

GraPL Release Notes

Updates to 15th Feb 2004

User interface

Chart specification. You can now use the right mouse menu on the chart-spec to insert chart elements, properties and so on. A new shortcut Ctrl+I will insert a single property, chosen from the list of properties appropriate for the parent command. For example hitting Ctrl+I under a **Note** will typically show *Background*, *NoteNudge* and *SoftHyphen* which are the only useful properties that may be added to the default set.

Preview options. These have been extended to allow immediate preview as VML, SVG or PDF in the standard chart panel to the right. This allows immediate viewing of SVG effects such as animations and gradient fills. It is also a useful way to compare output quality under the different viewers.

Note that you will need an SVG viewer here (free download from Adobe) and Acrobat Reader installed. All the previews are done using the 'Microsoft Webbrowser' object, so this also requires a reasonably up-to-date copy of Internet Explorer on your machine.

Which ever preview you use, you will find that the right-mouse menu on the preview now belongs to the chosen viewer, for example in VML mode, you get the standard IE dropdown menu here.

Text tab. In addition to chart spec and data, you now have the option of a tab for free text items. These may be single-line entries (for example your company name which you might need in several places), wrapped text (for chart notes) or scrolling edit fields (useful for SVG filters, JavaScript fragments and so on). Text items may be referenced by item name in the same way as data columns, and so may be used as a convenient place to store long notes and other similar content. Text may refer to other text via field codes.

Calculated Columns

The calculation tab is still available via Options, but has been mostly superseded by column calculations. These allow you to include arbitrary arithmetic expressions and lookups in the column definitions. Calculations are run in 'dependency' order (so the left->right layout of the datasheet is not important) and may be cyclic, up to a preset limit.

Note that calculated columns are shown with a grey background in the datasheet, as they may not be edited by the user.

Console Window

This has been redesigned with 2 panels to allow much easier experimenting with expressions. It is probably a good place to develop and test column calculations, which can then be pasted into the column definition.

Form View

This is an alternative to the datasheet view which may be appropriate for data with many columns, or wide fields. It shows the data row-by-row with the usual controls for paging through the records, adding and removing rows. You can toggle between form and table view with Ctrl+R and Ctrl+T respectively. If you position the cursor on a particular row in table-view, that row will be chosen in form-view and vice-versa.

Chart Improvements

Cloudchart – markers were being scaled (by projecting a unit cube and using the longest projected edge) for perspective, but then the computed scale was being rounded to 1dpl which meant that they were stepped in size rather than evenly graduated. Also, each series was being normalized independently so several sets of data (say one cloud at the far corner and another nearby) were being drawn at the same size. Now it all scales absolutely relative to the unit cube at the (0,0,0) point.

Table charts – simple table-formatter using X-labels for the coltitles and Y-labels for the row-stubs. The value style and format picture control the appearance of the cells. Both cells and labels may be wrapped and the coltitles may be spanned over more than one column. Intended use is to add simple summary tables to charts, for example see the boxplots in *Barley* which tabulate the mean yields to go with the raw data.

Venn – simple Venn Diagram for the 3-area case. May eventually be extended later for more complex examples.

Clipped axes – style 'clip' used on the chart or on either axis will now clip the data at the chart boundary as well as truncating the axis line.

Timescaled axes – styles 'monthly,exact' and 'annual,exact' now work as they should on the X-axis (only complete months/years are labelled). We treat a month as complete when data is available for the last week, and a year when data is available for December. A bit subjective, but seems to give reasonable behaviour with typical timeseries.

BGColour – new property sets the background attributes of the plotting area (as bounded by the axes) with colour, pattern, edge-weight as normal. This is drawn underneath any zones, axes and so on. It extends to the last tick-mark in each direction, so looks neatest when used with styles 'clipped/framed'.

