NAME

raster – pseudo-3D raster graph

SYNOPSIS

raster [runfile]

DESCRIPTION

Raster produces a pseudo-3D raster graph of traces from a run file, as created by *cap*(1), or *analysis*(1). The first valid trace from each frame is read from the specified *runfile* and displayed. If no *runfile* is specified, you will have to select one later.

At the bottom of the display, *raster* prints the following menu prompt line:

Alt-pens Baseline Clip File Go Hide Interpolate Locations Markers Plot Quit Start-bin Titles Vis-X-marks X-incr Y-incr

An operation is initiated by typing a single letter, the first letter of an item in the menu line. You can also step through the menu using the space bar and the backspace (or erase) key, to highlight the item you want, then press RETURN to select that item.

Alt-pens

This selection allows you to vary the pen numbers, and hence the plotting colours, of the traces displayed. on the graph. You are prompted for a list of pen numbers for trace plotting, which must be in the range indicated in the prompt. The traces will be plotted by alternating through this list of pen numbers in rotation. If this list is empty, as it is by default, the Data pen (described below) is used instead.

Baseline

Since the height of traces may drift somewhat, *raster* must measure a *reference level* for each trace in order to properly align the traces on the display. This selection allows you to choose the part of the trace which is averaged to obtain the reference level or baseline. You will first have to do a *File* operation, if you haven't selected a file yet.

The selected trace from the first non-empty frame is displayed on the screen. You can get another frame using the **N** or **P** keys to select the next or previous frames. Select the desired measurement range by using the pointing device to move the cursor to the desired position on the displayed waveform, then pressing either button **A** to set the START marker to the X-axis position of the cursor, or button **B** to set the END marker. Press button **C** or **D** when you are done.

If you set the START and END markers to negative values, left of the displayed sweep, then *raster* will display the traces as absolute voltage levels, without normalizing to a baseline. You can also disable normalization using the **R** key to select "no reference."

Clip

This selection allows you to choose the range of voltage levels, relative to the baseline, which are to be displayed from each trace. As well, it lets you clip off the start or end of the traces. You will first have to do a *File* operation, if you haven't selected a file yet.

The selected trace from the first non-empty frame is displayed on the screen. You can get another frame using the **N** or **P** keys to select the next or previous frames. Select the desired display range by using the pointing device to move the cursor to the desired level on the displayed waveform, then pressing either button **A** to set the minimum level to the Y-axis position of the cursor and the starting offset to the X-axis position of the cursor, or button **B** to set the maximum level and the ending offset. You can then use the space and backspace keys to make fine adjustments to the last level set. (These don't affect the X offsets.) If you want to set the Y range explicitly, press the **Y** key, and the program will prompt you for the upper and lower bounds, which you enter in mV. Similarly, pressing the **X** key will allow you to enter the left and right bounds in ms. Button **C** toggles the clipping option. If clipping is turned on, the display is limited to the range you selected. If clipping is turned off, the display is automatically scaled to include all data points in the traces. Press button **D** when you are done.

File

This selection allows you to choose a new *runfile*, trace number and frame list to be displayed. You are

prompted to enter the name of the file. Type in this name, then hit RETURN. If the file is a valid *run-file*, and its frames each contain more than one trace, you will also be prompted for a trace number. If a valid trace number is specified, or if there is only one valid trace number, that trace will be displayed for each frame.

If the file contains more than one frame, you will then be prompted to enter a list of frame numbers, which must be in the range indicated in the prompt. If you enter a valid frame number list, the trace you chose will be loaded from the specified frames, and displayed in that order. If no input is entered, the default list shown in the prompt (initially "**All**", meaning all frames from first to last) is used. The format for this list is the same as the *frame list* format in *frmsel*(1).

If you were displaying several frames, and with the latest selection you display much fewer frames, you will likely have to increase the *X-incr* and *Y-incr* to get proper spacing.

Go

This selection causes the graph to be redisplayed, after parameters have been changed.

Hide

This selection allows you to set the *hidden-line* option. If this option is enabled, as it is initially, traces will be partially obscured by those in front of them. This usually makes the graph clearer and more aesthetically pleasing. If disabled, traces will be displayed in their entirety. Initially, this option is enabled.

Interpolate

This selection allows you to set the *interpolation* option. If this option is enabled, the data points of the displayed traces will be connected by line segments. If disabled, only the data points are displayed. Initially, this option is enabled.

Locations

This selection allows you to move or remove the X and Y scale bars, and to reduce the screen area used to draw the traces.

