

# GC-Prevue/ GC-PrevuePlus Demonstration Guide

<b>Introduction .....</b>	<b>3</b>
<b>Recommended System Configuration.....</b>	<b>3</b>
<b>Symbols and Hints to using the Guide .....</b>	<b>3</b>
<b>Files required for using the Guide .....</b>	<b>3</b>
<b>Chapter 1: Basic Navigation .....</b>	<b>4</b>
Loading a GWK.....	4
Saving .....	4
Navigation – Zoom.....	4
GC-Explorer.....	5
View/Hide/Edit.....	6
Selecting Data .....	6
Query and Status Bar .....	8
<b>Chapter 2: Loading Gerber data .....</b>	<b>10</b>
Importing Gerber data.....	10
Aligning Data .....	12
<b>Chapter 3: Editing data (GC-PrevuePlus only).....</b>	<b>13</b>
Measure .....	13
Editing Data.....	14
Deleting Data.....	15
Step and Repeat / Panel Array.....	15
Advanced Scan and Replace .....	16
Exporting Data.....	17
<b>Other GraphiCode products .....</b>	<b>19</b>
GC-Services .....	19
GC-PowerPlace.....	19
GC-PowerStation .....	19
GC-CAM Edit.....	19
GC-PrevuePlus .....	19
GC-Prevue.....	19
<b>Copyright .....</b>	<b>20</b>
<b>Trademarks .....</b>	<b>20</b>

## Introduction

GC-Prevue is GraphiCode's industry leading Gerber viewer. PCB designers, fabricators, OEMs, and contract manufacturers use it worldwide. It has provided outstanding value for literally hundreds of thousands of users since its initial release over 10 years ago. Much copied, but never bettered, GC-Prevue is still the tool of choice for viewing Gerber.

In response to many enquiries from GC-Prevue users, GraphiCode has added simple editing tools, enhanced measurement tools, and outputs to GC-Prevue to create GC-PrevuePlus. Borrowing tried and tested functionality from our CAM product (GC-PowerStation), GC-PrevuePlus now allows you to make changes to the Gerber data, output updated information, convert from Gerber to Extended Gerber, import Autocad DXF/DWG files, and make major or minor changes to your data.

You will discover as you navigate through the demonstration guide that both GC-Prevue and GC-PrevuePlus save you time and money. The software allows you to view many different flavors of Gerber, catch and fix errors in the data, and translate customer data into more useful formats.

If you have any questions at any time throughout this demo, please call your authorized GraphiCode reseller. If you have obtained this Demonstration Guide from GraphiCode directly, please call 425-672-1980 or email us at sales@graphiccode.com.

## Recommended System Configuration

This demonstration guide assumes users have a working knowledge of MS Windows.

400 MHz Pentium or equivalent preferred  
Windows XP, 2000, NT (4.x), 95 or 98: NT or 2000 preferred  
64 MB RAM min. 256 MB preferred  
2 GB+ hard disk  
Windows accelerator video card with 2MB or more video DRAM  
17" or larger monitor, 800x600 or greater resolution

## Symbols and Hints to using the Guide

This symbol > represents "find and select".

All menu options are displayed in ***Bold Italics***

Example: Choose ***File > Import*** means choose File from the main menu then select Import.

## Files required for using the Guide

General Navigation.GWK  
Silkbot.gbr:  
Bottomside.gbx  
GC-conv-aper.zxz  
Top mask.gbr

Aperture.rep  
Silktop.gbr  
Topside.gbx  
Bottom mask.gbr  
Ncdrill.drl

# Chapter 1: Basic Navigation

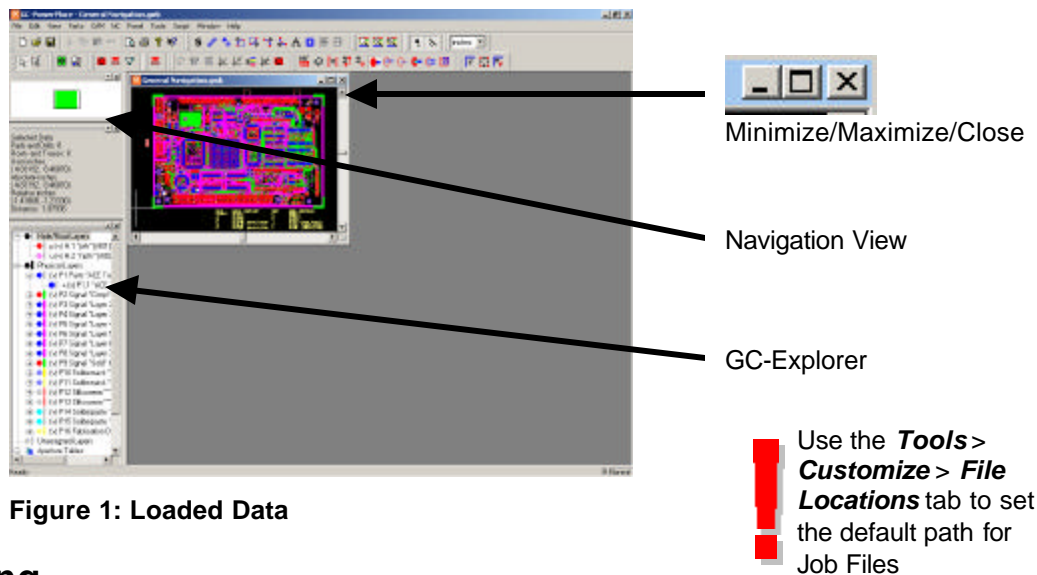
## Loading a GWK

All GraphiCode products (GC-PowerPlace with Test, GC-PowerPlace, GC-PowerStation, GC-CAM Edit, GC-PrevuePlus and GC-Prevue) save data in the GWK file format. This file format is backwards compatible and allows information to be easily transferred. A GWK file can contain printed circuit board layers, names, aperture lists, drill lists, BOM, editing changes, and feature settings. For this first lesson we have already loaded the raw Gerber data files for you and saved the information in a GWK file – later lessons will deal with loading many different types of Gerber and Drill information.

We will now spend a little time learning the major areas of the software by loading a GWK file and performing some simple tasks.

1. Start GC-Prevue or GC-PrevuePlus
2. From the main menu choose **File > Open**
3. Use the file picker to navigate to the directory where you uncompressed the zipped demonstration guide.
4. Select the General Navigation.GWK then select **Open**

A graphical representation of the physical board appears on screen (see Figure 1).



## Saving

Any changes made to the GWK can be saved by selecting **File > Save** (to save an updated version of the current file) or by using **File > Save As...** (to rename the updated file).

