

## TUTORIAL

A chip database is a collection of image chips or subsetting images where each image has a GCP associated with it. A chip database can be useful when orthorectifying different images of the same geographic area. ChipMan is an image chip database engine which stores, updates, and retrieves image chips. Its major purpose is to efficiently collect ground control points on raw imagery. Having a chip database eliminates the need to repeatedly collect the same GCP's on imagery of the same area.

The PCI Geomatica software allows for a chip database to be created using ChipMan and for the use of a chip database to collect GCPs in OrthoEngine. The process flows for these two tasks are outlined in this QuickGuide.

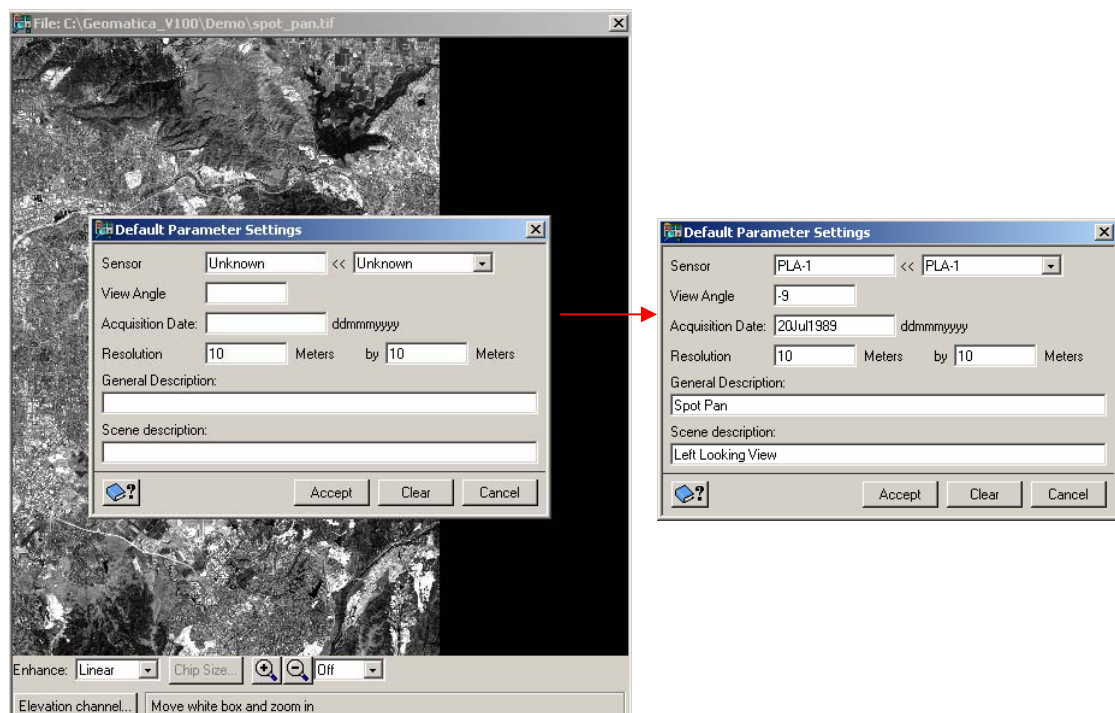
### I) Collecting Chips using Chipman

1. Launch ChipMan from the Geomatica Toolbar.



2. To set up the data for chip collection, perform the following tasks in the Chip Manager panel:

- Go to **File > New** to start a new chip database (\*.cdb) and assign a name to the database.
- Go to **File > Source Image** to select a source image that will be used to collect the chips from. After the source image is shown, specify the sensor parameters. If an orbital segment is available, the sensor parameters would be automatically extracted.

