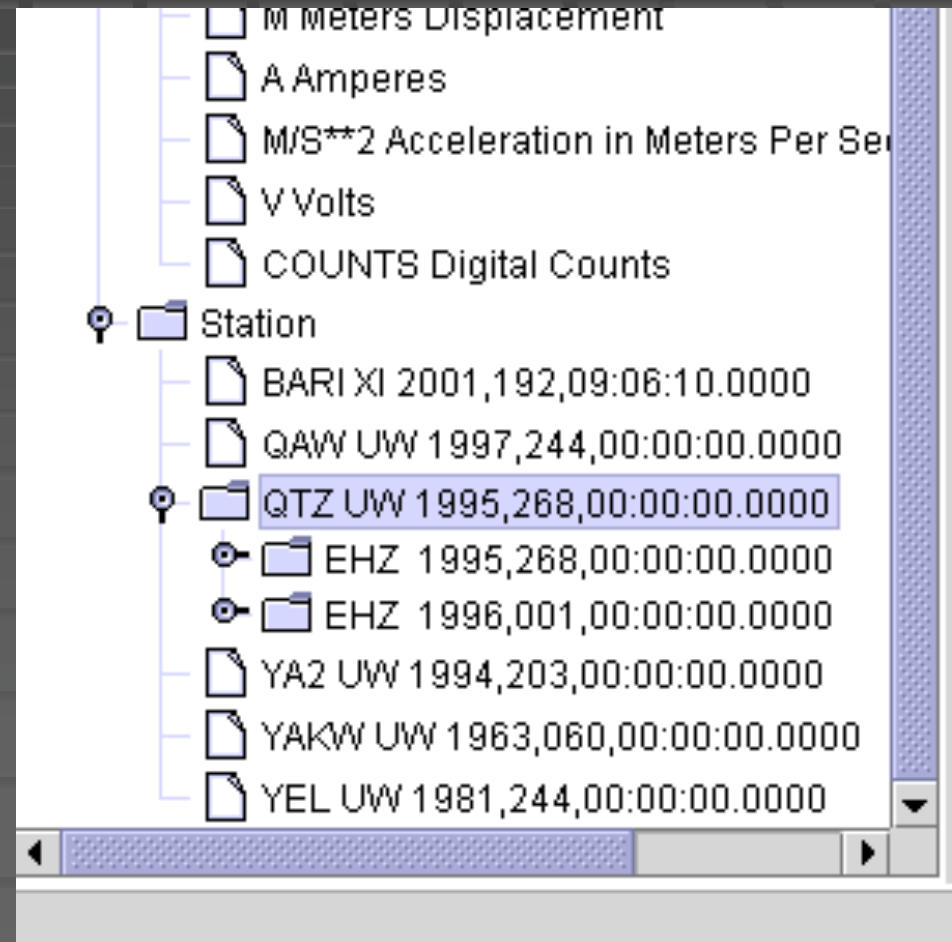
Database Volume

- There is always just one database volume in the Tree View
- The database volume is created through the *Import* menu function
- The database volume keeps track of what it has loaded and what changes it needs to write to the database



