

GraPL

Getting Started

by Adrian Smith

Causeway Graphical Systems Ltd.
The Maltings
7 Castlegate
MALTON, North Yorks
YO17 7DP, UK

Tel: +44 (0) 1653 696760
Fax: +44 (0) 1653 697719

Email: support@grapl.com

© Causeway Graphical Systems Ltd 2004

No part of this publication may be reproduced in any form by any means without the prior written permission of the copyright owner.

Version 2.24 for Windows

January 2004

TRADEMARKS

APL+WIN is a trademark of APL 2000

Dyalog APL is a trademark of Dyalog Ltd.

PostScript is a trademark of Adobe Systems Inc.

Acrobat is a trademark of Adobe Systems Inc.

Windows is a trademark of Microsoft Corp.

Internet Explorer is a trademark of Microsoft Corp.

Paint Shop Pro is a trademark of JASC Inc.

All other trademarks and copyrights acknowledged.

Getting to Grips with GraPL

Working with GraPL (Desktop)

Installation

Installing and Registering GraPL	2
Printing a Set of Manuals	3

Getting to Grips with GraPL

Introducing GraPL	4
Entering and Organising Data	8
Editing the Chart Specification	14
Importing Data into GraPL	18
Adding and Testing Calculations	21
Printing Charts and Data	25
Exporting Charts and Data	26
Setting Line Colours, Fill Patterns etc.	29
Creating and Using Templates	36
Setting Preferences and Global Defaults	41
Keyboard Shortcuts	42

Index	44
--------------------	-----------

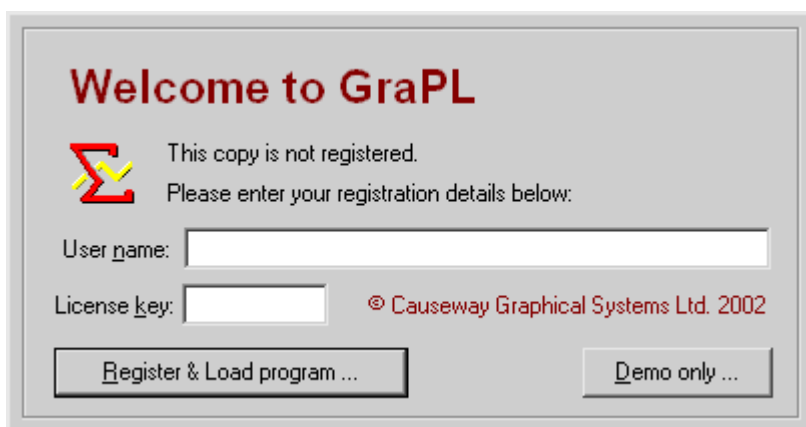
Installation

Installing and Registering GraPL

You may download GraPL from the internet, but you will need to register your copy before you can save data or copy the completed charts to the clipboard. Having run Setup.exe from your download, you will be able to start GraPL in the normal way from Start, Programs or simply by double-clicking on the GRAPL.EXE file. It will also be associated with any files with the .GPL extension, so you can double-click these as an alternative way of starting the program. You may like to add a shortcut to GraPL to your desktop – just drag the .EXE to the desktop to have Windows create the shortcut for you.

Registering your name and licence key

The first time you start GraPL, you will see a registration screen like this:



When you purchased GraPL, you will have given us your name (such as “Adrian Smith” or “Ampleforth College”) which will have been used to generate a unique licence key (such as QWE321) which will either have been emailed to you, or is noted on your printed invoice. You should type in your name as you gave it to us (although the key-generation process does ignore capitalisation and punctuation) and the licence key, and hit Register. If you just downloaded a trial copy, you may proceed to try out the program, but you will not be able to make clipboard copies, or save any completed charts.

The registration information is saved in a file USERINFO.DAT in your installation directory. You may copy your installation to any other computer which you use regularly, and it will remain registered to you. If you want to retain any other settings (such as the screen layout, templates folder etc.) you can export the registry key Causeway\GraPL (found under hkey_current_user\software) as a .REG file and copy this to your second machine. Just double-click it to import the settings into the registry. The first time you use GraPL on the new machine, you will see a message telling you that the

Flexgrid OCX has been registered, and there will be a short pause before GraPL starts. Alternatively, just rerun the installation from the original download and re-import your registry settings as above.

Running from a network server

If you have a network licence for GraPL, it should first be installed and registered (as above) by your network supervisor. This licence key is then valid for anyone who has legitimate access to the installation directory on the server. There is a copy of the Flexgrid OCX file kept in this directory so that when a remote user starts GraPL for the first time he/she will see the message “Registering the Flexgrid OCX” which must be known locally to Windows on each desktop computer which runs GraPL. The OCX is not copied to the desktop machine in this case – the assumption is that the server will either be a mapped drive or a fixed UNC name such as ‘\\gandalf\cdrive\shared\grapl’ and that the registered OCX will remain in the same place in the future. If the GraPL installation is moved, all the desktop users will once again see the registration message the first time GraPL is restarted.

Of course GraPL will start (and run) a little faster if it is installed locally – you may allow individual users access to an installation directory on the server (just copy Setup.exe from the download) and inform them of the correct user name and unlock code.

Any visual settings (screen layout etc.) are saved in the registry on the desktop computer, and so remain personal to individual users.

Printing a Set of Manuals

If you need more than one set of manuals (or you purchased GraPL over the internet at the ‘software only’ price) you may download the necessary files from the www.grapl.com/support area on our website.

Manuals are provided as PDF (Portable Document Format) files so you will require a suitable version of Adobe’s Acrobat viewer. *It is very likely that you already have this, so check by double-clicking one of the PDF files before you try installing the viewer.* It is available as a free download from Adobe’s web site at www.adobe.com.

Manuals are included in A4 and US Letter formats, designed for single-sided printing and left-edge binding.

Getting to Grips with GraPL

This chapter describes the GraPL user-interface. If you are comfortable with normal Windows conventions, you can safely skip most of it and go straight on to the tutorials. However, please do take time to learn the keyboard shortcuts and some of the quick ways to enter bulk data into the datasheets.

Introducing GraPL



GraPL is all about making useful graphs from sheets of numbers. You can use it to do some simple calculations, but it seems much more likely that you already used Excel for that and all you want to do is make a nice chart so you can drop it into a Word document or a web page.

This part of the documentation is designed to show you how to accomplish simple tasks such as getting data into the program, building up a chart definition, and saving the finished item for printing or screen display. Where appropriate, it is linked to the reference manual which describes all the chart types, chart properties and calculations in detail.

The Structure of a GraPL Project

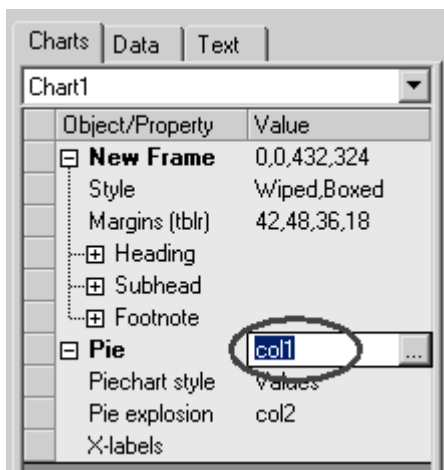
Each GraPL project contains one or more chart definitions, one or more data-sheets, and any number of miscellaneous text items (notes, glossaries etc.). Typically you will have a single datasheet, and a few chart definitions to plot the data in different ways. Sometimes it is convenient to have several datasheets (maybe data for different years) in the same project so that you can easily switch between them. When you begin a new project, it will have one chart and one sheet preset for you. You may want to open one or two of the sample projects (found under Help,Samples) to see how these have been set up with charts and data.

The Main GraPL Screen Layout

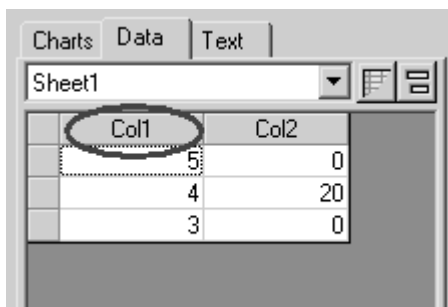
GraPL uses the left-hand side of the screen to develop the specification for your charts, to enter data into a collection of tables, and to build simple calculations which you can use to select and summarise the numbers. The three tabs on the left all work in similar ways:

- the **Charts** tab can hold one or more chart specifications. You page through these from the dropdown list at the top of the panel. Initially you will find that you only have one chart here – you can use the Insert menu or the corresponding tool button to add as many chart definitions as you like here. As you page through the charts, a preview of the current definition is shown on the lower right of the main screen – press F12 to toggle this to occupy the whole right-hand part of the screen or double-click it for a full-screen preview.
- the **Data** tab holds one or more data sheets. You page through these in the same way as for the charts, and you can add new sheets manually with the Insert menu, or create them from data already on the clipboard. This is probably the most convenient way of bringing in data from Excel.
- the **Text** tab is where you store simple text elements such as a company name for footnotes. You can also use this to edit chart notes, to store SVG elements such as symbols or filters, or to develop JavaScript elements for attaching to chart data.

You link the data-sheets to the charts very simply – wherever GraPL expects to see some numbers (a plotting command, or a chart property such as ‘Pie explosion’) you can type a column name into the specification sheet:



... which names a column from any data-sheet. If you can't remember the column names, just hit the ‘...’ button to see a complete list. In this case I just had the columns from the new file, so it was easy:

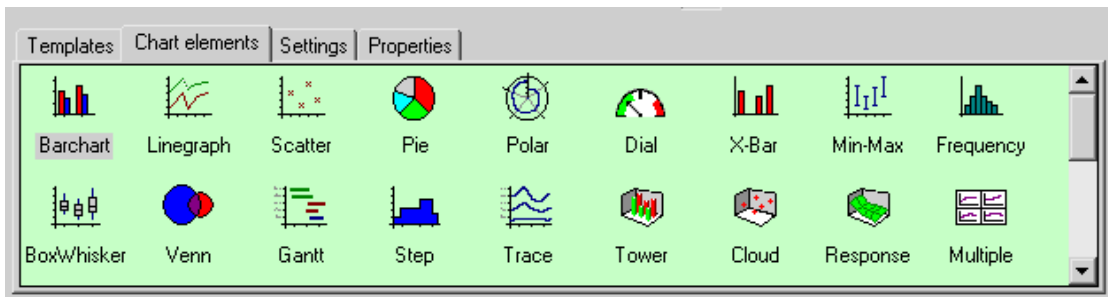


For more details on editing the chart specification please refer to *Editing the Chart Specification* (p.14), and you can find out more about the data sheets in the section on *Entering and Organising Data* (p.8). For now it is enough to know that you can refer to

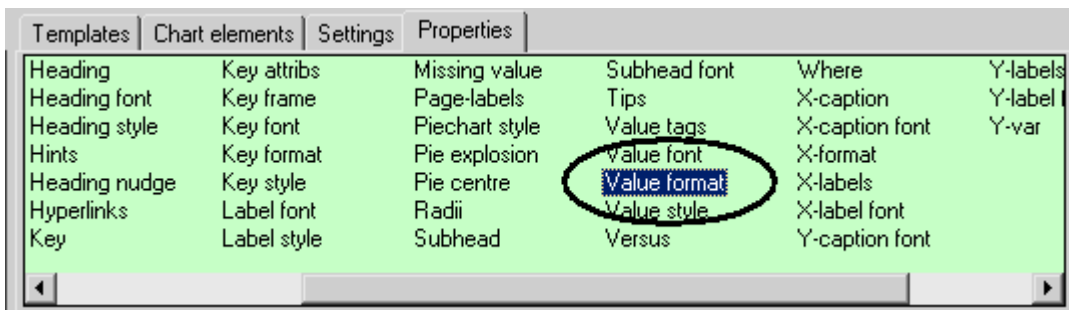
columns by their name (capitalisation does not matter here) or as “Sheet1.col3” if you have several data sheets with similarly-named columns in them.

Adding Charts and Properties

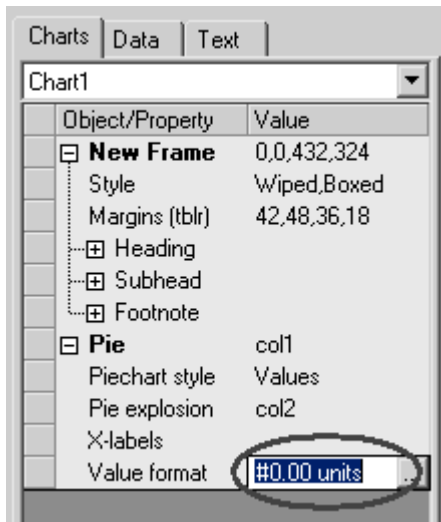
The right-hand side of the main screen is used to show a thumbnail view of the current chart, but it also acts as the source window for new charts, extra properties and calculation elements. Here are a few of the chart types you can have:



To add a chart to the current specification you can drag it across with the mouse, double-click it or simply select it and press Enter to have it added to the end of the current set of commands. It will begin by showing a dummy dataset called {data}, just to give you something to look at. Probably the first thing to do is to change this to reflect the column name you actually want plotted. You will also find that all the charts bring a ‘sensible’ set of properties with them, but if you want to add something extra, you can use the Properties tab to append anything else that you need:



Here I have chosen to modify the formatting of the value labels – again you can drag or double-click the selected item to add it to the chart sheet. If you know the format of any property, just type it in, otherwise hit Ctrl+Enter (the shortcut for the ‘...’ button) to get a handy pop-up screen which tells you what GraPL is expecting. In this case it is an example of the desired format in standard C# or VB style:



You can also press F1 with the cursor on any property or chart to go straight to the appropriate topic in the help file.

Using the Status Bar

The various fields in the status bar are used to give brief extra information about the current property and chart. As you move around in the chart specification you will see an expanded version of the property name in the left-hand field. When you are in a datasheet you will simply see the [col.row] index of the cell you are in.

The field in the centre is used for transient messages (such as the date and time you saved a file) and for extra help on menu items. It also shows any problems with calculations (such as mis-spelled column names) which have prevented a calculation from running.

Finally, with the default preview, you can use the right-hand field to read off the (x,y) co-ordinates in any 2-dimensional chart. Simply move the mouse to the data-point you are interested in to see an exact readout of its position. This is not available with the VML, SVG or PDF previewers.