## Navigation – Zoom

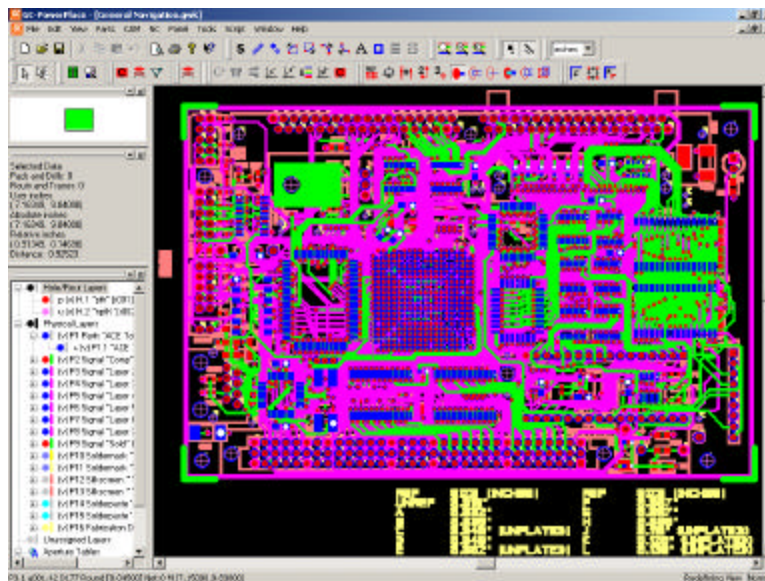
On many occasions, you will want to enlarge or reduce an area of the board for better viewing. Let's experiment with the zoom features of GC-Prevue or GC-PrevuePlus.

1. Figure 1 highlights Navigation view. This window gives a bird's eye view of the current graphical display with reference to the data extents.
2. Click on the Maximize button to maximize the current graphical window. Note how the Navigation View updates.
3. Click the right mouse button to obtain a list of options and choose **Zoom to Extents** (see Figure 2).



**Figure 2: Right mouse button menu**

4. The displayed data is then automatically fitted within the current graphical window. Zooming to Extents will always display the current visible data within the window at the lowest zoom level.
5. To zoom in, drag a window with your left mouse button around the area you wish to investigate. You will then see a pop-up menu that allows you to **Zoom In**. (The **Zoom to Window** option creates a new window at the new zoom and is best seen when graphical windows are not maximized).
6. To zoom out, click the right mouse button and select the **Zoom Out** option.
7. To zoom to the previous zoom level, click the right mouse button and select the **Zoom Previous** option.
8. If your mouse has a **mouse wheel**, rolling the mouse wheel away from you will zoom in and towards you to zoom out.
9. Continue to experiment with the zoom features. Note: For users of GC-Prevue v8.x or earlier you can still double right click to zoom out if you change the setting in **Tools > Customize > Edit** dialog.
10. All Zoom features can also be located under **View > Zoom** along with current hotkey settings.
11. When you are finished exploring, choose **Zoom Extents** to mirror Figure 3



**Figure 3: Zoom Extents**

## GC-Explorer

The GC-Explorer window contains information about all layers in the GWK file. Layers are divided into three distinct types.

1. Holes/Routs – These layers represent any drill holes or rout path information
2. Physical Layers – These layers represent the physical layers of the board and have a layer type definition. Physical layers can consist of one or many data layers allowing the combination of positive data and negative 'scratch' data within a single layer.
3. Unassigned layers – These layers are all remaining layers either not assigned as Physical Layers or layers not necessary to prepare an assembly program.

The properties for any layer can be viewed by double clicking the layer in the GC-Explorer window. They can also be viewed by selecting the layer with the left mouse button and clicking the right mouse button and selecting **Properties**.

1. Select the Physical Layer P2 “Comp” top with the left mouse button
2. Click the right mouse button and select **Properties**.
3. The Properties tab is displayed
4. You can see that the properties for a Physical Layer include such attributes as Layer Name, Layer Type, Side, Layer Colors, and Visibility. Feel free to change some of the properties, select **Apply** and note their effect in the GC-Explorer window.
5. The GC-Explorer list in the left pane of the dialog allows other layers to be selected and changed as required.
6. Select **OK** to come out of the GC-Explorer dialog.

## View/Hide/Edit

One attribute that is very useful to change is the Visibility Status of a layer. Layers can be edit-enabled (edit), hidden (hide) or visible (view). These different settings provide security by enabling you to only change layers that are edit enabled. If a layer’s status is set to view or hide, data on that layer cannot be edited.

1. Select **View > Layers > Hide All**. You will see all data disappear from the graphical window and all layers in the GC-Explorer window will now have the (h) status indicating they are hidden.
2. Now we will set Physical layer P2 to Edit status in preparation for editing. Select the Physical layer P2 using the left mouse button and then use the right mouse button to give the drop down menu and then select Edit. You will now see the GC-Explorer name is now shown in **bold** with the (e) attribute indicating Edit enabled status. The graphics screen will not refresh until you click back in the graphics window as this allows you to set the View/Hide/Edit status of other layers without having to wait for redraws.

You may have noticed that the hotkey for setting a layer’s status to edit-enabled was E (V for View and H for Hide) so now try experimenting by selecting a layer in the GC-Explorer and using the hotkey to rapidly set layer visibility.

3. Also try setting layer visibility when the Physical Layers branch is selected (as shown in Figure 4). You will notice that the change applies to the parent and the children (see Figure 5).

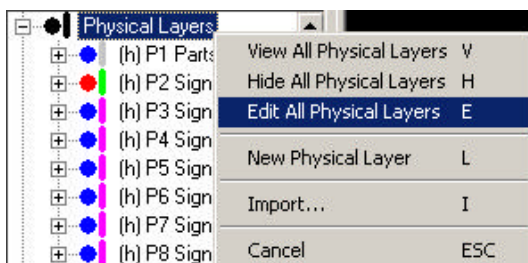


Figure 4: Highlighting the Parent

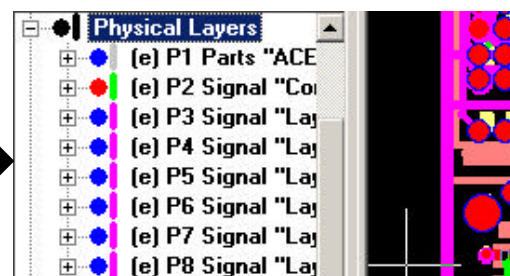


Figure 5: All Physical layers in Edit

4. After gaining a better understanding of how Hide/View/Edit status is controlled, Select **View > Layers > Hide All** to hide all layers and then make Physical layer P2 Editable by selecting that layer and hitting the Hotkey ‘E’.

## Selecting Data

Many functions within GC-Prevue or GC-PrevuePlus work with data that has been selected. This allows certain features on a layer to be worked upon without affecting the other data on the layer. Selection of data can only occur on a layer that has edit-enabled status set. We will now investigate some methods of selecting data – based on having all layers in the Hide mode EXCEPT for P2, which is in Edit mode.

