

SUN/219.1

Starlink Project
Starlink User Note 219.1

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5 June 1997

The GWM Xdisplay Widget

User's Guide

Abstract

The GWM Xdisplay widget is a Tcl/Tk-based replacement for the standard GWM Xdisplay manager. It provides several facilities not available in the standard display manager, including manipulation of the colour table of the display, capture of the displayed plot or image to JPEG format, and dumping to print files of various formats.

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1 Introduction

The TCL/GWM image display and plotting widget¹ is a alternative Xdisplay manager, to be used in place of the standard GWM Xdisplay manager.

By using TCL to develop the display manager, quite small amounts of code can be used to generate quite powerful systems, and it is relatively easy to extend to provide new features. This version is only a demonstration of what can be achieved. Users may make copies of the relevant code and extend it if they so wish.

Full details on the TCL/GWM widget and the standard GWM Xdisplay manager are give in SUN/186 (STARTCL) and SUN/130 (GWM) respectively.

2 Enabling the Widget

The TCL/GWM widget is the default display manager in use on Starlink systems, so just logging in and initialising the Starlink Software should enable you to use the widget.

It lives in the directory `/star/bin/startcl` on most Starlink systems, whereas the older standard display manager lives in `/star/bin`. If you have `/star/bin/startcl` in your PATH before `/star/bin`, you should get the TCL/GWM widget. This is setup by the Starlink initialisation on Starlink systems.

If you want to use the older display manager, you should put `/star/bin` in you PATH before `/star/bin/startcl`, or ensure that `/star/bin/startcl` is NOT in your PATH.

3 Using the Widget

If you have the TCL/GWM widget enabled it will be used when any 'xwindows' output is produced by a Starlink graphics program, whether the requirement is to display a colour image or a simple line plot.

The TCL/GWM widget can be invoked by the standard graphics system and can be generated with an overlay if required, in the same manner as the standard GWM 'xwindows' display. Those graphics programs that automatically generate a display 'xwindows' can use the TCL/GWM widget if it is available.

A typical TCL/GWM widget might be generated thus:

```
% xmake -colours 128 xwindows
```

where % is the shell prompt. This will generate a widget with 128 colours allocated called `xwindows`

¹A widget is the name given to this type of application in the TCL system. Any resemblance to the widgets found in beer cans is a figment of the imagination.

If you need an overlay plane (*e.g.* to plot contour maps over images) you can use the `-overlay` switch:

```
% xmake -colours 128 -overlay xwindows
```

A full list of the TCL/GWM widget command switches is given in SUN/186.

3.1 The main display window

The main window of the TCL/GWM widget is by default the standard GWM 'xwindows' size with buttons along the bottom which activate the facilities available. Along the bottom and down the right side are the scroll bars (a widget with an overlay plane has two sets of scroll bars, the inner set for the overlay and the outer set for the main plotting surface.)

In order across the bottom, the buttons are:

Exit Press this and the widget will exit.

Colours Displays the Gwm Colours dialog box that allows you to manipulate the colours on the plotting surface of the widget, including the foreground, background, overlay and crosshair cursor.

Clear Wipes the plotting surface clean.

Clear Overlay Wipes the overlay surface clean. This button is only present if you start the TCL/GWM widget with an overlay.

Capture Displays the Gwm JPEG dialog box that allows you to dump the current plot to a JPEG file.

Print Displays the Gwm Print dialog box that allows you to dump the current plot to a print file in a number of formats, including PostScript.

Crosshair Toggles the appearance of the crosshair cursor.

Help Displays the help text. The help text is essentially the same information provided in this document.

3.2 Colour manipulation

The Gwm Colours dialog box provides a mechanism which allows you to alter the colours on the plotting surface. You can change the colours using the Red, Green and Blue sliders, and you can select which colour or pixel value to alter by selecting the appropriate button.

Checkbuttons

Background: Colour (pixel value) 0 – this is the background colour of the plotting surface.

Foreground: Colour (pixel value) 1 – this is the foreground colour of the plotting surface.

Other: This option toggles the `Pixel` value slider which enables you to select any of the colours or pixel values to change, including 0 (background), 1 (foreground) and the overlay (if you have one enabled).

Overlay: If you have generated a TCL/GWM widget with an overlay for plotting contours on an image, you can change the colour used for the overlay by selecting the `Overlay` button.

Crosshair: This button allows you to modify the colour used to display the crosshair cursor. You don't have to have the crosshair cursor enabled to set the colour.

Buttons

OK: Closes the Gwm Colours dialogue box.

Help: Displays this help text.