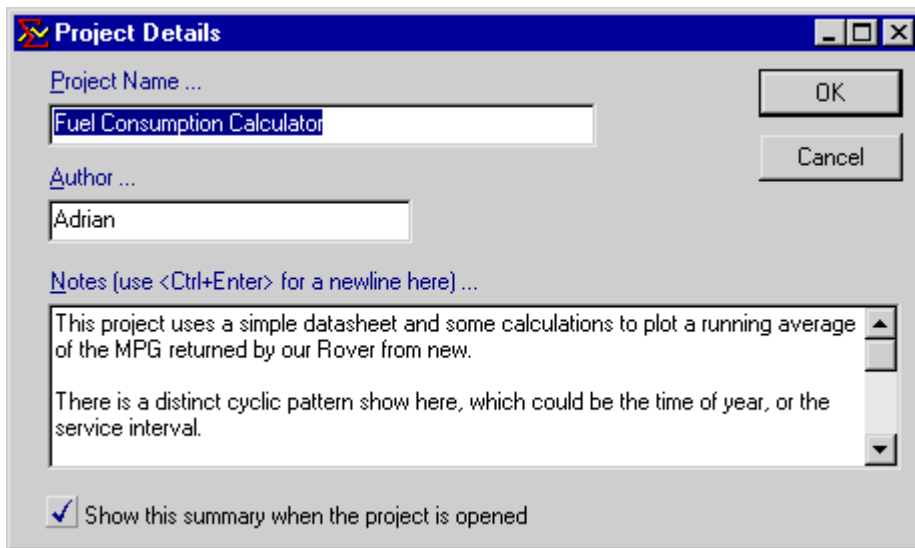
Customising the main screen

The left/right halves of the window are separated by a splitter bar, as are the two panes of the right half. Set these up how you want them and choose ‘Save settings now’ from the Options menu. You can choose to hide any of the right-hand tabs from the Options, Preferences screen, and you can make the usual selection of icon sizes and ‘Details’ view for the various tabs.

You may have any of these choices saved automatically on exit, or only when you choose 'Save now'. For maximum working area, you might also decide to hide the toolbar and status bar from the 'View' menu.

Documenting what you did

You can use the File,Project properties command from the main menu to make any general notes about the GraPL project as a whole.



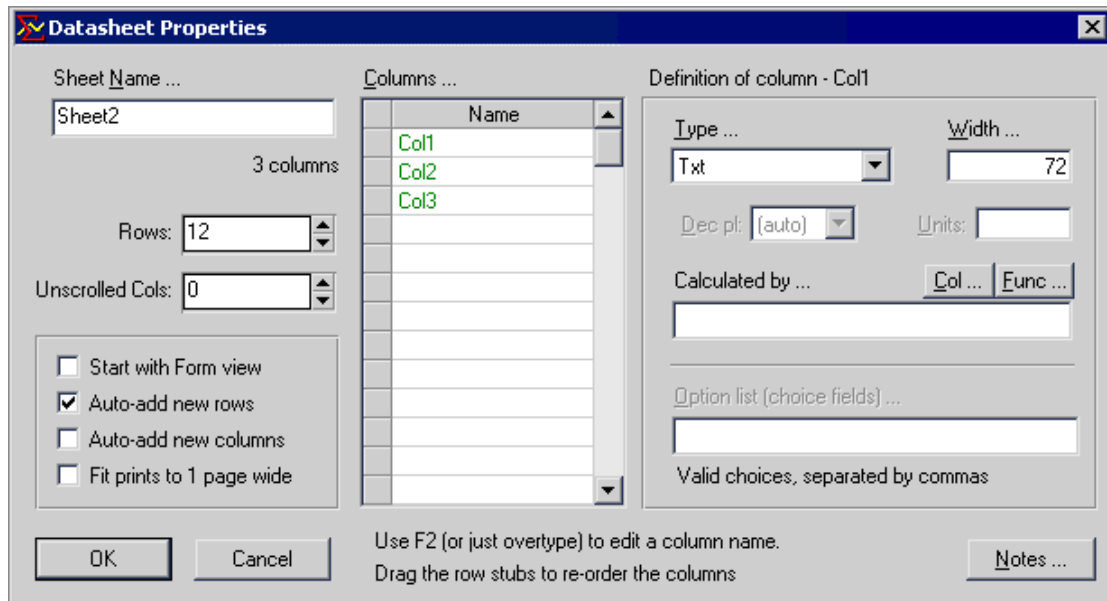
It might be a good idea to tick the option which shows this summary whenever the file is re-opened, as this can act as a good memory-jogger when you go back to working on some data you haven't seen for a few months. When you select File,Overview you have the option of printing this summary along with any notes you made about the charts, datasheets and calculations.

Entering and Organising Data

Before you can make a useful chart, you will clearly need to tell GraPL the numbers that you want plotted. When you first add a chart element (like a lineplot) to the chart specification, GraPL sets its data property to the placeholder {data} which will generate a short series of random numbers. This is enough to let you explore the chart formats, but at some point you are going to need some real numbers to work with.

Adding a new data sheet

GraPL can have as many data sheets as you like, stacked up behind the 'Data' tab on the left-hand side of the screen. A new project will start with one sheet, called 'Sheet1' which you can rename and modify to suit your data. Alternatively, you can add a completely new sheet and work from there. Select Insert, Data sheet (or click the appropriate tool button) and you will first be asked if you want to copy the definition from the current sheet; assuming you say 'No' you will now need to set up the sheet properties:



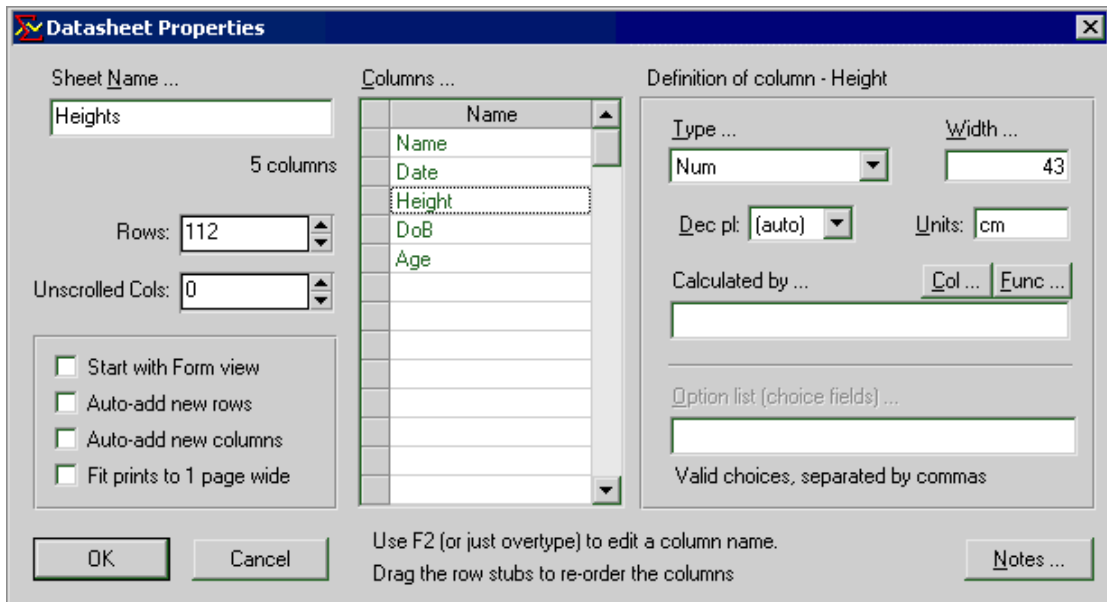
You can always get back to modify these settings by selecting 'Properties' from the right-mouse menu on any sheet or by pressing Alt+Enter when the data-tab is at the front and your sheet is selected.

The various fields on the Datasheet Properties screen allow you to:

- change the sheet name. It is best to keep these reasonably short unless you are careful to name your columns uniquely across all the sheets. Otherwise a plotting command like Barchart "My First Experiment.Time" could get tedious to work with. In general, choose short, meaningful names here and definitely avoid punctuation characters like ',' which is used to separate column names in the chart specification.
- set the rows and columns in the sheet. The rows will be extended automatically when you cursor down from the bottom row, so this can just be a rough guess. The columns are shown in detail in the table to the right, which has as many column definitions as you have columns in the table.
- make one or more columns non-scrolling. This can be very useful if you have a wide sheet and want to keep one or more of the leftmost columns in view when you scroll across.
- Open the Data tab in 'Form' view rather than table view for this sheet. This is useful if you have a very wide sheet, as it is much easier to edit one row at a time. You can always toggle between the views.

- Allow GraPL to add new rows (and possibly columns) as you type. The default is to auto-add rows only.
- force prints to be scaled to fit on no more than one page wide – again this can be useful for large sheets.

The columns themselves are set up in the panel to the right – here is another example with rather more columns in use:



In many ways, this part of GraPL has more in common with a database system (like Microsoft Access) than with a spreadsheet. Each column has a data-type (like numbers or dates) and will interpret what you type in a way which is appropriate to the column. In particular it is important to put dates into date-columns so that you can use a date column as an x-axis and have it correctly labelled and spaced.

In the example (from the *Heights* file which is included in your *Samples* folder) you can see that we have 5 columns defined as follows:

Column	Data type	Units	Notes
Name	Txt		Text is the simplest column type – you can put anything you like into a text column.
Date	Date		Date columns expect you to enter dates in the normal 'short-date' format such as 25/12/01 – the ordering of days and months is determined by your Windows regional settings. If you enter two numbers only the default is 'this year' and a single number is taken as a day in the current month. Also you can enter 't' to mean 'today'.
Height	Num	cm	This is a simple numeric column with no particular formatting. It will accept any reasonable numbers.

DoB	Date		Another date column. Another advantage of date columns is that you can do arithmetic with them, in this case subtracting two dates.
Age	Num2	years	Another numbers column, but this time we only want to see 2 places of decimals.

In addition to these types you can have 'Time' columns which expect entries like "10:32" in hours and minutes, 'GPS' columns which expect locations like "23:54.2W" and 'OneOf' columns which restrict your entries to a pre-determined list. The final column type is called 'Suggest' as it behaves very much like the normal text column but comes with a drop-down box in the data-sheet to suggest likely entries.

When you create a new data-sheet by pasting data from the clipboard or importing a .CSV file, GraPL will normally be able to guess the column types for you, but you should always check the list in the properties panel to be sure.

Adding notes about the data

If you want to make some comments about the datasheet, select Notes from the right-mouse menu and add any comments you like as free text. These will be printed with the table, or appended when you save it as a webpage, so this is a good place to make some general comments about each datasheet.

Entering data into the sheets

Obviously, you can just type into the cells, and use normal Copy/Paste to get data in from elsewhere. However there are some useful shortcuts to help you fill text, numeric or date data quickly:

- **Copy commands** – the symbols ^ < > " (the last one is the ditto symbol or double-quote) following a number will copy it in that direction to the end of the table. Text can be copied upwards or downwards only.
- **GrowBy commands** – you can fill a column with a linear series by typing an expression such as 10g2 into the top cell. This reads as '10, grow by 2' and will fill down from the cell with 10,12,14 and so on to the end. Similarly to grow each cell by 5% compound you can enter '100c5' which will be 100,105,110.25 ... and so on. You can also use this syntax with dates, so to make a weekly series, try '25/12g7' in a date column. The 'GrowBy' interval defaults to 1, so '12g' in a date column will run forward in days from the 12th of the current month and 'tg' is days, forward from today.

If you have formatted columns with an explicit decimal setting, then your numbers will always be shown with the required decimal places, however they are always held internally to the full precision of the computer (about 15 significant figures), so any calculations based on these columns will not suffer from loss of accuracy.

To enter a long series of numbers into a column, type each number and press **Enter** to move down to the row below. This will automatically add new cells at the end of the sheet as you need them. If you prefer, you can create a large number of empty rows by

holding the down-arrow key, then go back and fill these in with numbers. You do not need to worry about removing unused rows, as GraPL will clean them up automatically before saving the data.

To delete rows one at a time, hit Ctrl+D (or Ctrl+Delete) with the cursor anywhere in the row. To delete a block of rows, select them (using the mouse or by holding down Shift and using the arrow keys) and select Delete Row(s) from the right-mouse menu on the row stubs, or from the main Edit menu. Pressing 'Delete' simply clears the data in that cell.

Working with wide tables

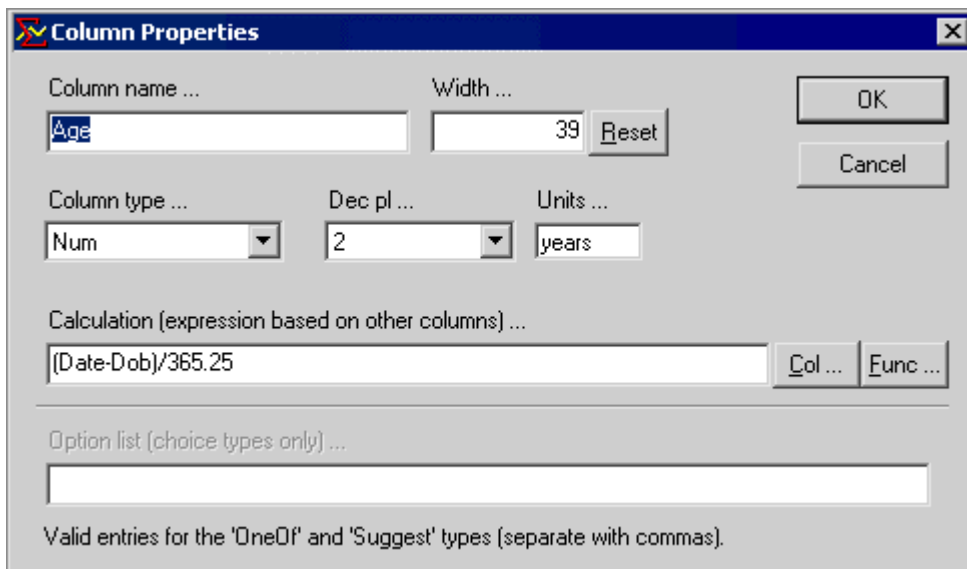
It may be more convenient to see each row of the table laid out 'form' style. You can toggle between table and form view at any time with Ctrl+T and Ctrl+M respectively. GraPL will remember which row in the table you were working on, and automatically open the form view at the correct record.

Re-ordering columns

You can re-order your columns in the DataSheet Properties dialogue by dragging the row stubs in the definition table. Alternatively, choose Options, Preferences from the main menu and select the check box for "Re-order columns by dragging headers". This option is off by default as it makes it hard to select multiple columns by 'drag-selecting' the row headers.

Adding or removing columns

Use the right-mouse menu on the column headers to insert, append or delete columns from the datasheet. You will be prompted to fill in the column name and datatype when you add a new column. Enter the units if you know them as these provide useful documentation.



This dialogue can also be used to change the properties of a single column – it is also available from the right-mouse menu on the column headers.

Sorting the datasheet

Choose Options, Preferences and turn on the checkbox to allow 'one-click' sorting on the column headers. Now, whenever you click on a header the entire table will be sorted using that column as a key. The sort alternates between ascending and descending and preserves the order of any rows where the keys are the same. This makes it very easy to arrange your data (say) by date within name – just sort by date first and then by name. You can choose exactly how you want to sort any column for the right-mouse menu, for example you might want an alphabetic sort on the last word to get a list ordered by surname.

Once you have arranged your data in the order you want, it is a good idea to disable sorting (and column dragging) as it is very easy to do these actions by accident on columns which you didn't intend to click.

Referring to data values in charts and calculations

You refer to any data column simply by entering its name against the plotting command or calculation input. The names are case-independent, so you can use 'AGE', 'age' or 'Age' to refer to a column called 'Age'. If the same column name occurs many times in the data (you might have one sheet per year, with columns called MinTemp, MaxTemp, RainFall) you should prefix the columns with the sheet name, e.g. 1999.Rainfall. If you do not prefix the name, GraPL will pick the first matching column, working forwards through the sheets.

You can refer to an entire datasheet (such as the output from a CrossTab calculation) simply by giving the sheet name. This is exactly the same as listing all the (named) columns – CrossTabs intentionally leave the first column un-named so that you can easily select just the data portion.

