In this presentation the following topics are covered:

- Loading of field data collected using MagLog software.
- Magnetic data filtering based on Larmor signal levels.
- Location map and profile graph presentation and inspection.
- Using MagPick profile markers to locate magnetic anomalies.
- Cutting survey turns and splitting data into new line sets.
- Using MagPick robust filtering to separate local anomalies.
- Grid interpolation.
- Adjusting map color scale, coordinate and Lat/Lon grids and overall map appearance.
- Hard copy preparation using Postscript output.
- Picking positions of magnetic field maximums from the map and converting them into Excel spread sheet.

* Note: this presentation covers only very limited portion of program operation

Loading MagLog INT data file(s)

File Edit Inve	rse.	Options	Opera
New			
Open			
Save			
Profiles	Þ	Load list	
Open nick		Simple load	
Save nick		Save	
Pick export		Export	
	_		
Preview			
Picture export	•		
Close			
Close All			
Exit			
Recent Files	•		

- Start Magpick
- Select File / Profiles / Simple Load

List of files to Load

Load X,Y,Data profiles 🔀
Add Delete Delete all
☑ Save as profile list
False Easting: 0.00 False Northing: 0.00
Note: false Easting and Northing are to be added to your positions
I⊽ Filter by signal Signal column: 2 Signal level: 200 Ok Cancel
Choose data file Image: Choose data file Look in: Image: Old 29MAY2005 mag data Image: Choose data file Image: Old Comparison of Compariso
Desktop My Documents My Computer
File name: Image: Compare the polator (%:NT) Image: Compare the polator (%:NT) My Network Places Image: Compare the polator (%:NT)
Modify annotations

- Set check "Save as profile list"
- Check "Filter by signal"
- Set signal column (2 for one mag systems)
- Set signal threshold (200)
- Press "Add" button"
- "Choose data file" dialog appears.
- Select file you wish to load

Specify data information.

Load X,Y,Data profiles	×
Load X,Y,Data profiles	Add Delete Delete all UTM (Gauss-kruger) transformation setup Ellipsoid parameters Ellipsoid name: WGS-84 1984 Major axis, m: 6378137.00000 Flattening: 298.25722 Projection parameters Image: Get central meridian from 1-st sample Central meridian (degrees): 105.00 Scale factor (0.9996 for UTM): 0.999600
Ok Cancel	Central memory (begrees): 10500 Scale factor (0.9996 for UTM): 0.999600 False Northing, m: -2040000.00 False Easting, m: -600000.00 Note: Northing and Easting are added to transformed values Load from file Save to file UTM calculator Ok Cancel

- Split data: by distance or by line column. Pick interpolator line column.
- Specify where positions and data are.
- Use depth, altitude and time if available.
- If data in Lat/Lon, select "Auto short UTM" and UTM dialog pops up.
- It is recommended to save UTM parameters for future use.

Files to be loaded are shown.

Load X,Y,Data profiles	×
SPLIT=17 XFALSE=0.00 YFALSE=0.00 TIME1=5/6 "C:\data\JPACK\Case 0311 mag data\C	Add
	Delete
	Delete all
l ✓ Save as profile list	
False Easting: 0.00 False Northing: 0.00	
Note: false Easting and Northing are to be added to your positions	
I Filter by signal Signal column: 2 Signal level: 200 Ok	Cancel

- Repeat "Add" button for each data file you wish to load.
- When complete, press "Ok".
- Program prompts for list file to save. Assign new name and presss "Save"

Select list file name to save.

Load X,Y,Data profiles	×
SPLIT=17 XFALSE=0.00 YFALSE=0.00 TIME1=5/6 "C:\data\JPACK\Case 0311 mag data\C	Add
	Delete
	Delete all
Save as profile list	
False Easting: 0.00 False Northing: 0.00	
Note: false Easting and Northing are to be added to your positions	
🔽 Filter by signal Signal column: 🛛 Signal level: 🛛 🖉	Cancel
Save list file name here	
My Network File name: Save as type: Profile list files (*.lst) Car	

- Type new list file name here.
- Next time you need to load the same data, go to "Files / Proifiles / Load List".

Wait while data is being loaded.

Profile loading	×
Loading file:	0311.26MAY2005.survey.INTERPOLATOR.INT
Total loaded:	
	Stop loading

• Program shows progress loading data files.

Loading is complete.

Magnetic map picking	
File Edit Inverse Options Operations Profiles Window Help	
Operation completed	
5 profiles loaded.	
Pick profi	le

- Program shows total number of data lines loaded.
- Note that if all survey was done as one line, this could be "1"

Now show position plot.

File Edit	Inverse
New	
Open	
Save	
Profiles	Þ
Open pick	
Save pick	
Pick export	. •
Preview	
Picture export	t 🕨
Close	
Close All	
Exit	
Recent Files	F.