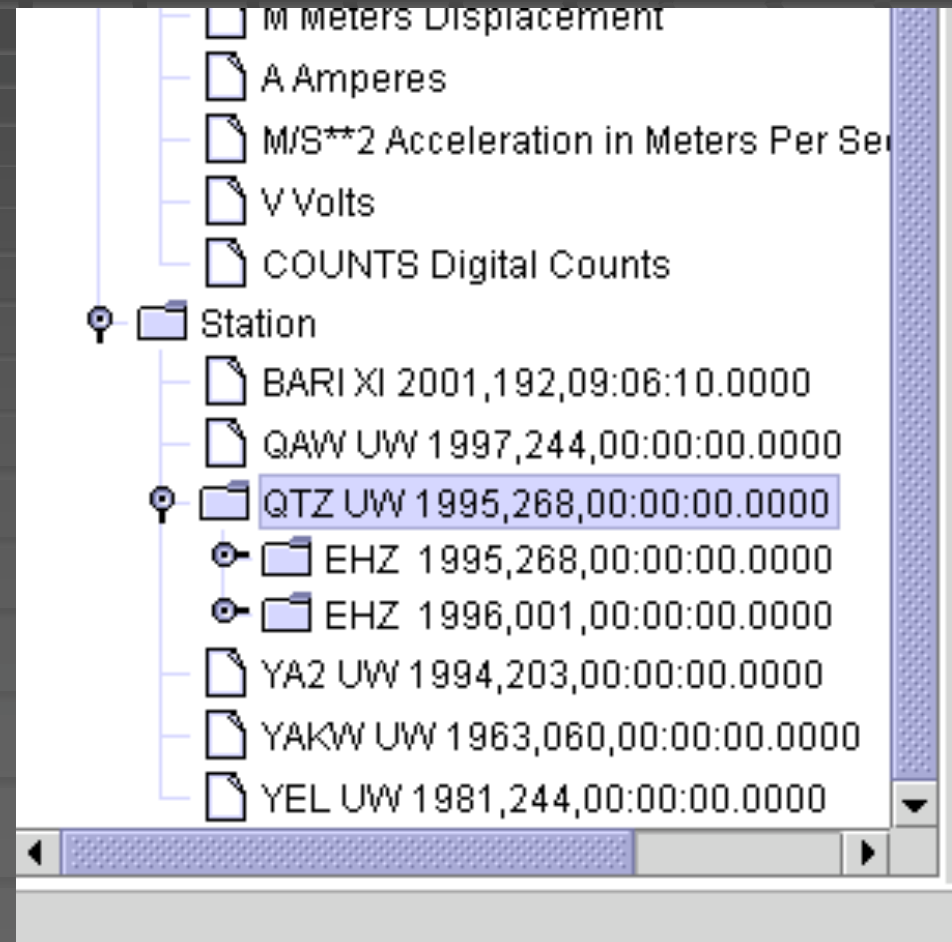
Only Stations Loaded

- When you first import a database volume, only the stations and its dictionaries are displayed
- Double-click on the station name to load the channels and their associated information

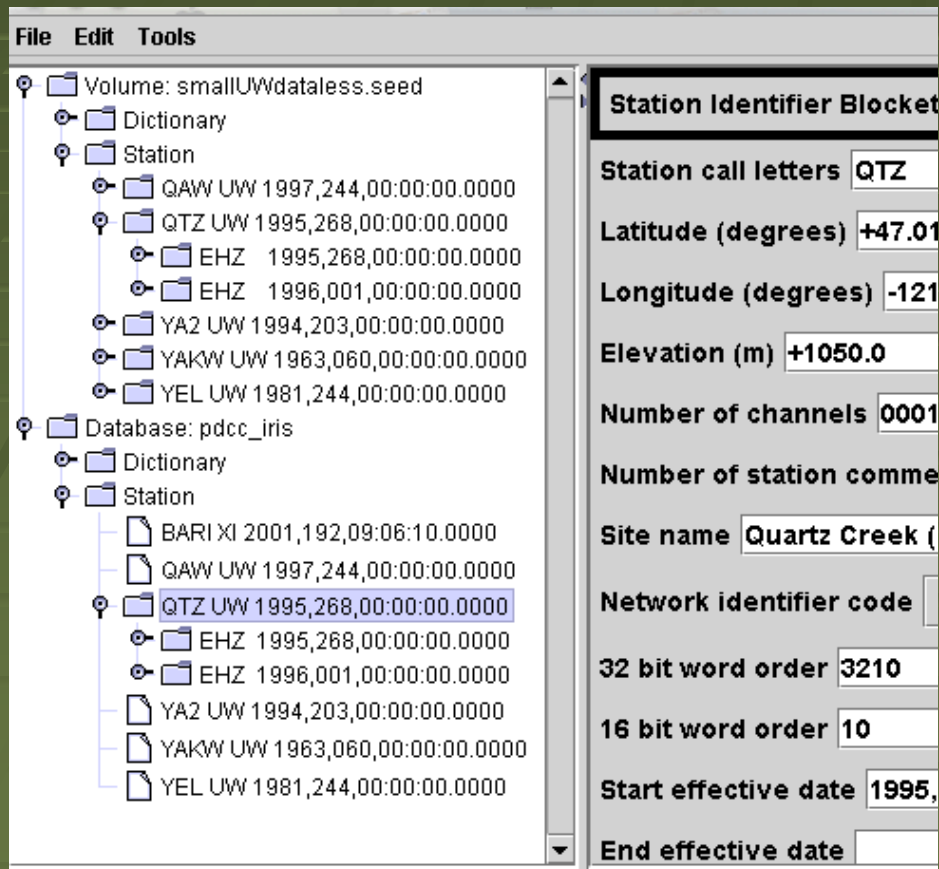


Only Stations Loaded

- Note that this is the default mode of loading from the database.
- You can configure PDCC to load all of the child nodes: channels and responses



