PowerDOT
Version 2.0

by Tim Miller

A PowerSOFT Product from
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INSTALLATION INSTRUCTIONS

The distribution disk you have received does not have an operating system on it. It cannot be backed up, but it has a special file transfer system which can be used to move the program files onto a diskette of your choice. Once you have moved the files onto your diskette, that diskette then becomes your **master disk**. Make several backups of the master disk, then put it AND the original distribution disk away in a safe place.

To use the file transfer system, follow these steps:

1. Model I users: Format a single density diskette using TRSDOS.
   Model III users: Format a double-density diskette using TRSDOS. If you have more than one drive, place this diskette in drive 1.
   If you have only 1 disk drive then prepare a TRSDOS system diskette with as much space on it as possible. Delete everything but the system files.

2. Boot the distribution diskette. You will then be presented with a list of the files on the diskette, and the transfer system will ask you for the destination drive. Enter the drive number where your formatted diskette is. Press <ENTER>.

3. The file transfer system will move the files onto your diskette one by one. If you have only one drive, you must enter 0 for the destination drive, and you will be told when to swap diskettes.

4. After all the files have been transferred, take the distribution disk out of drive 0. Boot up a system diskette. Make several backups of the disk which now contains the new files.

5. Put the distribution disk and one copy of your file master away in a safe place. Don't touch them again unless you absolutely have to.

If you are using LDOS, DOSPLUS or MultiDOS: This diskette can be treated as an ordinary data diskette by these systems. You can simply use the COPY library command to move the files onto your own diskette. However, the distribution diskette cannot be backed up using "mirror-image" backup procedures. This is a characteristic of the file transfer system. It is not intended as a protection device.

If you are using LDOS, DOSPLUS, or MultiDOS and wish to use the file transfer system, you must format the destination disk using TRSDOS. The file transfer system only recognizes TRSDOS formats on the destination disks. If you are using a Model I, do not create a double-density TRSDOS 2.7DD disk for your destination disk! Use single-density TRSDOS 2.3 ONLY.

Note to Model 4 users

PowerDOT will work on the Model 4 in its default power-up (Mod III) mode. It may be run under LDOS or TRSDOS 1.3. However it will NOT run under TRSDOS 6.0 or take advantage of the 80-column screen or the extra 64K bank of memory if installed.

NOTICE

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Breeze/QSD will replace this package if the distribution media is found to be damaged or defective, providing that such damage was not caused by the end user, and providing that the entire package is returned with proof of purchase within 10 days of purchase to the address below.

Breeze/QSD, Incorporated
17060 Dallas Parkway, Suite 114
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TECHNICAL SUPPORT

If you have any questions or problems with this program that are not of an urgent nature, send them in writing to the address above and mark the envelope "PowrDOT Support." Include a self- addressed stamped envelope for our reply. We will endeavor to answer all questions in a timely manner.

If you have an urgent question, call PowerSOFT Support at (214) 733-4475 between the hours of 10 a.m. and 5 p.m. CENTRAL TIME. Alternatively, if you have access to the CompuServe Information Service, you can send EMAIL or leave a message on PowerSOFT's

XTRA-80 SIG (G PCS-56 from any menu prompt). Address all messages either to SYSOP 76703,374 or to Tim Miller 73115,73. Be sure to check back in a couple of days for an answer.

Acknowledgements

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PowerDOT: An Overview

PowerDOT is a disk-based drawing program which is capable of producing bit-image graphics on printers which have this feature. Drawings are made using standard TRS-80 graphics (low resolution) and are stored on disk. When the graphics are printed, they are translated to the appropriate (user-selectable) high resolution mode.

PowerDOT is a modular system. Its two major components are subtitled "Part 1" and "Part 2" respectively. Part 1 is the Dot Editor. It has the filename PDOT1/CMD on the distribution disk. This module allows you to create graphics using your computer's free memory as a drawing board. The size of your drawing is not limited to what can be shown on the screen; all of free memory is usable, and the screen can be thought of as a window into your drawing board. Some of the features of the Dot Editor are:

1. Completely user-controllable graphics cursor.
2. Ability to intermix text and low-resolution graphics
3. Ability to create and recall character sets.
4. Positioning aids to display coordinates within the drawing board.
5. AUTODRAW' routine to draw lines by simply specifying the end points, or circles by specifying the diameter.
6. Aspect ratios of circles are user-controllable to allow for printers "that don't know round."