- Select "File/New". This allows to create map or profile graph window.
- Note that Map is displayed in short UTM coordinates (meters).
- If both Map and Profiles windows are used at the same time, profile displayed is show on the map as red.

Select Map or Profile window

ile	Edit	Inverse	Options.,	. Operations
C	eate			×
	Туре:			
	Grid view	N		
	Profile v	iew		Ok
				Cancel

- Select the type of view you want – Map (grid) or Profile (graph plot).
- You can repeat this operation if you need multiple windows.

Position plot is displayed.

- Here is your position plot.
 Depending on your last program settings, it might look different.
- Red is the current active profile. You can see when you create profile view window.
- Note that coordinates are short UTM.
- Now let's adjust map parameters.

Call map view size dialog.

File Edit Inverse	Options Operations Pro
NoFile x1: 2716.25 y1:	Size vy2:7889 Settings Drawings
280790300060006000600060006000000000000000	UTM setup 300000000 Status line Title Lat/Lon grid Info
7500	

 Select "Options / Size" This allows you to change view size by changing size of virtual cells used to compose the view.

Setting map size

Magnetic map picking
File Edit Inverse Options Operations Profiles Window Help
MoFile x1: 2716.25 y1:5547.48 x2: 4182.86 y2:7889.33
7700 7700
7600
7500 Resolution
7400
7300
7200
7100 Y-size, cell 10 1 1 1 100
7000
6900 Zoom : 2 2 ▲ 10
6700
6400 Left margin, pixels: 50
6300 Right margin, pixels: 50
6200
6100 Top margin, pixels: 50
6000 Bottom margin, pixels: 50
5900
5800
5/00
5600
280E9CEDCE1CE2CEBCE4CEECEBCE2CEBCE2CEBCE2CEBCE2CEBCE2CEBCE2CEBCE2CEBCE2CEBCE2CEBCE2CEBCE2CEBCE2CEBCE2CEBCE2CEBCE

- Increase X, Y cell sizes. Keep both the same to avoid different scales along X and Y.
- Select default zoom level you want to use when you zoom parts of the map.
- Set amount of white space around the map (in pixels)

Redraw the map with new size.



• Just answer "Yes" here to apply your new map view parameters.

Map displayed with new size.



- Map now is bigger. Use scroll bars to access different parts of the map.
- Dragging mouse with while holding middle button scrolls the map as well.

Now create profile view.

File	Edit	Inve	erse
New	J		
Ope	n		
Sav	e		
Prof	iles		•
Ope	n pick		
Save	e pick		
Pick	export .	9	►
Prev	/iew		
Pictu	ure expo	rt	•
Clos	e		
Clos	e All		
Exit	ļ.		
Rec	ent Files		•

 Now let's create profile view window. Select "File / New" and then select "Profile view"

Creating new profile window.



- Selecting "Profile view" creates windows where you can see one profile at a time. This profile is highlighted in red on the map.
- Selecting "All profiles in the window" creates profile view where you can see all profiles on the map at the same time. This is typically used for profile based inversion.

New profile view is created.



- Here is new Profile Window display.
- By default, graph is displayed as function of X coordinate.
- To adjust view settings, right click mouse and select "Settings" or use "Edit / Settings" from the menu bar.

Selecting graph parameters

Profile view parameters			×
Profile graph layout	Tmin: 43625.1	Tmax: 43971.1	🔽 Data limits
F T grid	Xmin: 0.0	Xmax: 29691.0	🔽 Data limits
e I d Xscale=T[nT]/disp.units	🔽 Draw X gri	id Xgrid: 100.0	🔽 X autogrid
Xgrid	🗹 Draw T gri	id Tgrid: 100.0	T autogrid
Xmin Distance along profile Xmax	T scale: 1.1531	X scale: 59.3821	Ok
Shrink to canvas Type: Along profile 💌	T size: 300	X size: 1000	Cancel

- Select what horizontal axis should be: X, Y, distance along profile or time
- Select canvas size in pixels for vertical (T-size) and horizontal (X size:) dimensions.

Zooming in profile data.

¥2005	SURVEY INTE		INT			
)	4000	6000	8000	10000	12000	1400(
			Redarw Settings Browse Set marker			
<u>)</u>	4000	6000 -	Zoom Marker stat	us , 10000	12000	14000

- Use context or main menu and select "Zoom" note how mouse cursor changes its shape.
- Press left mouse and drag to select area of interest. Release when complete.
- Program will present data in the zoomed window only.
- To restore original scale, select "Redraw"

Setting markers.



- Here a portion of the zoomed field is presented. Use context menu and select "Set Marker" Note mouse cursor changes.
- There are only two possible markers in the program: Up and Down arrows.
- When you set markers again, previous markers are erased.

Two markers show on the plot.



- Here you can see two markers on the plot. You only can set marker on the graph itself and only at the actual location of the data sample.
- If now you would try to set marker again, "Up" arrow disappears and moves into the new place you selected.
- The same happens with 'Down" arrow when you try to set marker again.