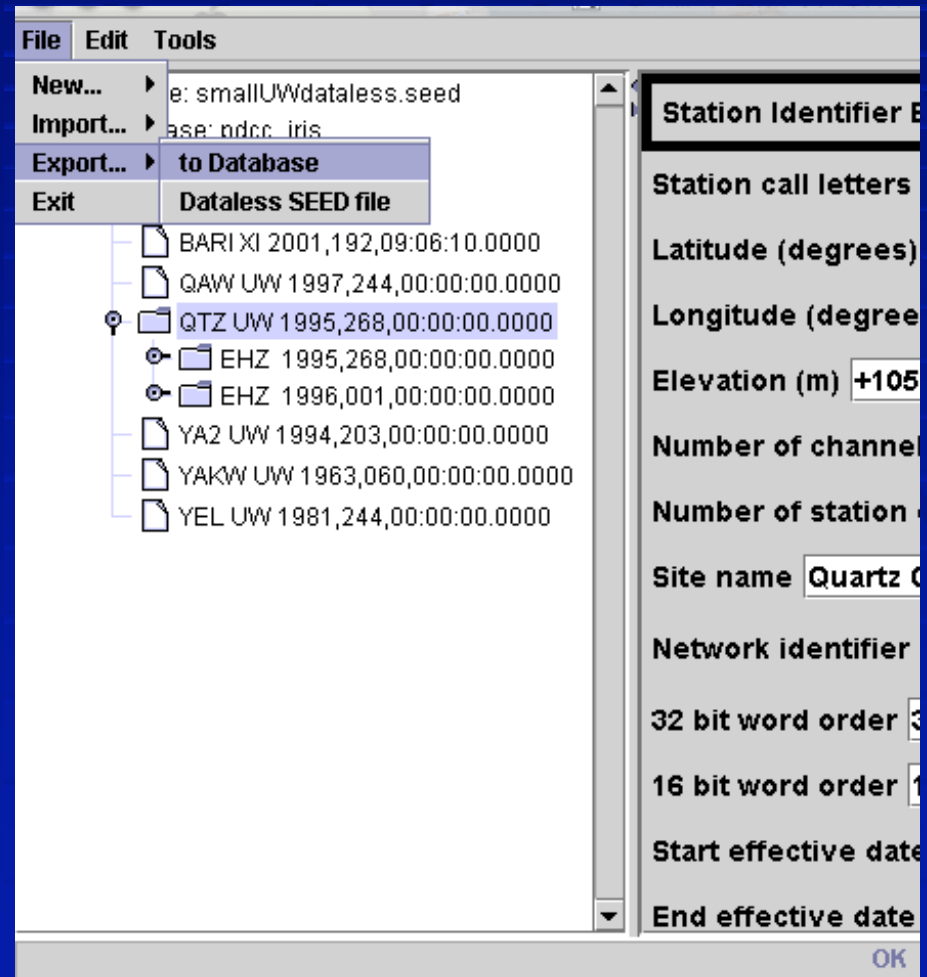
Treat like a file volume



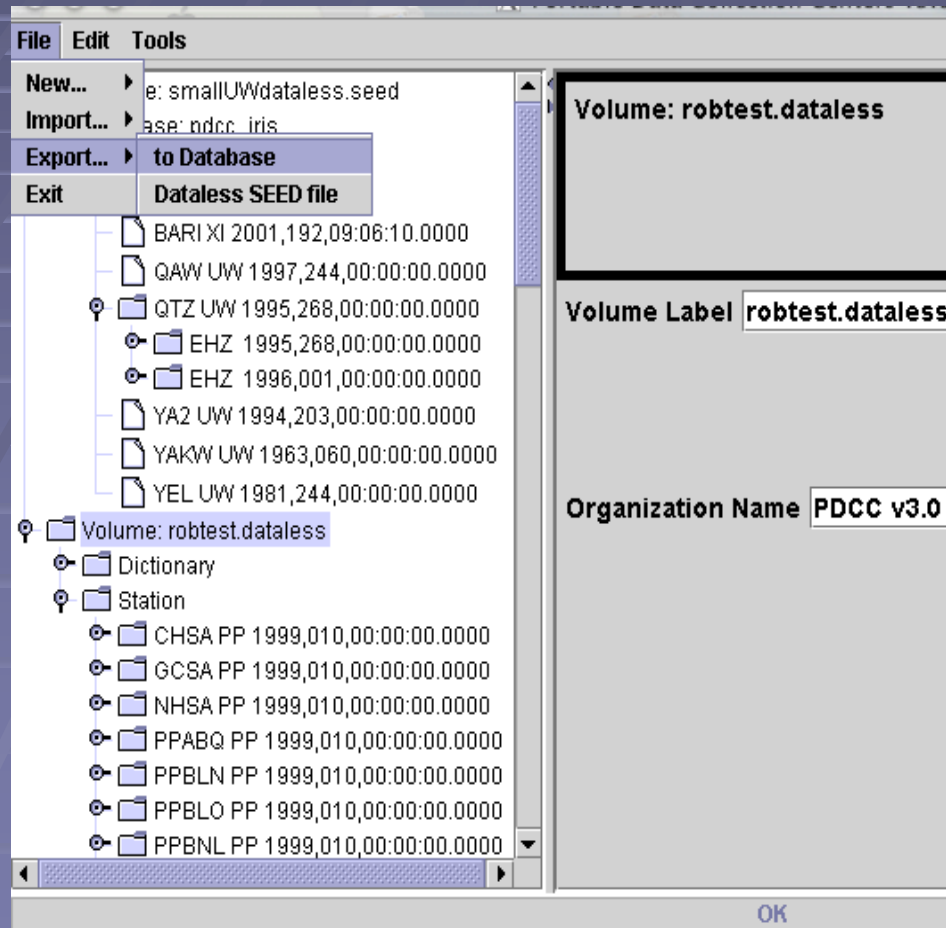
- In most respects, you can treat the database volume like a file volume
- Perform all the usual operations and edit functions
- Cut and paste to and from the database volume to other volumes

