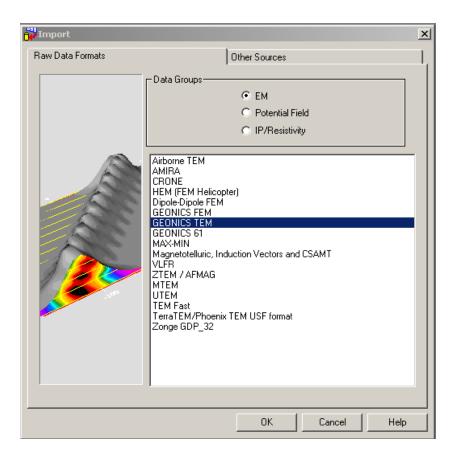
## **Importing Geonics Field Data**

Importing Borehole Data, Surface Data, Single loop transmitter:



Click the button on the main EMIGMA toolbar to open the Import window.

Select GEONICS TEM as the Import Utility

Click OK

EONICS TEM Import Wizard, Step 1: Input File Specification.		×
System type Fixed system  Moving system  Borehole system Government	Components V X V Y Z Detect	
Input Filename: F:\Uranium One\may08\tem_database\data\MAY0808B.GX7	Browse	
, Input Filename of Original Jraw Data (Not De-Rotated)	View	
< Back	Next > Cancel	Help

#### Step 1 - Input Files

After selecting the **System type**, place the cursor in the **Input Filename** box and **Browse** for your data file.

You may view the data files by selecting the filename box of your choice and select **View**.

Select **Detect** to view which components are contained in the file.

If your data consists of multiple profiles, then select the **Multiple Surface Profiles** box and then select all of the profiles.

Click Next.

EONICS TEM Import Wizard, Step 1: Input File Specification	ı. 🔀
System type Fixed system O Moving system O Borehole system Borehole data measured only along hole axis (Z component) Input Filename of De-Rotated Data E:\EmigmaV7.8\import\Geonics\Borehole\Q5x7n@^.raw Input Filename of Original .raw Data (Not De-Rotated) E:\EmigmaV7.8\import\Geonics\Borehole\Q5x7n.raw	Components X Y Z Detect Browse View
☐ Multiple Surface Profiles	
Filenames	Components
< Back. Next >	Cancel Help

Borehole Data:

#### Step 1 - Input Files specification

Select **Borehole system**. Place your cursor in the filename box and **Browse** for your derotated raw data file. To import additional (unprocessed) information which otherwise might be missing, de-select the **Borehole data measured only along hole axis** box. This activates the box labelled **Input Filename of Original.raw Data (Not De-Rotated)**. Place your cursor in this field and click **Browse** to search for a non de-rotated raw file. The non de-rotated data file contains information required for accurate calibrated simulations.

You may view the data files by selecting the filename box of your choice and select **View**.

Select **Detect** to view which components are contained in the file.

Dip (degree, horizontal) 45 h RealAzim 330 330.6 t\Geonics\Boreh	Depti 500 GridAzim Di 360 -45	р 5 5.8	
h RealAzim 330 330.6 t\Geonics\Boreh	GridAzim Di 360 -45 360.6 -45	5 5.8	]
330 330.6 t\Geonics\Boreh	360 -45 360.6 -45	5 5.8	]
330.6 t\Geonics\Boreh	360.6 -45	5.8	]
t\Geonics\Boreh			
	nole\Q5x7geom.d	lat	
igical Azimuth		azimuth	
	be used ogical Azimuth t tre C Fi	ogical Azimuth 💿 Grid A	ogical Azimuth 💿 Grid Azimuth

#### Step 1a Borehole Geometry Specification

Information on borehole geometry (i.e. dip and azimuth) are not contained in Geonics borehole data files. For this import application, this information is recovered from an ASCII borehole geometry file (i.e Maxibore Survey file). Browse for your borehole geometry file.

