Chapter 6 **Tektronix 4014 Graphics**

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Chapter Overview

NCSA Telnet can emulate the Tektronix 4014 graphics terminal. This emulation includes text modes, Tek 4014 text sizing, zoom, pan, and multiple output devices. It supports CGA, EGA, Hercules, and the Number Nine Revolution 512 x 8 video systems, with the capability to write out images in PostScript, HPGL, or Tek drawing commands. The use of Tektronix graphics with NCSA Telnet depends upon host programs that can produce graphic images. When these programs run and produce Tektronix 4014 graphics commands, NCSA Telnet automatically switches into graphics mode and does the drawing.

This chapter describes steps in preparing to emulate the Tektronix 4014 and how to use the Graphics menu.

Emulating a Tektronix 4014 Graphics Terminal

Initializing a Plotter

If you will be plotting directly to a plotter, the communications port for the plotter must be initialized before you run NCSA Telnet. To do so, use the DOS `mode` command. See the DOS manual and the plotter manual for examples.

Setting the Configuration File

You'll use NCSA Telnet's configuration file to install the hardware and software configuration for Tektronix graphics. There are several settings you should insert in the configuration file, detailed in Chapter 7, "Installation and Configuration," before you use Tektronix emulation.

1. Include `tek=yes` in the configuration file to enable graphics operation.

2. Specify the video type with the `video` parameter in the configuration file. This is the only step required for selecting the video display because all of the screen drivers are included in NCSA Telnet.

3. Install specific filenames to be used when writing each of the three different kinds of drawing commands. The `hpfile` parameter selects the file to receive HPGL commands, the `psfile` option selects the file to receive PostScript drawing commands, and the `tekfile` option selects the file to receive Tektronix drawing commands. If you do not make any settings here, the default files are `hp.out`, `ps.out`, and `tek.out`.

If you want HPGL output to go directly to a plotter that is connected to COM1 rather than to a disk file:

4. Add `hpfile=com1` to your configuration file. Note that you use COM1 *without* a colon.

Switching to and from Graphics Mode

Graphics Mode

When host programs produce Tektronix 4014 graphics commands, NCSA Telnet automatically switches into graphics mode and does the drawing. The exact command sequence which causes the switch to graphics mode is the Tektronix clear screen command, ESC-FF, which is sometimes written as ESC-CTRL-L. A copy of your text screen is saved while you are in graphics mode.

The second way to enter graphics mode is to press CTRL-HOME. This key switches from text mode to graphics mode and clears the graphics screen. Host programs that produce Tektronix 4014 graphics commands cause the screen to automatically go to graphics mode, so you will not usually need to use CTRL-HOME to switch to graphics manually.

The third method of starting graphics mode is to re-display the last graphics image. The re-display option is from the Graphics menu, described later in this chapter. At the completion of the re-display command, the screen remains in graphics mode.

Text Mode

To return to text mode, press HOME. When you are in graphics mode, HOME will set your display back to text mode and redraw the text screen which was visible before the graphics mode began. No host command exists which automatically returns to text mode. When you are in text mode, HOME has a different function.

Using the Graphics Menu (ALT-G)

You display the Graphics menu by pressing ALT-G. Figure 6.1 shows the Graphics menu, as it appears with the default filenames. You can change the fields in bold.

Figure 6.1   Graphics Menu

```
ALT-G                           Graphics menu
<            Press the appropriate function key or ESC to resume        >

 F1 - Write postscript to a file called: ps.out
 F2 - Change postscript output file name

 F3 - Write HPGL code to a file called: hp.out
 F4 - Change HPGL output file name

 F5 - Write Tektronix 4014 codes to a file called: tek.out
 F6 - Change Tektronix output file name

     View region is currently: 0,0,4095,3119
 F7 - Set a new view region (Zoom, Pan)
 RETURN - draw picture on screen in current zoom factor

 Enter choice:
```

From this menu, you press the appropriate function key, or RETURN to redraw the most recently displayed graphics picture.

Writing Graphics Files to Disk

To write out graphics images, use the Graphics menu. First, you should display the image on the screen using host software that generates Tektronix images. NCSA Telnet always keeps the last graphic image in memory. Select one of the options which writes this image to disk. The program writes images using the current view region.