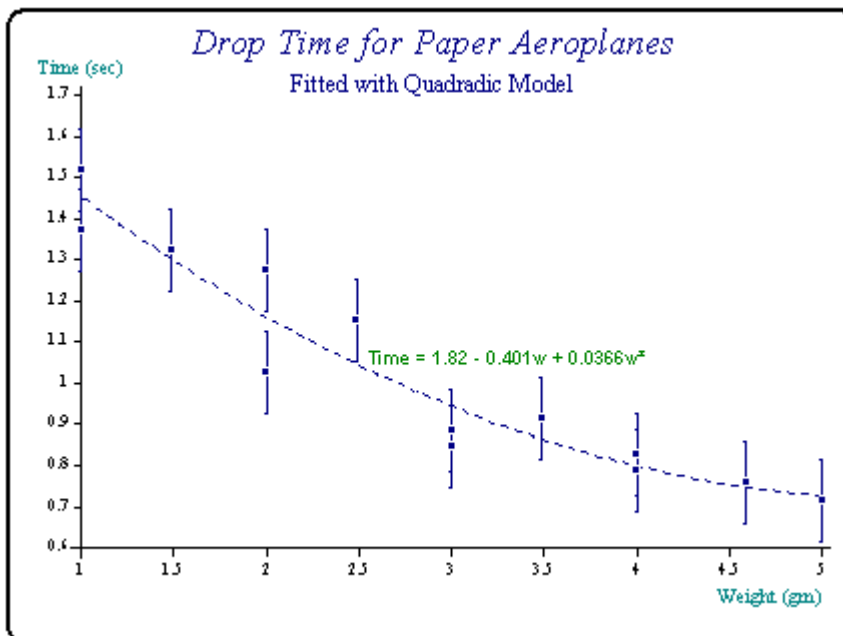
Find dialogue – selecting Edit,Find from the main menu (or pressing Ctrl+F) will allow you to search for any value in the current column of a datasheet. Repeatedly pressing F3 will circulate around the rows where the data is located.

Updates to 2nd February 2003

Piecharts – if the axis line weight is set at 0 the spider lines really should go away, not be shown as hairlines. Fixed. Also, either of NoTick/Plain should kill them off. It does now. Also we have a more flexible way to add values to the 'xlabels' here. If the 'ValueFormat' is "The XL is ###0.0" then the value of each xlabel will be substituted into the value format. This is rather neater than the default of "xlab : value" which is the current behaviour.

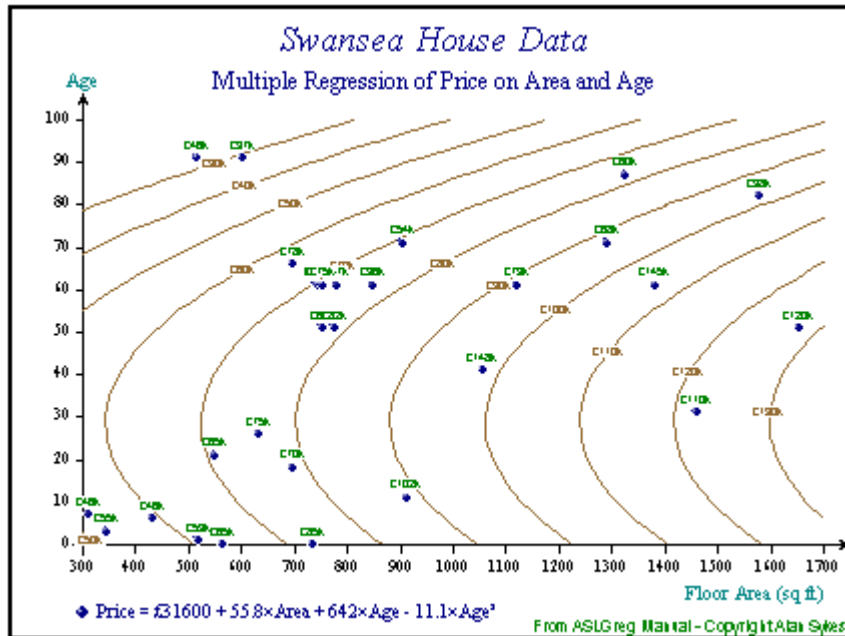
Model fit – some new properties to help write the equation nicely. These are to set a 'picture format' and to position the equation. For example in Aero we have:

```
Equation style = "index=40,above"
Equation format = "Time = C0 + C1w + C2w{squared}"
```



You can have 'left/middle/right/atend' for positioning, as well as explicitly setting index=1-100 which goes n/100 of the way along the fitted curve. The default is 'above' or you can set 'below/straddle'. The default is 'transparent' but 'opaque' is also allowed. The text is aligned left or right depending on the slope of the line at the point where you put the equation.