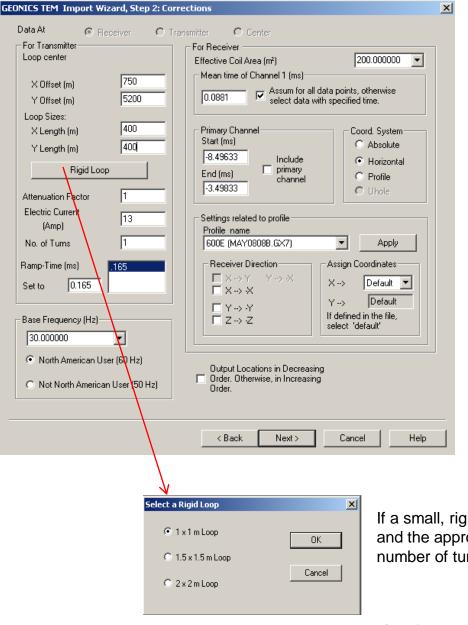
HLE# Depth RealAzim GridAzim Dip 99-HLE-45 0 330 360 -45 99-HLE-45 3 330.2 360.2 -45 99-HLE-45 6 330.5 360.5 -45.3

#### **Collar Coordinates**

As the collar coordinates are not contained in either the Geonics borehole data file or the Maxibore survey file, the user must input the X, Y and Z coordinates of the collar position.

#### Azimuth to be used

Often grid azimuths are used for the local coordinate system. The user may define either the real or the grid azimuth.



#### **Step 2 Corrections**

#### Loop Centre

The loop centre is not specified in the Geonics data file. The loop centre is assumed to be 0, 0 unless the X, Y coordinates are input. If the loop centre is not at 0, 0, be sure to input the correct position.

The following parameters are detected from the Geonics data file. They should all be checked for errors. Loop Sides Electric Current Ramp Time Effective Coil Area Mean Time of Channel #1 Primary Channel

If a small, rigid loop is used, select this option and the appropriate loop size. Check that the number of turns is correct.

#### Step 2 Corrections

#### **Receiver Direction**

The user may apply a change in direction to any of the receiver coils. This in effect changes the sign of the response. This is necessary for example, when one line is measured in one direction and then field crew runs the next line in the opposite direction with the coil orientated in the opposite directon. For borehole systems, the X,Y components are switched due to borehole component conventions in EMIGMA.

#### Assign Coordinates

Default is set to X coordinate in column 1 and Y coordinate in column 2. The import also checks to see if there is a direction associated with the coordinate. I.e. if it sees 500S in the first column, it will set column 1 as the Y coordinate. If the columns are incorrect, you can adjust them.

#### Coordinate System

Choose Absolute, Horizontal or Profile for Surface systems. Choose Uhole (Z up) for borehole systems and Horizontal for surface data. Horizontal assures that the xcomponent is directed along the profile.

#### **Output Locations**

Output locations are set in decreasing order. Deselect to output in increasing order. **Apply Changes** must be pressed to keep any changes before advancing to the next page or select a new file to edit.

#	X	Y	Z	
	550.000	5000.000	0.100	
2	550.000	5400.000	0.100	
3	950.000	5400.000	0.100	
1 5	950.000 550.000	5000.000 5000.000	0.100	
,	330.000	3000.000	0.100	
c 👘 👘				
Edit loop v	vertex			
No. of v	ertex 🗙	Y Z	Modify	
5	550	5000 0.1		
10	550		Insert	
Re	everse Current Directio	n Import f	rom a loop file	
Re	everse Current Directio	m Import f	rom a loop file	
Re	everse Current Directio	n Import f	rom a loop file	
Re	everse Current Directio	in Import f	rom a loop file	
Re	everse Current Directio	in Import f	rom a loop file	
Re	everse Current Directio	nImport f	rom a loop file	
Re	everse Current Directio	n Import f	rom a loop file	
Re	everse Current Directio	n Import f	rom a loop file	
Re	everse Current Directio	n Import f	rom a loop file	
Re	everse Current Directio	n Import f	rom a loop file	
Re	everse Current Directio	nImport f	rom a loop file	
Re	everse Current Directio	nImport f	rom a loop file	

#### **Step 3 Loop Location**

Loop corners are displayed in the order they are written in the file. This order sets the direction of current flow in the loop and thus the sign of your data. If after import and simulation the sign of your data is incorrect, re-import using the **Reverse Current Direction** option. The last corner is a repeat of the first corner to close the loop.