Getting information on markers.



 You can obtain information on data at marker's location by selecting "Marker status" from context menu.

Marker status information

Marker Status	×						
Marker type: UP Field: 43743.20	Marker type: DOWN Field: 43738.75						
X: 105 58.88210398' Y: 18 30.37742382'	X: 105 58.87881603' Y: 18 30.38699999'						
Time: 18:35:26.219	Time: 18:35:35.423						
Sensor depth: 14.71	Sensor depth: 12.86						
Distance between markers: 18.58 Recommended profile separation: 11.5 Field level on adjacent line, % 25 0							
Inverse UTM Position Format: Deg. min Decimals for position: 8 0 ● ●							
Clo	ose						

- Here is the dialog which shows information on both markers.
- You can adjust position format or display Lat/Lon.
- You can estimate recommended profile separation if markers are set at half of amplitude of magnetic anomaly of interest.

Finding marker on the map.



- Now activate map window again. If you don't see your markers, select "Find marker" from context menu.
- This will scroll map view so UP marker is in the middle of the window.

Marker in the middle of the map.



 Here you can see how program scrolled map window so you can easily find the marker.

Adding marker location to the list



- You can convert your markers locations into the target file you wish to save.
- Activate profile view and select "Pick Profile Target" or press Ctrl Z".
- Program computes middle point between markers and uses it as target location.
- This is very primitive but useful way of data interpretation.

Picking target from profile.



- After target is picked, field changes into dashed line between markers.
- Note that MagPick does not display previously picked targets on the profile.

See target location on the map.



- Go to the map window and find the marker. Select "Zoom" from context menu.
- Note that mouse cursor changes its shape. Hold left button and drag a square around area of interest.
- Release the button. New map window will pop up and show zoomed area.

View part of the map zoomed



- Here you can see part of you map zoomed in a separate window.
- Note the "Up" and "Down" markers on the profile line.
- Note that target location is marked with a dot and number.
- You can close this window when you don't need to view it anymore.

Presenting targets in work sheet.



 From any of the map windows, go to the "Inverse / Work sheet / Targets" menu. This calls worksheet window with hand picked targets (as opposed to the targets obtained by inversion)

Work sheet on the screen.



• Here is the work sheet window. It shows both locations and parameters of the targets.

Formating work sheet positions.



- Use context menu (right mouse click) to manipulate worksheet.
- You can format positions to shot UTM or Lat/Lon degrees and minutes.

Formatting work sheet positions

1			-	7. J.	11 -	7	7	+			
	<mark>₩</mark> Ma	nua	l targets :	sheet							
1		Τ	X		Y		Z	AMP1	AMP2	Depth1	Depth2
	1	Ρ	3590.85		6491.45	9.29		43743.20	43738.75	14.71	12.86
				Po	psition form Position 1	at ormat:	D	egrees:minu	tes 💌		
					Inversion	e UTM	Digi	ts after dot:	6		
	•					Ok		Cancel			

- Here is dialog to format work sheet positions.
- Check "Inverse UTM" if you wish to see Lat/Lon
- Select "Degrees and minutes"
- Enter number of decimal places you wish to have for minutes.

Exporting worksheet data

Å - F	x,y				_			
$(\Lambda \perp$		T X		Y	Z	AMP1	AMP2	Dept
V.	1	Ρ	105 58.880460'E	18 30.382212'N	9.29	43743.20	43738.75	14.71
1			Grid functions	8				
		Ŀ	Load					
- 1			Save					
			Undo					
- 1			Clear all					
-1			Format positio	ns				
	•		Export					

- Use context menu to access export functions.
- Work sheet can be exported into CSV (comma separated values) to view in Excel Spread sheet.
- Work sheet also can be exported to be used as flags or survey plan in MagLog software.

Select worksheet export format

			-{		1	1	:
T	x	Y	Z	AMP1	AMP2	Depth1	Depth2
1 P 105 5	58.880460'E	18 30.382212'N	9.29	43743.20	43738.75	14.71	12.86
	Export works	haat file:					2 1
	Caure Works	in: 🕞 0211.26 and	29MAY2005 mag d	ata 🗖			
	Jave		23MA12005 mag u	ala			
_	My Recent Documents						
	- 7						
	Desktop						
	My Documer	its					
6445.15 0.000	My Compute	er 🛛					
		File name:			•	Sav	/e
	My Network	Save as type:	Comma-separate	d values (*.csv)		Can	cel
	Places		Comma-separated MagLog Flags (*.1 MagLog Map (*.n Atlas Boundary (* AutoCAD dxf (*.d:	d values (*.csv) FLAGS) hap) .bna) xf)			<i>li</i> ,
			All files (*.*)			,	

- Select export format by selecting file name extension in this dialog.
- If CSV is selected, Excel is launched automatically upon saving of the file (see below).
Cutting profiles



- Here we demonstrate how to cut turns using MagPick. The Profile view window should also already be open.
- Select "Pick profile" from context menu. Note mouse cursor shape.
- Pick profile of interest.
- Select "Set marker" from context menu.
- Set markers where you want to cut.