1. Choose **Edit > Select All**. The data should turn White indicating that the data is selected. Note also that the Co-ordinate Summary Window indicates the number of Pads and Drills and Routs and Traces selected (see Figure 6). This is always a useful place to check to ensure that data is not unintentionally selected.

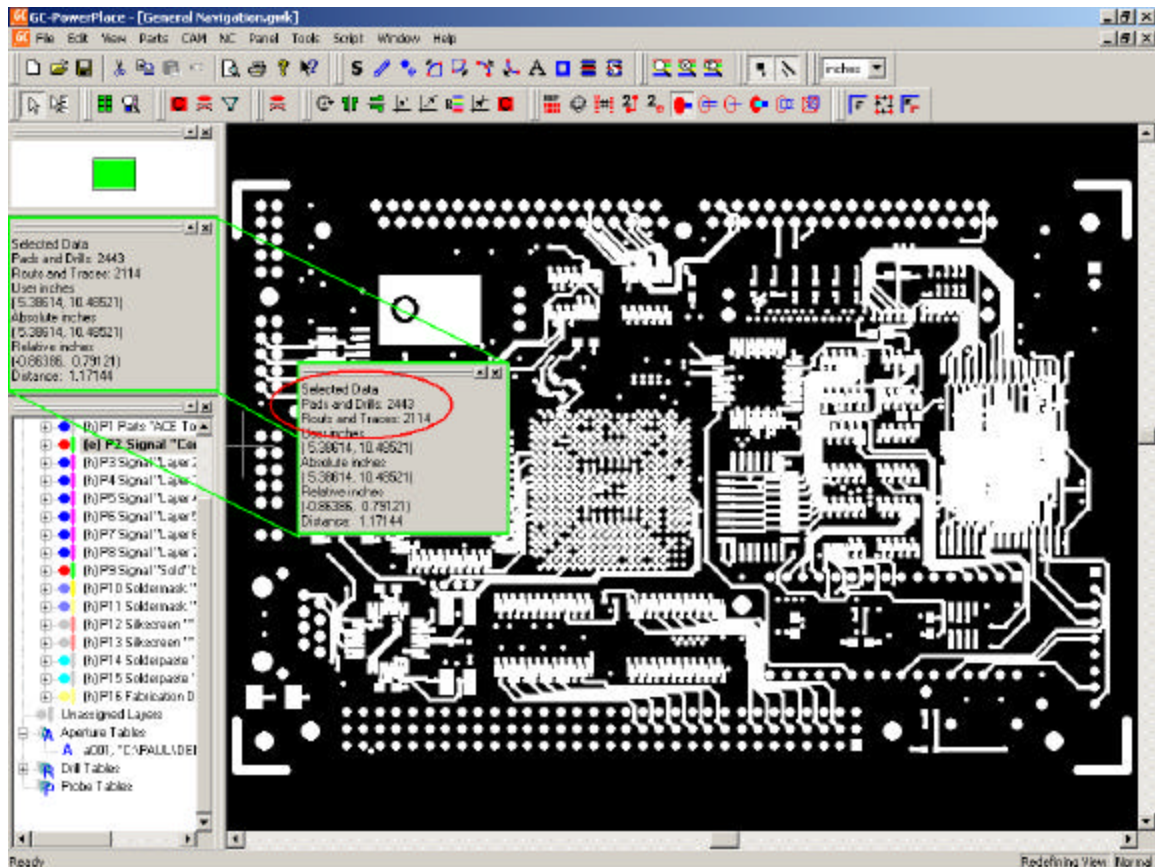


Figure 6: Co-ordinate summary

2. Zoom in on a selected area (see the preceding section for how to zoom in) and we will look at unselecting and reselecting data. Ensure that a number of entities (pads and traces) appear large enough on screen so that it is clear when the crosshair is positioned over an entity.
3. Now use the Left mouse button to deselect a currently selected entity. You can reselect the feature by using the left mouse button. The left mouse button toggles the selection of data in an edit-enabled state.
4. Holding down the Control button while selecting with the left mouse button will deselect all data prior to selecting the entity under the cursor. This is a quick method of ensuring that the selected data is the only entity selected.
5. To select an area, drag a box with the left mouse button and either choose the option **Select Touching** or **Select Inside**. The Select Touching option will select data that is both completely or partially within the box. The Select Inside option will select data that is completely within the box. The same also applies to the **Unselect Touching** and **Unselect Inside** options.

**!** Use the **Tools > Customize > Edit** tab to turn off left mouse button selection if you prefer

- After experimenting with the above methods of selecting, choose **Edit > Unselect All**. You should have zero values in the Co-ordinates Summary window for selected data.
- Now move your cursor over an entity and click the right mouse button. Choose the **Select this Tool** function. A tool simply refers to an entry in an aperture or drill table. Any occurrence of this tool should be selected. (If this is not the case make sure that the cursor and the crosshair are joined by hitting the space bar).

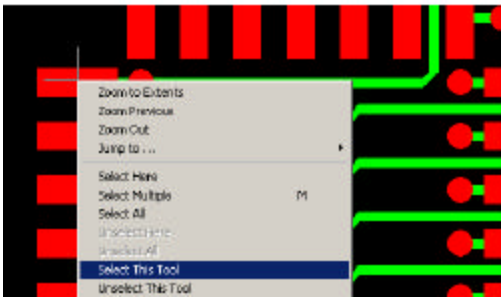


Figure 7: Select This Tool - Before

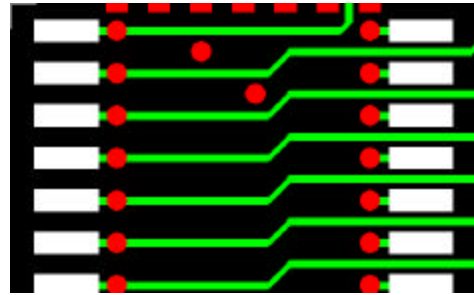


Figure 8: Select This Tool – After

- The **Unselect this Tool** function can be used in the same manner.
- The **Edit > Select > Filter Selection** option also allows for entities to be selected or unselected based on size, shape, D-Code.
- When you are happy with the idea of selecting and unselecting data choose **Edit > Unselect All**.

## Query and Status Bar

It is often useful to know some of the information about an entity such as D-Code, size, shape, and position as well as reference designator, part number, and package type. GC-Prevue or GC-PrevuePlus provides that information in a quick and easy-to-understand way.