GraPL creates a small number of special scratch variables for you:

- \$sheets – this simply lists all the sheet names in your project
- \$data – the entire collection of datasheets, as a list of tables
- Sheetn\$cols – one variable for each sheet, which lists the column names in the sheet. This could often be used to form the key of a barchart.
- Sheetn\$notes – one variable for each sheet, which has the notes you may have made about the sheet. This could be used to add a note to a chart based on data from the sheet.
- \$coeff – the coefficients from the most recent Modelfit (intercept, linear term, etc)
- \$fitted – the fitted y (or z in a 3D scatter) values. This will be a vector of numbers exactly matching the plotted values in length. Missing values in the data will be included (as missing values) in the fitted data.
- \$resid – the residuals (differences from the data and fitted values) as above.

You may reuse scratch names, or even overwrite the names GraPL creates for you if you don't need them. Use the Console window (View, Console) to inspect the contents of a scratch variable.

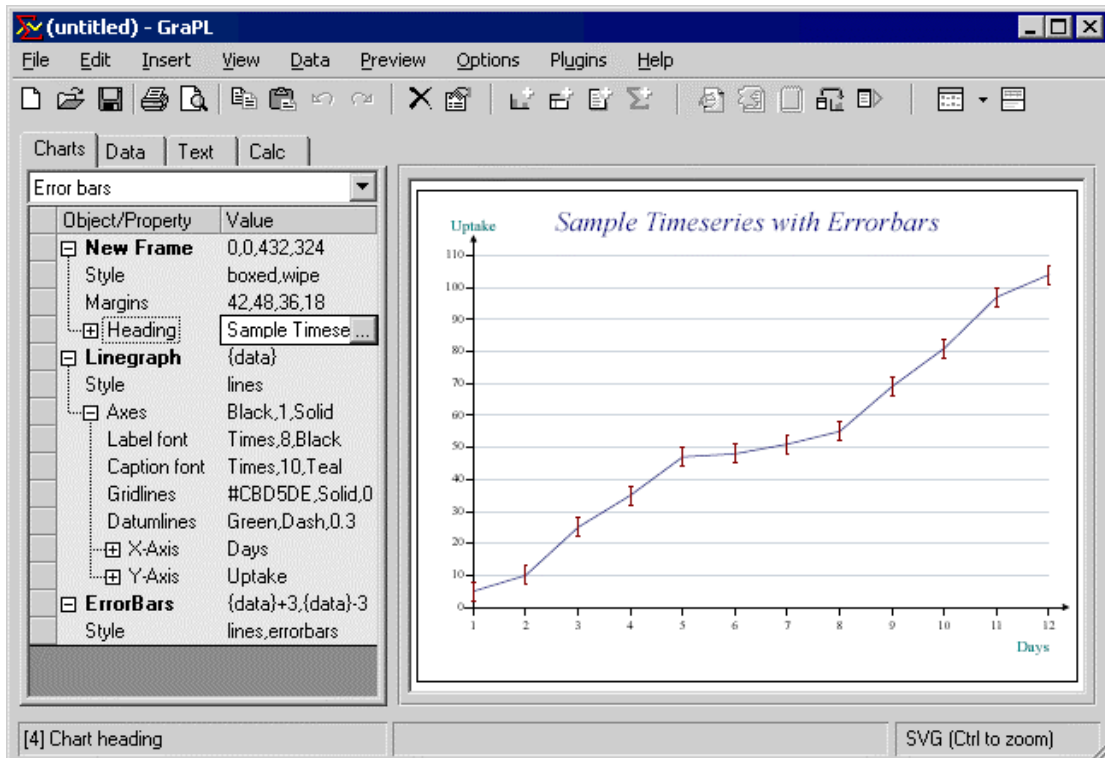
Printing and exporting data

You might like to print out all or part of a datasheet for checking, or export it as a text file (in tabbed or CSV format) or possibly as an HTML table for inclusion in a web page. Use the right-mouse menu on the body of the table, or choose the appropriate tool button here. If you select more than just a single cell, the export will give you the choice of exporting only the selected cells. The columns will always be arranged in the order shown in the table, but for very wide tables, any 'non-scrolled' columns will be repeated on every page of the printout. Any notes you made about the data will be included below the sheet when you print it, or export it as a web page. Exported CSV files only include the column headers and the selected data.

When you choose 'Export to Clipboard' from the right-mouse menu GraPL will copy the entire table, including the column headings, but not the sheet notes. You can now paste this straight into Excel or Word and have it easily converted to a Word table.

Editing the Chart Specification

The chart specification sheet is the key to the power of GraPL, so it is worth taking time to understand it well and to learn the keyboard shortcuts so you can use it efficiently. Here is a typical chart (from the ErrorBars template) which illustrates most of the important points:



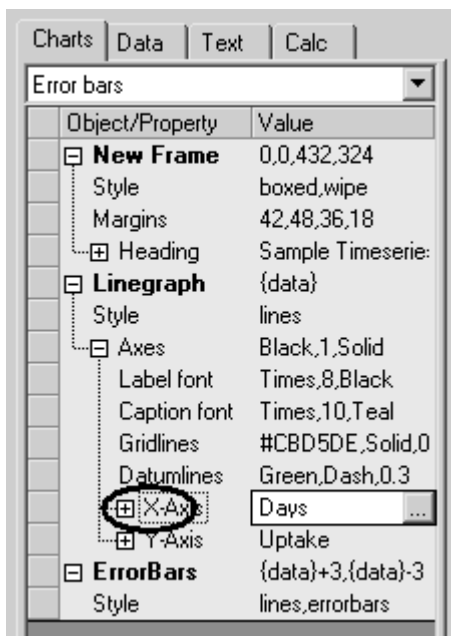
The left-hand column (labelled 'Object/Property') contains a mixture of charting commands (always shown in bold) and the properties which apply to that command. You can see that there are three of these commands in this example:

1. **New Frame** – this is always the first command in a GraPL chart definition, although you can miss it out if you are happy with all the default settings. It sets the size of the paper (the units are points, where one point = 1/72") which defaults to 6" by 4.5" which is ideal for pasting into Word documents. It may also set the margins (where captions and axis labels go) and other fixed items like headings and footers.
2. **Linegraph** – this draws the first chart on the frame we have just defined. At this point you have nailed down the axes, so you can do as many more charts as you like against the same set of xy co-ordinates, but do remember that the first plot in the GraPL specification sets the axes up for all the rest.
3. **ErrorBars** – this uses the 'Max-Min' chart element to superimpose a set of vertical lines through each data point. Because it is the second command in the set, it inherits all the settings from the linechart.

Notice that as you add these verbs, GraPL automatically cycles through a preset collection of colours and line-styles – you can customise these collections by adding items from the Settings (p.29) tab if you need to.

Working with the Property Tree

You will notice that the verbs and properties are arranged in a tree-structure so that you can 'roll-up' the parts you don't need to see. For example if I click on the '-' box beside the Axes property, the details of the axes will be hidden, giving me more space to work in.



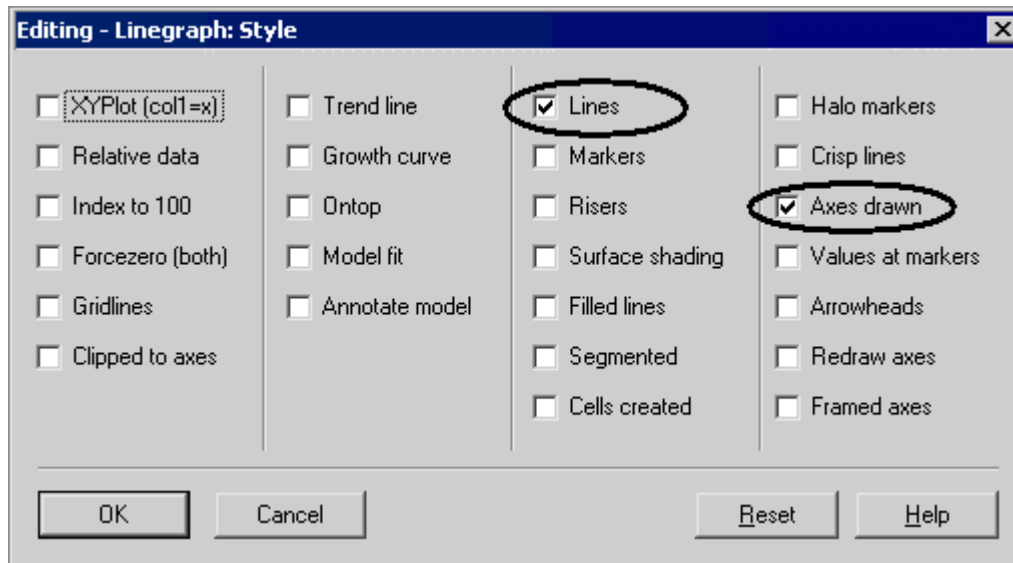
Wherever you see a '+' in the tree it means that there is more detail hidden here. To open up a branch of the tree you can click the '+' with the mouse, or press **Shift+Enter**. Pressing Shift+Enter again will close up an open branch – this means you can explore a tree very efficiently with the keyboard.

Note that when you build up a chart 'by hand' by dragging in properties from the Properties tab, they are always added at 'level-1' in the tree. You can tidy up the indenting using the Tidy Indenting option from the right-mouse menu.

The other important keyboard shortcut is **Ctrl+Enter**, which has the same effect as hitting the '...' button on any chart definition or property

line – it brings up a little dialogue box to help you fill in the right information.

For example:



This is what you will see when you hit Ctrl+Enter on the 'LineGraph,Style' property. Of course you could just type any of the keywords in to the edit field (many of them are pretty obvious) but this little pop-up lets you know exactly what is available here.

Actually, there are two checkboxes ticked – lines are turned on and so are the axes. However the 'Axes' option is the default setting so the word 'axes' was not required in the property. Try turning it off from the checkbox to see what happens!

Every property pop-up box has a **Help** button and a **Reset** button. The Help button has the same effect as hitting **F1** with the cursor on that property and the Reset button has the same effect as hitting **Ctrl+R** – it sets any property back to 'factory defaults' which is useful if you can't remember the sensible initial values.

Adding and removing Objects and Properties

You can add new chart elements to the current specification by dragging them over from the 'Elements' tab (or selecting the chart icon and pressing Enter or double-clicking it) and new properties from the Properties tab.

Alternatively, use Insert,Chart element from the main menu, or from the right-mouse menu on the specification. If you want to add a specific property, you may also use Ctrl+I to pop up a list showing only those properties which are relevant to the chart element you are editing.

You will notice that when you drag a property, a heavy black line is drawn on the specification to show you where it will be inserted when you let go the mouse – you can drop a new property absolutely anywhere. When you drag a chart, the 'target' highlight skips between the other top-level objects as it makes no sense to add (say) a barchart in the middle of the properties belonging to a linechart. By default, a chart element will bring a default list of properties with it (note the small '+' attached to the mouse pointer)

– if you just want the chart on its own, hold down *Alt* as you drag the chart icon over to the specification.

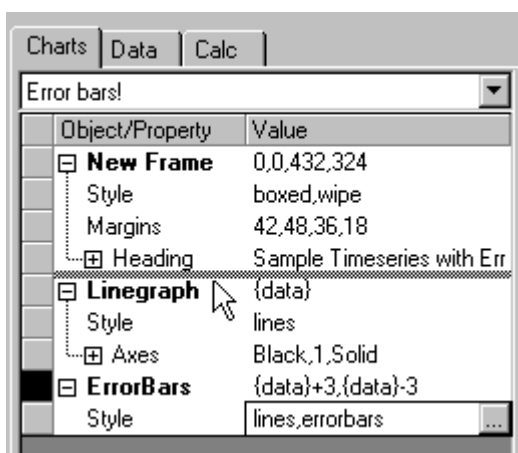
If you prefer to run the preview full-size, you can select View,Property window from the main menu to bring up a free-floating window of the full property list. Properties can be dragged from this in just the same way as from the Properties pane, so this may be a more comfortable way to work if you have several unrelated properties to add.

You can also drag over a new template – because this completely replaces the existing specification the highlight always sticks to the very top of the sheet. If you realise you didn't want the property you are dragging, just drop it somewhere off-screen, or press Escape. The sheet will scroll automatically if you need to drop something below the bottom (or above the top) of the visible part.

To remove an unwanted chart or property, click on it and press Ctrl+D (or just Delete if the cursor is not actually in the moving edit field) or use the right-mouse menu. If you remove a 'parent' object this automatically removes any children, whether or not they are hidden. You can also use the standard Windows shortcut 'Ctrl+X' here to 'cut' the chart as you might want to re-insert it on another specification, or just move it somewhere else.

Moving Charts and Properties around

As well as normal 'Cut/Copy/Paste', you can easily move charts around with the mouse by dragging the row stubs (the plain grey rectangles to the left of all the rows).



Here you can see that the ErrorBars chart is about to be dropped just above the Linegraph (this will draw the bars first so the line will draw over them).

When you move a chart or property, it always takes all its children along with it. As for adding new items, you can move a property anywhere you like, but a chart will always skip to the end of the property-list of the chart you drop it on.

Normally, when you use the clipboard to copy a chart, you will get all the properties copied with it, however you can choose only to copy some of the children – just select

the rows you want with the mouse (or use Shift+down-arrow) then use Ctrl+C to make the copy.

Drawing the finished Chart

Because you might want to change several properties, GraPL will only 'run' the specification sheet when you press Enter (on the specification sheet) or hit F9 or press the Run tool-button. This will show the chart in the preview window at the lower right. Press F12 to give this the whole right-hand half of the screen, or double-click it for a full-screen preview. You can check details on the preview or thumbnail by dragging a 'zoom' rectangle over the part of the chart you want magnified (hold Ctrl and drag to zoom up in the SVG preview mode).

Documenting what you did

You can add comment lines (drag the 'lamp' icon to the chart spec) anywhere in the specification, as well as making notes (use the Properties command from the right-mouse menu) about your chart. When you print the specification (again, you will need to use the right-mouse menu here to access the Print command) any notes you have made will be printed along with the complete property-list in a 2-column table. You can also select all the rows and use the clipboard to copy the chart elements and properties ready to paste into a Word document. Once you have it in Word, select it and choose 'Table,Convert text to table' to make a neat report.

Summary of Keyboard Shortcuts

- F1 – gets help on any chart or property
- Enter – runs the current property sheet to rebuild the current chart
- Shift+Enter – opens up or closes up a branch of the tree
- Ctrl+Enter – edits the property setting in a pop-up form
- Alt+Enter – brings up the property sheet and notes page
- Ctrl+D – removes a chart or property
- Ctrl+I – offers a picklist of suitable properties for the current chart
- Ctrl+R – resets any property to 'factory defaults'
- Ctrl+C – copies a property (or a chart and all its properties) to the clipboard
- Ctrl+V – pastes a copied property or chart
- Ctrl+X – removes a chart or property, but keeps a copy on the clipboard
- F9 – runs the completed chart
- F12 – toggles the thumbnail view to full-screen and back

Importing Data into GraPL

Sometimes, you have to generate your own data, but often it is already available on someone's hard-drive, very probably in an Excel spreadsheet. Although GraPL cannot read Excel files directly, it makes it very easy to import spreadsheet data so that you can plot it with the minimum of fuss. There are two basic methods:

- using the Clipboard
- reading files saved in 'CSV' format

Both of these will normally be able to guess the column type and to import text, numbers and dates correctly.