If you select Tektronix 4014 format, NCSA Telnet writes the image directly to disk and then returns you to your current session. After selecting the `HPGL` or the `PostScript` option from the Graphics menu, you are returned to your session while the file is written to disk in the background. After this image has been completely copied from memory to disk, a message on the console screen tells you that the process has completed.

Renaming Graphics Output Files

If you did not set up alternate files to use in the configuration file and you do not want to use the default filenames `hp.out`, `ps.out`, or `tek.out`, you can change the names before or after writing the file. Use the Graphics menu options to change one of the current file names before writing the image to disk. If you want a name changed after writing out the file, use ALT-E to escape to DOS, then use the DOS `rename` command. Use `exit` to leave DOS and return to NCSA Telnet.
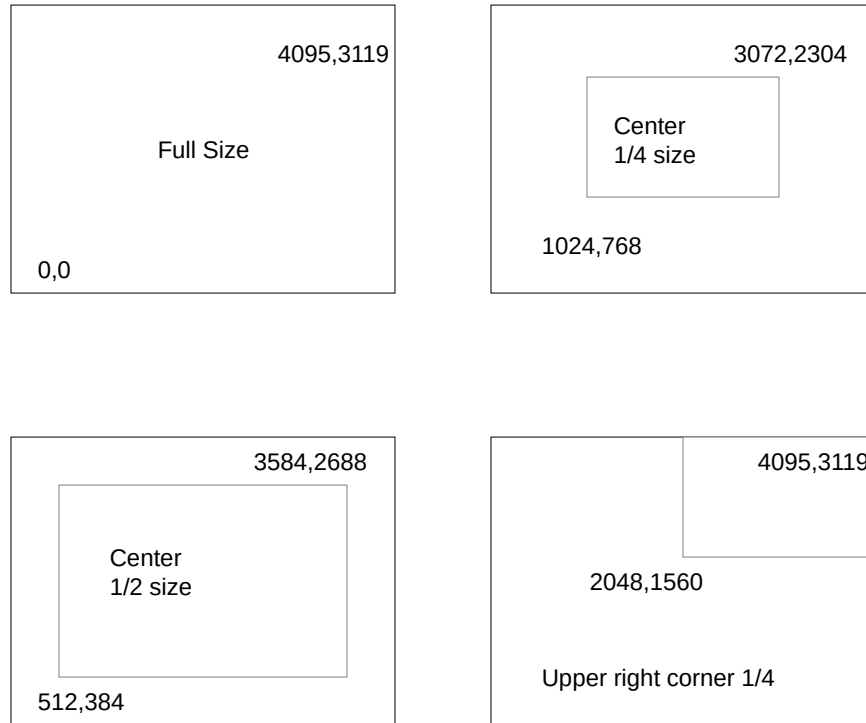
A special feature allows you to append the current image to an existing disk file instead of overwriting. Enter any of the three file names as you would normally, adding a plus (+) to the beginning of the name. NCSA Telnet takes the plus (+) to indicate that you want to open that file for "append", adding another image to the file. A filename which does not begin with a plus (+), causes NCSA Telnet to overwrite the file when saving each image.

Setting the Viewing Region (Zoom Factor)

Another Graphics menu choice lets you set the viewing region, or zoom factor. Any portion of the image can be enlarged and made to fill the screen. Tektronix drawing commands are resolved to a 4096 x 3120 pixel resolution. Values start with 0,0 in the lower left, and go to 4095, 3119 in the upper right.

The default view region for NCSA Telnet is (0, 0, 4095, 3119), which is the full image. Figure 6.1 has examples of possible viewing regions that you can use.

Figure 6.2   Sample Viewing Regions

4095,3119 Full Size 0,0	3072,2304 Center 1/4 size 1024,768
3584,2688 Center 1/2 size 512,384	4095,3119 2048,1560 Upper right corner 1/4

Redrawing Last Image

Use the Graphics menu option, `Redraw Last Image`, is used when you want to review the image that is currently in memory. This option always zooms and enlarges the image according to the view region that is visible. The selected view region always fills the screen so you can see more detail.

This command leaves you in graphics mode, so press HOME if you want to return to text mode.

Plotting a Stored File

If you have used the Graphics menu to store a file of HPGL drawing commands, the DOS `copy` command can send those commands to an attached plotter (which is connected to COM1 in this example).

```
C:> copy filename.out com1
```