Hopefully the picture format is obvious! C0-Cn are placeholders for the coefficients and '+' is a placeholder for the sign. If a term is nearly 0 (within 1E-10) then it is omitted. If it is exactly 1 then the value is omitted. You can query the equation (after the chart has been run) with the {equation} fieldcode. This returns the formatted text with the coefficients inserted. An obvious place to put this would be the key! Note that for multiple regressions (Cloud charts and Scatterplots with the 'contour' option) the coefficients are generated in the order Int,x1,x2,...,y1,y2,...,y4 depending on the order of fit chosen for x and y. Set the equationstyle to include 'forcezero' to cut out the constant term and force the fit through the origin.



A selection of regression examples (simple and multiple) have been added to the *Samples* folder.

Notes – you can set the vertical spacing of the text in the note-style with the syntax:

```
Note font = "arb,12"
Note style = "left,pitch=15"
```

... to over-ride the default line-spacing which is $1.2 \times \text{fontsize}$. For fonts such as Arial, you may find a more open spacing looks better. As an alternative, you can set a percentage of the current fontsize (for example "pitch=130%"). This applies to anything which can be multiline, so headings, captions, x/y labels, keys, values and pagelabels. To cancel a previous setting, set 'pitch=auto' for any of these.

Contours – the labels are now formatted with the same picture setting as the value tags (since they must come from the same dimension).

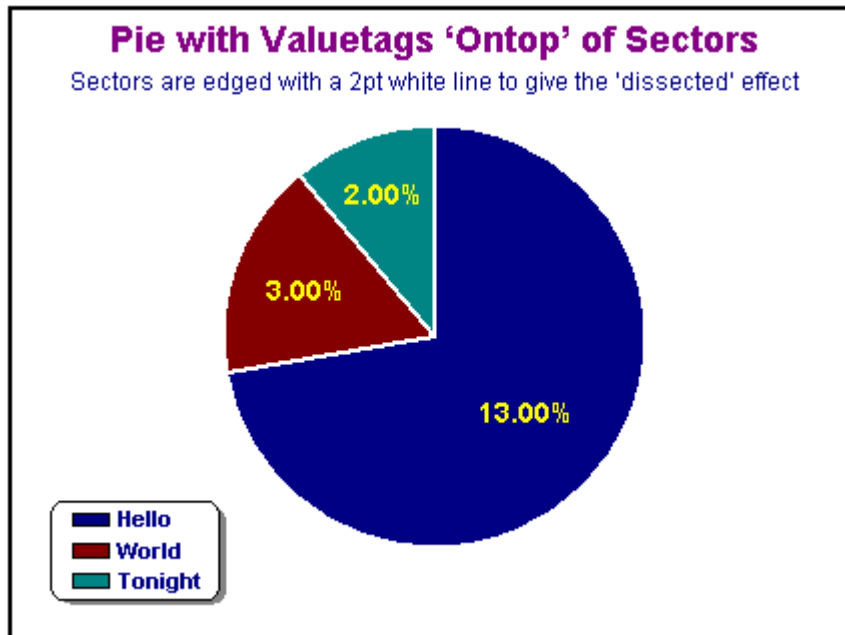
Import CSV – timestamp columns of the form '21/03/2002 15:35' were not being recognised as 'date' type columns. Also the edit field in the data-sheet for the 'date' type did not accept blank as a valid character, which made it impossible to add a time to an existing date value. Both problems fixed.