Using the Clipboard

To copy a block of data from Excel as a new GraPL datasheet, you should first copy it to the clipboard, including its column headings:

	A	B	C
1	Name	Date	Height
2	Richard	02/06/00	178
3	Richard	04/10/99	176
4	Richard	08/09/99	175.5
5	Richard	04/01/99	169.1
6	Richard	26/09/98	166
7	Richard	03/01/98	158.3
8	Richard	23/10/97	157
9	Richard	03/09/97	156.4
10	Richard	02/01/97	152.2
11	Richard	06/10/96	151.2
12	Richard	01/06/96	149.1
13	Richard	22/10/95	145.7

... then choose Edit,Paste as new sheet to define your sheet to match the data on the clipboard:

CSV Import Options

Use first row as column names

Use second row as data units

Filtering

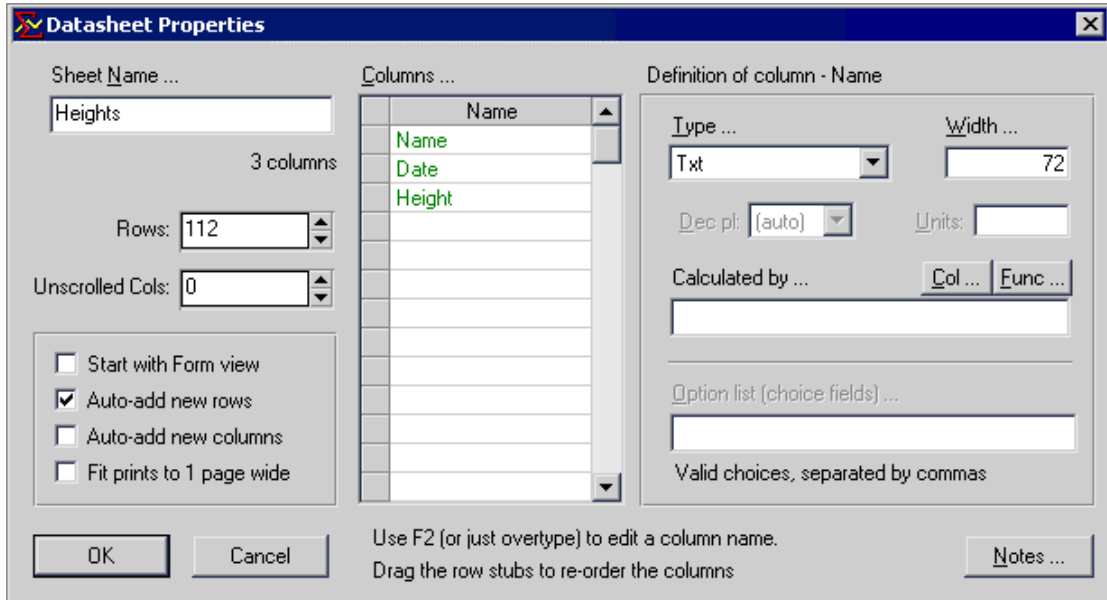
Remove rows with fewer than delimiter(s)

Additional rows to discard

From top: From bottom:

OK Cancel

GraPL will take a quick look at the data, and guess if the first one or two rows should be treated as column headers and units. At this point, you can also choose to discard data from the top or bottom of the import, and to ignore rows with too few delimiters (typically blank lines). Assuming that it guessed correctly, just hit <OK> to confirm the properties of the new datasheet:



At this point, you can change the sheet name, and you might need to alter the column types and add units information for your data. Choose OK to add the datasheet, which you can now use for graphs and calculations as normal.

Please note that GraPL can only recognise dates which have been copied in the simple 'short-date' format such as '25/12/98' or '25-Dec-2001'. If you include the day of the week, you will find that dates are pasted as a text column and you will not be able to use them as a time axis. You should use Excel's column formatting to change the date format before you copy the data to the clipboard. The ordering of the date field will normally match your country, so if you are running GraPL in the US, dates will generally be expected in MM/dd/yy format.

The same approach will work from any text data which is separated by commas or tabs, for example a Word table or a text file loaded into Notepad.

Reading from text files

If you have data saved to a text file, either tab-separated or comma-separated, you can use File,Import to read it into GraPL as a new datasheet. If the first row of the file contains any non-numeric items, GraPL will ask if you want to use it as the column names – otherwise they will just be named Col1,Col2 and so on. You can then clean up the table definition in the property sheet (as above) and choose OK to add the new datasheet.

If you read in very large files (say 10,000 rows by around 10 columns) you will need to wait a few moments for GraPL to convert the text to the correct internal form (numbers, dates, times). By default, GraPL is limited to using around 10Mb of memory (this is what

the parameter Maxws=10000 on the program shortcut is for) – this is simply to prevent ‘runaway’ use of memory if you accidentally generate a huge table in a calculation. If you get a WS FULL error reading a very large text file you should exit the program and increase the amount of memory available, say to maxws=64000 if this is the amount of ‘real’ memory available on your computer. Alternatively, break the data into logical chunks and import it into several separate tables. You can check the available memory with Help>About.

Documenting what you did

When you import from a file, GraPL logs the file name and time into the datasheet notes. You might like to use the Notes command (use the right-mouse menu on the datasheet) to add a little more information about the data source.

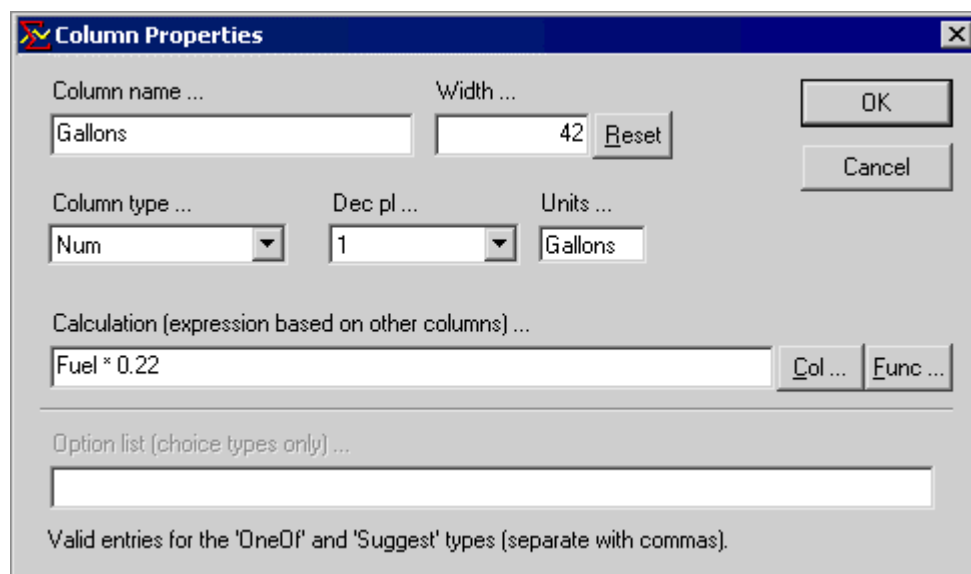
Adding and Testing Calculations

Although GraPL is not intended to be a spreadsheet, it does have the ability to do basic arithmetic between columns, and to make simple column-lookups between datasheets. Several handy utilities are supplied for smoothing and averaging ‘noisy’ data to help you see patterns in timeseries – all these can be applied as column calculations so that you can see the resulting numbers as well as plotting them.

You can enter many of these formulae directly into the chart specification – it is up to you whether you prefer to add extra columns to hold calculated data or just have GraPL work them out on the fly when the values are plotted.

Simple column arithmetic in the data definition

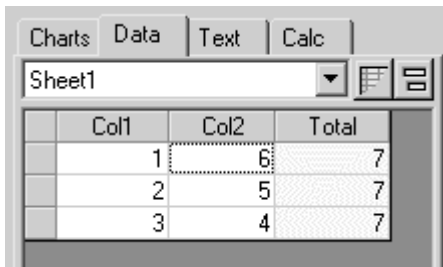
When you define any column, you may add a simple arithmetic expression to have the values calculated for you. For example in the sample file of fuel-consumption data, one of the columns converts litres to gallons like this:



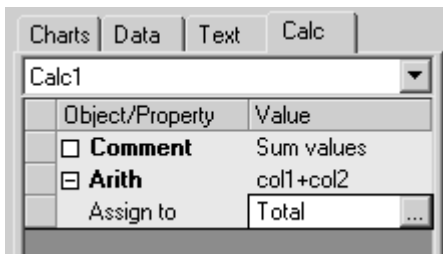
If you add an expression like this, you will notice that the column is now shown on a light grey background, and you cannot overwrite the numbers. It can be used like any other column in charts, or for further calculations.

Simple column arithmetic with the Calc tab

This gives you a more programmatic way to do basic arithmetic between columns, for example:

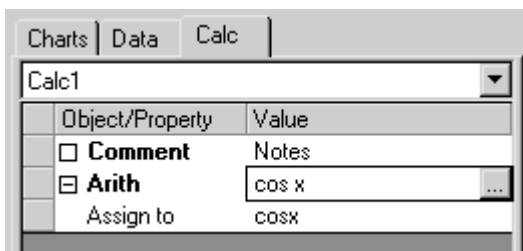


	Col1	Col2	Total
	1	6	7
	2	5	7
	3	4	7

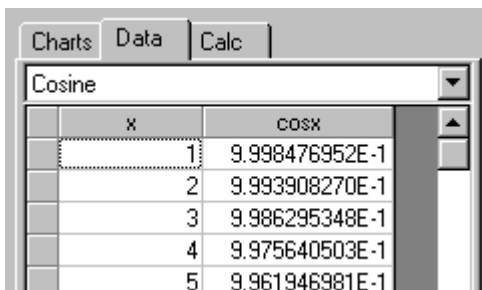


Object/Property	Value
<input type="checkbox"/> Comment	Sum values
<input checked="" type="checkbox"/> Arith	col1+col2
Assign to	Total

Here we have simply added two columns together to make a total. You can also use any of GraPL's built-in functions here; these are listed for you by choosing View,Function Crib from the main menu. For example if we make a data column of degrees (a good example of a GrowBy formula such as 1g1 to fill a column in 1-degree increments) we can use a calculation like:

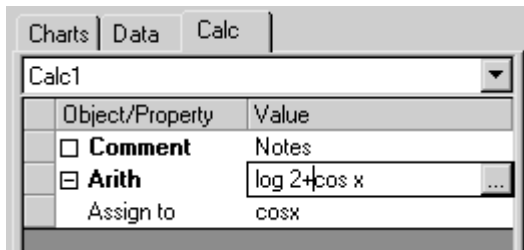


Object/Property	Value
<input type="checkbox"/> Comment	Notes
<input checked="" type="checkbox"/> Arith	cos x
Assign to	cosx



	x	COSX
	1	9.998476952E-1
	2	9.993908270E-1
	3	9.986295348E-1
	4	9.975640503E-1
	5	9.961946981E-1

This applies the cosine function to the column called 'x' and assigns the result to 'cosx'. In GraPL you can chain calculations like this to make really complex expressions, for example if you would like to plot the log of the cosine, you would write:



... which reads "Log of 2 plus Cos x". The rule is very simple – the argument to any mathematical function is the entire expression to its right. This saves thinking about 'do I do times before plus' but it can be confusing, particularly if you are used to a calculator which typically involves pressing the keys in exactly the opposite order! When in doubt use brackets to make things clear, so write this as "log(2+cos x)" or even "log(2+(cos x))" if you are unsure.

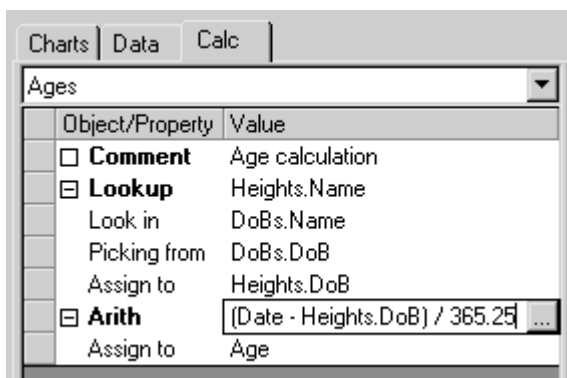
Linking sheets with column look-ups

The data in the sample 'heights' project is a good example of why you sometimes need to cross-refer between two data sheets. We can easily plot the boys' height against date to show 2 nearly parallel lines, but much more interesting would be to plot height against age. If we add a small extra datasheet to record date of birth:

The screenshot shows the 'Data' window with a dropdown menu set to 'DoBs'. Below the menu is a table with two columns: 'Name' and 'DoB'. The table contains the following entries:

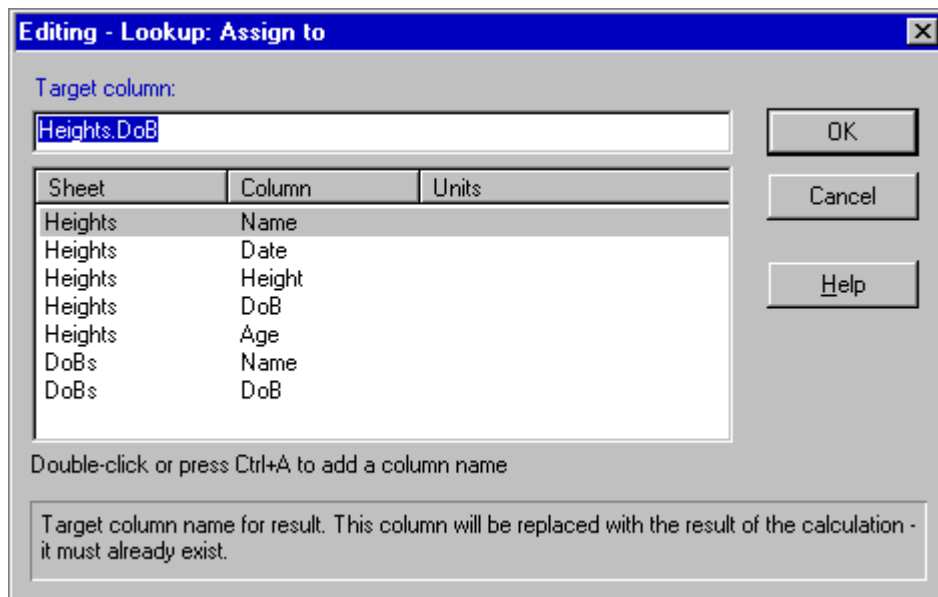
Name	DoB
Richard	04/10/83
Tim	12/01/86

Then we can use a *Lookup* calculation to generate a column with the birthdate repeated for each child. Then all we need to do is subtract this from the date the measurement was taken and divide by 365.25 to get an approximate age in years.