7. Ability to extend graphic files on disk beyond their original size
8. Ability to display special characters by simply entering their ASCII values in "code mode."
9. Ability to produce the TRS-80 graphics character set on printers which do not support them.

The Dot Editor creates disk files into which graphic drawings are written. These disk files may be extended as required, so that the size of the drawing is limited not by available memory, but by available disk space. This allows for the creation of large graphics which would otherwise be impossible.

All printing is done from disk via "Part 2," the Dot Addressor. This module will take the files created by the Part 1 and send them out to the printer along with the appropriate printer control commands to produce graphics of the desired resolution. Note that a separate "Part 2" module is supplied for each printer supported by PowerDOT. This is necessary because printer manufacturers have not standardized bit-image graphics commands. Elsewhere in this manual you will find a list of printers supported by PowerDOT along with the corresponding filenames used for the Dot Addressor module.

Some of the features of the Dot Addressor are:

1. Ability to adapt to 132-column wide printers.
2. Ability to print low-resolution (character) graphics and text.
3. Ability to print Standard, High Resolution, and Ultra-high resolution dot graphics.

4. Ability to generate the Model III special character set on the printer.

In this manual, we will use the terms "Part 1" to refer to the Dot Editor, and "Part 2" to refer to the Dot Addressor. Remember that you must use the appropriate Dot Addressor module for your printer. Printer differences, if any, will be pointed out as required.

Getting Started

NOTE: While some operating systems require the use of high memory for proper operation, you should make sure that high memory usage is reduced to the absolute minimum possible before running PowerDOT.

Before using PowerDOT, it is important to make sure that any printer driver routines maintained by the operating system are TURNED OFF. These routines are likely to interfere with the printing of the graphics. Consult your disk operating system manual for the appropriate commands (FORMS, RESET, etc.).

From the DOS command level, type PDOT1 and press <ENTER>.

PowerDOT Part 1 will be loaded from disk and will execute. A logo will appear briefly on the screen, and then you will be shown the main menu:

0 Return to DOS Ready
1 The Dot Editor
2 Initialize Graphic File
3 Extend Graphics File
4 Save/Load Graphic Buffer
5 Save/Load Screen
6 ASCII File I/O
7 Define Graphic Buffer
8 Define Circle Parameters
9 Clear Graphic Buffer

The first thing you will probably want to do is select Option 9, Clear Graphic Buffer. PowerDOT Part 1 does not clear memory when it executes.

This is to allow you to return to working on your graphic after exiting to DOS Ready, either inadvertently or on purpose. However, when you first start the program, memory will most likely be filled with garbage from other previous programs. You will want to clear the garbage out before setting to work. So simply press 9. You will be asked to confirm your decision (just in case you selected it by accident). You can skip past the confirmation prompt by pressing SHIFT-9 instead of simply 9. The computer's memory will be cleared, and you will return to the Main Menu.

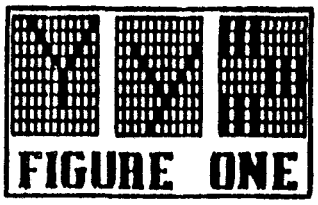
The next step is to initialize your graphic file. Remember that the PowerDOT program is file oriented. Graphics must be written to disk, and will be printed ONLY from disk files. To open a file, select option 2, Initialize Graphic File. You will be asked to supply a filename. Type in an appropriate filespec. If you do not supply an extension, it will automatically default to "/DOT."