Select "Set marker"



• Select "Set Marker" from context menu.

Set markers where you want to cut.



Activate profile window.



- You can actually cut only from profile window.
- Activate profile window by clicking on it.
- Select menu item "Edit / Cut"

Select what you want to cut.

X



Operation type:

Cut from start of the line to the UP marker Cut part after UP marker to the end of the line Cut outside UP and DOWN markers

Cut between UP and DOVVN markers

Ok

Note: This uses distance along the ine, NOT along X, Y or pointer.

Cancel

• Select "Cut between UP and DOWN" markers.

- This will remove all data between these markers.
- Program will redraw profile view for you.
- If you want to see result of cut on the map, activate map window again and redraw it.

Redraw the picture to the changes.



- Select "Redraw" fro context menu to the changes.
- Note that you don't have to redraw the map after each cut.

See changes in on the map.



• You can see here how map has changes after the cut.

Saving profiles.



- After you complete cutting the data, save you profiles.
- Select "File / Profiles / Save"
- The idea is the following: save data and re-load them again using gaps in position as new line indication.

Profile save dialog

Save profile data
What to save: All profiles
How to save: As XYZ
Line numbers: Simple line number:
Data type: Field, Alt+Depth 💌
Decimals after dot for X, Y:
3 1 ◀ ▶ 10 Decimals after dot for data:
3 1 • • 10
Save as Lon/Lat. UTM parameters
Ok Cancel

- Here you specify how you want your data to be saved
- You save all the profiles, X, Y, sensor depth, altitude and measured field, as well as total water column depth (altimeter + depth sensor)
- You save your positions in short UTM format.
- You might want to save you position in Lat / Lon (decimal degrees)

Now reload your data again

Magnetic map picki	ing
File Edit Inverse.	Options Operation
New	
Open	
Save	
Profiles 🕨 🕨	Load list
Open nick	Simple load
Save nick	Save
Dick export	Export
Preview	
Picture export 🕨	
Close	
Close All	
Exit	
Recent Files 🔹 🕨	

- After you successfully saved your data, re-load them in the program.
- While reloading, request data split by distance. This will create new lines.
- Newly loaded data does not have turns.
- Go to "File / Profiles / Simple load ..." as it was done at the very beginning.

Select data file to load.

Load X,Y,Data profiles				Add Pelete Delete all
I Save as profile lis False Easting: 0. Note: false Easting I Filter by signal S	t 00 and Northing are to b ignal column: 2	False Northing: 0 e added to your posit Signal level: 200	.00	Ok Cancel
Choose data file Look in: Wy Recent Documents Desktop My Documents Wy Documents	0311 26 and 29MAY 0311.26MAY2005 0311.26MAY2005.sur 1 Sur 0311.26MAY2005.sur 1 Sur 0311.26MAY2005.sur 1 Sur 1 Sur 1 Sur Sur 1 Sur 1	2005 mag data vey. vey.880 vey.COMMENT vey.FLAGS vey.INTERPOLATOR.INT vey.Intinfo vey.lineNumber vey.loginfo1.txt vey.loginfo1.txt vey.loginfo3.txt		? × • g.dat d ▶ Open Cancel

- Set check "Save as profile list"
- Check "Filter by signal"
- Set signal column (2 for one mag systems)
- Set signal threshold (200)
- Press "Add" button"
- "Choose data file" dialog appears.
- Select file you just saved.

Specify columns to load

Load X,Y,Data profiles	Create profile description	Add Delete
I Save as profile lis False Easting: □ Note: false Eastin I Filter by signal S	Name: cut-data.dat Split: Distance Distance: 5 Decimation: 1 X: 1: X Y: 2: Y Data: 5: T Depth: 3: Z Alt: 4: ALT	Cancel
	Active color: RED Inactive color: BLUE Apply UTM on input (positions in Lon/Lat): No UTM	
	UTM parameters Ok Cancel	

- Specify columns you wish to load.
- Note that column names and numbers are different from original file.
- Set "Split: Distance" and set "Distance: 5"
- When program sees gap in the positions more than 5 m it assigns new line.
- Note that "No UTM is selected. This is because data was saved in short UTM

Actual loading starts

ile	Edit	Inverse	Options	Operations	Profiles
	Question				×
	-				-
	0				
	0	Append to	o previous pr	ofile list ?	
I	9	Append to	o previous pr	ofile list ?	
I	Ye	Append to	o previous pro	ofile list ? Cancel	

- Complete your "Simple Load" dialog as earlier.
- Save profile list file.
- When actual loading starts, program asks what you want to do: append new data to the previously loaded or discard old data?
- Answer "No". This will remove old profiles from memory and load only new ones.

Profile loading is complete.

