Model 4

Hi-Res Utilities Package

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Installation of a High Resolution graphics board on the computer using these utilities is required.

From time to time the author may choose to enhance or improve this product, either through documentation or through the program. The author reserves the right to apply these enhancements and/or improvements without notice.

INTRODUCTION

This manual describes general use utilities for those users who have either the Radio Shack or Micro-Labs High Resolution (Hi-Res) graphics support board. The utilities featured are HRLSRPRT (LasetJet and DeskJet printer support), HRFXPRT (Epson FX- and RX-, and most Epson-compatible dot matrix printer support), HRLOAD (Hi-Res file loader), HRSAVE (Hi-Res file saver), HRVIEW (Hi-Res screen viewer), HRCLS (Hi-Res screen clearer), HRHALF1 and HRHALF2 (Hi-Res screen image reducers), and HRFLIP (Hi-Res screen image reverser).

HRLSRPRT AND HRFXPRT are used to send a copy of the image of the Hi-Res screen to the printer. Various parameters allow you to specify printer densities and formats.

HRLOAD allows you to load a Hi-Res file saved under various formats into the Hi-Res screen memory.

HRSAVE allows you to save a copy of the contents of the Hi-Res screen to a disk file under various storage formats.

HRVIEW allows you to examine the contents of the Hi-Res screen.

HRCLS allows you to erase the contents of the Hi-Res screen memory.

HRHALF1 and HRHALF2 allow you to reduce the size of an image on the Hi-Res screen. This has application when used in conjunction with the POSTMATER Support Utilities package.

HRFLIP reverses the image stored in the Hi-Res screen, switching on bit to off, and off bits to on.

HRLSRPRT

Laser and DeskJet Printer Utility

HRLSRPRT/CMD is a Hi-Res support utility for use on the Model 4 with either a Radio Shack or a Micro-Labs High Resolution Graphics Board installed. The extent of this support is to send copies of the Hi-Res screen to a Laser Printer or a DeskJet Printer, providing you with several options to enhance the printed image. You can also have this utility download a Hi-Res file and print it. This last option is especially handy for those who do not have a Hi-Res board in their current computer, as HRLSRPRT will then be able to print a copy of the file without the Hi-Res board present in the computer.

HRLSRPRT can load standard Hi-Res files (/HR), Crunched Hi-Res files (/CHR), and Supercrunched Hi-Res files (/SHR).

Standard Hi-Res files are stored on disk as raw data. A Hi-Res screen image has a dot resolution of 640 x 240 dots, or 153,600 total dot positions. Since a single TRS-80 computer byte can store 8 dots, a file will always contain 19,200 bytes, which is 75 disk sectors worth of data (a disk sector contains 256 bytes), or 18.75 K (a K, Kilobyte, contains 1024 bytes, or 4 sectors). Crunched and Supercrunched files are stored in a compressed format which takes up less disk space by storing consecutively repeated bytes in a file in only 1 byte. Crunched files limit the repeat length to up to 80 bytes. Supercrunched files can have a repeat length of up to 127 bytes, thus saving even MORE space. The average Supercrunched file will be several sectors shorter than a Crunched file. Crunched files will in turn be several sectors shorter than a standard saved Hi-Res file. Thus Supercrunched files are the absolute shortest, often being as short as 25 sectors in length as opposed to 75 sectors for a standard Hi-Res file.

To get help in using HRLSRPRT, from the DOS Ready prompt enter:

HRLSRPRT ?

A help listing will be shown, which lists all your options.

By default, HRLSRPRT prints the image of the Hi-Res screen "sideways" with a graphics resolution of 75 x 75 Dots Per Inch (DPI). By making use of the RES= parameter, this can be changed to 100, 150, and 300. For example, RES=300 will cause the image to be printed at 300 x 300 dots per inch.

If you wish the Hi-Res screen to be printed in reverse video (screen inverted), include the INV parameter.

If you wish to print the graphic image upright instead of sideways on the paper, include the XAXIS parameter.

If the picture appears "crushed" from top to bottom, try using the DOUBLE parameter, which will double the height of the printed data by printing each line twice. You may also choose to include either the WHITE or the BLACK parameter. Using either of these two parameters in conjunction with DOUBLE will cause each printed line to be separated by a white line or a black line, even if the INV parameter was also used. In effect, the 2nd printed line will not be a duplicate of the 1st as it normally would, but will instead be replaced by a white or black line. The effect is quite impressive for removing the "grainy" look that may appear in lower DPI ranges. WHITE works well with 300 DPI printed images, removing some of the black smudginess that may appear due to intricate detail in such a tight space. Note that the BLACK and WHITE parameters will be ignored if the DOUBLE parameter is not used.