Sliders

Pixel value: When you have the `Other` button selected, this slider selects which colour or pixel value is to be modified.

Red, Green, Blue: These control the intensity of the red, green and blue colour for any given colour (pixel value) previously selected.

The Gwm Colours dialog box can be left on screen while plots are being made to the TCL/GWM widget.

3.3 Capturing the display

The Gwm JPEG dialog box allows you to dump the plot currently on the plotting surface to a named JPEG file. You can also select the image quality.

Slider

Image quality: Selects the quality of the image produced in the JPEG compression. You can vary the quality from 50% to 95% with 95% being the highest quality and therefore largest file.

Checkbutton

Progressive: A 'progressive' image is an image that, when loaded by a JPEG viewing program, will be displayed in increasing quality as the viewer program reads more of the file. This is the option to select if the JPEG image is to be used on the World Wide Web.

Entry

Filename: You should type in the name of the file you want to dump into, including the file extension if you want one. JPEG files traditionally have the extension `.jpg` but this widget does NOT supply any default extension.

Buttons

OK: Start the dump. When the dump is complete, the Gwm JPEG dialog box exits and control is returned to the GWM/TCL widget.

Cancel: Abandons the Gwm JPEG dialog without dumping to file.

Help: Displays the help text.

The **Filename** is the only entry you must fill in, there is no default filename for the dump.

When you have chosen and entered a filename, select the **OK** button to capture the plot and complete the dump to JPEG file.

3.4 Printing the display

The Gwm Print dialog allows you to create a print file in a specified format with a chosen filename. The file can be printed later on an appropriate printer.

Menu

Format: The format menu gives a choice of various print formats: B/W (greyscale) and colour PostScript, B/W (greyscale) and colour Encapsulated PostScript, and HP InkJet.

Checkbuttons

As Window: / **Colour:** The two checkbuttons control the background colour of the image as printed. You can chose either the background colour of the image on the plotting surface, or define the colour yourself using the 'Colour:' checkbutton, and selecting the required colour in the entry window below. White is the default colour.

Entry

Filename: You can choose the filename to which the print image is dumped. There is no default file extension for any of the Formats – you have complete control of the full filename. The convention is that standard PostScript files are given a .ps extension and Encapsulated PostScript files are given a .eps extension. HP InkJet dump files may be given a .dat extension.

Buttons

OK: Activates the print action and closes the Gwm Print dialogue box.

Cancel: Exits from the Gwm Print dialog box without creating a print file.

Help: Displays the help text.

To create a print file, select a format, background colour and filename, then select the **OK** button. The dump will be started and the control returned to the TCL/GWM widget. While the print is being captured, the **Capture** and **Print** buttons on the TCL/GWM widget are greyed out, indicating that the functions are unavailable. When the print capture and dump has completed, the buttons return to normal and it is then **OK** to send more plotting commands to the widget.

4 Differences in behaviour

4.1 Size of plotting surface

The TCL/GWM widget is controlled slightly differently than the standard GWM Xdisplay manager when specifying the size of the plotting surface.

The standard GWM Xdisplay manager creates a plotting surface with a boarder round it either of the default size (780 by 512 pixels), or governed by the `-geometry` command line switch. The command:

```
% xmake -geometry 900x600 -colours 64 xwindows
```

will generate a 64 colour window 900 by 600 pixels in size called `xwindows`.

The TCL/GWM widget takes any `-geometry` command line switch information to use as the size of the entire widget, and packs the buttons and scrollbars round the largest plotting surface it can create inside the size of widget defined.

To create a plotting surface 900 by 600 pixels you should use the `-height` and `-width` command line switches. The command:

```
% xmake -height 600 -width 900 -colours 64 xwindows
```

will create a widget with a plotting surface 900 by 600 with the buttons and scroll bars packed round the plotting surface.

You should note that the standard GWM Xdisplay manager does not understand the `-height` and `-width` command line switches and will generate an error message.

4.2 X resources

The TCL/GWM widget responds to a slightly different form of X-resource default definitions. These are typically defined in `/${HOME}/.Xdefaults`.

The following example shows definitions that will create a plotting surface of 850 by 600 pixels with 64 colours and with foreground and background colours set to green and black.

```
!
! GWM
! standard set
*Gwm*foreground: green
*Gwm*background: black
*Gwm*colours: 64
*Gwm*geometry: 850x600
! TCL set
*gwm*Foreground: green
*gwm*Background: black
*gwm*Colours: 64
*Gwm*Height: 600
*Gwm*Width: 850
!
```


Defaults set in the `.Xdefaults` file will be overridden by any command line switches or by applications generating their own 'xwindows' displays with specific size, colour and other options.