X

GEONICS TEM Import Wiz	ard. Step 4: Run and Output.	X
Data reduced by trans Not reduced Reduce data by		
🔲 Average Data if more	e than one has been found.	
Process	Status Geometry Waveform Profile Data	
	Processed Lines: Output file will be saved automatically when you click <finish>.</finish>	
	< Back Finish Cancel H	elp

#### Step 4 Run and Output

Reduce data by current

Data simulated with EMIGMA is current normalized. Activate the checkbox to divide the imported data by the loop current for direct comparison to simulated data.

#### Process

Reads in all the information from the file.

#### Average Data

PEImport detects if more than one measurement was taken at a station and averages the results. If you would not like the data averaged, deselect the checkbox.

Save to DB Saves imported data to database.

*Processed Lines* Displays the lines that have been processed.

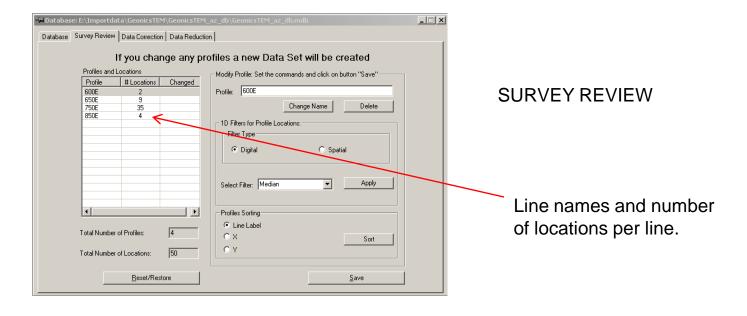
#### Restart

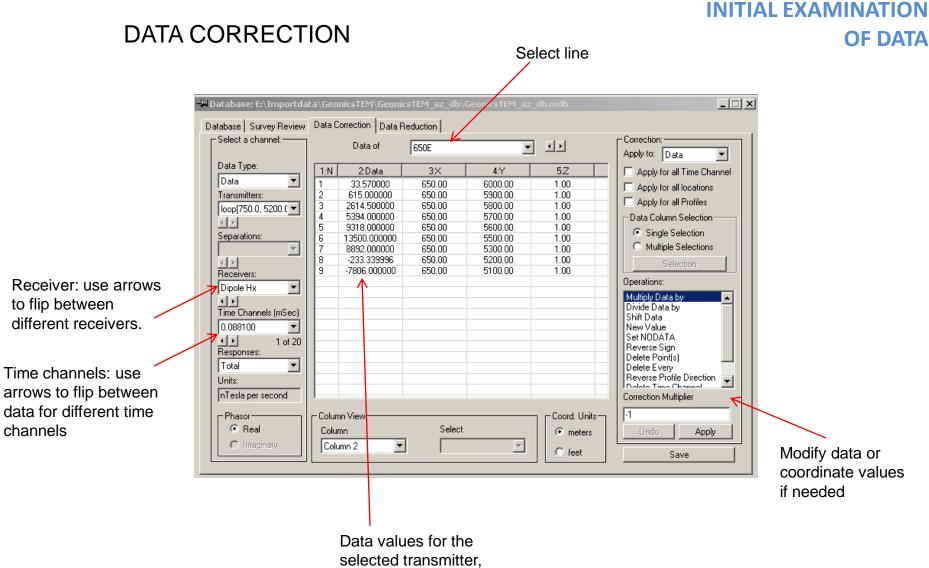
Return to the beginning of the import process losing any information you may have entered.

Database : E:\Importdata\G Database Survey Review Data		lb∖GeonicsTEM_az_db.mdb
az tem	MAY0808B	Survey Name:     MAY0808B     Change Name       Survey ID:     1       Copy     Survey Comments     BackUP       Paste     Add Survey     Delete Survey
Project ID: 1 Date Created: 6/27/2011 Project Name: az tem	Data Sets in Survey Meas Time	Data Set     Measured     Data Set ID:     1       Domain Type:     Time     Date Created:     6/27/2011 3:27:2       Data Set     Meas Time     Change     Total       Model Name:     Change     Total
Change Name Delete Project Create Project	Data File Name: GeonicsTEM_az_db_1.dat Configuration	Model     Delete Data Set     Grid(s)     Data Set Info
		This license maintenance expires December 01, 2011

# INITIAL EXAMINATION OF DATA

DATABASE – after you click 'finish' you will see your imported data.



