

Vibe Data Processing Tools

Importing Data

GPSQL can import Pelton, Sercel and Tigenav vibe data, either in batch or a file at a time. The user will be asked for the file(s) to import then be presented with a coordinate system selection dialog. In the case of Pelton, it is assumed that the coordinates are WGS84 geographics and GPSQL will transform to local grid. In the case of Sercel, it is assumed the coordinates are in local grid and the corresponding WGS84 geographics are computed. Next, GPSQL will ask whether to compute local heights (Pelton) or WGS84 heights(Sercel) using a selected geoid model.

The field structure of the table of the imported data is the same for the first dozen fields. This includes the familiar Station (text), Station (value), Track, Bin, Descriptor,.... fields. Only when you get past the coordinate and height fields do differences become apparent.

Computing the COG Of Vibe Data

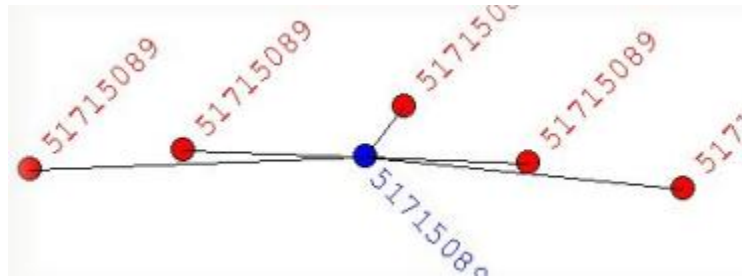
GPSQL has a utility that uses the data of a query and creates or appends a table with records consisting of the position average of all records for each station in the parent table. The table contains the averaged coordinates and values which indicate how many points went into deriving the average and the RMS of the individual distances from each point to the resulting COG.

When creating this average table, the user is prompted for station, easting, northing and height fields in the parent table. All points for an individual station are placed in the averaging routine to compute the COG unless the user want to compute the average of selected sub-groups, and then use those values to compute the final COG. In this case, the user would select the appropriate option on the field selection dialog and select the vibe ID field. Averaging done in this manner will compute the average coordinates for all records which have the same 'vibe id' and then take the resulting coordinates and compute the COG from these.

Note that there are also options for adding fields to the parent table as averaging is done. The added fields display individual distances to the resulting COG and how many points went into computing the COG. This can be useful for subsequent query building and trying to isolate bad duplicate groups. In fact, this can be considered to be a new and useful tool for managing your vibe data. You can query for duplicates which have distances or group member numbers beyond expectations.

The GPSQL/QuikMap Connection

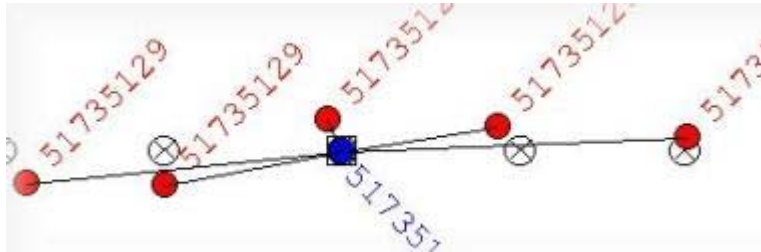
With the parent and averaged table discussed above, you are in a good position to start looking at the vibe data visually. You start by writing queries that represent the imported vibe data and the averaged data (these should exist in two separate tables if you followed along above). Select the imported vibe data query as the first layer and the averaged data query as the second layer and send this to QuikMap using the two layer utility. Once the data is displayed, go to the File menu and select 'Compare/Offsets'. Zoom in and prepare to be enlightened.



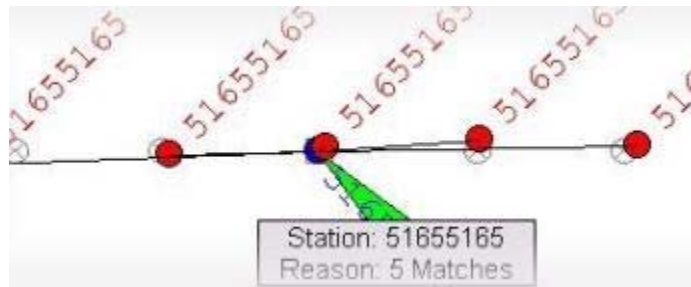
Now the use of the averaged data query as the second layer is valid for visually seeing how many points are 'connected to its COG', but the user might want to see the vibe locations relative to the position surveyed initially by the rover in which case the second query might reference the Postplot table. Just remember that there is no restrictions as to which position you compare the vibe positions to. This can be the COG, Postplot or Preplot.

QuikMap Tools

If you want to overlay the intended relative vibe locations, you can do this by first designing a template. You will find a menu item called 'Template Design' in QuikMap, QuikLoad, QuikView and GPSQL. It allows the user to create a file which indicates a line azimuth and a number of inline and crossline values which indicate the intended relative locations of the vibes around each survey point. Once created, you can use this file in QuikMap to drop a template overlay at each place you click (see below). If you want to selectively remove a template you inserted, there is a new polygon capture tool which removes vector entities within the polygon.