- Simply move your crosshair over the entity that you wish to investigate.
- View the Status bar along the bottom edge of the application (see Figure 9) to find out information about that entity including Layer, Aperture size and Shape, Position, Part Number, Reference Designator and other useful information. Note, the information varies with the type of entity being investigated (Pad v Trace v Drill v Part)

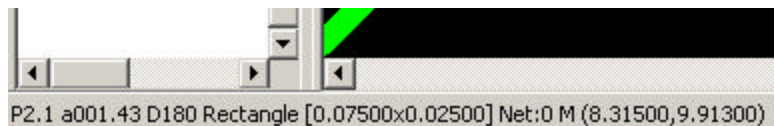


Figure 9: The Status Bar

- If multiple items need to be investigated then the Query function can be used. The Query function works on selected data so make sure that a number of items are selected.
- Select **Tools > Query** and the Query window will appear (see Figure 10)
- The list of selected items is shown along with a graphical window showing the item, the navigation view and the Properties of the current item. Pads, Traces, and Parts are separated and displayed by making a radio button selection in the bottom left corner.
- Features such as Auto Zoom and Zoom In and Zoom Out make changing the graphical view straightforward. Auto Zoom makes the transition from viewing large objects to small objects easier.

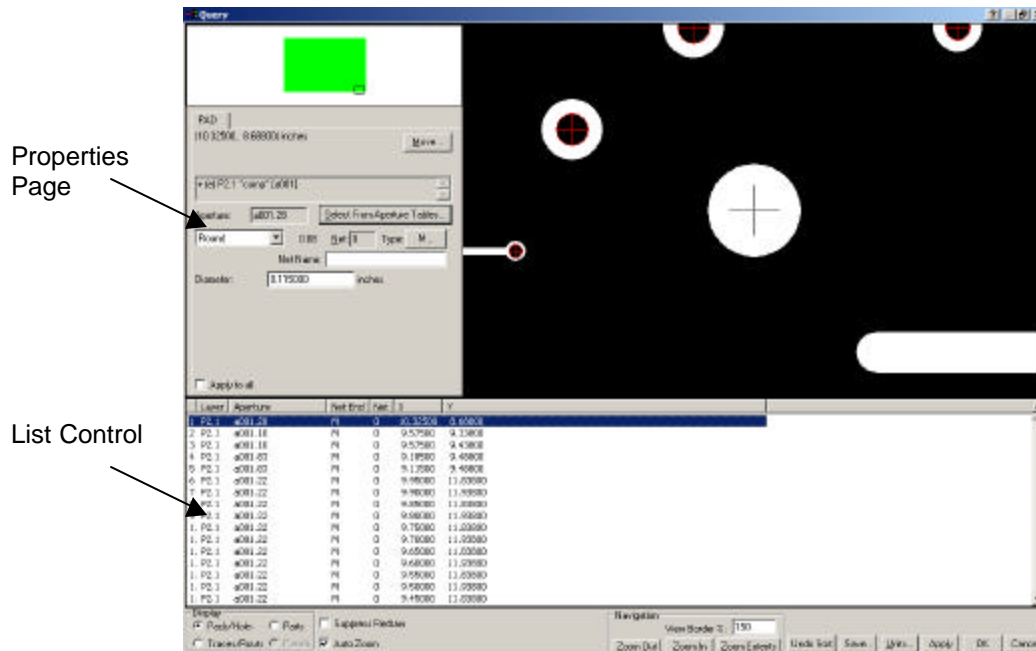


Figure 10: The Query Window

7. The Properties page can be used to change information associated with the entity.
8. To close Query select the **OK** button.
9. You can now Close this GWK dataset (without saving) in preparation for loading some Gerber files and performing edits (if you are using GC-PrevuePlus). Select **File > Close** and select **No**.

## Chapter 2: Loading Gerber data

### Importing Gerber data

The dataset that we will use to illustrate many of the features of GC-Prevue or GC-PrevuePlus has been adapted to include some RS-274-X files (Extended Gerber), some RS-274-D files, some aperture lists that convert automatically, an aperture list that needs manual conversion, and some drill data. Gerber data will normally arrive in a consistent format for each job and it is important to understand that this dataset is purely meant to illustrate each of the common file types you may encounter.

1. From the menu choose **File > New**
2. From the menu choose **File > Import**
3. The standard Windows file picker dialog appears. Navigate to the directory where you uncompressed the zipped demonstration guide. Select the following files using the standard Windows selection techniques of using the Control button and/or Shift button:

Aperture.rep: A recognized aperture format  
Silkbot.gbr: Bottom silkscreen Gerber file (uses Aperture.rep)  
Silktop.gbr: Top silkscreen Gerber file (uses Aperture.rep)  
Bottomside.gbx: Bottom Signal Extended Gerber file (apertures embedded in file)  
Topside.gbx: Top Signal Extended Gerber file (apertures embedded in file)  
GC-conv-aper.zxz: Aperture File that requires conversion  
Bottom mask.gbr: Bottom soldermask Gerber file (uses GC-conv-aper.zxz)  
Top mask.gbr: Top soldermask Gerber file (uses GC-conv-aper.zxz)  
Ncdrill.drl: Drill file

4. Hit **Select** when you have selected the required files. The program now automatically recognizes file types and formats.
5. You will see the Import – Verify File Information dialog. You will notice that all file formats except for the GC-conv-aper.zxz file have been reported as successfully recognized. You can alter the width of each column by dragging on the column header.
6. In order to convert this unrecognized aperture format we select from the Drop-down list that is accessed through the down arrow in the File Type field (see Figure 11) and choose Aperture List.