	File	gnetic n Edit	nap pick Inverse	cing	Option	s	Оре	eratio	ns
					·				
=		Op	eration	com	pleteo	1	×		
			į)	59 p	rofiles l	oade	d.		
				Ok	:				

- After program completes loading, you can see that many more profiles are there.
- Proceed as before from this point.

Now show position plot.

File Edit	Inverse
New	
Open	
Save	
Profiles	Þ
Open pick	
Save pick	
Pick export	. •
Preview	
Picture export	t 🕨
Close	
Close All	
Exit	
Recent Files	F.

- Select "File/New". This allows to create map or profile graph window.
- Note that Map is displayed in short UTM coordinates (meters).
- If both Map and Profiles windows are used at the same time, profile displayed is show on the map as red.

Select Map or Profile window

ile	Edit	Inverse	Options.,	. Operations
C	eate			×
	Туре:			
	Grid view	N		
	Profile v	iew		Ok
				Cancel

- Select what type of view you want – Map (grid) or Profile (graph plot).
- You can repeat this operation if you need multiple windows.

New map window

ile Edit	Inverse	Options	Operations	Profiles	Window	Help
NoFile x1:	: 2720.44 y1	:5654.05 x	2: 4153.30 y2:	7858.46		
2812 7800 7600 7500 7400 7300 7200 7200 7000 6900 6900 6600 6600 6400 6300 6400 6300 6300 6400 6300 6300 6400 6300)0 00 00 00 00 00 00 00 00 00 00 00 00 0		

- Now you can see that all turns you cut are gone.
- Splitting into lines by distance can result into very short lines; you may remove them if you see them

Create profile view.

Magnetic map pick	king
File Edit Inverse	Options Operations Profiles.
New	4 y1:5654.05 x2: 4153.30 y2:7858.4
Open	
Save	
Profiles 🕨	12868498888888888888840400U
Open pick	7000
Save pick	7600
Pick export 🕨	7400
Preview	1-1-1-1-1-1-1-1-1-7300
Picture export 🕨	7200
Close	
Close All	
Exit	
Recent Files 🔹 🕨	
6300	6300
6200	6200
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5900	
5800	· · · · · · · · · · · · · · · · · · ·
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282990000	8286843888828888404000

- Select "File / New" to create profile view window.
- New profile view will show current active profile (red).
- You can use profile profile view window to browse through the profile data.

Select "Profile view"

• This creates a new profile view window.

Browsing through the profile data.



- After you adjust profile view using "Setting" dialog, select "Browse" from the menu.
- This will bring modaless dialog to browse through all available profiles.

Browser dialog.



- Use >> and << to navigate the list.
- Currently selected profile is shown on the graph and highlighted in red on the map.
- You can use "Delete" button to delete profile. Cation! You can not currently undo this action.

Filtering local component of the data



- For magnetic search operations geological magnetic field is considered noise. Besides this, diurnal variation is present.
- You need to filter these out to produce a useful map. On the red curve, you might want to keep only sharp magnetic anomalies.
- MagPick provides different options to filter the data.
- Select "Edit / Smooth" menu item to proceed.

Smooth dialog.



- "Robust" smoothing may be the best.
- Select what to smooth active or all profiles.
- Select window size. This is spatial window. Anomalies shorter than this windows are to be separated.
- You can use ideas about you possible target depth and magnetometer altitude.
- You will have to try a few options to get optimal results.

Smoothing in progress



- Here is program filters the data.
- Depending on data amount and PC horsepower, it can take from few seconds to few hours.
- Be patient and wait till task is complete.
- If you need to cancel, than keep in mind that only part of the profiles will have been filtered.

Preview smoothing results



- After computation is complete, you can preview the results before accepting them.
- Green line is result of smoothing. This example represents a good case.

Accept smoothing result.



- After you examined your profile data (using "Browse" function) and are satisfied with the results, select "Edit / Accept..." menu.
- This will allow you to replace data with result of smoothing (green) or with difference between original and smoothed curves (red minus green).

Selecting what to accept.



- For all the profiles, select: Difference: original – smoothed value.
- This will compute this difference and replace all the data.

Final results of the filtering.



- You can see here that all background geological field is gone, and local anomalies are highlighted.
- Note that data is now noisier that it use to be. This is a drawback of high pass filter.
- Note that data are now centered around zero.
- They do not require diurnal correction any more and can be used for the map.

Interpolate map (grid).



- Activate map window and select "Profiles / Interpolate / Splines. This is build-in magpick gridding.
- Note that you can save filtered data and use other software (such as Golden Software "Surfer") to grid the data.

Select gridding parameters.