If you wish to view the image before printing, use the PAUSE parameter. The PAUSE parameter will cause the image to be displayed with no printer action until a key is pressed. If you press "Q" or BREAK, the program will return to DOS. If you press "/" then the reverse video flag (even if set by INV) will be flipped

to its opposite state before transmitting the screen data to the printer. Pressing any other key causes the image to be sent to the printer.

You can load a Hi-Res file at the same time you execute HRLSRPRT by typing the full filespec (file specification -- filename) for the file after the HRLSRPRT command, thus:

HRLSRPRT filespec

Be sure to include an extension, such as /HR, /CHR, or /SHR if the graphics file has one. You can then follow this with optional parameters, enclosed in parentheses.

If you already have a graphics image loaded into memory, you can invoke HRLSRPRT without a filespec. Optional parameters are still allowed.

Please note that you can abbreviate all parameters down to their first character.

As a final note of interest, you do not need to have a Hi-Res board installed to use this program if you are loading a Hi-Res file with the program.

EXAMPLES

HRLSRPRT (XAXIS)

The image will be printed out "upright" on the sheet of paper.

HRLSRPRT (DOUBLE,WHITE,RES=150)

The image will be printed out sideways, where it's normal height from the top of the image to the bottom will be doubled. Instead of filling the increased space with a repeat of the set or reset bits, it will be filled with white space (non-printed data). Finally, the image will be printed out with a resolution of 150 x 150 DPI.

HRFXPRT

FX/RX Compatible Dot Matrix Printer Utility

HRFXPRT/CMD is a Hi-Res support utility for use on the Model 4 with either a Radio Shack or a Micro-Labs High Resolution Graphics Board installed. The extent of this support is to send copies of the Hi-Res screen to an FX/RX compatible printer. This family covers all recent EPSON printers and most others, except for the Radio Shack printer, which are usually DMP types with 7-bit graphics. HRFXPRT provides you with several options to enhance the printed image. You can also have this utility download a Hi-Res file and print it. This last option is especially handy for those who do not have a Hi-Res board in their current computer, as HRFXPRT will then be able to print a copy of the file without the Hi-Res board present in the computer.

HRFXPRT can load standard Hi-Res files (/HR), Crunched Hi-Res files (/CHR), and Supercrunched Hi-Res files (/SHR).

Standard Hi-Res files are stored on disk as raw data. A Hi-Res screen image has a dot resolution of 640 x 240 dots, or 153,600 total dot positions. Since a single TRS-80 computer byte can store 8 dots, a file will always contain 19,200 bytes, which is 75 disk sectors worth of data (a disk sector contains 256 bytes), or 18.75 K (a K, Kilobyte, contains 1024 bytes, or 4 sectors). Crunched and Supercrunched files are stored in a compressed format which takes up less disk space by storing consecutively repeated bytes in a file in only 1 byte. Crunched files limit the repeat length to up to 80 bytes. Supercrunched files can have a repeat length of up to 127 bytes, thus saving even MORE space. The average Supercrunched file will be several sectors shorter than a Crunched file. Crunched files will in turn be several sectors shorter than a standard saved Hi-Res file. Thus Supercrunched files are the absolute shortest, often being as short as 25 sectors in length as opposed to 75 sectors for a standard Hi-Res file.

To get help in using HRLSRPRT, from the DOS Ready prompt enter:

HRFXPRT ?

A help listing will be shown, which lists all your options.

HRFXPRT prints the image of the Hi-Res screen "sideways" with a default graphics resolution of 120 Dots Per Inch (DPI) by 72 DPI (by paper orientation). This can be changed by using the RES= parameter. Selecting a RES value of 60 prints the image at 60 x 72 DPI. 72 select 120 x 72 DPI (default). 172 select 72 x 72 DPI. 80 select 80 x 72 DPI. 90 Selects 90 x 72 DPI. 144 selects 120 x 144. 1144 selects 60 x 144. 216 selects 240 x 216. I realize that this seems confusing, but it can become quite easy to use once you have settled in to your favorite resolutions. Feel free to experiment.

If you wish the Hi-Res screen to be printed in reverse video (inverted), include the INV parameter.

If the picture appears "crushed" from top to bottom of the image, try using the DOUBLE parameter, which will double the height of the printed data by printing each line twice. You may also choose to include either the WHITE or the BLACK parameter. Using either of these two parameters in conjunction with DOUBLE will cause each printed line to be separated by a white line or a black line, even if the INV parameter was also used. In effect, the 2nd printed line will not be a duplicate of the first line as it normally would, but will instead be replaced by a white or black line. The effect is quite impressive for removing the "grainy" look that may appear in lower DPI ranges. Note that the BLACK and WHITE parameters will be ignored if the DOUBLE parameter is not used.