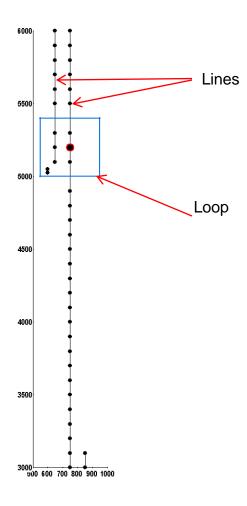


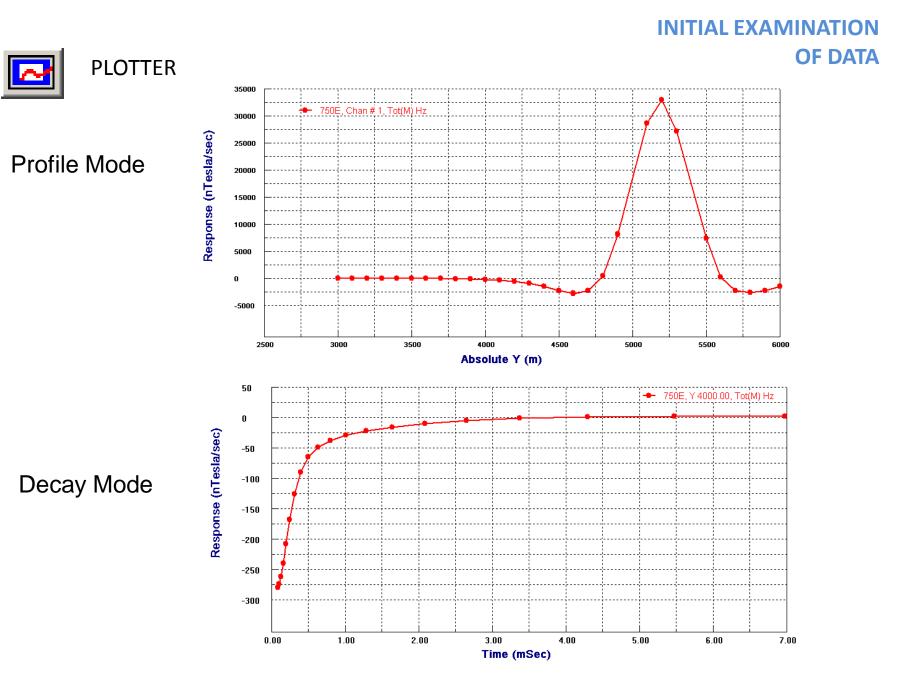
selected transmitter, receiver, time channel, and line.

# INITIAL EXAMINATION OF DATA



# SURVEY EDITOR – Check survey geometry (including loop location)





**Geonics Import** 

# INITIAL EXAMINATION OF DATA

Database: E:\Importdata\Ge		b\GeonicsTEM_az_db.mdb
Projects in Database	Surveys in Project	Survey Name: MAY100008 Change Name Survey ID: 1 Copy Survey Comments BackUP Poste Add Survey Delete Survey
Project ID: 1 Date Created: 6/27/2011 Project Name: az tem	Data Sets in Survey Meas Time	Data Set Measured Data Set ID: 1 Domain Type: Time Date Created 6/27/2011 3:27:2 Pate Set Meas Time Change Tota Model Name: Change Change I
Change Name Delete Project Create Project	Data File Name: GeonicsTEM_az_db_1.dat	Model     Delete Data Set     Data Set Info
		This license maintenance expires December 01, 2011

It is recommended that you build a simple layered earth model with a reasonable resistivity for the site to check the data. i.e., verify that the data was imported properly (correct units, etc) and the system was set up properly. Also check that the sign of the data matches that of the simulation.