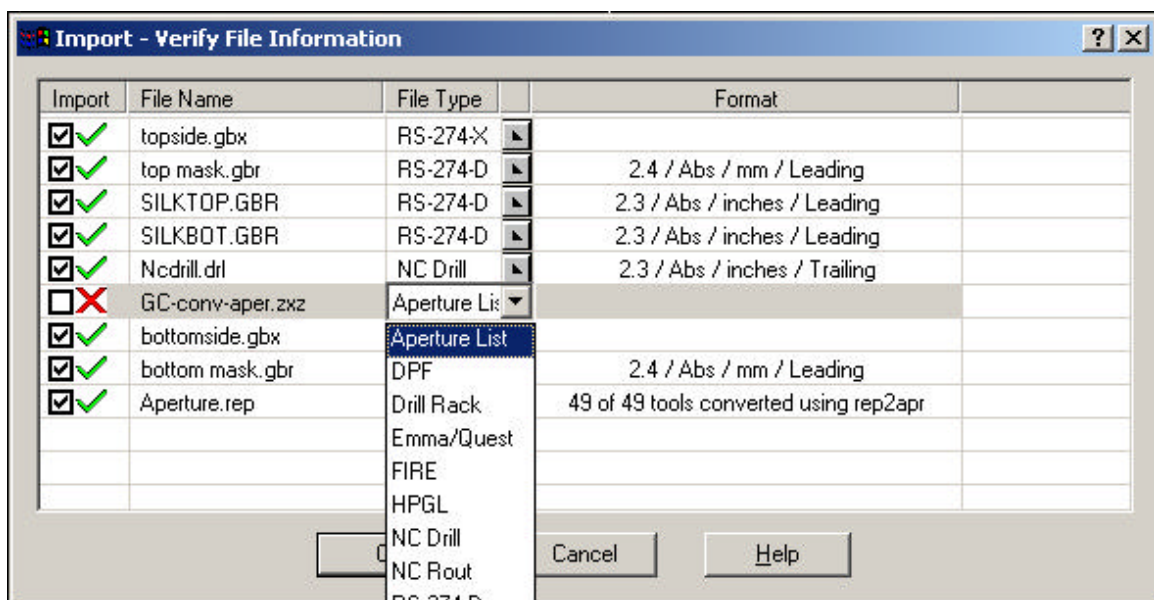
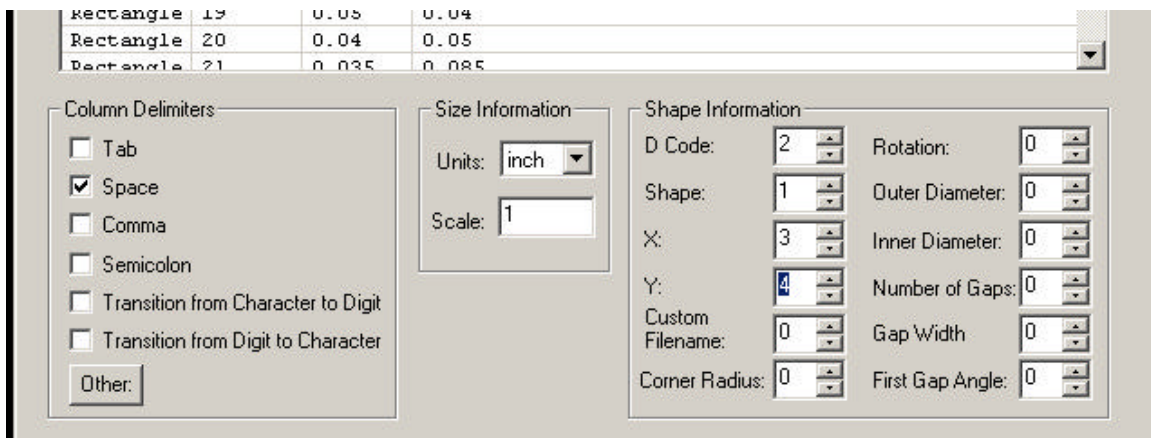


Figure 11: Verify File Information

7. When the format is chosen, the Tool Table Assistant is automatically started, and the file is interrogated to see if its format matches an existing format. If the match is successful then the conversion is reported in the same way as the Aperture.rep file. If conversion is unsuccessful, the Tool Table Assistant is displayed.
8. The File Type is set to Aperture Table by virtue of your choice from the drop down list. Original data type is set to Delimited (some character or whitespace delineates different fields). Change the Start Import at row: field to read 5. Select Next.
9. Enter the values (as shown in Figure 12) to correctly assign different fields to their correct value. The delimiter in this case is whitespace (i.e. whitespace separates different fields) and the field number for each value can be easily be seen. Take care to ensure that units are correctly set to inches.



**Figure 12: Tool Table Assistant**

10. Select Next.
11. The next dialog allows the assignment of GraphiCode standard aperture shapes to the keywords used in the aperture file. In this case, descriptions are clear and there is nothing to change. Select Next.
12. The final dialog allows the format information just entered to be memorized and re-used on further aperture files of this format (use the Memorize button). For this demonstration we will not do this but rather simply select Finish. You are then prompted to save the converted file as an external file (can then be re-input at any time without requiring conversion). Select No and you will be returned to the File Verify File Information dialog but now you will see that the GC-conv-aper.zxz now has a Green Checkmark next to it and the 35 tools have been successfully converted.
13. GC-PrevuePlus users also have the option to Import DXF and DWG file formats using the File Import menu item. Select **OK**.
14. The Assign Tool Tables dialog appears. This dialog is used to assign an aperture table to the file that requires it. In this example, we have two aperture lists, each used by two Gerber files, two files (the RS-274-X extended Gerber files) which generate their own aperture tables and a Drill file (which generates its own Tool table). Again, use the drop down box to correctly assign the aperture tables. The files Silktop.gbr and Silkbot.gbr need to use the Aperture.Rep file and the Top mask.gbr and Bottom mask.gbr need to reference the GC-conv-aper.zxz file. All other layers are fine as they are. See Figure 13.

File Name	File Type	Tool Table
topside.gbx	RS-274-X	New Combined Aperture Table
top mask.gbr	RS-274-D	a001, "D:\1_prevue_import\GC-conv-aper.zxz"
SILKTOP.GBR	RS-274-D	a002, "D:\1_prevue_import\Aperture.rep"
SILKBOT.GBR	RS-274-D	a002, "D:\1_prevue_import\Aperture.rep"
Ncdrill.drl	NC Drill	New Drill Table for Ncdrill.drl
bottomside.gbx	RS-274-X	New Combined Aperture Table
bottom mask.gbr	RS-274-D	a001, "D:\1_prevue_import\GC-conv-aper.zxz"

**Figure 13: Aperture Table Assignment**

15. Select OK and the layers will start to load and you will see layers being created in the GC-Explorer area. Once loading is completed, you will see the File Import Result Dialog.
16. There are three tabs: File, Errors, and Tools.
  - a. File Tab – Double paned properties page, the right side of which allows you to name the layer, set the layer type, change the pad and trace colors for the layer, and change other properties of the Physical layer.
  - b. Errors Tab – Lists any problems with any of the layers loaded. For example, any calls within the Gerber file for an aperture that is not present in the used aperture list will be shown in this tab.
  - c. Tools Tab – Shows the Aperture Table or Drill Table that is being used by the layer being investigated.
17. Select **OK** when you are ready to continue and you will see the loaded Gerber data on screen ready for the next section of the demonstration.

## Aligning Data

You will notice that the Drill layer is misaligned with the Gerber data. We will now move the Drill layer to align with the Gerber files, thus correcting the problem. GC-Prevue allows the movement of the entire layer, whereas GC-PrevuePlus allows the movement of individual entities or groups of entities. This section of the demonstration guide offsets the entire drill layer.

The layer(s) to be offset must be in Edit mode and must also have data selected. As GC-PrevuePlus can offset individual features that are selected, we will select the entire layer. GC-Prevue will offset the entire layer even if only one pad/trace is selected on the layer.

1. Select **View > Layers > View All**.
2. Now set the drill layer (H.1) to Edit status in preparation for offsetting it to the Gerber data.
3. Click back in the Graphics Window, right click and **Select All**.
4. Move the cursor and crosshair near to a feature that will be the reference point (this will be a drill hole that can be aligned to a reference point on one of the other layers).
5. Use the Jump Nearest feature (located in the Edit Menu - hotkey is "S"). This will jump your cursor to the nearest feature. Then Zero Relative (located in the Tools menu - or hotkey "Z"). This sets your Relative Zero coordinates to 0,0. The Relative distance now displayed in the Co-ordinate Summary dialog measures the position of the crosshair from the zero position. The zero position is the center of the drill hole. If we move our crosshair to the center of the pad upon which this drill hole needs to be placed, we will know the distance to be moved by reading the Relative Distance in the Co-ordinate Summary dialog.
6. You will notice that the crosshair is now fixed, and only the cursor moves with the mouse. Re-attach (carry) the cursor and crosshair by pressing the Space bar.