Magnetic map picking
File Edit Inverse Options Operations Profiles Window Help
NoFile x1: 2720.44 y1:5654.05 x2: 4153.30 y2:7858.46
280000000000000000000000000000000000000
7800
7600 X parameters
X min: 2926.63 X max: 3957.58 🔽 Data limits Interval: 1.00
7200 Y parameters
7000 Y min: 5968.97 Y max: 7543.55 🔽 Data limits Interval: 1.00
6800
low constrain
6400 Low constraint by min data value Limit. 10.00 reinsion (0-1). 10.20
6200 High constrain by max data valu 🗸 Limit: 100.00 Format: GS BINAF
6000 ····
5900
280 Output file: C:\data\JPACK\Case 0311 mag data\0311 26 and 29MAY2005 mag data\cut-
Iterpolation by by P. Wessel and W. H. F. Smith
See Smith and Wessel (Geophysics, 3, 293-305, 1990) for details.
Ok Cancel

- Select cell size in meters.
- Select XY limits.
- Select output file name.
- See article for details on interpolation method.

Gridding in in progress



- Depending on data amount and grid size, it can take between few minutes to few hours. Be patient.
- After gridding is completed, map is loaded into current map window.

Grid is loaded.



- Here you can see grid loaded and plotted with contours
- This might be not what user wants.
- Need to adjust color scale, coordinate grid lines, etc.
- Go to "Options / Settings" menu item

Changing map appearance.



- Select "Options / Settings" to change map presentation parameters.
- The following dialog allows you to plot or remove color map, plot contours, select color scale, plot or remove profile locations, plot or remove stack plot.

Adjust map parameters

real of the second s	cal-2.grd x1: 2926.63 y1:596	8.97 x2: 3955,84 y2:7543,55		
	3000	3200	3400	
7400	Common parameters Field direction: □ ✓ Show x grid x: 2 ✓ Show y grid Y: 2 Grid color ✓ Show crosses □ Shap to grid ✓ Click on (*) items to cha	.0000 Data min: -11 Data max: 70 Data max: 70 V Autoscale Vrap color s Contours* V Colored m Show profiles* Change parameters Palette ty	2.86 50 scale hap* lette	
7200		Ok Cand Palette Numbe	type: Uniform r of color points: 2 2 250 Ok Cancel	

- Set appropriate coordinate grid spacing, in meters.
- Note that check boxes marked with * call additional dialogs when selected.
- Press "Change Palette"
- Select "Uniform"

Select Palette by Number

Magnetic map File Edit In	picking verse Options Operat	tions P <u>r</u> ofiles <u>W</u> indow <u>H</u> elp	
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- Use slider to preview and select color scheme you like. Number 33 is recommended
- Uncheck "Equalize colors" box. In many cases it is very useful, but in some not.
- Press "Ok" button to return to the "Common parameters" dialog.

Select data range.

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7000					

- Uncheck "Autoscale"
- Enter "Data min" and "Data max" values. You may try few times to find appropriate scale.
- Press "Ok" button
Map plotted with new colors.



- Here is map plotted with new colors.
- Local anomalies are seen much better now.
- Let's add color scale to the map for presentation purposes.

Adding color scale



- From the context menu, select "Add / Add color scale". This adds color scale to the plot at the mouse location.
- Use mouse to select and adjust color scale (stretch it as needed).
- Select and then right click on the scale to define its parameters (next slide)

Adjusting color scale



- Left click on the color scale to select it. Note that square handles will appear.
- Use handles and left button to adjust size.
- Right click on the scale to call context menu.
- Select "Edit" menu item.



• Adjusted color scale

Adding Lat/Lon grid to the map.

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💏 cut-d	ata-local-2.g	Size Settings	8	.97 x2: 3955	.84 y2:75
		Drawing UTM set Status li Title	s up ~ ne ~		
		Lat/Lon Info	grid		
6600					

- Select map window.
- Select "Options / Lat/Lon grid..." menu.
- Note: for Lat/Lon grid to be correct, you need correct UTM settings. If you are working with different areas and keep data in short UTM, you may need to load correct UTM parameters for your current area (menu Options / UTM setup)

Lat/Lon grid dialog



- Check "Draw Lat/Lon grid" if you want grid to appear.
- Select annotation format (decimal degrees, deg. And minutes, deg., min., seconds)
- Set appropriate spacing. You may need to try few times to get what you want.
- Select color.
- Select what part of the frame to label.
- Select decimal places.

Redraw map to see the grid



- Right click on the map to call context menu.
- Select "Redraw"

Map with Lat/Lon the grid



Let's prepare hard copy.



- To create decent hardcopy, MagPick relies on Ghostscript / Ghostview free Postscript interpreter.
- You will need few tries to make output. To speedup procedure, let's first temporally remove colored map from the window.
- Select "Options / Settings" menu

Remove complex plots

Magnetic m	ap picking Inverse Options Operations Profiles Window Help	
F cut-data	-local-2.grd x1: 2926.63 y1:5968.97 x2: 3955.84 y2:7543.55 6600 Common parameters Field direction: 0.0000 Data min: -1.00 Data max: 1.00	
	Image: Show x grid x: 200 Image: Show y grid Y: 200 Grid color Image: Show y grid X: Image: Show y grid Y: 200 Image: S	
	☐ Show crosses ☐ Contours* ☐ Colored map* ☐ Snap to grid ☐ Show profiles* Change palette	
	Click on (*) items to change feature parameters	

- Uncheck "Contours"
- Unckeck "Colored map"
- Uncheck "Show profiles"
- This leaves coordinate and Lat/Lon grids and color scale alone.