If you wish to view the image before printing, use the PAUSE parameter. The PAUSE parameter will cause

the image to be displayed with no printer action until a key is pressed. If you press "Q" or BREAK, the program will return to DOS. If you press "/" then the reverse video flag (even if set by INV) will be flipped to its opposite state before transmitting the screen data to the printer. Pressing any other key causes the image to be sent to the printer.

You can load a Hi-Res file at the same time you execute HRFXPRT by typing the full filespec (file specification -- filename) for the file after the HRFXPRT command, thus:

HRFXPRT filespec

Be sure to include an extension, such as /HR, /CHR, or /SHR if the graphics file has one. You can then follow this with optional parameters, enclosed in parentheses.

If you already have a graphics image loaded into memory, you can invoke HRFXPRT without a filespec. Optional parameters are still allowed.

Please note that you can abbreviate all parameters down to their first character.

As a final note of interest, you do not need to have a Hi-Res board installed to use this program if you are loading a Hi-Res file with the program.

EXAMPLES

HRFXPRT (PAUSE)

The image will be displayed before being printed. Pressing BREAK will abort the print operation, "/" will invert the printed image (print white dots on the screen as black on the paper), and pressing any other key will cause the image to print out.

HRFXPRT (DOUBLE,WHITE,RES=216)

The image will be printed out sideways, where it's normal height from the top of the image to the bottom will be doubled. Instead of filling the increased space with a repeat of the set or reset bits, it will be filled with white space (non-printed data). Finally, the image will be printed out with a resolution of 240 x 216 DPI.

HRLOAD

HIGH RESOLUTION SCREEN FILE LOADER UTILITY

An additional program included in the general utilities is HRLOAD/CMD. This is a high speed loading utility for reading Hi-Res files (/HR), Crunched Hi-Res files (/CHR), and Supercrunched Hi-Res files (/SHR). It will load a specified file into Hi-Res memory, then wait for you to press any key before leaving the graphics mode and returning control to DOS. It can also load PC screen dump files (640 x 200 resolution) if you include the BLOAD parameter. It is used to load a file which is specified after the HRLOAD command in the form:

HRLOAD filename

If you are loading a PC screen dump file, then use the format:

HRLOAD filename (BLOAD)

Be sure to include the file extension, if it has one. Once loaded, HRLOAD will figure out if the file is a standard Hi-Res file, a Crunched Hi-Res file, or a Supercrunched Hi-Res file automatically.

Standard Hi-Res files are stored on disk as raw data. A Hi-Res screen image has a dot resolution of 640 x 240 dots, or 153,600 total dot positions. Since a single TRS-80 computer byte can store 8 dots, a file will always contain 19,200 bytes, which is 75 disk sectors worth of data (a disk sector contains 256 bytes), or 18.75 K (a K, Kilobyte, contains 1024 bytes, or 4 sectors). Crunched and Supercrunched files are stored in a compressed format that takes up less disk space by storing consecutively repeated bytes in a file in only 1 byte. Crunched files limit the repeat length to up to 80 bytes. Supercrunched files can have a repeat length of up to 127 bytes, thus saving even MORE space. The average Supercrunched file will be several sectors shorter than a Crunched file. Crunched files will in turn be several sectors shorter than a standard saved Hi-Res file. Thus Supercrunched files are the absolute shortest, often being as short as 25 sectors in length as opposed to 75 sectors for a standard Hi-Res file.

HRSAVE

HIGH RESOLUTION SCREEN FILE SAVER UTILITY

An additional program included in the general utilities is HRSAVE/CMD. This is a high speed saving utility for Hi-Res files (/HR), Crunched Hi-Res file (/CHR), and Supercrunched Hi-Res files (/SHR). It will save the current data in the Hi-Res video screen to a specified file following the HRSAVE command in the form:

HRSAVE filename

If you want to save the file in the crunched format, use the CRUNCH parameter, in the form:

HRSAVE filename (CRUNCH) **or** ***HRSAVE filename (C)***

If you want to save the file in Supercrunched format, use the SUPER parameter, in the form:

HRSAVE filename (SUPER) **or** ***HRSAVE filename (S)***

Standard Hi-Res files are stored on disk as raw data. A Hi-Res screen image has a dot resolution of 640 x 240 dots, or 153,600 total dot positions. Since a single TRS-80 computer byte can store 8 dots, a file will always contain 19,200 bytes, which is 75 disk sectors worth of data (a disk sector contains 256 bytes), or 18.75 K (a K, Kilobyte, contains 1024 bytes, or 4 sectors). Crunched and Supercrunched files are stored in a compressed format that takes up less disk space by storing consecutively repeated bytes in a file in only 1 byte. Crunched files limit the repeat length to up to 80 bytes. Supercrunched files can have a repeat length of up to 127 bytes, thus saving even MORE space. The average Supercrunched file will be several sectors shorter than a Crunched file. Crunched files will in turn be several sectors shorter than a standard saved Hi-Res file. Thus Supercrunched files are the absolute shortest, often being as short as 25 sectors in length as opposed to 75 sectors for a standard Hi-Res file.