Updates to 12th December 2002

VML,PDF,SVG – you could provoke some odd effects by setting an explicit y-range of (say) 0-10 then plotting a vector including a number like -1.1E35 in the series. We now limit the edge of the paper to around 10000pt or about 12ft square which means that the lines still spike off the visible region, but do not actually try to draw all the way to Mars.

EdgeAttributes – new property so we can set the colour and edge weight of piecharts. The line-style is accepted, but pies will ignore it until someone asks for a pie with dashed edges!

ValueStyle 'inside' – now works on piecharts. This writes the values in the sector (at the approximate centre of gravity) rather than appending them to the end of the X-labels. They are always written with 'transparent' text.



A new selection of *Piechart examples* have been added to the samples folder.

Y-captions – places top caption under top tickmark, unless we only have one! In this case it just uses the chart margins to find the best place. Only relevant to plots of unranked datasets like a scatter of 0 versus 0!

Updates to November 2002 (Release 2.1)

Gradients and Opacities – Patterns 16-39 are now supported as an easy way to generate semi-transparent shadings and basic gradient fills compatibly across VML, SVG and PDF formats. This example simply sets `pattern=36` on the chart frame and `pattern=33` on the bars. The final appearance of the chart is as close as possible to looking the same under all 3 formats. See ...



- The same chart saved to VML
- The same chart saved to SVG
- The same chart saved to PDF

Titlebar – user can now set the browser titlebar explicitly in SVG (and the ‘title’ of a PDF document).

Labels and Value tags – text items are now formatted by the Picture setting in a similar way to numbers. Typical would be ‘XXXXXXXX’ which simply restricts the length – longer items are trimmed to one less than the length and an ellipsis character (...) is added to the end. In addition, insertions are supported in the usual way, so a picture like ‘SKU:XX/XXXX’ would format codes such as ‘HK1324’ nicely. If the picture ends in a semi-colon, the text will be wrapped to this width, rather than being trimmed. This is a simple way to get multi-line X and Y labels.

Missing Values – extended to allow a vector of values, any one of which will eliminate the matching point. This allows for the behaviour of many common data-loggers which may produce a variety of ‘invalid’ readings depending on the particular error-condition raised. Polar/Dial charts were not eliminating missing values at all, and Tower chart was confusing the colour cycle when there were missing towers. All are now correct.

Polar chart – minor ticks were not being computed. These now behave as you would expect, e.g. ‘XTick’ (3 2) will give ticks every 3 hours when the X-style is ‘time’ with minor ticks on the hour. The default is to treat x-values as proportions here, so on a directional plot, you could use a setting like (‘xstyle’ ‘compass’)(‘xtick’ 10 4) to get ticks every 10 deg with 4 minor ticks in each interval. Y minor ticks are now generated as for a conventional y-axis, but are always drawn centered across the axis.

Min-max plot – two simple extensions. You can now use style ‘terminated’ with this chart, which simply uses the current marker symbol at one or both ends of the line. Style ‘drift’ limits the

terminators to the 'far' end of the line and also works with the existing 'errorbar' or 'arrow' styles to make a directional line.

Interim Updates to June 2002

Interface improvements

Full **Undo/Redo** capability added for both chart specification and data sheets.

Right-mouse on chart spec now has 'Insert >' which only shows you the (unused) properties which are appropriate for the chart type the cursor is on. Use Ctrl+I as a short-cut for the property list.

Right-mouse on chart preview now offers various export types and also 'preview as SVG' which uses the IE OCX to view the chart saved as a temporary SVG file.

Plugins now have their own menu, and you can easily list available plugins and view their associated help files.

Paste as New Sheet – more tolerant parser will accept columns separated by multiple spaces as well as tabs and commas. Handy for pasting from text files and mail messages. Also allows more control over discarding 'noise' from the top and bottom of the data.

New and improved charts

Cloud chart now has the option of a fitted model (up to quartic in either X or Y) or a trend surface, fitted using an exponential weighting set by the 'flexibility' property as for the Scatterplot. If **risers** are chosen, they are drawn to the fitted surface to emphasise the residuals.