Empty grid



- Here is an empty grid ready to be plotted.
- When we are satisfied with paper layout and scale, we then re-enable all elements to make final output.
- We can convert output to PDF format using Ghostview (below)

Selecting output format

Magnetic map pic	king
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Close All	GeoTIFF
	Postscript
Exit	
Recent Files	
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- Picture can be exported into the following formats:
- DXF (UTM or Lat/Lon)
- Bitmap (BMP) Just a window dump.
- GeoTIFF. Compressed format with ability to georefernce. Also screen dump.
- Postscript vector format can be converted to PDF.
- Select "Postscript"

Postscript setup dialog

Magnetic map picking File Edit Inverse Options Operations Profiles Window Help
Cut-data-local-2.grd x1: 2926.63 y1:5968.97 x2: 3955.84 y2:7543.55 6600
PostScript Export parameters
Paper units: cm 💌 Paper size: Letter 8 1/2 x 11 in 💌
Scale (map units in one paper unit): 1
Orientation: Orientation: Orientation:
Offsets (paper units) X: 1 Y: 1
Output to: O Printer O File O Preview
I Fit paper size X margin, %: 10 Y margin, %: 10
Printer command: Ipr
Preview command: C:\Program Files\Ghostgum\gsview\gsviev
Titles Ok Cancel
18d30.20'N

- Use this dialog to setup page layout and scale. Note that paper size is not related to your printer.
- If "Fit paper size" is not checked, you can set appropriate hard copy scale, such as 10 m = 1 cm on paper.
- "Preview" calls external program (gsview) to preview the result.

Gsview pops up.

≥ Csview	
G5view Registration	
GS view can be registered on and http://www.ghostguan.com.au/ Registered to: Unregistered Number: Ok Register Now Help	
No File Reading	

- This is startup screen of external program, Gsview.
- It is unlimited shareware (use to be free). You may get rid of nagging screen by paying a \$50 fee. Otherwise, program is fully functional.
- Press "Ok" to proceed

Preview of your page

GSview		
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- Here is preview of your page
- Use menu to select paper size.
- Use zoom buttons to see it better.
- Use "measure" function to find distances on paper (in points, mm, inches).
- Refer to the complete Gsview manual for details.
- Close the program when you are done.

Putting color map back.

File Edit Inverse	Options	Operations	. Profiles	Window
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- Let's assume we are satisfied with paper layout. Close
 Gsview and proceed back to MagPick.
- Select menu "Options / Settings". Put all that you need back.

Show profiles and color map

Common parameters		X
Field direction: I Show x grid X: I Show y grid Y: Grid color	0.0000 200 200	Data min: -1.00 Data max: 1.00 Autoscale Wrap color scale
 Show crosses Snap to grid Click on (*) items to 	Contours*	✓ Colored map* S* Change palette

- Check "Show profiles" if you want have then in final printout.
- Check "Colored map" if you want it in final printout.
- Click Ok to get back to the map window.

Go to the picture export again



- Now go to the menu "File / Picture Export / Postscript" again.
- Press "Ok" to proceed to the Gsview screen. It can take longer this time because of the graphics

Convert picture to PDF.

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 In Gsview program, select "File / Convert" item.

Select format to convert.

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- Select "Device" pdfwrite
- Select "Resolution" 600
- Press "Ok" to proceed.
- In the File selection specify full name, including extension PDF.
- You can use Acrobat Reader to read and print PDF files.

Finding Min/Max points on the map.



- Now back to targets. It would be nice to obtain positions of all peaks on the map.
- MagPick has an option for this, called "Auto Max/Min peak."
- Select Auto Max/Min Pick from the "Edit" menu.
- You have to pick minimums and maximums in two steps.

Picking max. points



- Select Pick type Maximum.
- Select minimum value to be picked – all below 0.4 nT are ignored in this example.
- Select max. limit. All above 10000 are ignored in this example.
- Set a radius to reduce duplicate picks. 10 m is in this example.
- Remove any old picks, if any present. Programs asks to save these into a separate file prior to removal.

Auto picking in progress.



• This typically does not take long. Be patient anyway.

Picking results.



- Small black crosses are picks. If you don't see them, go to Options / Settings and make sure "Show crosses" is set.
- You can add them to the target work sheet.

Converting to targets.



- Select "Inversion / Pick into targets" menu.
- This will convert all the picks on the map into targets, add them to the worksheet and remove them from the map.
- You will be prompted to save picks into separate file prior to removal.

Proceed with pick to target conversion?