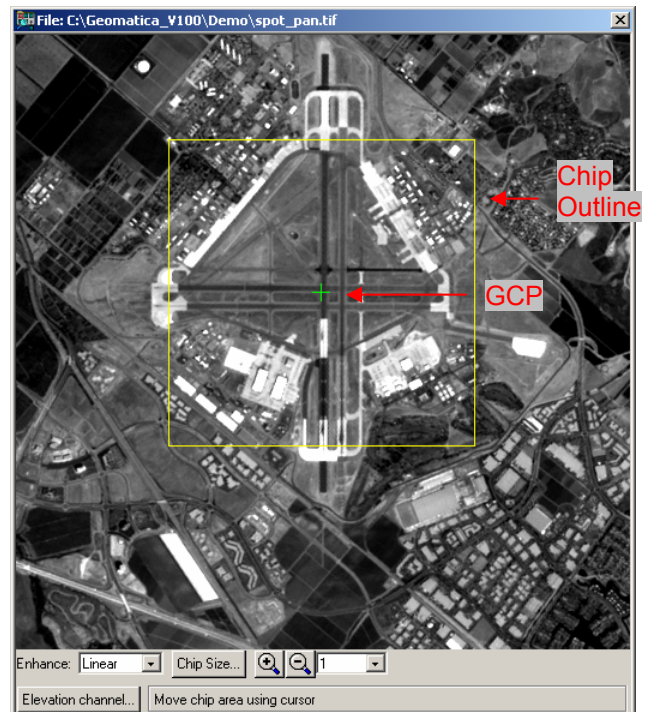
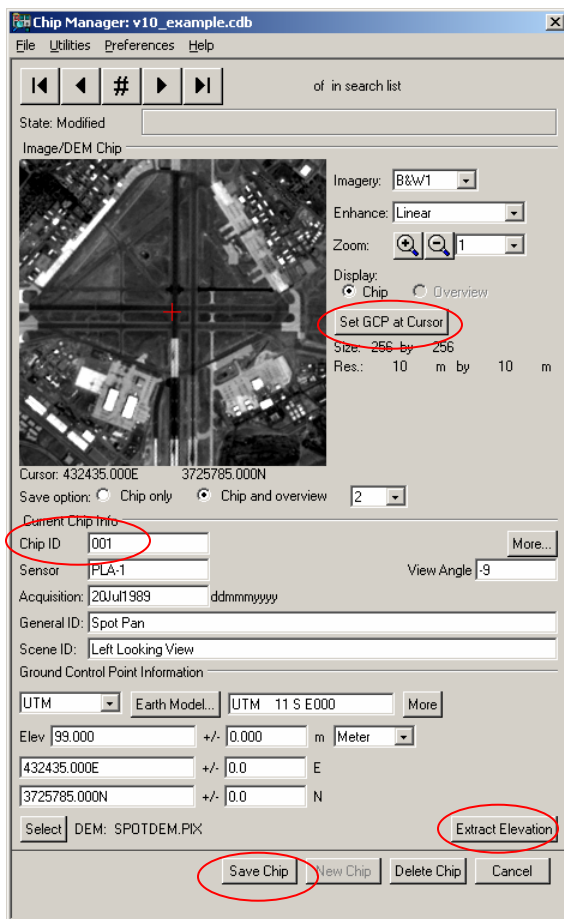


- Click on the **Select** button to browse to a DEM from which elevation is extracted for each chip

3. With the source image and DEM loaded, chips can be collected as follows (reference diagrams are below):

- Click on the **New Chip** button at the bottom of the Chip Manager panel.
- In the Current Chip Info panel, enter a unique value as a Chip ID.
- On the source image, zoom in and click on the location of the first chip. A yellow outline on the source image shows the outline of the chip to be collected.
- The location of the GCP (cursor location) can be changed in the Image/DEM Chip view in the Chip Manager panel.
- Once the chip and GCP locations are correct, on the Chip Manager panel, click on the **Accept GCP from Cursor** button, then the **Extract Elevation** button. Finally, click on the **Save Chip** button.

**Note:** click on the New Chip button every time a new chip is generated. Otherwise the information collected on the previous chip will be overwritten.