7. Move the crosshair and cursor to the corresponding point on the reference layer and Jump Nearest to that point.
8. Select Move To Offset (located in the Edit menu - Hotkey 'O') and the relative distance will appear as the default. Press Enter and the data should move accordingly.
9. As all the data on the drill layer was selected prior to moving, all data has moved by the same amount. NOTE: In GC-PrevuePlus you can select specific entities and move only those entities.
10. Right click and **Unselect All** to ensure that all data has been unselected.

## Chapter 3: Editing data (GC-PrevuePlus only)

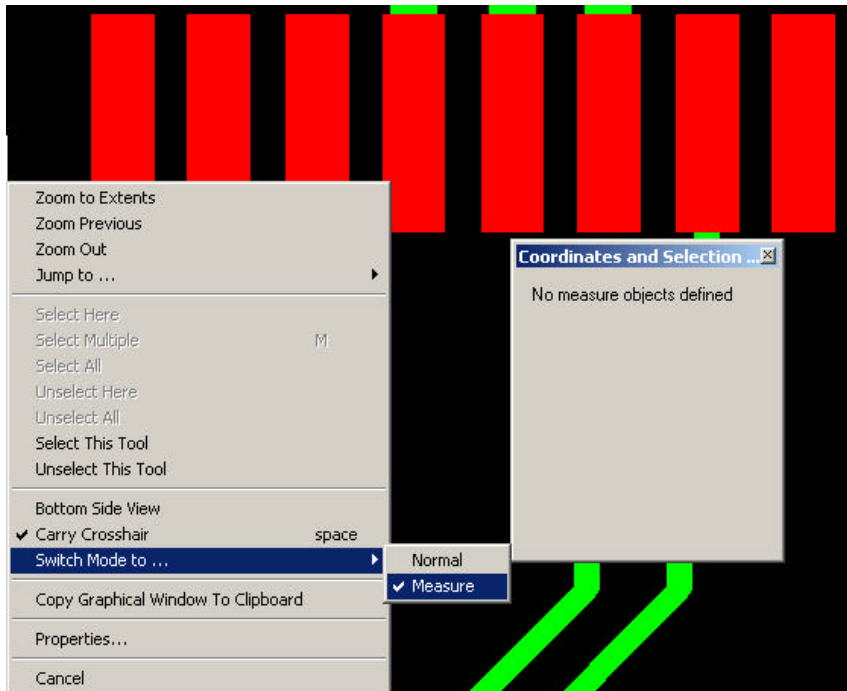
We will now make measurements, make an amendment to pad shape, delete some data, step and repeat data and output an RS-274-X file. GC-PrevuePlus can also perform many other tasks regarding the data and we leave it up to you to investigate the other menu items.

For On Line Help simply hover over the menu option and hit F1.

Firstly we will return to the earlier GWK to ensure the images in this demonstration guide are consistent.

### Measure

1. From the main menu choose **File > Open**
2. Use the file picker to navigate to the directory where you uncompressed the zipped demonstration guide
3. Select the General Navigation.GWK then select **Open**
4. Select **View > Layers > Hide All**. You will see all data disappear from the graphical window and all layers in the GC-Explorer window will now have the (h) status indicating they are hidden.
5. Now set Physical layer P2 to Edit status in preparation for measuring (although we can also measure in View mode), editing and step and repeating.
6. Zoom in so that you can see a number of objects that you are interested in measuring. We will use a row of pads from one of the devices on the board and take measurements of separation and of pitch.
7. In the graphics window, right click and choose the option Switch mode to... and then select the Measure option.
8. You will notice a number of things – the cursor has changed to indicate a different mode and also the Co-ordinate Summary has changed in preparation for displaying measured values (see Figure 14).



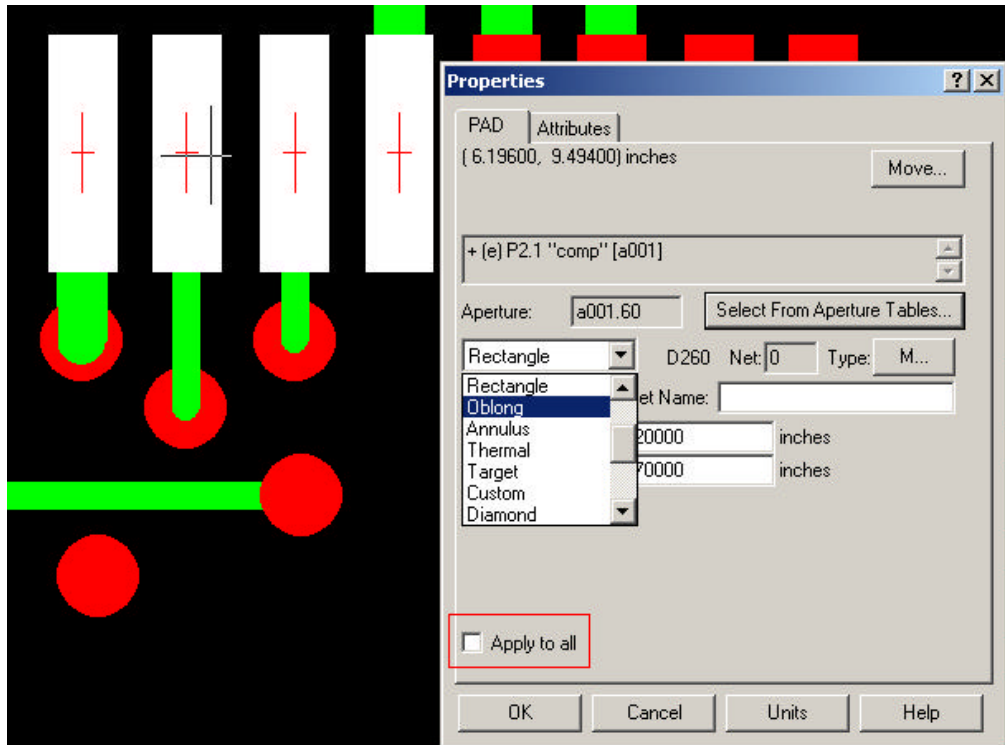
**Figure 14: Measuring**

9. The order of selecting the entities for measuring is important for the following reasons.
  - a. Measurements are given for Edge to Center and Center to Edge. The order of selection will affect which is the desired result
  - b. Measurement only occurs between two objects. A third object will shuffle the previously selected objects down. This is best shown by example.
10. Click on an object on screen. You will see the Co-ordinate Summary register one object defined.
11. Click on a second object and the measurement will be given in the Co-ordinate Summary and also graphically. You can change the measurement reported in the Co-ordinate Summary window.
12. Next, click a third object. You will now see how the objects shuffle down. The last two defined objects are now the measured objects.
13. The other possibility is that you wish to make multiple measurements from a reference point. In this case, select the reference point first and then choose the second measure point. Hit **Escape** and this will remove the second defined object (but retain the reference point), leaving you free to define the next measure object.
14. Hitting the **Escape** key twice will remove both defined objects and hitting it a third time will return you to the Normal mode. You can also change back to the Normal mode at any time by right click, **Switch Mode to ... Normal**.