Results of conversion



- Black crosses are now gone from the map.
- New targets are added into the worksheet.
- They are marked with "G" grid.
- They may not have some information as profiles picked targets are, such as depth, time, amplitudes, etc.

Saving worksheet into file

C Y I'''	nua	l targets sheet					
	Т	X		Y	Z	AMP1	A
1	Ρ	105 58.880460'E	18	3 30.382212'N	9.29	43743.20	43738
2	G	105 59.037580'E	18	3 30.429846'N	0.00	0.41	0.41
3	G	105 58.695022'E	11	Grid functions	200	0.46	0.46
4	G	105 58.888164'E	1	anarancaons	- 00	0.46	0.46
5	G	105 58.615427'E	1	Load	00	0.48	0.48
6	G	105 59.036291'E	1	Delete	00	0.49	0.49
7	G	105 58.928808'E	1	Undo	00	0.50	0.50
8	G	105 59.013702'E	1	Clear all	00	0.51	0.51
9	G	105 58.613751'E	1	Format positions	00	0.53	0.53
10	G	105 58.594479'E	1	Export	00	0.57	0.57
11	G	105 58.612273'E	18	3 30.31 3334 W	0.00	0.61	0.61
12	G	105 58.848955'E	18	30.648200'N	0.00	0.62	0.62

- Use context menu on the worksheet and select "Save".
- You are prompted for file name.
- Save data into this file.
- MagPick uses proprietary ASCII format to store this data.
- To load data into some standard spreadsheet application, use Export into CSV.

Exporting worksheet into CSV

Ma	inua	l targets sheet					
	Т	х	Y	Z	AMP1	AMP2	
1	Ρ	105 58.880460'E	18 30.382212'N	9.29	43743.20	43738.75	
2	G	105 59.037580'E	Grid functions	þ.00	0.41	0.41	
3	G	105 58.695022'E	Land	- p.00	0.46	0.46	
4	G	105 58.888164'E	Load	p.00	0.46	0.46	
5	G	105 58.615427'E	Delete	p.00	0.48	0.48	
6	G	105 59.036291'E	Undo	p.00	0.49	0.49	
7	G	105 58.928808'E	Clear all	0.00	0.50	0.50	
8	G	105 59.013702'E	Format positions	p.00	0.51	0.51	
9	G	105 58.613751'E	Export	0.00	0.53	0.53	
10	G	105 58.594479'E	18 30.383355'N	0.00	0.57	0.57	
11	G	105 58.612273'E	18 30.313334'N	0.00	0.61	0.61	_
12	G	105 58.848955'E	18 30.648200'N	0.00	0.62	0.62	

- Adjust position format in worksheet the same way you want it appear in the spreadsheet application.
- From context menu, select "Export".

Selecting CSV file for export.



- In the file selection dialog, select "Comma separated values" option.
- Assign new or pick existing CSV file.
- Upon saving into file, MagPick calls your default application to handle CSV files. It could me Microsoft Excel or Open Office spread sheet application.

Excel launched by MagPick.

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	1			_	11		10	G	10	05 58.5	944791	E	18 30.3833	355 'N				
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1	Ρ	105 58.880	0460'E	18 30	21	2	20	G	10	05 58.7	77253	E	18 30.5352	276'N				
2	G	105 59.037	7580'E	18 30	22		21	G	10	05 59.0	17209	E	18 30.2472	271'N		-		
3	G	105 58.695	5022'E	18 30	4 4	F	\targ	jets /					•					
4	G	105 58.888	3164'E	18 30	Rea	idy [NUM			- /		
5	G	105 58.615	5427'E	18 30.	5686	38'N		0.00		0.48		0	48	0.00		0.00		
6	G	105 59,038	5291'E	18 30	4032	91'N		0.00		0.49		0	49	0.00		0.00		
7	G	105 58 928	3808'E	18.30	4954	61'N		0.00		0.50		0	50	0.00		0.00		
8	le.	105 50.020000 E		18 30 429428'N			0.00		0.50		0	0.50 0.00		0.00				
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9	6	103 30.013/31 E		10 30.47 37 02 N			0.00		0.55		0.3	0.00 0.00			0.00			
10	6	5 105 58.594479 E		18 30.383355 N			0.00		0.57		0.9	0.57 0.0			0.00		_	
11	IG Ic	5 105 58.612273°E		18 30.313334		34'N	1 U.UO			0.61		0.	J.61 U.UU			0.00		_
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•																		

- Here is Excel window launched by MagPick.
- Adjust Excel spread sheet as you desire.
- Save it into Excel XLS file if you wish.

Add an Outline

Mag	netic map picking		
<u>File</u>	Edit Inverse Op	tions Operations	Profiles \
M cu	Redraw Select	:6.63 y1:5968.97	x2: 3955.84 y
	Simple pick Rectangular pick Auto pick		
_	Auto Max/Min pick Delete pick Delete all picks Zoom		
	Direction		
	Pick profile Set marker Find marker		
	Add	•	