You are first asked for the scale bar coordinates. Enter up to four numbers on the line, separated by spaces, indicating the X and Y positions of the time scale, then the X and Y positions of the voltage scale. (These positions are specified in pixel offsets, and vary depending on your screen resolution.) If any of these numbers is omitted from the end of the line, a **0** is assumed. Initially, this line is blank, so both scale bars are placed at (0,0). If the X or Y position for either scale bar is given as a negative number, that scale bar is not drawn.

Next, you are asked for the trace area size reductions. Enter up to four numbers on this line, indicating the reductions (in pixels) on the left, bottom, right, and top of the traces. If any of these numbers is omitted from the end of the line, a **0** is assumed. These reductions are especially useful when you need to make room somewhere for the scale bars.

Markers

This selection allows you to place vertical and/or horizontal marker lines at selected locations on the graph. You are first prompted for a list of up to twenty-six X markers (vertical lines). Enter these in the units shown on the graph's X-axis scale bar, usually milliseconds. You are then prompted for a list of up to twenty-six Y markers (horizontal lines). Enter these in the units shown on the graph's Y-axis scale bar, usually millivolts. (The Y markers are displayed relative to the baseline of the traces.) Hitting RETURN for either list leaves it untouched. Typing a space, then RETURN for either list clears that list. The X markers are only shown when the *X-incr* is set to zero, and the Y markers are only shown when the *Y-incr* is set to zero. This restriction is required because the markers are meaningless unless the relevant data are properly aligned.

The X markers, when shown, are tagged with capital letters. The Y markers, when shown, are tagged with lower case letters. A line above the graph shows the time or voltage values associated with each of the marker lines. Note that these numbers may not be exactly those that you typed in; the marker positions are rounded to the data's X or Y resolution. For example, if the displayed traces contain samples at every 0.3 ms, then a marker requested at 10 ms will actually be placed at 9.9 ms.

Plot

This selection brings you to the plotting sub-system, which presents you with a secondary menu. See *PLOTTING* below.

Quit

This selection causes the program to terminate.

Start-bin

If the current *runfile* is the result of a *cycle-triggered average,* this selection allows you to choose which bin represents the start of the cycle. Initially, the graph begins with bin **1**. You are prompted to enter the starting bin number. Respond by typing a number greater than 0, and not greater than the number of bins (traces) displayed, then hit RETURN.

Titles

This selection allows you to set the *top-title* option. If this option is enabled, the two title lines, at the top of the graph, will be displayed. If disabled, the lines are omitted, and the graph is slightly expanded to use up the extra space. Initially, this option is enabled.

The first of these two lines shows the file name and the number of frames in the file. The second shows the run description, if available, followed by the frame description line (from the **.frd** file, if available) for the first frame selected from the run.

Vis-X-marks

This selection allows you to place vertical marker lines at selected locations on the graph, using the pointing device. The *X-incr* must be set to zero for this, so that the traces are aligned to the same time offsets. The graph will be redisplayed so that the effect of any parameter changes will be seen, then you can proceed to add or delete markers.

To add markers, use the pointing device to move the cursor the the desired offset on the display, then press button **A** to place a marker at that location. To delete a marker, place the cursor directly over the marker you wish to delete, then press button **B**. You cannot move an existing marker – you must delete it and place a new one at the location you want. The markers are lettered sequentially from A to Z. When you add a marker, it is tagged with the next available letter, and when you delete a marker all following markers are re-lettered to eliminate the gap. Press button **C** or **D** when you are done.

X-incr, Y-incr

These selections allow you to change the X and Y increments. These numbers represent the number of pixels by which one trace is offset from the next. When a *runfile* is selected, *raster* attempts to calculate ideal increments, but small adjustments may improve the appearance of the graph.

The X-increment you specify can be a negative number. This will change the "viewing angle" of the graph. Specifying a negative Y-increment will cause the traces to be displayed in the reverse order.

Increasing the offset between traces causes the displayed traces to shrink. If either increment is too large, *raster* will not be able to draw the graph.

!command

Whenever the menu line has just been printed, instead of typing a letter to select a menu item, you can type an exclamation point, followed by any UNIX command, then hit RETURN. A UNIX shell is invoked to interpret and execute this command. You can recall and edit the last command entered, by hitting the "up arrow" key, or Control-K, after typing the exclamation point.

$ or %

Whenever the menu line has just been printed, you can also type either a dollar sign (**$**), to invoke an interactive Bourne shell, or a percent sign (**%**), to invoke an interactive C shell. In either case, the shell will continue accepting commands until you type a **Control-D**, to exit from the shell, and return to *raster*.

? or /

Whenever the menu line has just been printed, you can also type either a question mark (**?**), or slash (**/**), to get a short description of all choices available in the current menu.