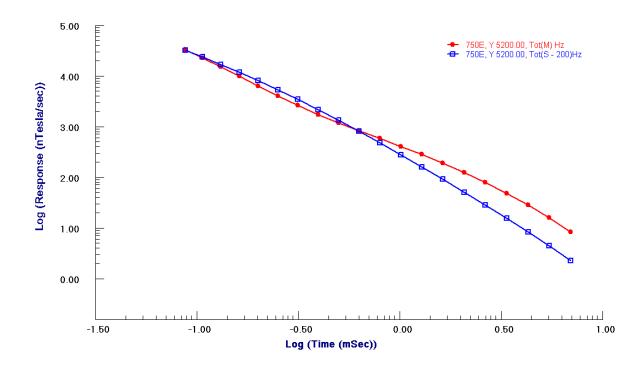
N	Susceptibility	Resistivity	Density	Thickness	Configuration	
1	0	1e+008	0	1e+008	Survey Name	Meas Time
2	0	200	0	1e+008	Model Name	
					Total Number of Layer	<b>s</b> 2
					C Depth	
					Top Depth	0
Edit Mi			Parameters		Bottom Depth	-1e+008
	Insert Layer	Laye	r #	2	Cole-Cole Polarization Mode	e Parameters
	Replace Layer	Resi	stivity (Ohm.m)	200	C (exponent) parameter dimensionless	0
		Relai	tive Permittivity	1	M parameter (chargeability) dimensionless	0
_	Delete Layer	Rela	tive Permeability	1	T (time constant) paramete seconds	r D
	Undo Delete	Susc	eptibility	0	Resistivity & Susceptibility G	irid Data Files
	Restore	Dens	sity (g/cm^3)	0		
	< Import Layers	Thick	kness (m)	1e+008	Convert to GPSZ	nt View File Delete File Layer(s)

Build your model. This is a 200 Ohm m half-space model.

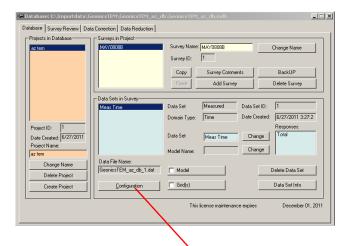
=# Database: E:\Importdata\Ge	eonicsTEM\GeonicsTEM_az_dl	\GeonicsTEM_az_db.mdb		_ 🗆 🗙
Database Survey Review Data	Correction Data Reduction			
Projects in Database	Surveys in Project			
az tem	MAY0808B	Survey Name: MAY0808B		Change Name
		Survey ID: 1	_	
		Copy Survey Com	iments	BackUP
		Paste Add Surv	vey	Delete Survey
	Data Sets in Survey			
	Meas Time	Data Set Simulated	Data Set ID	): 3
	200	Domain Type: Time	Date Creat	ed: 6/27/2011 4:01:4
Project ID: 1				Responses:
Date Created: 6/27/2011		Data Set 200	Change	Total
Project Name:		Model Name: 200	Change	
	Data File Name:			
Change Name	GeonicsTEM_az_db_3.dat	V Model		Delete Data Set
Delete Project			_	
Create Project	<u>C</u> onfiguration	🗖 Grid(s)		Data Set Info
		This license mainten	ance expires	December 01, 2011
			anoo onpiros	20001120101,2011



Simulate data for your model using the 'forward simulation' button. To learn about the frequency to time domain transform, see the FSEMTRS manual



Plot measured data against model as a quick check. This simple half-space model does not fit the details of the decay but the amplitude is as expected. Proceed with further modeling, or inversion, as desired.



