GRAFFER — A flexible electronic graph paper
Version 1.03

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1 Introduction

The original idea for GRAFFER goes back some considerable time. It arose from the frustration at the lack of any utility to fill the gap between xfig and writing an application-specific program to plot the data. Its primary function is the generation of X-Y plots and annotating them; in other words, to fill that niche occupied in the dark ages[1] by *graph paper*. Unlike real graph paper it is easy to switch from linear to logarithmic plots, to change scalings, to change and move annotations or to adjust points. It's also easy to save the plot so that it can be incorporated into other packages (e.g. xfig or LaTeX).

1.1 Requirements

GRAFFER is written in IDL and requires at least version 4.0.1 to be able to operate[2]. A terminal or workstation supporting IDL widgets is needed, with a sufficiently large screen to hold the main GRAFFER control window which using Motif widgets on my workstation is about 900 pixels in the y-direction which is likely to be the critical dimension. You will also need a 3-button mouse or something which emulates one.

Although it should work on anything which supports IDL with widgets, testing has been done using IDL 4.0.1 on a Sparc-5 running Solaris 2.4.

2 Using GRAFFER

2.1 Starting up

To run GRAFFER it is necessary to have the directory with the GRAFFER routines in your !PATH variable in IDL. There are two ways to do this, either by adding the directory to the !PATH explicitly within IDL, e.g.:

```
IDL> !path = '/datan8/sjt/graffer/:'+!path
IDL> graffer
```

or by adding the path to your IDL_PATH environment variable[3], e.g.:

```
xuna> setenv IDL_PATH '/datan8/sjt/graffer/:+/datana/idl/lib/'
xuna> idl
.
.
IDL> graffer
```

[1] When a dumb terminal cost as much as a workstation now does and most users had to work on teletypes.

[2] The only feature which I believe to be version-4 dependent is the use of tracking events—the package should work, apart from the function description window under version 3.6

[3] If using this method note that the IDL_PATH environment variable must be set to the whole path that is to be used, not just the extra path items (see the IDL documentation for more details).

Once you are in IDL with !PATH correctly set, then to start up GRAFFER give the command graffer. graffer takes a single optional string argument specifying the filename to use this may either be a pathname or a simple filename in which case the current directory is used. If no filename is given, then a pickfile menu appears to allow you to select a file or specify a file name. In addition to the argument, there are four keywords that may be given:

XSIZE : Specify the X-dimension of the display window in pixels (the default is 600). Values less than 600 are ignored, for greater values, the display window is created as a scrollable window.

YSIZE : The same for the Y-dimension.

GROUP : The group leader of the widget hierarchy, only used when GRAFFER is invoked by another widget.

DEBUG : If this is set and non-zero, then run GRAFFER in debug mode (information level messages are enabled and it doesn't return to the caller on a crash)[4].

Examples of ILLEGAL GRAFFER calls:

```
IDL> graffer test.grf                   ; No comma after command name, no
IDL>                                    ; quotes around file name

IDL> graffer, 'test.grf', 800, 800      ; too many arguments

IDL> graffer, debug                     ; DEBUG is a keyword (this would
IDL>                                    ; be valid if DEBUG were a string
IDL>                                    ; variable containing a filename)
```

What was probably meant is:

```
IDL> graffer, 'test.grf'                ; Comma after command name,
IDL>                                    ; quotes around file name

IDL> graffer, 'test.grf', xsize=800, ysize=800
IDL>                                    ; X and Y sizes given as keys

IDL> graffer, /debug                    ; Start graffer in debug mode
```

2.2 A quick tour of the main GRAFFER window

Now that you've got GRAFFER up and running, you should see the main GRAFFER window dominating your screen. Before going into the details of how to use it, let's just make a quick tour of the main areas of the window and what they do.

[4] Under normal circumstances I should be the only person who needs to use this.

The most obvious item should be the *plotting panel* in the upper-right quadrant which will contain a basic set of axes (assuming you've started up with a new file). This is where the plot will be displayed. It is also possible to enter data and select the location for text using the cursor and mouse in the plotting window.

To the left of and below the plotting window are a selection of buttons and entry windows that allow you to control the plot. The simplest thing is to go over these from top to bottom.

Right at the top comes the *utility control menu*, this is a pull-down menu which allows you to get out of `GRAFFER`, to make hardcopies, save files or open new ones. Below this are two text windows which display the name of the current file and the current directory, these are not writable by the user.

Beneath this comes the *general settings* panel, which has entry windows for settings affecting the whole plot. The general settings panel is followed by two essentially identical *axis settings* panels, one for each axis, which allow you to set the properties of the axes (e.g. range, log or linear etc.).

Underneath these and extending under the plotting window is the *dataset control*, which also includes some items which don't fit anywhere else. The detailed layout of this panel is liable to change from version to version and the descriptions here apply to Version 1.03. Working from left to right, you will see firstly the buttons for selecting the dataset on which to operate, and below it the current cursor position. To the right of this are various buttons and entry boxes to set the properties of the current dataset, with underneath a message window for any warning or error messages from `GRAFFER`. At the far right are buttons for accessing the various ways of setting the data in the current data set and the text/data mode selector button.

Right at the bottom of this lower panel is the "function" window which displays a brief description of the function of the object currently being pointed at with the mouse.

3 X-Y data

The principal function of `GRAFFER` is to allow you to make plots of Y *vs.* X data, therefore it seems logical to make that the first detailed topic of this manual.

`GRAFFER` supports the plotting of multiple plots on a single set of axes, each plot is referred to as a *data set*. All data plotting operations act on the *current* data set.

3.1 Entering data

There are seven ways to enter data:

With the mouse: To enter a datum using the mouse, move the cursor to the desired location (if cursor tracing is enabled the current location will be displayed in the location windows in the lower left of the screen and continuous cross hairs will be displayed from the cursor location to the axes). When the cursor is where you want it click with the *LEFT* mouse button, the cursor location will then be added to the current data set. To move a datum, move the cursor near to the point to be moved then press