LineGraph – setting xstyle 'log' did not correctly log the data when the style 'xyplot' was used, rather than setting the 'versus' property. Fixed.

Stepchart – sets the 'crisp-edges' flag to ensure edges of step-charts are not anti-aliased by SVG renderers.

Keys or Legends – new 'autofit' style which steps down the font-size until all the key text fits into the allowed frame. Gives up and just overflows when the text reaches 3pt which is as small as we can read it. This works with all the other key-styles, e.g. reversed, vertical.

Surface shading – was always setting 'crisp' edges for SVG. Now takes note of the setting appropriate to the chart type so filled polar charts have anti-aliased edges.

SVG circles, ticks, lines, markers – all make a small compensation for the reduced line-weight when anti-aliased lines are used. This is particularly obvious in the grid-lines on polar charts which almost vanish when anti-aliased. The intention is that you see no change of weight when you set the SVG viewer to 'higher quality' off using the right-mouse menu.

Linegraph – adds new ‘segmented’ style which draws a series of separated line-segments where there are missing values in the data. A segment will only get drawn if there are at least 2 points in each block, after the data has been partitioned on the missing values for each set of y-values given.

Character markers in SVG and VML – defined markers with any decimal value are now OK, and are simply passed out in `&#nnnn;` format. This allows any Unicode char to be used as a marker.

DefineFont – tolerates a list of font names (maybe quoted with single quotes) which is then correctly passed through to VML or SVG.

Axis styles – XYZ axes now notice style *nolabels* which allows axes to get tick marks and gridlines but prevents labels being drawn. Useful if you have a vertical or horizontal trellis where you probably only want the bottom or leftmost chart-axis labelled, but ticks on all of them.

Response – style ‘risers’ now works as it should. May be used with *nolines* and *nomarkers* to give a ‘bristle’ plot which can be a good way to view a dense matrix of Z values for a rectangular xy grid. Could be achieved before with the cloud chart, but this is much easier to work with if you have a rectangular array of Z values.

LineGraph – notices style ‘crisp’ which kills SVG anti-aliasing for the line. The apparent effect is to embolden the line somewhat when the line-weight is low (around 1-pixel).

Max-min – uses filled rectangles if the ‘nib’ is very broad. Otherwise Windows draws the ‘lines’ with round ends which can bulge out under the axis and collide with the value tags and generally make a mess. This has no effect on SVG or PDF output which drew it correctly already!

Max-Min – a GraPL user has long-term min/max averages to plot as a backcloth to a temperature chart. This can be done with a filled lineplot but much better to do it with min-max which already has the data shaped up right. Use style ‘filled’ to fill the region between the two sets of y-coords. Generally these will not cross over, but the chart will work OK if the lines do cross (e.g. imports/exports showing the ‘trade gap’). For now only one shading is allowed – maybe in the future we will allow 2 settings for ‘a above b’ and ‘b above a’ respectively.

Notes – now have style option ‘Rounded’ and there will shortly be some new properties to give full control over the corner radius and the shadow opacity and offset. Keys and the chart frame can have round corners in the same way.

Dial – new chart type. Emulates a dashboard dial with one or more pointer(s) and one or more warning zones. Adds new properties ‘XZ,YZ,IZ,ZA’ to set up zones – these are supported by the normal XY plots (e.g. for control charts) as expected. Set up the attributes with ‘ZA’ (colour,patt,edge) if needed – the defaults are Red,solid,none – and add zones as required. You can set matching vectors of X and Y zones to make rectangular areas.

Notes – a new property ‘NoteNudge’ which is in points, and allows you to place a note using chart co-ordinates (which baselines it at the xy given), and then nudge it an absolute distance, say to get

the text descenders clear of a gridline, or to offset from a data-point by an amount related to the fontsize.

LineGraph – if 'values' have been set for all datapoints (as numbers) this will now notice the 'contour' style and the 'flex' and 'ZTick' settings to draw contour lines based on the values. This allows a standard 2D scatterplot to show a map of values in a 3rd dimension.