## Editing Data

Let's make changes to some of the pads that comprise the device we have been measuring and then let's delete the targets and text box from the layer prior to creating an array.

1. In Normal mode, select a pad or two. They will turn white. Right click while the crosshair is over one of the pads and select **Properties**. The Properties page appears (Figure 15).



**Figure 15: Properties Page**

2. In the properties page you can change the size and shape of the selected pad. If the Apply to all button is checked, then the changes made will apply to all identical selected pads. (Identical means they share the same aperture (a001.60 in the above figure)). In this case let's make the shape **oblong**.
3. A different set of attributes will be presented depending on whether the data under the crosshair is a pad, trace, or drill.
4. When changes have been made, make sure that all data is unselected (right click and **Unselect All**) before moving on.

## Deleting Data

Deleting unwanted data is very straightforward in GC-PrevuePlus. In order to delete any data within GC-PrevuePlus the layer that contains the data to be deleted must be in Edit mode and also, the data to be deleted must be selected. Once you have selected the data, go to **Edit > Delete** and the data is removed.

Deleting data in this way has no affect on the aperture table.

If you prefer to keep a copy of the deleted data around you can use **Edit > Cut** and **Edit > Paste to...** to move the cut data to its own layer. Tip: When the Paste to... dialog asks you for a layer enter **U.New** and the data will be stored on a new Unassigned layer.

## Step and Repeat / Panel Array.

A single image (such as we have been looking at) may be arrayed with GC-PrevuePlus. The most straightforward array pattern (and the one described below) is an m x n pattern. The array

function once again applies to selected data. It can therefore be used not only for arraying layers, but also for arraying sections of layers, down to a single pad.

1. Select **View > Layers > Edit All**. You will see all data appear from the graphical window and all layers in the GC-Explorer window will now have the (e) status indicating they are edit ready.
2. Highlight layer P16 (the Fabrication drawing) in the GC-Explorer and set its status to Hide. We will not array the Fabrication Drawing.
3. This example will create a 2 x 3 array with a 0.3 inch gap between images in the x plane and a 0.5 inch gap in the y plane. The values we will enter can easily be found by measuring from the lower left corner of the board to the upper right corner and adding the desired gap.
4. Click into the Graphics window and right click on the mouse. Select **Select All** and all data on screen should turn white.
5. Select **Panel > Array Copy and Paste**.
6. Enter '2' in the X copies
7. Enter '5.675' inches in the X step
8. Enter '3' in the Y copies
9. Enter '4.000' inches in the Y step
10. Select OK.
11. Right click and **Unselect All**.
12. Right click and **Zoom to Extents**

The array pattern is now created. The data has been copied to make the array. This means that each individual image can be edited if necessary.

More complex array patterns can be created by combining the Array Copy and Paste function, the Rotation function and Move to Offset function. If the array copy and paste is performed when in Layers (Panelize) mode (see On Line Help for details) the array consists of virtual copies of the original – allowing changes made to the original to automatically update the other images in the array.

## Advanced Scan and Replace

1. From the main menu choose **File > Open**
2. Use the file picker to navigate to the Examples directory that is a sub-directory in the Installation directory. (For a GC-PrevuePlus v4.4.2 standard installation this would be in C:\Program Files\GraphiCode\PowerPlatform 4.4.2\GC-PrevuePlus\Examples).
3. Select the Loaded.GWK then select **Open**
4. Select **View > Layers > Hide All**. You will see all data disappear from the graphical window and all layers in the GC-Explorer window will now have the (h) status indicating they are hidden.
5. Now set Physical layer P3 to Edit status in preparation for converting some of the features that look like pads but are constructed using Traces.
6. Highlight P3 in the GC-Explorer tree, right click and choose Properties. You should receive the Properties page for this layer (alternatively you can double click P3). In the Properties page you will see two small drop down boxes of color which are grouped together – one is the color of Pads, the other is the color of traces. Click the drop down box next to pad: to change the color of the pads on the layer. Make sure that the pads and the traces are different colors. Click OK and then click in the graphics area. You should see that the pads and traces are now displayed in different colors.
7. The aim of the Advanced Scan and Replace function is the convert a trace or traces into a pad. Pads are useful because they are easier to edit in many cases and can be used to create other data (for instance the locations of pads can be used to aid in the creation of a drill file).
8. Zoom in to an area that contains a number of SMD pads (note that they should be drawn using the Trace color because they are, in fact, not pads but traces. Click on ONE of

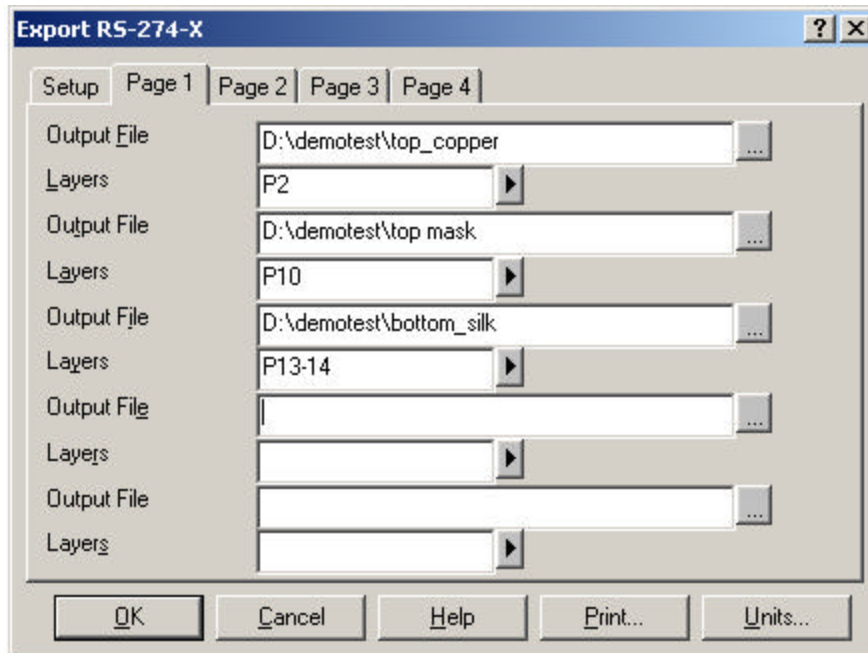
these traces so that it is highlighted (you can verify that it is a trace by using Query or Properties if you wish).