Notice that I have two columns called 'Name' here, so in this case I needed to add the name of the datasheet to make it clear which I meant. If you use the '...' button on any

of the properties which can take a column name or expression, you will get a simple dialogue box listing all the columns:

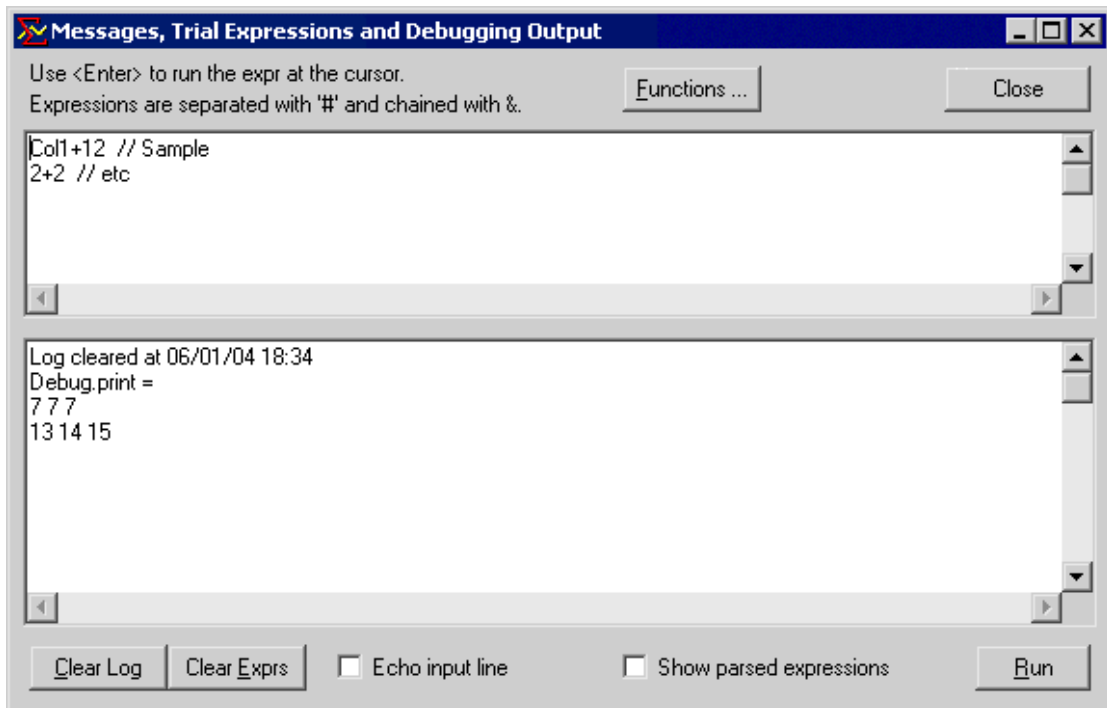


When you click in the list of sheets and columns, GraPL will add “sheetx.colx” if the column name occurs more than once, or just “colx” if the name is unique. If you do leave off the sheet qualifier, the sheets are searched in order, so the first sheet with a matching name will be the one GraPL uses when it looks for the column.

Calculation sequence

If you chain a series of calculations together, you should be careful to get them in the right order. The sheets are run in order, starting with the first one in the stack, and the lines in each sheet are run from the top down. This allows you to break complex expressions apart, and to save intermediate results in temporary columns or scratch variables so that you can check your logic. Scratch variables always begin with the character ‘\$’ and can be used to store intermediate results if you do not need to keep them in a datasheet column. Any other name will be rejected unless it matches an existing column.

If you just want to see the numbers, open the Messages window (View, Console from the main menu) and leave the 'Assign to' property empty. The results will be displayed in the messages window for you to check.



For a full list of calculations and arithmetic functions, see the reference section.

Documenting what you did

There are three places where you can add explanatory notes to your calculation sheets:

1. as comments after any of the input properties. Anything typed after a '//' marker is ignored.
2. as separate comment lines. Just drag the 'lamp' icon over from the Calculations tab on the right and type as much text as you like. When you print out the sheet, your notes will be wrapped into the right-hand column.
3. in a separate Notes page.

You can print out the calculation sheet (use the Print or Print Preview toolbar buttons or the right-mouse menu on the sheet), together with any notes you made about it, as a single document. Alternatively select all the rows and use the clipboard to copy the entire sheet into Word, where you can easily format it up as a table and add extra comments if you need them.

Printing Charts and Data

GraPL allows you to print your datasheets, completed charts, and the chart specifications and calculation sheets. You can also use File, Overview to set up a complete report for all the charts and tables in a GraPL project. You should complete the information in the

File,Properties panel if you want your tables printed with a neat set of headers and footers showing the project name.

Printing your Charts

To print your chart to the current default printer, simply hit the Print button on the toolbar with the appropriate chart displayed in the thumbnail view and the Chart tab on top. To print the chart when any other tab is on top, use the right-mouse menu from the preview.

If you use the File,Print command from the main menu you will be able to choose a different printer, set the number of copies and so on. This also lets you invoke the printer's Setup options.

Printing a Datasheet

Simply hit the Print (or Preview) button with the sheet shown in the Data tab. Note that you can use the sheet properties to have one or more columns of wide sheets repeated down the left of every part-page, or have the entire sheet scaled to fit on a single page wide. You can also select Print Preview from the right-mouse menu, and choose a target printer from there.

Printing a Chart Specification or Text Item

Either of these may be printed (or previewed) with the normal toolbar buttons or the Print commands from the File menu.

Creating a Project Overview

You can create and save a simple list of 'things to be printed' using File,Overview from the main menu. If you have made any general notes about the project as a whole (using File,Properties) these will be included, as well as any of your charts, datasheets and calculations that you want to have printed.

Simply drag the items you require from the tree on the left to the list on the right; if you drag a 'parent' item like 'Charts' this will automatically include all the charts in the list. You can re-organise the order of printing by dragging the items around within the list. You can use Print Preview at any time to check how the report will look, or press Web Page to export the entire overview as a single HTML file, embedding the charts as VML text. Use OK to exit and have your list saved with your GraPL project.

Exporting Charts and Data

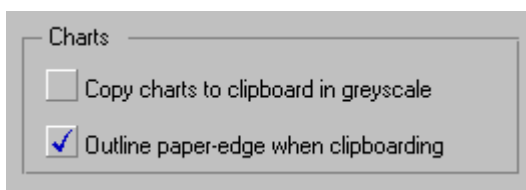
Although GraPL is primarily an engine for making, printing and exporting graphs, you may find it useful also as a simple way to create HTML tables for your web pages. You can also export your datasheets to text files (tab or comma-separated) or to the clipboard. This section covers the various options for exporting the completed charts and working tables.

Saving your Chart to the clipboard

Virtually all modern Windows programs can paste data in 'Windows Metafile format' which is what GraPL uses when you select 'Edit, Copy chart as Metafile' from the main menu. Alternatively you can use the right-mouse menu on the chart preview, or press Ctrl+C when you have this zoomed to a full-screen view.

The chart will be pasted into (for example) Word, sized to fit the frame that you set in the New Frame properties; by default this will be 6" wide by 4.5" high, but you can make any shape you like here. Of course you can stretch the chart to fit your report once you have it in Word or Excel.

You should use Options, Preferences to adjust two important settings which affect the way GraPL saves data on the clipboard:



- Although coloured charts look very nice on the screen, some Windows printer drivers make a very poor job of converting them to greyscale when you print them on black and white printers. Select 'Copy charts to clipboard in greyscale' to have GraPL do this for you; this will ensure you get really good black and white prints of the charts in your finished report.
- You can also choose to have GraPL outline the edge of the 'paper' with a black border – this usually improves the look of the charts in the final document.

If you are developing a webpage for display by Internet Explorer you can also choose to copy the chart to the clipboard as VML. This is a text description of the graphic in vector format and you will be able to paste it directly into any web-page development tool. You will need the correct information in the header of your page also – use File, Export chart, Webpage to make a simple (standalone) page containing your chart in VML format and take the necessary details from there.

Exporting the Charts to File

GraPL supports a wide variety of export formats, suitable for different applications:

- Webpage (VML) – this saves a complete webpage (with the .htm extension) including the chart as VML markup. You can load this straight into IE (5.0 or higher) to see the results. This is an excellent format if you know your users will have IE, for example for publishing on an Intranet. The VML representation will be much smaller than an image file, and it will print at very high quality direct from the browser.
- Scalable Vector Graphic (SVG) – this is a ratified internet standard (see www.w3c.org for more details) which may be supported in the future by many major browsers. It currently requires a plug-in viewer (from Adobe) so this format is not yet suitable for production use on the internet. It is excellent for in-house use, and the rendering quality is generally a little better than the VML version of

the same chart. SVG files support animation and a wide range of other special effects.

- PNG image – this saves the chart as a compressed image file with the .PNG extension. This is the best format for publishing graphics on the Internet if you cannot rely on IE5 availability. However it does not (yet) support the full range of gradient fills and opacities which may be used in the various vector formats.
- Webpage with Image – this saves the chart as a PNG file and a companion webpage as simple HTML.
- EPS format – this saves the chart as Encapsulated PostScript, which is suitable for any high-end publishing tools. You should definitely use this format if you are preparing material for publication in a journal or newsletter which will be professionally printed. You can import EPS pictures into Word to check the layout but Word can only display simple header information on screen. Your documents will print correctly on a PostScript printer.
- Windows Metafile – this saves the chart in Windows Metafile format as a file with a WMF extension. Most Windows programs can import and display this style.
- Portable Document Format (PDF) – this saves the chart for viewing with Adobe's Acrobat Reader. This is a good format if you need to send graphics to users on a non-Windows platform, such as a Macintosh, and be sure they display correctly.
- Raw PostScript (for PDF) – this saves the chart in bare PostScript for use by Acrobat Distiller to make PDF files. You may also send the output directly to a suitable PostScript printer such as the Tektronix 840 or any Xerox Phaser. Simply type the device name (such as "\\server\hplj") when prompted for a file.

If you need other file formats, you can use a package such as Paint Shop Pro to convert the PNG files to a wide variety of bitmap formats, or CorelDraw to process the charts saved in WMF format. You can also paste the charts into PowerPoint and use the right-mouse menu Grouping, Ungroup to break the chart apart so you can move parts of it around, add fancy fill effects and so on.

Exporting Datasheets to File

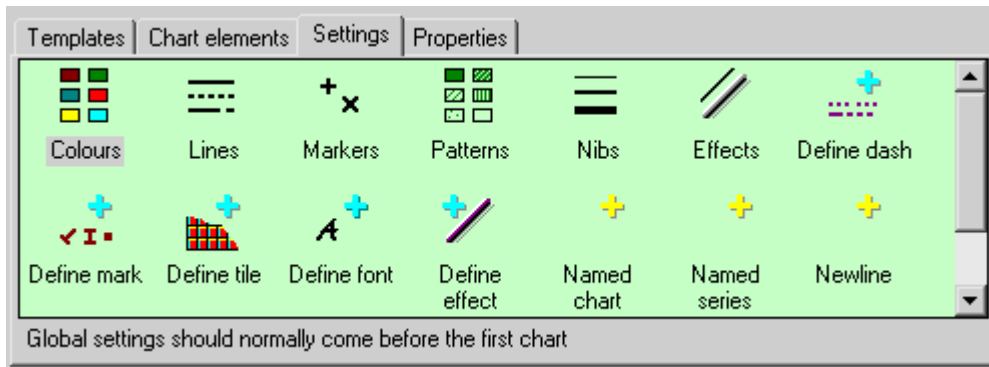
GraPL supports three simple text-based formats:

- CSV for Excel – this saves the datasheet as 'comma-separated values' for loading into Excel or many other spreadsheet or database products.
- Text (tab-separated) – this saves the datasheet as Tab-separated text. This is also suitable for Excel and many other products. It is probably the best format if you want to import the data into Word as a table.
- Save as Webpage – this saves a complete webpage including the datasheet as a table. You can load this directly into Internet Explorer, or use Cut-and-Paste to put the table into your own webpage.

You can use either the CSV or text options to move data between GraPL and Excel. When you save in HTML format, GraPL applies the column formats (such as Num2 to round the data to 2 decimal places), and also appends any notes you have made about the sheet. To copy a datasheet into another GraPL project, use File, Import sheet, GraPL project, which will copy the column formats and notes as well as the raw data.

Setting Line Colours, Fill Patterns etc.

Rather than making you set the colour and style of every line and bar individually, GraPL uses the concept of *cycles* of colours, styles, patterns, markers and nib-weights so that you can set these up in advance and have your data-series use them in sequence. The defaults are carefully arranged to ensure that it takes a long time for a particular combination to come around again, so you can safely plot a large number of series on the same set of axes without worrying about repeating the same set of (say) style and marker in your key.



The Settings tab lists these for you, and you can add any setting to your current chart by dragging it to the specification. The settings apply from the line where you add them, downwards, so you can add several copies of (say) the colour setting if you want explicit control over the colours used by particular charts.

If you have a 'house style' set of colours which you want to use consistently, you can make a simple template which just has the colour cycle set up for you and use it as the basis for all your charts, or you could update the default cycle permanently using Options, Global Defaults.

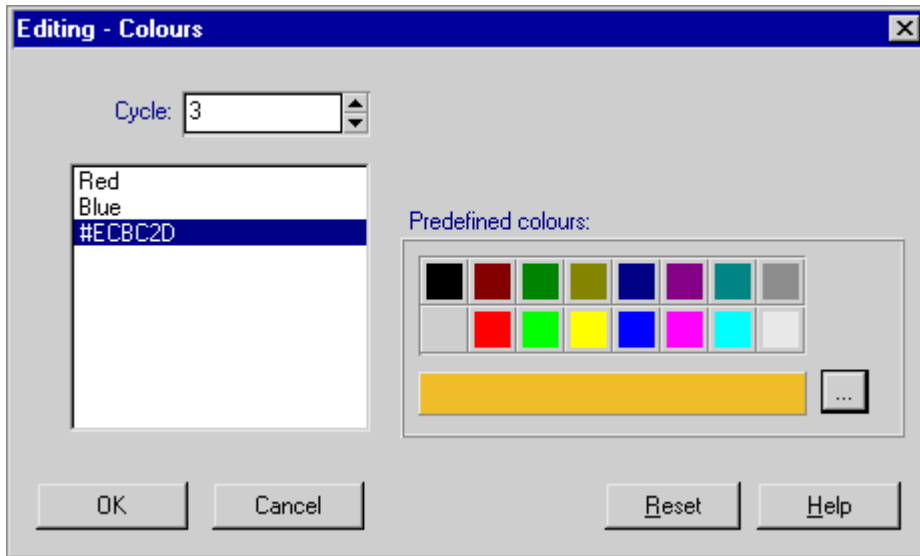
Defining a colour cycle

Suppose you are plotting some data where the colours have a natural significance, say total goals scored in the English, Italian and Dutch football leagues. Obviously you want the English in Red, the Italians in Blue and the Dutch in Orange, so if the data table looks like this:

The screenshot shows a data table in the 'Data' tab of GraPL. The table has three columns: England, Italy, and Holland. The rows represent different categories, with the first row having values 10, 18, and 7. The second row has values 12, 16, and 9. The third row has values 8, 14, and 3. The table is titled 'Goals'.