To get help in using HRLSRPRT, from the DOS Ready prompt, enter:

HRLSRPRT ?

A help listing will be shown, providing you with all its options.

If you do not supply an extension to the filename, HRSAVE will supply one for you. If you do not use a parameter, it will supply a default /HR extension, and of course save the file in standard Hi-Res format. If you use the CRUNCH parameter, a default extension of /CHR will be supplied, and the file will be saved in Crunched Hi-Res format. If you use the SUPER parameter, a default extension of /SHR will be supplied, and the file will be saved in Supercrunched Hi-Res format. Of course, regardless of what parameter you do or do not select, if you supply your own file extension, then that one will be used. If you do not wish to have an extension on the saved file, supply a blank extension by following the filename with a slash "/", such as FRAME/. Drive specifications are allowed regardless.

HRVIEW

HIGH RESOLUTION SCREEN VIEWING UTILITY

An additional program included in the general utilities is HRVIEW/CMD. This is a utility for viewing the Hi-Res video screen. It will switch in the Hi-Res screen, and then wait for you to press a key. After a key is pressed, it will leave the graphics mode and returning control to DOS.

HRCLS

HIGH RESOLUTION SCREEN CLEARING UTILITY

An additional program included in the general utilities is HRCLS/CMD. This is a utility to simply erase the Hi-Res screen.

HRHALF1 & HRHALF2

HIGH RESOLUTION SCREEN IMAGE REDUCING UTILITY

HRHALF1/CMD and HRHALF2/CMD are two handy utilities which can be be used to reduce the Hi-Res screen image by a factor of 2. Factoring as used in this utility package refers to the reduction of each dimension of an image. Thus a factor of 2 indicates reducing the width by 1/2 and the height by 1/2; effectively reducing the size of the image to 1/4 its original size.

HRHALF1 works best with images which have a lot of unlit pixels on the screen. It favors the "on" bits.

HRHALF2 works best with images which have a lot of lit pixels on the screen. It favors the "off" bits.

Depending upon the image, reducing its size to a substantial degree almost becomes an artform, as you may have to experiment which HRHALFx program to use, or how to intermix their use when reducing images by factors of up to 4 and 8 (accomplished by re-running one of the HRHALFx programs). This can be further enhanced by making use of the HRFLIP utility, included in this package. Because of this, do not try to reduce original, unsaved work until it is indeed safely stored on a disk file.

It is difficult to rely on a set "formula" for using these programs to reduce images while retaining a reasonable amount of detail, as it seems that every Hi-Res image handles differently. Some images, such as those with a lot of thin lines, suffer greatly during reduction and lose all recognizable resolution when reduced twice (a factor of 4). Other transform incredibly well. Best results can be expected from images that are clear cut black and white fields with little intricate detailing. After all, a single reduction reduces 4 dots to only 1:

```
o o
o o   —>  o
```

HRHALF1 will set the result dot if at least 3 of the 4 dots are set (on). HRHALF2 sets the result dot if at least 2 of the 4 dots are set.

Notice that when an image is reduced that the top-left coordinate of the image remains at 0,0, thus "moving" the entire image toward the top-left corner during each reduction. This is handy when used with the HRFLIP utility, when is another useful tool in working out your image reduction strategy, as with it you can "flip" only the reduced image, and not the entire screen.

These programs have useful application with other, third party utilites, such as a drawing program which is capable of capturing a section of the screen, or by the MAKEICN icon capturing utility in the POSTMASTER Support Utilities, from ***Computer News 80.***

HRFLIP

HIGH RESOLUTION SCREEN INVERTING UTILITY

HRFLIP/CMD allows you to flip the bits in a Hi-Res screen; setting on bits to off, and off bits to on, accomplishing a reverse video effect. HRFLIP was especially designed to work in conjunction with the HRHALF utilities. Sometimes during reduction, the process works much smoother if during a step in reduction that the image was reverse, thus increasing or decreasing the number of set dots on the screen. In that HRFLIP supports the SCALE parameter, with allowed values of 1, 2, or 4.

Normal inversion of the entire screen can be accomplished by entering:

HRFLIP

If you wish to use a scaling factor of 2 or 4, you can use the format:

HRFLIP (SCALE=x)

Where "x" is 1, 2, or 4.

1 is the default, thus flipping all bits on the Hi-Res screen on a 1 to 1 basis.

2 is handy in that it flip the image on the screen which has just been reduced by one of the HRHALF utilities; thus flipping only the top-left quarter of the screen.

4 reduces a section of the screen in the top-left corner equal to 1/16 of the screen size (width/4 x height/4). This is handy in flipping an image that has had 2 consecutive reductions performed on it by an HRHALF utility.