When you compare points as above, if there are multiple matches, QuikMap can construct a special DXF layer which is comprised of pointers to duplicate groups that fail to meet some user criteria. For example, below is a group with a green pointer. Click the pointer and a text box shows what the problem is. For the group below, there are five matches but the user said there should be four.

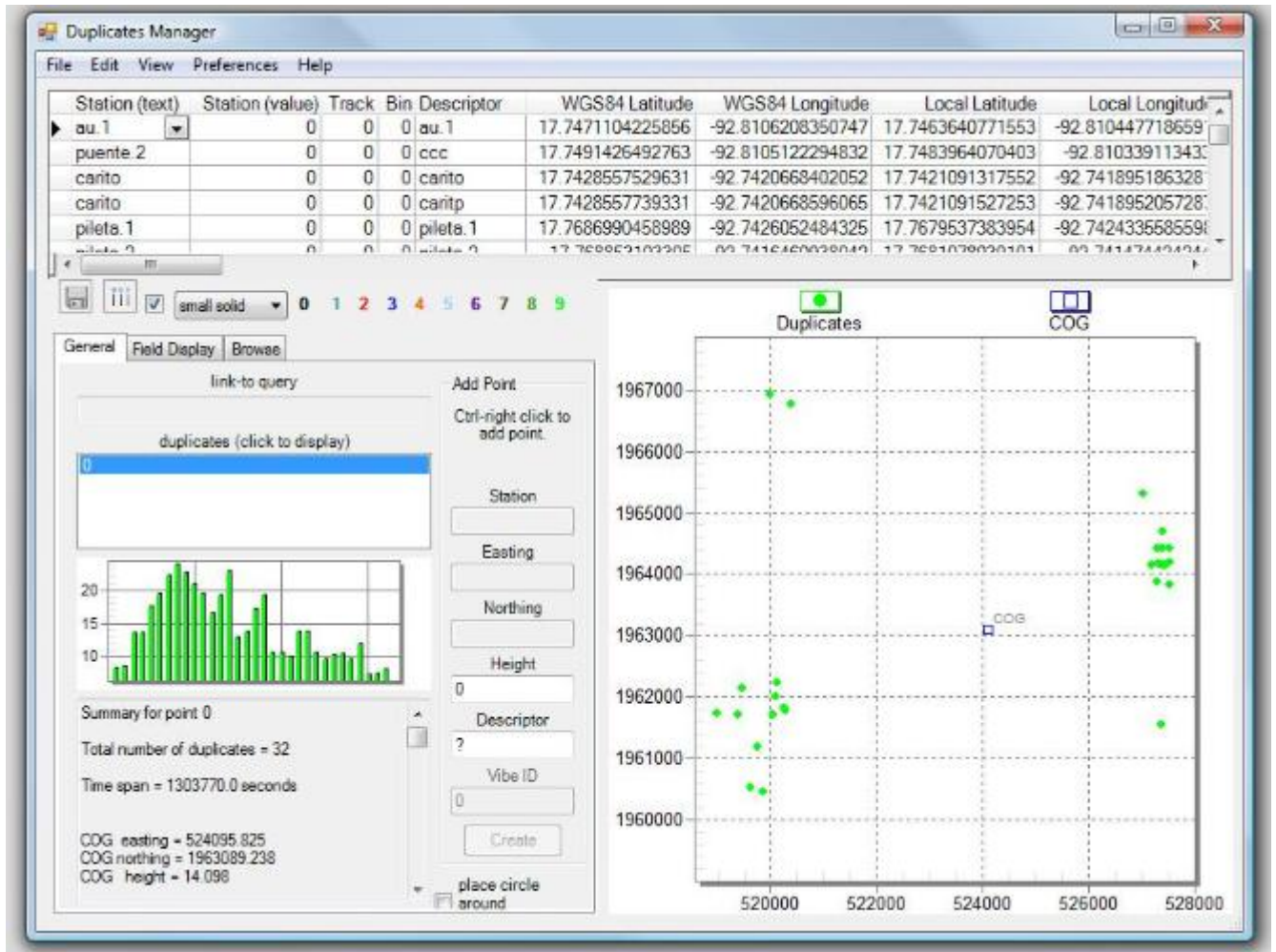


Can you delete points or add points to the database but do this in QuikMap? The answer is Yes, but remember to set the preferences in Project Manager to use databases in shared mode and select the option in GPSQL to let QuikMap actually open the database when sending query data its way. When you set this preference and option, you can delete or add points in QuikMap and then use the Edit menu option to update the database. If you have forgotten, its CTRL-click to create a point and deleting points can be done by polygon capture and use of the appropriate popup menu item.