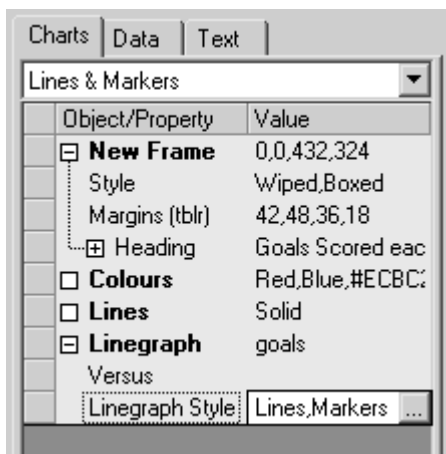
	England	Italy	Holland
	10	18	7
	12	16	9
	8	14	3

... we would add a colour cycle at the top of the chart specification and set it to 3 colours:



As you click through the colours in the cycle, the chosen colour is shown in the large swatch at the bottom. You can choose any of the 16 'base colours' from the set of buttons or press the '.' button beside the colour swatch to bring up the standard Windows colour-chooser. Your colours will always be shown in the list in the standard HTML style as '#FFCC00' strings or the colour's name (like 'Maroon') if you choose a base colour. For charts to be published on the internet, it is best to stay with the base-colours, or the published list of 'Netscape-safe' colours if you can.

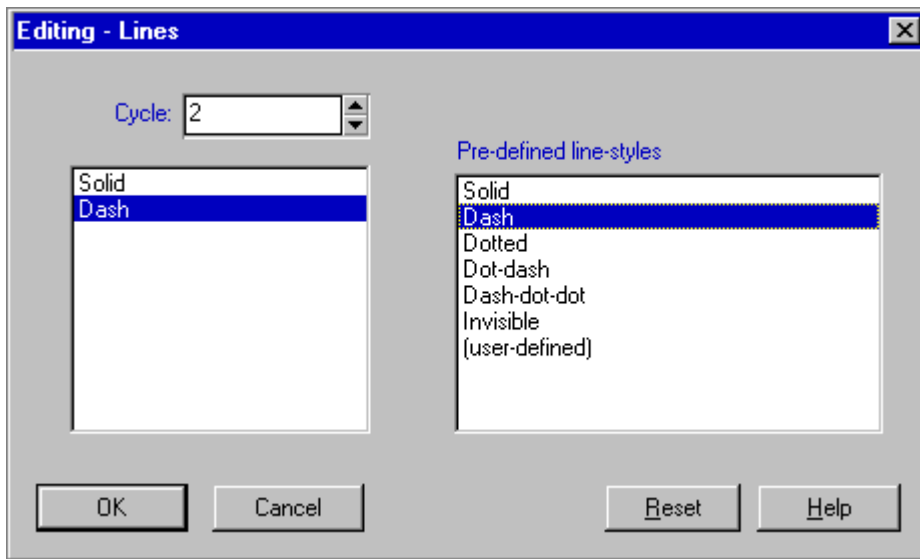
My completed chart specification now looks like:



You will notice that I have also reset the default line-style sequence to 'Solid' as I do not need to print these lines on a black and white printer.

Setting the line-styles

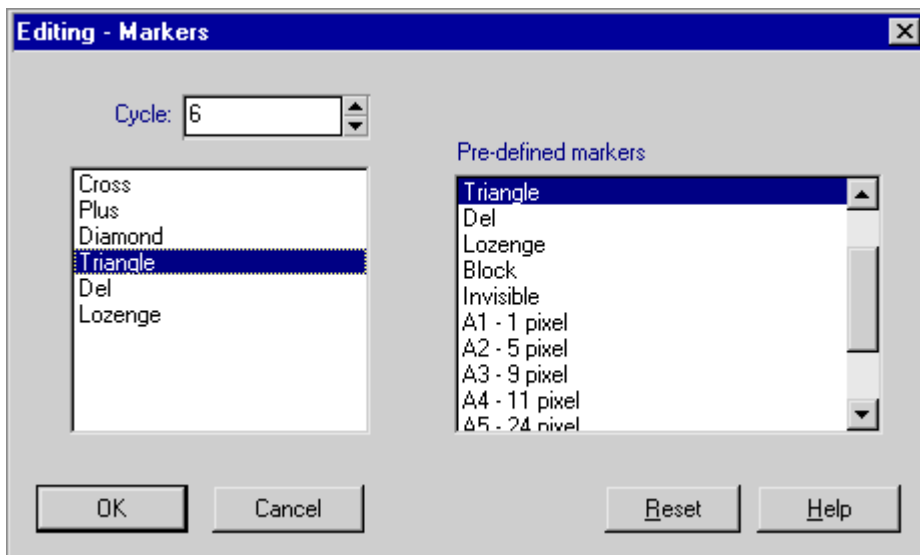
This setting uses a very similar screen to the colour-chooser:



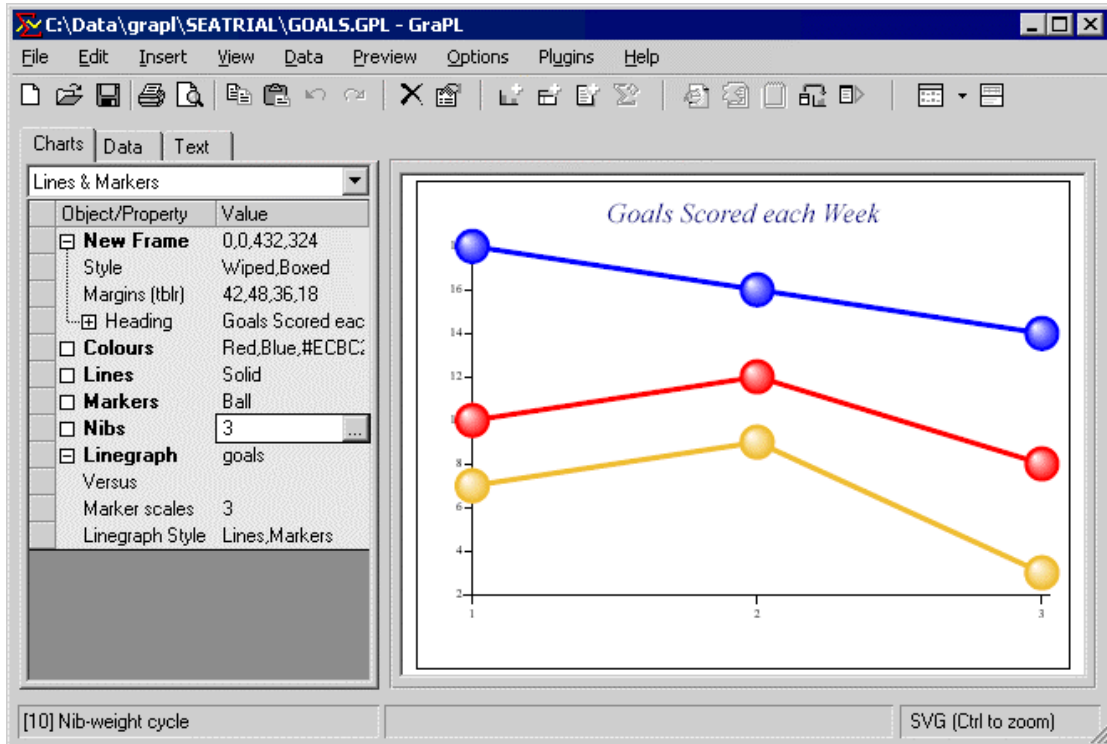
Here you can see I have chosen to alternate solid and dashed lines. You can make the cycle as long as you like, or simply set it to 1 if you want all your lines the same. You can pick from any of the 6 pre-defined line-types or add a custom dash-pattern of your own.

Setting a marker cycle

This is mostly used for scatter plots where you have several categories of data plotted against the same set of axes.



Again, you can add your own markers to the list, for example by using characters from the WingDings font. You can also choose to scale the markers, independently of the chosen nib weight. You will need to add a 'Marker scales' property which may be a single number (as shown here) or may refer to a data column if you want the marker size to reflect the data values.



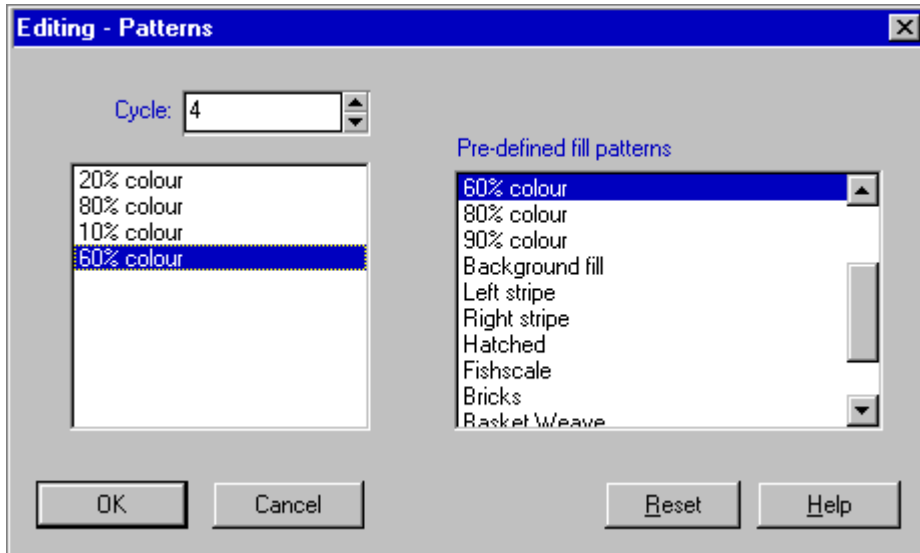
Here I set the marker cycle to a single value (the 3D ball) and scaled them to 3 times normal size.

Setting nib weights

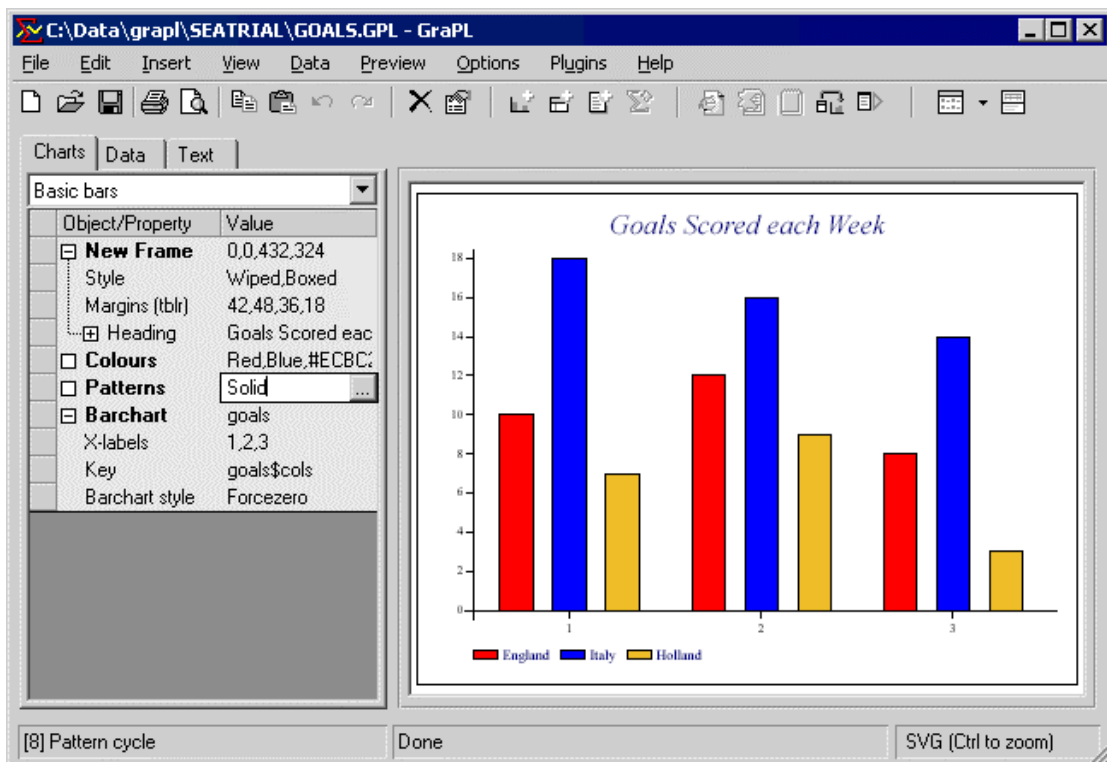
By default, GraPL sets the nib thickness at 0.3 points, which equates to a 1-pixel line on screen and a nice hairline on the printer. You can set this from a selection screen (as for lines and markers) or simply type in a list of numbers here. In the example above, I have increased the nib weight to a 3-point line which looks much better on screen.

Setting a pattern cycle

GraPL uses a default set of shading patterns for barcharts and piecharts, again with the objective of making your charts print well on black and white printers. Also you will find that half-tone colours work better on screen for most normal charts. However, if you want to set up some special effects, add a 'Pattern cycle' above the chart, and set the cycle length and pattern for each element:



For our football example, we probably want solid colours everywhere, so a cycle of length-1 with 'Solid' set for all the bars is all we need:



Notice that this also sets the colour and pattern used in the key, which has been set to pick up the column titles here. If you are using VML or SVG in the Preview pane, you can experiment with a variety of simple gradient fills here also.

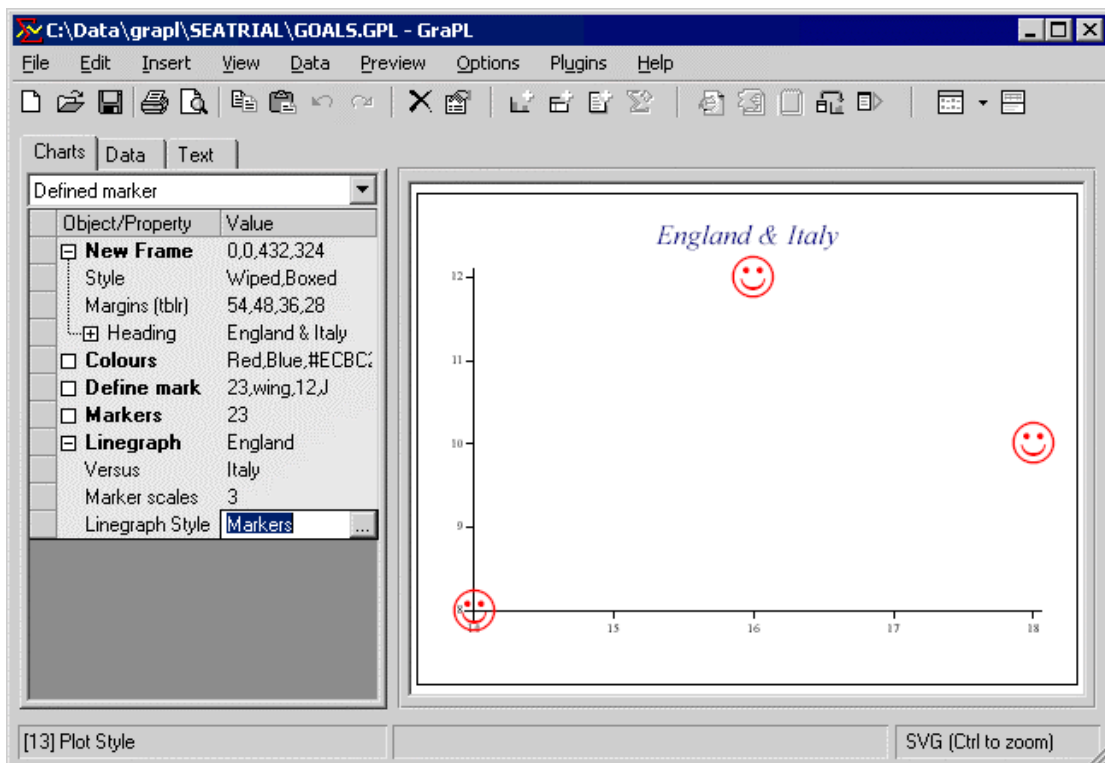
Defining your own line-styles

You can set any repeat pattern of dots and dashes by adding a 'DefineDash' setting at the top of your chart specification. Here you give the dash-pattern a number, and then the repeat pattern with any combination of 'line-gap-line-gap' values in points, say "12,15 14 6 14" to make repeat pattern number 12 have a 15-point line, a 14-point gap and so on. Obviously, you must give an even number of values here. To refer to the custom style in your line-cycle, just give a list like "Solid,Dash,12" – you can use any numbers you like for custom patterns as long as you keep clear of the preset numbers.