9. Select **CAM > Advanced Scan and Replace...** You will see the Advanced Scan and Replace dialog appear. This dialog asks for a tolerance to use when converting and the required ending pad shape. The tolerance value defaults to zero that means we are going to find an exact match to the selected data with no tolerance variation. A custom pad is an exact match to the taught data and can be utilized when none standard pad shapes are required. The custom pad requires a name and a unique name is provided based on date and time of creation but this is user definable. In most cases (and in this example case) it is better to use the simplest pad shape to describe the ending shape. Using Rectangle, Round, Oblong etc will result in a pad being created of the exact dimension that can then be further edited as necessary.
10. In many cases a drill file can be created by creating Round pads from, say, a DXF file which has drawn the drill locations using traces.
11. Selecting OK will scan the entire layer for the same construction and convert that construction to a pad. The changed data is highlighted (we also scan in 0, 90, 180 and 270 degree orientations to make conversion faster) after conversion. When you right click and Unselect All you should see that the features are now the color of the pads.
12. Use this function a number of times to become familiar with its operation and be aware that whatever data is initially highlighted will form the basis for the searched construction. TIP: Sometimes it is better to go to Ball and Stick mode when initially selecting your starting construction.
13. When you wish to move onto Exporting data please choose **File > Open** (there is no need to save the GWK file) and use the file picker to navigate to the directory where you uncompressed the zipped demonstration guide
14. Select the General.Navigation.GWK then select **Open**

## Exporting Data

In addition to saving data in the GraphiCode GWK workfile format, GC-PrevuePlus also allows the output of RS-274-X, RS-274-D, NC Drill files, basic DXF, HPGL and DPF. We will now simply output a couple of RS-274-X (extended Gerber) files to illustrate the ability to translate data with GC-PrevuePlus.

1. Select **File > Export**
2. Choose the RS-274-X option
3. The Export dialog appears.
4. To change the units or precision select the setup tab and make the appropriate changes.
5. In the Page 1 tab, simply enter the output file name in the Output File field and couple this with the layer or layers you wish to output to that file. Continue with other layers in the same way. You will also notice that by using the Layer picker, you can select multiple layers to be output to the same file. Use the Windows standard methods of Shift or Control while selecting with the mouse.



**Figure 16: Export Dialog**

6. You can change the default output file directory by canceling and selecting **Tools > Customize > File Location** tab and modifying the Export Directory.
7. Continue on to Page 2 etc. if you need to output many files.
8. Select **OK**.

## Conclusion

This demonstration guide for GC-Prevue or GC-PrevuePlus has only scratched the surface of what can be achieved with these tools. Feel free to investigate further on your own and be sure to let us have any constructive feedback so that we can continually improve the products.

Thanks for your time

GraphiCode  
(425) 672 1980  
sales@graphiccode.com

## **Other GraphiCode products**

### **GC-Services**

GC-Services is more than technical support. It provides customers with product support, training, consulting, and data preparation services. GC-Services provides expertise to elevate employee skills, boost manufacturing efficiency, and quickly resolve technical issues. If time or a lack of personnel is keeping you from delivering work, GC-Services will do the work for you.

### **GC-PowerPlace**

GC-PowerPlace is used by many world-class contract manufacturers and OEMs. PCB assembly engineers utilize Gerber data, bill of materials, and/or CAD-XY files to generate pick and place programs completely off-line. Centroids are extracted automatically with sub-micron precision so accuracy will always be attainable. GC-PowerPlace also creates programs for X-ray inspection machines, fluid dispensers, and screen printers.

### **GC-PowerStation**

GC-PowerStation serves sophisticated PCB fabricators. Since 1988, GraphiCode has delivered high performance CAM software on the PC and it remains the performance and quality leader on the PC platform. GC-PowerStation has all of the features that you expect from a high-end PCB CAM system at a fraction of the cost. GC-PowerStation produces data for photoplotters, NC drill and rout machines, penplotters and Postscript devices from various data sources.

### **GC-CAM Edit**

GC-CAM Edit meets the needs of PCB designers and entry-level CAM operators who require convenient design modification capabilities. Plus it features all the powerful panelization and editing tools necessary for PCB photoplotting, drill and routing, stencil manufacturing, and basic design modification. GC-CAM Edit is the low-cost high quality leader for PCB data preparation, panelization, and output.

### **GC-PrevuePlus**

In response to many inquiries from GC-Prevue users, GraphiCode created GC-PrevuePlus to fill the need for an inexpensive Gerber translator and editor. Building on proven functionality from GraphiCode's existing family of products, GC-PrevuePlus takes GC-Prevue to the next level. In addition to GC-Prevue's capabilities, GC-PrevuePlus includes AutoCAD® DXF/DWG import, enhanced measurement tools, data editing capabilities and multiple output formats. Users now have the answer to verify, translate, edit and convert PCB data files.

### **GC-Prevue**

GC-Prevue is GraphiCode's free data viewer, which is fully compatible with GC-PowerStation, GC-PowerPlace, GC-CAM Edit, and GC-PrevuePlus. GC-Prevue gives you the ability to share the information within the GraphiCode GWK file with any user at no extra cost. Use it as a tool on the shop floor to allow colleagues to quickly identify a component by reference designator or location.

## Copyright

© Copyright 1990-2002 ManiaBarco Inc. dba GraphiCode – Mountlake Terrace, WA USA

All rights reserved. This material and instructions for use contained herein are the property of ManiaBarco Inc. dba GraphiCode. The material, information, and instructions are provided on an AS IS basis without warranty of any kind. There are no warranties granted or extended by this document. Furthermore, ManiaBarco Inc. dba GraphiCode does not warrant, guarantee, or make any representations regarding the use or the results of the use of the software or the information contained herein. ManiaBarco Inc. dba GraphiCode shall not be liable for any direct, indirect, consequential, or incidental damages arising out of the use or inability to use the software or the information contained herein.

The information contained herein is subject to change without prior notice. Revisions may be issued periodically to advise of such changes and/or additions. No part of this document may be reproduced, stored in a data-base or retrieval system, or published in any form or in any way electronically, mechanically, by print, photoprint, microfilm, or by any other means without prior written permission from ManiaBarco Inc. dba GraphiCode

## Trademarks

All product names cited are trademarks or registered trademarks of their respective owners. Correspondence regarding this publication should be forwarded to: ManiaBarco Inc. dba GraphiCode

## Contact Information

GraphiCode  
6608 216<sup>th</sup> Street SW, Suite 100  
Mountlake Terrace, WA 98043 USA  
Phone: (425) 672-1980  
Fax: (425) 672-2705  
Email: [info@graphiccode.com](mailto:info@graphiccode.com)  
Web: [www.graphiccode.com](http://www.graphiccode.com)