Exporting changes to DB

- When the database volume has been edited, the system will not write these changes automatically
- You must *Export* this volume to the database for the updates to occur

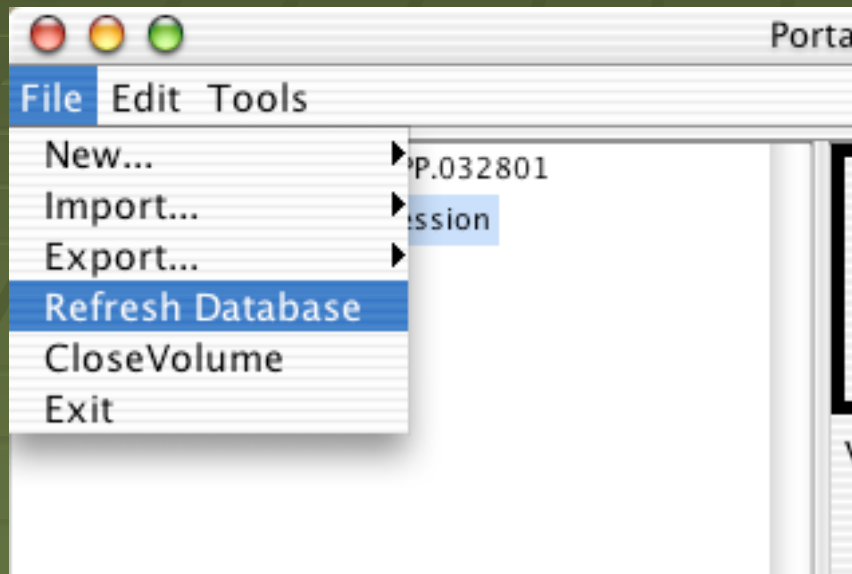


Exporting files to the DB



- New file volumes can be added to the database
- Select the file volume and activate the Export to database menu option
- The file volume's contents will be appended to the database as new entries

Database Refresh



- There is a Refresh option that functions like an Export, followed by an Import
- You can use this to routinely keep your changes up to date with the database
- It also helps to verify that the database is holding your data

Metadata Management

- Using this toolkit, it should be possible to maintain and update current dataless SEED files
- Custom dataless SEED files can be constructed and generated for output
- Station and channel information can be stored and maintained over the long term
- Is this the end result of PDCC? *No!*

PDCC is a work in progress

- Initial goal for PDCC was to get metadata management working and to be able to build new dataless SEED files
- Database persistence was also important as an early development goal
- There are a multitude of features planned for PDCC to increase its scope of functionality

What is around the corner?

- Increased tool functions through the GUI for metadata management
- Support of response dictionary blockettes (41-48)
- Multiple select of objects in GUI
- Database filtering and query functions
- Improvements to memory management
- Hotkeys for faster function access

Further on the horizon

- Waveform processing and archiving
- Full SEED and SAC output formats
- Helper tools (“wizards”)
- Command line interface for scripting
- Adaptation to NetDC request processing
- Adaptation to Data Handling Interface (DHI) processing
- Waveform compression and generation tools

Dataless SEED Files from IRIS DMC

- Getting an initial sample of dataless SEED information can make construction of new station information easier
- They serve as building blocks for new metadata
- Send a `breq_fast` request for a custom IRIS DMC dataless:
`mailto: dataless@iris.washington.edu`

Dataless SEED Files from IRIS DMC

- Dataless SEED files can be requested from the BUD Query Interface on the IRIS DMC web site

http://www.iris.washington.edu/bud_stuff/dmc/index.htm

- There are pre-built dataless SEED files available through FTP:

<ftp://ftp.iris.washington.edu/pub/RESPONSES>

Response Files from IRIS DMC

- Response (RESP) files are also available through FTP:

<ftp://ftp.iris.washington.edu/pub/RESPONSES>

- The Response file import feature is not yet bulletproof, so some editing of the RESP file may be necessary for import into PDCC

Prototype responses

- Prototype responses have been provided with the PDCC installation disk
- The response files are organized by instrument name, with many variations contributed from many networks
- A sample station and channel serves as the example of the instrument package
- This will be provided at IRIS DMC online after the workshop is completed

End of Presentation