If you wish to view or modify the system parameters, select 'configuration'.

roperty Pages	iput	<u>×</u>
System Name	System	n Type Fixed Tx, Moving Rx
1. System Mode EM/IP	Transmitter Coord System: Absolute: Parallel to absolute system	Separation(s) (moving system) input>
	1. TX-ANTENNA LOOP Number of vertices = 5           #         X         Y         Z           1         550.000000         5000.000000         0.100000           2         550.000000         5400.000000         0.100000           3         950.000000         5400.000000         0.100000           4         950.000000         5000.000000         0.100000           5         550.000000         5000.000000         0.100000	
Tx/Rx Replacement Mode     C Add	Receiver Coord System: Horizontal: X horizontal along profile, Z vertic: 💌	
Coil C Voltage Dipole C Loop C Pole	1. RX-DIPOLE Hx 2. RX-DIPOLE Hy 3. RX-DIPOLE Hz	Tx         Rx         Sep           1         1         1           1         2         1           1         3         -
Ip/Res System Wizard		
		OK Cancel Apply Help

On the Tx-Rx page, the details of the transmitter and receiver are specified, as well as the separation (for a moving system).

			· ·	
#	Start	Mid	End	Domain Time Units Window Total
1	0.07997	0.0881	0.09622	O Frequency O Static
2	0.09667	0.107034	0.117397	Waveform: Generalized Square Wave Sec
3	0.117961	0.131174	0.144388	O Spectral   Time  Wavelonn: Juditious20 Square wave
4	0.145107	0.161953	0.1788	Waveform Settings Pulse To Step
5	0.179717	0.201197	0.222677	Frequency Mode
6	0.223846	0.251232	0.278619	
7	0.280109	0.315027	0.349946	
8	0.351846	0.396366	0.440887	Add C Replace     Initial Frequency(Hz)
9	0.443309	0.500073	0.556837	C 9mm 2
10	0.559926	0.6323	0.704673	Frequency # 20 # of Decades in 3
11	0.708612	0.800888	0.893165	astending order © Base 10
12	0.898186	1.01584	1.13349	Frequency value(Hz) 1 #Freq/Decade 3
13	1.13989	1.2899	1.43991	
14	1.44807	1.63933	1.83059	< Add to List
15	1.841	2.08485	2.32871	< Add to List < Add to Frequency List
16	2.34198	2.65289	2.96381	
17	2.98073	3.37714	3.77356	- Spectral Mode
18	3.79513	4.30056	4.806	Spectral Mode
19	4.8335	5.47793	6.12235	- Input
20	6.15742	6.97906	7.80071	Starting sequence index (from -1 🕞
				to 7) Minimum frequency
				End sequence index 4 Maximum frequency 0
				Number of harmonics to skip
				over (from 0 to 15) Base Frequency (Hz) 30
				Base Period (s) 0.0333333
				< Generate and Add to the Frequency List
	Retre	ive/Restore		
				OK Cancel Apply Help

On the Waveform page, the times of the channels are given as well as the base frequency. Select 'waveform settings' to view the waveform parameters.

/aveform Settings	$\checkmark$			
General Input Section Base Frequency (Hz) 30	Base Period (ms) 33.	3333 Half Period (ms)	16.6667	Time Derivative
Waveform Section (Time unit: ms)— Waveform Type Boxcar: no off-time 1/2 Sime: Input, Geo TEM, MegaTE Triangle Pulse: AeroTem Ramp/Saw tooth: Utem Generalized Square: Strotem, Crom Generalized Square: Strotem, Crom Generalized Square: Since on/off: VL Generalized Square Since on/off: VL Generalized Square Unipolar: TEM Generalized Pulse: MTEM I	em JSine of Frequency for Sine of	Image: Constant (ms)         Image: Co	C Er Time Origin at: C	ginning of Pulse at of Pulse On-Time Beginning Beginning of Ramp Off End of Ramp Off
Do Normalization	tinuous Location <b>Profile</b> d Location 1 600	Location	Y	Shift Windows
Reduction         respace       C Ch. 1         Divisor         Freespace       C Ch. 1         Total         Use Absolute Values	Type of Normalization for Divisor     Continuous Time     Fixed Channel     Crime to Given     Ongin (ms)     C Chennel	Normalization Component Same Receiver Multiple Components X X Y Z Units for H-Dipole (Absolute) Amps/m/s (H) C n	Convention PPM Percent Ratio Testa/s (B)	Restore OK Cancel

A generalized square wave (exponential on, ramp off) is used for the Geonics system. To learn about the details of the different waveforms and their settings, see the FSEMTRS manual.