PLOTTING

The *Plot* selection is used to produce a plot similar to what would be displayed on the screen by the *Go* operation. A new menu is presented, allowing you to change certain plotting parameters. The choices are:

Axes Data File Interpolation Markers Plotter Quit Screen Text Video

Selections are made by typing the first letter of an item in this menu.

Axes, Data, and Markers

These selections allow you to change the pen numbers used to plot axes, data points, and markers, respectively. You will be prompted to enter a pen number, an integer from **0** to **8**. The three pen numbers are initially set to **1**. Selecting pen number 0 suppresses plotting of those items.

File

This selection allows you to store the HPGL commands used to plot the graph in a file. You will then be able to plot this graph, at a later time, by invoking *hardcopy*(1). You will be prompted to enter the file name. If you enter a file name, the graph will be stored in this file. If the file already existed, it will be overwritten.

Interpolation

This selection allows you to change the plot interpolation option. If this option is enabled, the data points of the plotted graph will be connected by line segments. If disabled, only the data points are plotted. This is similar to the "Interpolate" option for the screen display, but is maintained as a separate option because it is common to want interpolation enabled for plotting, but not for the screen display.

Plotting with interpolation enabled allows the plotter to work much faster, with less wear on the pen.

Plotter

This selection allows you to plot the graph directly to the plotter. The *hardcopy* program is invoked to plot the displayed graph. Before beginning this operation, make sure the plotter is powered up, on-line, and that a clean sheet of paper has been loaded. Also make sure the plotter's *autoload* option is enabled.

Quit

This selection returns you to the previously displayed menu.

Screen

This selection allows you to change the screen redraw option. If this option is enabled, the graph will be redrawn on the screen while it is being sent to the file or the spooler. If disabled, the current contents of the screen will remain, while the plot is generated.

Text

This selection allows you to change the plot text option. If this option is disabled, the generated plot will not contain any text; all titles and labels will be stripped from it, leaving only the axes, tick marks, data points, etc. This is useful when the plot is reduced in size to the point where the text would be illegible. If enabled, the generated graph will be complete with all titles and labels.

Video

This selection does not affect the pen plotter, but instead produces a printed copy of the video display's current contents – a screen dump – by invoking *sdump*(1). The same thing can be accomplished by pressing the *quit* key, normally **Control-B**. The *Plot/Video* operation has the advantage that it can be used even when the program is reading its commands from a file, rather than the terminal. Also, the *Plot/Video* operation clears the menu area before performing the screen dump.

X WINDOW SUPPORT

When the X Window version of this program is run on an X Window terminal, a new window will be shown for displaying program output. Unless the input was redirected from a file, it will be taken from the keyboard when this window is the "input focus", i.e. the active window. When running this way, it is essentially detached from the *xterm* window from which you run the command, and it can be run in the background.

As for most other X Window programs in this package, the following X command line options are accepted:

−cursor *num*

> You can specify any cursor number (not cursor names) in the Standard Cursor Symbols described in the *X Window System User's Guide* using the **−cursor** or **−curs** option. The default value is 68, the left pointer symbol. This can also be specified using the **CURSOR** environment variable.

−display [*host*]**:***server*[**.***screen*]

> By default, the host, server and screen, which identify your X terminal, are obtained from the environment variable **DISPLAY**. However, you can also specify them using the **−display** or **−disp** option. The *host* is the name of the machine or terminal, on which the window is to be created, *server* is the server number, and *screen* is the screen number (default is 0).

−fn *font*

> You can specify any fixed-width font to be used for text display using the **−fn** or **−font** option. The default value is **9x15** if the window is at least 900 pixels wide initially, and **fixed** otherwise. This can also be specified using the **SCRFONT** environment variable.

−geometry *geometry*

> By default, the program will create a window that covers most of the display. However, you can specify custom window dimensions and location using the **−geometry** or **−geom** option. The format of the *geometry* string is described in the *X Window System User's Guide*. This can also be specified using the **GEOMETRY** environment variable.

−iconic

> This option will cause the program to start up in an iconified state, which can be reactivated by double-clicking on the icon.

−rev This option will cause the program to use reverse video in its display window.

−title *name*

> This option will change the name shown on the window's title bar, which is usually just the program name. It can also be given as **−name** *name*.

NOTES

Raster should be run from a graphics terminal, or X terminal, in order to view generated graphs. It can be run from other types of terminals, to plot out graphs, but no graphs will be generated on screen.

FILES

*.frm	the frame file (or runfile)
*.txt	the run description
*.frd	the frame descriptions

SEE ALSO

cap(1), analysis(1), frmsel(1), hardcopy(1), sdump(1)