Defining your own markers

The various Windows typefaces provide a rich source of good graphical markers to be added to the built-in set. For example the characters JKL provide the happy, neutral and sad faces ☺☹☹ which might be ideal for our football scores. More usefully, you might like to plot the results from a chemistry experiment with the string 'pH' as your marker on a scatterplot.

To use the smiling face as a marker in a scatter plot, add a 'Define mark' entry to your chart definition and fill in the required font, the point-size and the character you want as the marker:

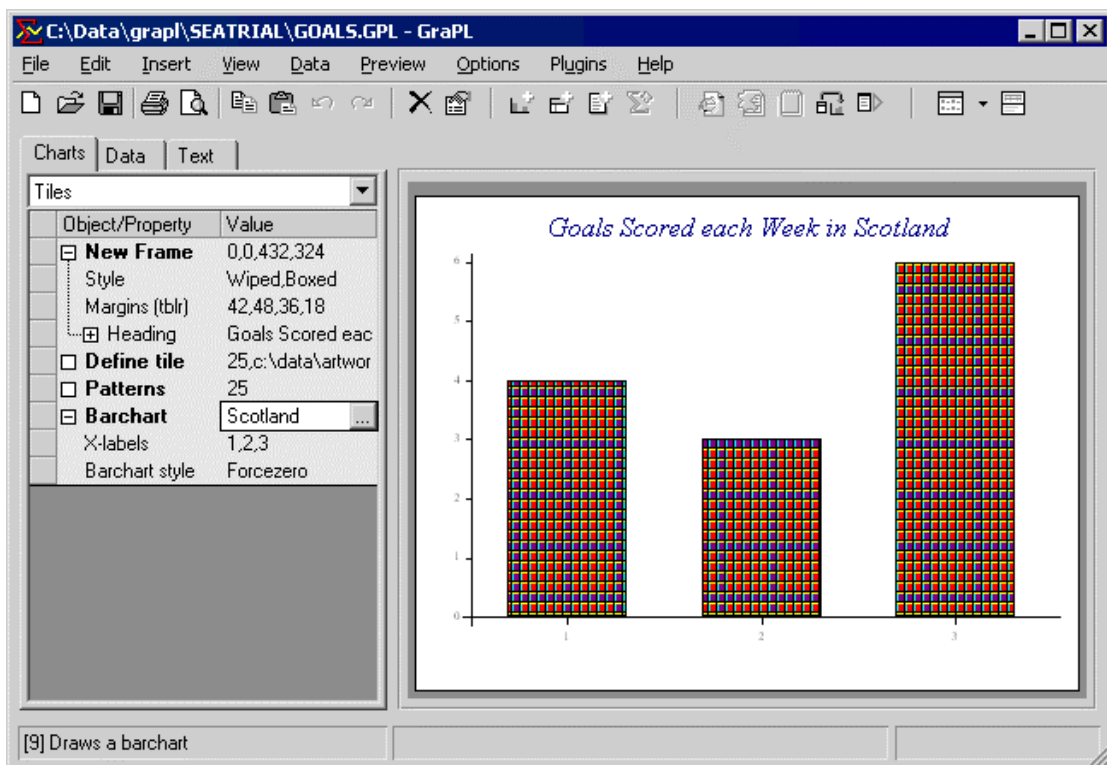


Here I have defined the new marker as number 23 (use any number you like as long as it is greater than 16) and applied it to my marker-list before running the scatterplot. To

refer to characters which are hard to type (such as the Windows logo which is the very last character in the WingDings font) you can give the decimal index of the character preceded by '#' e.g. the ringed numbers which start at #139 can be very good markers. Use Charmap (in the Windows, Accessories menu) to select an appropriate symbol, and read the number from its statusbar, or just paste the character directly into GraPL.

Defining fill patterns

GraPL provides a good set of basic fill patterns for bars and pies, however there are plenty of requirements for specialist fills, for example geologists like to shade limestone with just the right kind of irregular block. To make a custom fill, you must first draw it and save it as a bitmap (e.g. using Windows Paint) then you can add a 'Define tile' entry to your chart definition, give the pattern a number as for lines and markers, and use it anywhere a fill pattern is required. The example adds a column of data for Scotland and uses a tartan pattern for the bars:

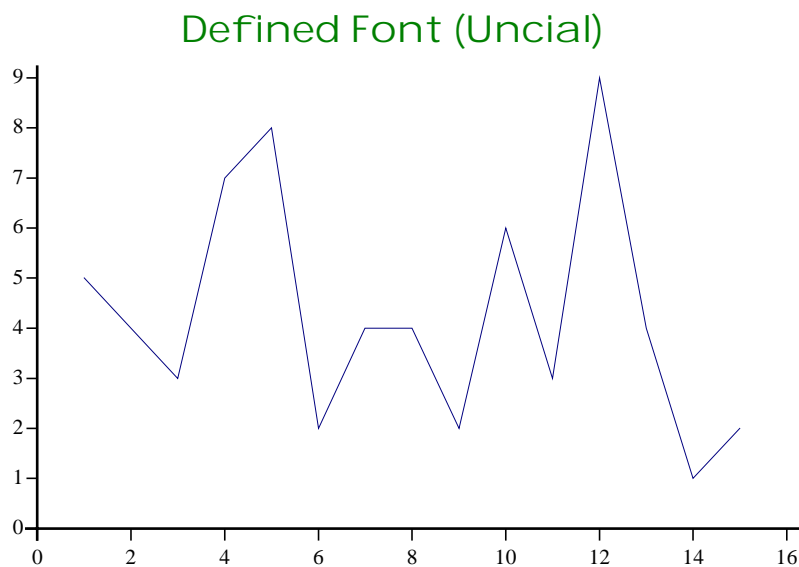


Here I have defined tile number 25 as the bitmap "c:\data\artwork\tartan" and set the pattern cycle to use it. Obviously you can use any standard fill pattern here – Paint Shop Pro comes with a good selection of background fills for nice relaxed effects.

Adding extra font codes to the supplied list

GraPL comes preset with Times, Arial, Courier, Symbol and WingDings defined with 2-letter short codes (see Options,Font list to change the default set). If you stay with these fonts, you will ensure that your charts are completely portable and work well in any web browser (not just on Windows). However you may want to add new abbreviations to give you access to any font on your computer – in the example I have added Comic Sans

with the short code 'cs' to allow me to use it italicised in the heading and bolded for the axis labels.



If you want to add a font that only comes in a single flavour (such as WebDings) you can use up to 4 characters for the short code, otherwise it is best to leave the last 2 characters free to be used for the 'b', 'i', 'bi' suffixes. Once a font is defined, you can use it anywhere GraPL expects a short-code, so if you have a set of non-standard fonts which you use regularly, you might consider adding them to a template so that they are always available.

Creating and Using Templates

The leftmost tab on the right-hand side of the screen is there for you to collect your favourite chart styles, so that you don't have to build them up from scratch each time. GraPL is shipped with a few simple templates as examples (such as the ErrorBars chart) which you can examine, modify or discard as you like.

If you don't use this tab, select Options, Preferences (p.41) from the main menu and uncheck it to have it hidden in the future.

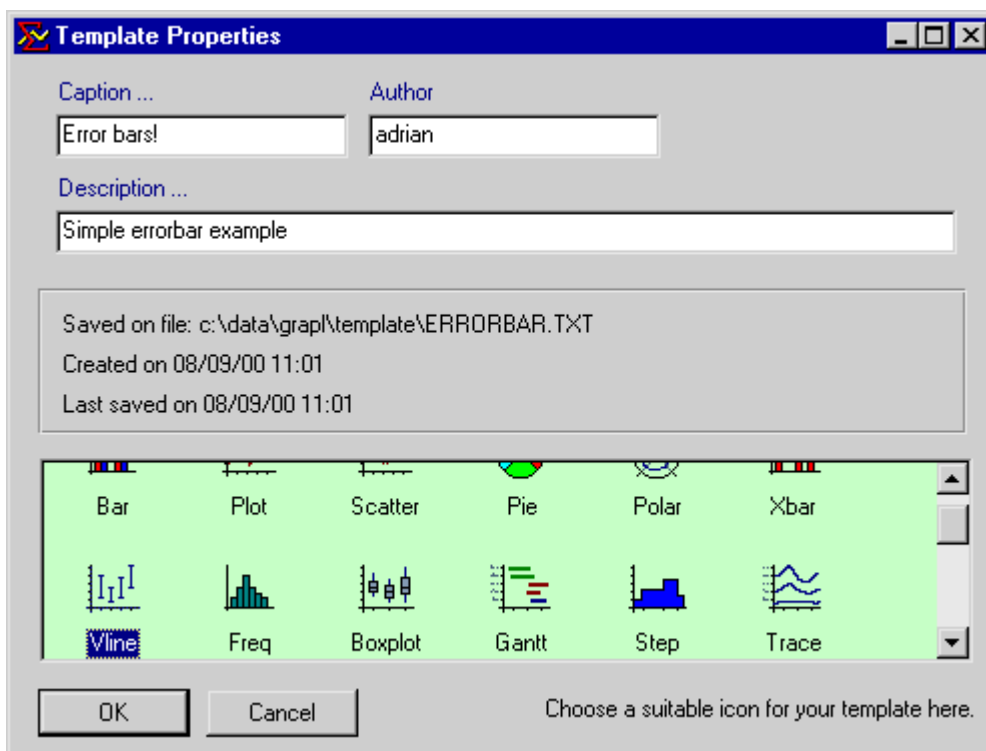
How templates are stored

A GraPL template is simply a text representation of the chart specification, with any references to column names changed to read {data} so that it refers to the {data} generated series when you use it again. Templates are saved with a .TXT file extension in the Template folder (by default – you can change this from the Preferences dialogue) so that you can edit them with Notepad, move them around with Windows Explorer, put them into mail messages to send to your friends and so on.

A typical template looks like:

```
[Header]
Author=adrian
Created=08/09/00 11:01
Saved=08/09/00 11:01
Name=Error bars!
Descr=Simple errorbar example
Icon=7
[Properties]
New Frame:New:0,0,432,324
.Style:BS:boxed,wipe
.Margins:MG:42,48,36,18
.Heading:HE:Sample Timeseries with Errorbars
..Font:HF:TII,18,Navy
..Style:HS:
Linegraph:Plot:{data}
.Style:ST-L:lines ..... and so on
```

The header part is what you see when you use the right-mouse menu on a template icon to access its Properties:



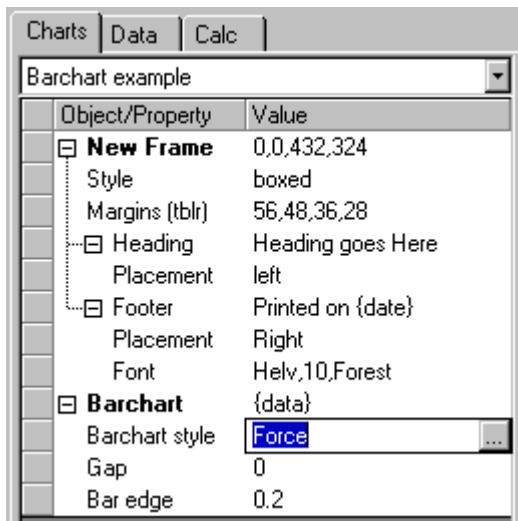
This dialogue also lets you pick an appropriate icon from GraPL's collection of chart miniatures. The [Properties] section of the file has one line for each line in the chart specification. The indenting is determined by the number of leading dots, so you can easily tidy this up in a template file. Each line then consists of three elements:

- the text description of the chart or property. You can make this anything you like – it will be used in the left-hand column of the tree to describe the line.
- the internal GraPL chart name or short code ('HS' is a heading style) for the property.
- the property setting (exactly as it will be shown in the Chart tab)

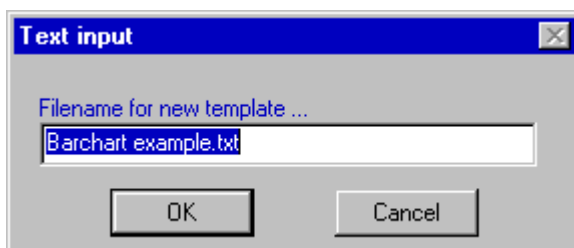
When you base a new chart on a template, GraPL always reads the latest version from file so you can check your work by saving the template from Notepad, switching to GraPL and dragging the modified template across to the Chart tab. If you change the header information, or copy a new file into the templates folder, you will need to choose View,Refresh templates (or press F5) to have your changes show up in the Templates tab. You can preview a template at any time by selecting it in the Templates tab and pressing F1 or selecting 'Preview template' from the right-mouse menu on a template icon.

Saving a chart as a template

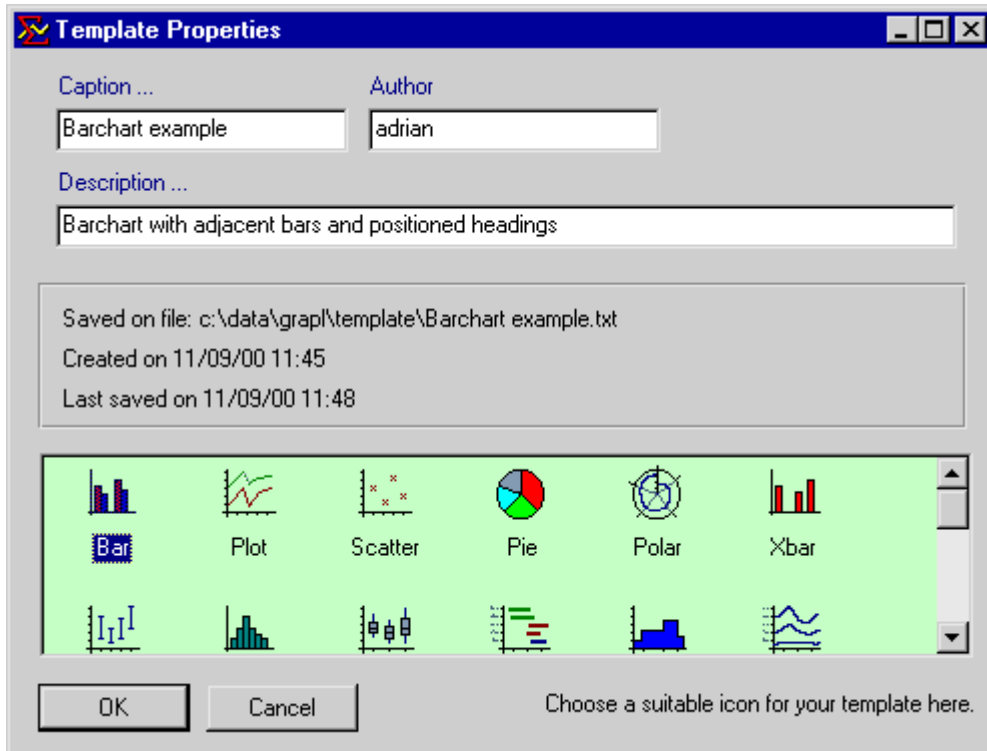
Typically, you might set up a simple chart with your choice of fonts for headings and subheads and a standard footnote such as 'Printed on {date}' See Field codes for more details.