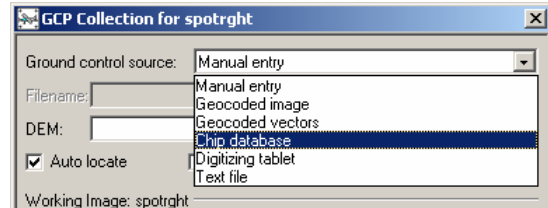
4. Repeat step 3 to collect the remaining chips. To add chips from another image, change the source file under File > Source Image and repeat the above steps.

## II) Using Chips to Collect GCPs in OrthoEngine

In the GCP Collection step in an OrthoEngine project, open the working image and then click on the [Collect GCPs Manually](#) or [Collect GCPs Automatically](#) button.

### Manual Collection of GCPs:

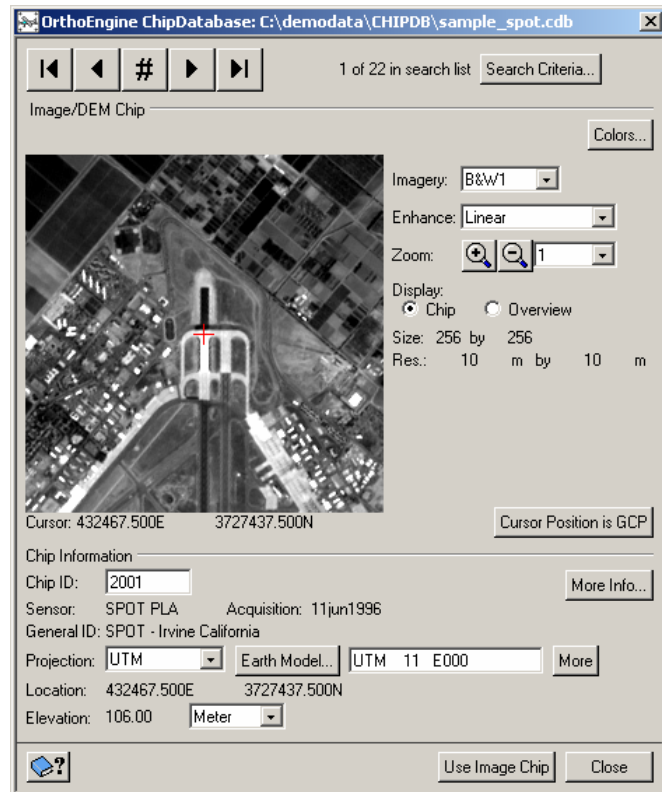
1. In the GCP Collection Panel, select Chip Database as the ground control source. Afterwards, select the chip database (.cdb). The OrthoEngine ChipDatabase panel will then be shown. Specify a DEM if applicable.



2. In the OrthoEngine ChipDatabase panel, navigate to the chip which would be the source of GCPs.

There are several options for navigating a chip database:

- 1) click on the # button and type in the Chip ID in the subsequent window
- 2) use the scroll arrows
- 3) type in the Chip Id in the Chip Information section
- 4) click on the [Search Criteria](#) button to reduce the number of chips for selection



3. Although the GCP is located at the centre of the chip, it is possible to change the position of the GCP to another location inside the chip. To do so, click on a new point in Image/DEM Chip Viewer of the OrthoEngine ChipDatabase panel and then click on the [Cursor Position is GCP](#) button.
4. Once the desired GCP location is specified, click on the [New Point](#) button in the GCP Collection panel. Then click on the [Use Image Chip](#) button in the OrthoEngine Chip Database panel.
5. The area in the Chip Viewer will be shown in the OrthoEngine Viewer. Click on the [Use Point](#) button in the OrthoEngine Viewer to enter the image pixel and line values for that GCP. The point information section in the GCP Collection panel will be updated.

- Click on the [Accept](#) button to save the GCP.
- Repeat steps 2 to 6 until all the desired chips have been entered GCPs. After GCP collection has been completed, close the GCP Collection panel.

Note: select Compute Model to view the computed residual values.

### Automatic Collection of GCPs:

- In the GCP Collection panel, select Chip Database as the control source and select the chip database file. The available chip IDs will be listed in the Chips section of the panel.