GPSQL Tools

There is a very effective utility in GPSQL for managing duplicates. This utility can be used to isolate duplicates in a query and see just the points that make up each duplicate group along with a computed center of gravity (COG). It is also possible to see a point with the same station name from another query as well as a template of intended relative vibe locations. While its intended use is to manage vibe data, it can be used to see any duplicates visually.

You start by selecting a query and selecting the 'Manage Duplicates' item in the Modification menu. You will be prompted with the field selection dialog. The first listed field (default is 'Station (value)') is important because it is this field that duplicates are based on. If it is necessary to look at duplicates based on any other field, you must drag that selection to the top of the output list. Also note that if you have selected the option on the Miscellaneous dialog which averages each 'vibe ID' before computing the COG, then this field must be specified too. Once you have selected the fields, it is possible that no duplicates exist based on the field selected. However, if there are any duplicates at all, you will be presented with a dialog and a list of all duplicates in the query. When you click on a duplicate group in the list, a spreadsheet of all points that make up the duplicate group are shown and a 'map' of the points are shown as below.



The actual points are green and the COG is blue. Points are numbered according to their order in the spreadsheet. At the right of the display is a textbox which gives the COG coordinates and a summary of all points relative to the COG. There is a graph of all heights of the currently selected duplicate. Clicking on a height will scroll the spreadsheet to the respective record.

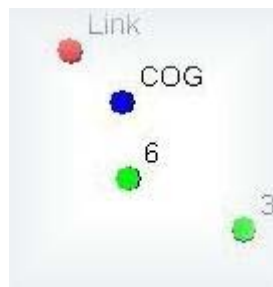
If you click on a point on the map, that point's row will be selected in the spreadsheet. As with other spreadsheets, it is possible to allow modifications and delete one or more rows you have selected. You may also modify easting, northing or height values. As you do, the new values will be reflected in the map and summary. You can add a point by CTRL-right clicking on the map at the spot where you want the point created. This action will display a dialog which lets you modify values should you want. The dialog is initialized with easting and northing but will have a height of zero. You must enter this and any desired descriptor. If you have elected to average using a vibe ID group, you must enter this value as well.

Note for those using vibe averaging - When a point is added, you will see it along with a number indicating its order in the spreadsheet. If vibe ID averaging is being used, this may place it first, last or somewhere in the middle.

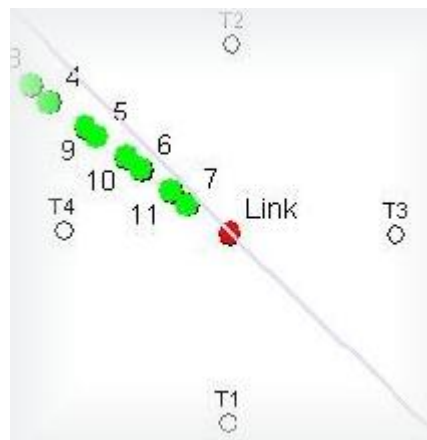
Note for all users - You should probably know a little 'behind the scenes' trick that is being performed. Immediately before this dialog is displayed, a field is created at the end of the table called 'IsADuplicate'. When you add a point, you are guaranteed of seeing it within your query because your basic query is modified (as the utility is being used but not permanently) with the addition of a clause '...Or `IsADuplicate` = 1...'. When a point is added, a '1' is purposely entered in this field so that no matter what your original query is, the utility knows that this new point should also be displayed. That said, the utility deletes this field when the dialog is closed. This means your added points might not be included in your original query. Think about this because it can cause the user to believe the added point has disappeared when in fact, it is just not within the basic query. Example: Lets say your query says something like 'track > 5001'. When you add a point, the track field is left blank so the original query won't work anymore for this added point. You might want to consider adding a descriptor that identifies this added point uniquely, and then modifying your query accordingly.

Linking To A Reference Station - You can display a station from a different query by selecting a query from the dropdown list and pressing the 'eyeball' toolbutton. As before, you are presented the field selection dialog so you may select the station, easting,

nothing and height. When a match is found, you will see it as a red point with the name 'Link'. The summary will now contain Link-to-COG values and Link-to-point values. You can clear this link by pressing the 'grey eyeball' toolbutton. Note that there may be more than one of these stations in the linked query but only the first encountered is displayed.



Using A Template - If you are using the utility for managing vibe data, it is useful to depict the intended relative positions of the vibes around the survey position. When you choose a template file, if there is no Link station, then the template is centered on the COG, but otherwise, it is centered on the Link station. The points of a template are numbered 'T1', 'T2',etc. A grey line is drawn which represents the line azimuth. You can clear the template by selecting the 'reset template' toolbutton.



Summary Of Vibe Data Processing Tools

- 1) import utilities for Pelton, Sercel and TigerNav in GPSQL
- 2) ability to create table of averaged data in GPSQL
- 3) ability of QuikMap to add template overlays
- 4) ability of QuikMap to add diagnostic DXF layer for multiple comparisons
- 5) duplicate managing utility in GPSQL