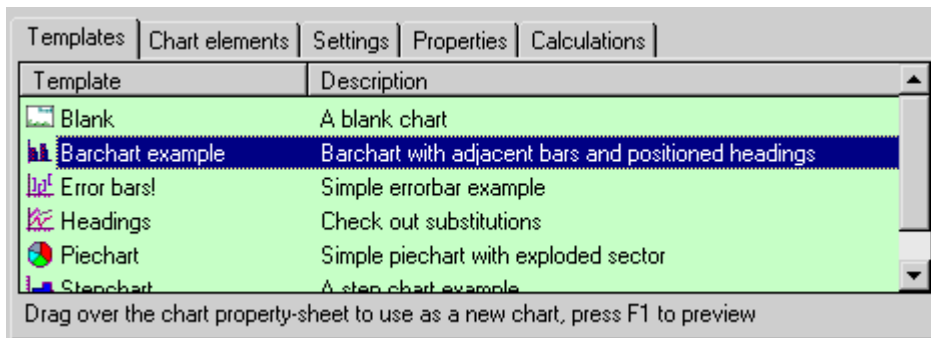
This example also sets the 'forcezero' style, takes out the gap between bars and increases the footer font a little. You can check out the appearance in the chart thumbnail, and when you are happy with the effect, select File,Save as template which will first ask you for a file name (the default is the name of the current chart sheet).



... and then allow you to pick a suitable icon and give the template a more helpful description:

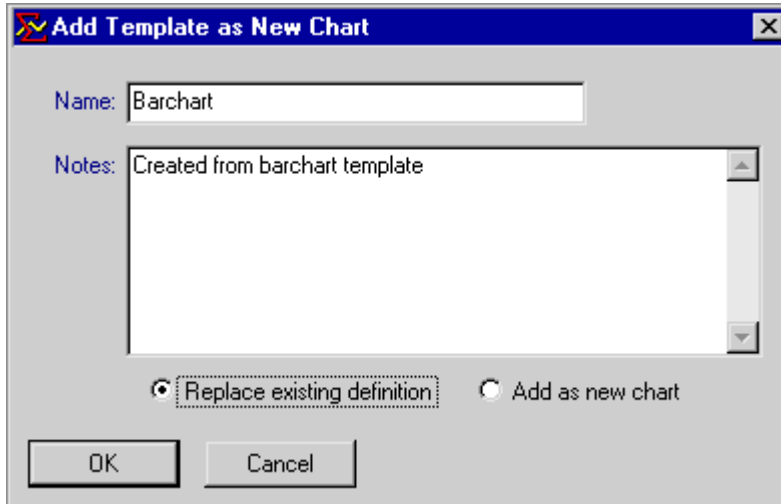


When you choose OK here, the definition will be saved for you as a text file in your template folder and the Templates tab will be updated. If you want to see the longer descriptions here, select View,Details to put the list of templates into 'Report' style:



Making a new chart based on a template

The easy way to do this is just to drag the template icon over the Charts tab. You will be given the choice of replacing the current chart or adding a completely new definition – you can also change the suggested name and add some notes at this point:



Now all you need to do is change the {data} placeholder to refer to your datasheet and the chart is ready to use.

Note that you can change the chart type here (use the right-mouse menu on the chart element) but you will probably have to collect some extra properties to make it work for you – for example if you change the **Barchart** to a **Linegraph** you will need to add a 'Linegraph style' before it will draw anything for you!

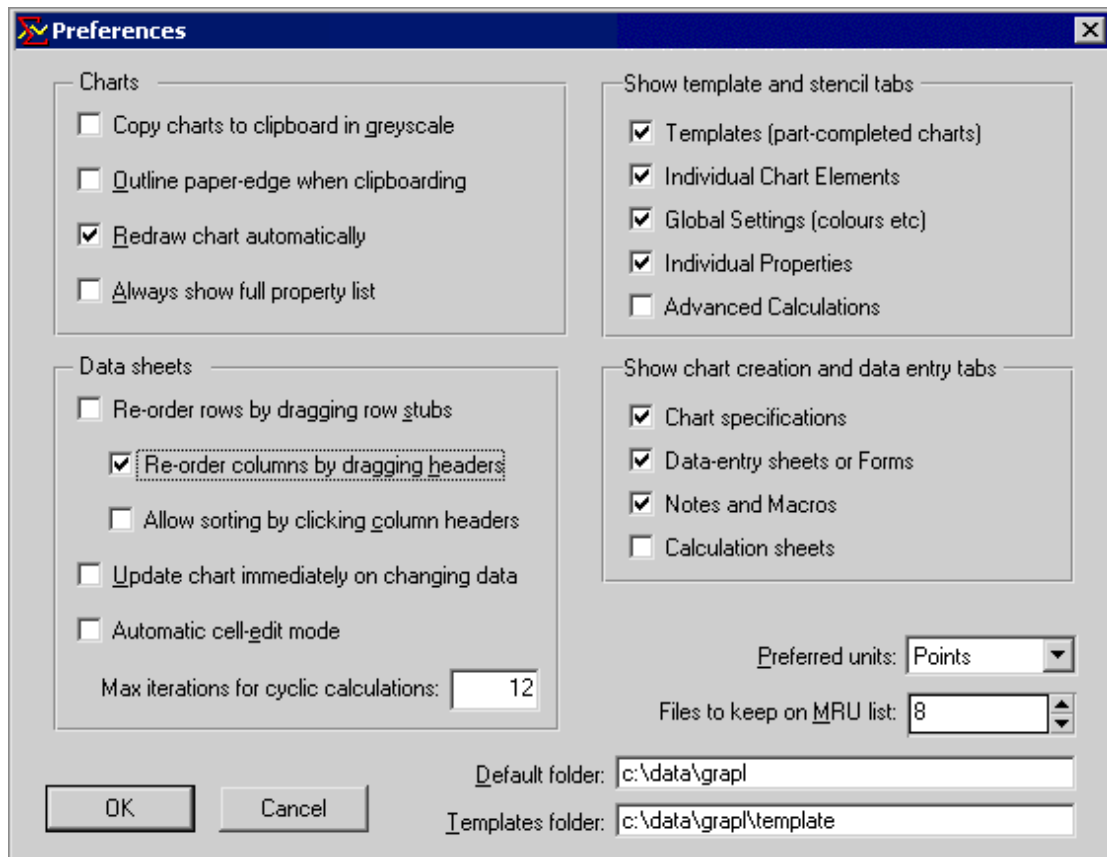
Summary – benefits of templates

Templates can obviously be a major timesaver, but also allow you to mould GraPL to behave as you want. You only need the properties in the chart specification which you actually use, and you can arrange them in any order you like. You also get a much more consistent appearance – if you like brick-red bars you can add a Colour cycle (p.29) to your barchart template which sets this as the first colour, and so on.

Once you have a set of templates that you like, you can easily move them around, tidy them up in Notepad, attach them to mail messages and so on.

Setting Preferences and Global Defaults

GraPL has a single Preferences panel which lets you customise the interface and choose the location of your templates folder:



The top set of checkboxes allows you to choose which of the right-hand tabs you want to see, for example if you never use templates, just turn this tab off.

The left-hand panel controls how datasheets behave:

- If you allow sorting by clicking the headers, it is very easy to sort a column by accident! Enable this option to sort your tables, sort them, and turn it off again to prevent accidents.
- Normally, GraPL will only rebuild the current chart when you 'commit' a bunch of changes on a datasheet by pressing Enter or hitting F9. You can enable the second option to have the chart redrawn on changing every cell.
- If you frequently move columns around (maybe to make a variety of different export tables) it is very handy to allow GraPL to do this by dragging the headers, rather than having to use the Properties panel for the datasheet. Again, it may be better to leave this option off otherwise, as it makes 'drag-selection' of a bunch of columns very difficult.
- If you set 'automatic cell edit' GraPL assumes you want to edit each cell as you get to it, rather than waiting for you to type something into it or hit F2. For numeric sheets this option is much better left turned off.

The right-hand panel controls two settings on how charts are copied and exported:

- by copying charts in greyscale you will improve the look of finished reports when printed on many black and white printers from Word etc. This is because GraPL takes care to map the colours sensibly to grey shades, whereas many printer drivers do it very badly, and some colours may disappear completely.
- if you outline the paper edge you will get a nice 'paper' effect on images exported for web graphics (PNG or VML format) and a border drawn around any charts you clipboard to Word. Experiment to see if you like this effect.

Finally, you can set your default units, the number of files GraPL should remember on the history list (shown at the bottom of the file menu) and the location of your data and templates folders. The templates folder can either be a full pathname (as shown here) or the path relative to your GraPL program folder (the default location is just '\template').

Making a collection of 'house fonts'

GraPL is shipped with a table of short-codes for the basic Windows and PostScript fonts (Times, Arial and so on). This allows you to type in font settings quickly and reliably, but it may conflict with your house standards, for example it might be a standard that all major headings should be in Arial Black, which is not on the list. However you should try to stay with the standard set for any charts you intend to publish on the internet in VML format.

You can edit the current set of font codes (to re-order them, add new fonts and so on) using Options,Global Defaults from the main menu. The font-table is saved in a simple text format as defaults.txt in your GraPL program folder, so if you prefer you can safely copy and modify it in Notepad or any other text-editing tool.

Keyboard Shortcuts

General

- Ctrl+N – starts a new GraPL project
- Ctrl+S – saves the current project
- Ctrl+O – opens an existing file
- Ctrl+P – prints the current object (chart, datasheet, calculation)
- F1 – gets help on the current item
- F2 – puts the datasheet into cell-edit mode
- F5 – refreshes the Templates tab
- F9 – runs the completed chart
- F11 – zooms the current datasheet to its own window
- F12 – toggles the thumbnail view to full-screen and back

The Specification Sheet

- F1 – gets help on any chart or chart property
- Enter – runs the current property sheet to rebuild the current chart

- Shift+Enter – opens up or closes up a branch of the tree
- Ctrl+Enter – edits the property setting in a pop-up form
- Alt+Down – moves to the next chart
- Alt+Up – moves to the previous chart
- Alt+Enter – edits the chart property sheet
- Ctrl+I – inserts a new property (picked from selective list)
- Ctrl+D – removes a chart or property (and its children)
- Ctrl+R – resets any property to ‘factory defaults’
- Ctrl+C – copies a property (or a chart and all its properties) to the clipboard
- Ctrl+V – pastes a copied property or chart
- Ctrl+X – removes a chart or property, but keeps a copy on the clipboard

The Data Sheet

- Ctrl+F – finds any value in the current column
- F3 – reruns the last ‘Find’ with the same value
- Ctrl+T – toggles into Table view
- Ctrl+M – toggles into Form (row-by-row) view

Index

A

Acrobat Distiller 28
 Adding a new data sheet 9
 Adding and Testing Calculations 21
 Adding chart elements 16
 Adding Charts and Properties 6
 Adding or removing columns 12
 Arith 21

B

Build charts 14

C

Calculation sequence 24
 Calculations 21
 documenting 25
 Chart
 save as template 36
 Chart Specification
 editing 14
 Charts
 adding 6
 documenting 18
 keyboard shortcuts 18
 moving 17
 printing 26
 properties 15
 removing 17
 running 18
 Charts and Data
 exporting 26
 printing 25
 Charts tab 5
 Clipboard
 importing 18
 Colour cycle
 defining 29
 Column calculations 21
 Columns
 deleting 12
 inserting 12

 ordering 12
 properties 12
 Comments 25
 Cosine 23
 CSV files
 exporting 26
 importing 18
 Custom line-styles
 defining 34
 Custom markers
 defining 34
 Custom patterns
 defining 35
 Customising
 main screen 7
 Cycles
 colour and style 29

D

Data
 entering and organising 8
 importing 18
 Data sheets
 adding 9
 cell copy 11
 exporting 14
 exporting as CSV 28
 fill down 11
 one-click sorting 13
 printing 14, 26
 save as webpage 28
 Data tab 5
 Data type 10
 Datasheets 8
 properties 9
 Dates
 arithmetic 23
 Define
 colour cycle 29
 custom 34
 line-style cycle 31
 marker cycle 31

- nib-weights 32
 - pattern cycle 33
- E**
- Editing
 - chart specification 14
 - Entering data 11
 - EPS (Encapsulated PostScript) 28
 - Error bars 17
 - Exporting 26
 - Exporting charts
 - clipboard 27
 - file 27
 - Exporting datasheets
 - CSV 28
 - tabbed 28
 - webpage 28
- F**
- Fill down 11
 - Fill patterns 29
 - defining 35
 - Fonts 41
 - defining 35
- G**
- Grow by 11
- H**
- HTML 26
- I**
- Importing
 - clipboard 19
 - Excel 18
 - text files 20
 - Importing data 18
 - Installation 2
 - Internet Explorer 27
 - Introduction 4
- K**
- Keyboard shortcuts 42
- L**
- Line colours 29
 - Line-styles
 - custom styles 34
 - defining 31
 - Linking datasheets 23
 - Lookup 23
- M**
- Manuals
 - printing 3
 - Marker cycle
 - defining 31
 - Markers 29
 - defining 34
 - Maxws 21
 - Memory
 - available 21
- N**
- Network use 3
 - New template
 - adding as a chart 17
 - Nib weights
 - defining 32
 - Notes (comments)
 - calculations 25
 - chart 18
 - data 11
 - datasheets 11
 - importing data 21
 - project 8
- O**
- Objects
 - adding and removing 16
 - Organising data 8
 - Overview 8, 26
 - printing 26
 - save as webpage 26
- P**
- Pasting data from the clipboard 11
 - Pattern cycle
 - defining 33
 - PDF (Portable Document Format) 28
 - PNG (image file) 28
 - Preferences 41
 - Printing and exporting data 14

Printing Charts and Data 25
Project properties 8
Properties
 adding 7
 adding and removing 16
 moving 17
Property Tree 15

R

Reading from text files 20
Registration 2

S

Save as Webpage 26
Scratch variables 13, 24
Settings
 colours 29
 markers 29
 patterns 29
Sorting the datasheet 13
Statusbar 7

T

Templates 36
 creating 36
 creating from a chart 38
 properties 37
 using 40
Text files
 importing 20
Text tab 5
Thumbnail view
 zooming 18

V

VML (vector graphics) 27

W

Windows Metafile 28
WS FULL 21