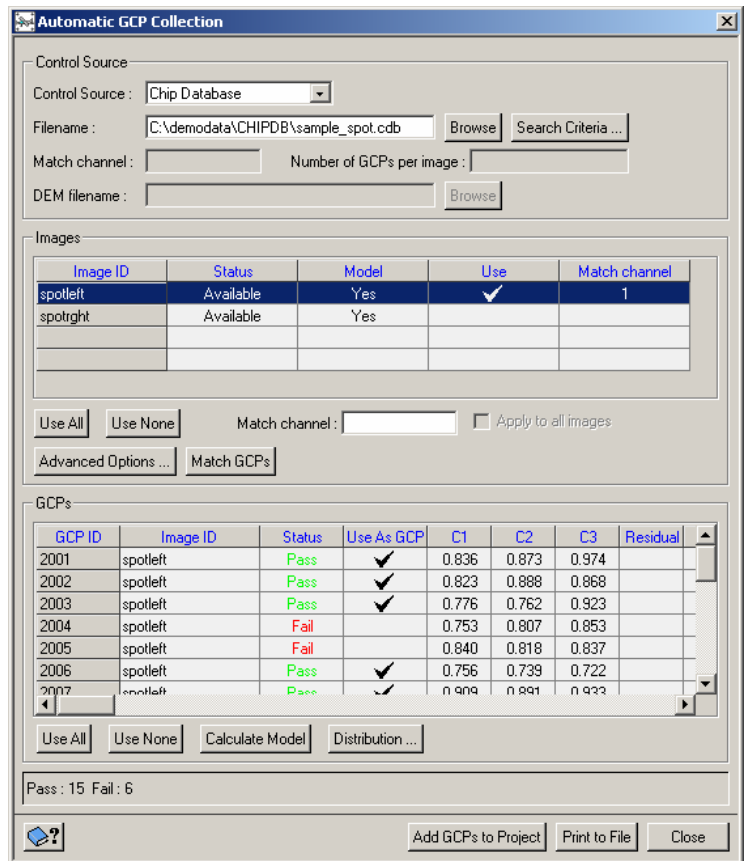
- In the Images section of the panel, click in the appropriate cell under the [Use](#) column to specify the uncorrected images.

Only images with an “Available” status and a computed model (“Yes” under Model) can be selected.

The Match Channel parameter is for specifying the channel of the uncorrected image that the chips are to be matched to. This channel would then have to be similar to that of the imagery from which the chips were collected.

For example, if the chips were collected on imagery that is between 0.4µm and 0.5 µm, then the Match Channel would be the one that has the closest spectral range. As such, it is not possible to achieve good match results if radar chips were applied to multispectral imagery.

- Click on the [Match Chips](#) button to start the matching process.



- Once the matching is completed, the table in the Chips section will be filled. The Status column indicates whether the chips were found in the uncorrected image based on the Correlation Thresholds set (C1, C2, C3 columns). A “Pass” signifies that the chip can be found in the image. A high correlation threshold value (i.e. close to 1) shows that there is a good match between the chip and the image. A “Fail” signifies that the chip could not be located in the raw image.

Below are suggestions for improving the status from Fail to Pass:

- i) Change the Correlation Thresholds: go to Advanced Options and decrease the values. Correlation Threshold is the desired level of similarity (or correlation) that is between the chip and raw image. A high correlation would lead to fewer chips matched. Please note that very low threshold values would not be useful.

The C1 (coarse), C2 (intermediate) and C3 (full) parameters refer to the resolution that the raw image is compared to the chip.

- ii) Use another Match Channel.
  - iii) Larger chips may be difficult to match. Since the default size of a chip is 256x256, the size can be reduced to 64x64.
  - iv) The resolution difference between the chip database and uncorrected imagery may be too great which would reduce the number of matched chips. It is recommended that there is less than 4x difference between the chips and raw image.
5. Once the desired chips are successfully matched (Pass), click on the [Use as GCPs](#) button to store the GCPs for the project.