If the file already exists on disk, it will be brought in and you will be returned to the main menu. If it is a new file, you will be given a chance to abort by pressing <BREAK>. (NOTE: pressing BREAK will usually bring you back to the main menu from any of the main procedures. Exceptions are documented as they occur.) If you press <ENTER> instead, you will be asked to supply a width for the graphic. The width is in terms of character spaces and need not be limited to screen width. You may supply a width of 156, which will define a graphic 156 characters wide, for example, and the dimensions of the graphic buffer in memory will adjust accordingly, that is, you will be able to scroll SIDEWAYS for 156 character spaces. The width you supply will also determine the minimum amount of data that

PowerDOT Part 1 will write to a file. This minimum amount is a block of data sixteen lines deep times whatever width you supply.

To see one of the example files supplied on your PowerDOT disk, select option 2 and enter SUPERDOT when prompted for a file name. This graphic will be brought into memory, and you can examine it by using the cursor movement keys, described below. You will note that when you read in a previously created file, you are no longer asked for the width, as that information is kept in the file itself.

Note that a character space is not the same width as a graphic pixel. Figure 1, below, shows the relationship between characters, pixels and high resolution dots.



A character space is two pixels wide, so that setting the width to 156 character spaces will give you a pixel (dot) width of 156 x 2 or 312. When the file is printed and each pixel is converted to one dot, with a width of 156 characters you can create a dot graphic with a resolution of 312 dots wide.

If you are opening a new graphic file at this point, you will be asked to supply a message. This

message becomes part of the new file's header block and helps to identify the file when it is next loaded in. The message may be up to 200 characters long.

Once the message has been supplied, you will be returned to the main menu. At this point you can select Option 1, **The Dot Editor**, to enter the editor proper. The screen will be cleared and a flashing pixel cursor will appear in the middle of the screen. You are now ready to begin creating your graphics.

NOTE: Pressing **SHIFT-1** will place you in JOYSTICK MODE. If you do not have a PowerSOFT Joystick Interface installed your computer will most likely hang. Press **RESET** to reboot. Consult Appendix A for information on using the joystick interface.

Remember that you are not limited to the area visible on the screen. Your screen is only a window into the wider area of memory which makes up your "drawing board," which itself is a subset of the total available area on your disk for the graphic file. Figure 2 shows this relationship.

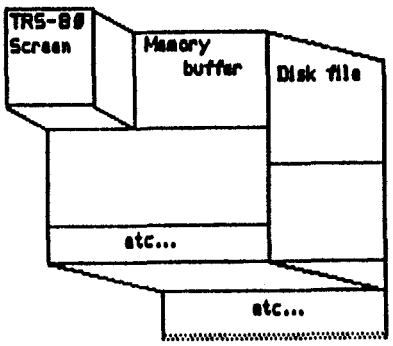
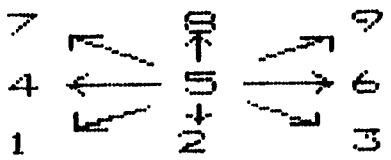


FIGURE TWO

Normal Draw Mode Functions

Cursor movement in PowerDOT Part 1 is accomplished through the numeric keypad of the computer. The positions of the number keys relative to the number "5" define the direction of the cursor's movement, i.e.,



Thus pressing 8 would cause the cursor to move straight up, leaving a line behind it as it moves, and pressing 1 would cause it to move downward and to the left. The number 5 is always the reference point and does not cause any cursor movement. 0 is not used.

Several other keys may be used in conjunction with the numeric keypad to achieve different results. These keys are called "modifiers." They are to be pressed simultaneously with one of the directional keys on the numeric keypad.

<CLEAR> sets ERASE mode. When pressed together with a number key (use your right thumb!) any pixel passed over by the cursor will be reset, i.e., turned off. You can use this modifier to quickly erase a line or move across a blank portion of the graphic without leaving any lines. It is the fastest way to relocate the pixel cursor to another place. Note that any character (not just graphics) passed over by the pixel cursor while in this mode will be erased.

M sets Angle 1 for the diagonal movement keys 1, 3, 7 and 9. When M is pressed and either 1, 7, 9, or 3 is held down, the pixel cursor will move diagonally, but at a new angle. This angle is more obtuse relative to the original.

N sets Angle 2 for the diagonal movement keys. This sets a more acute angle than the original if held down while either 1, 3, 7 or 9 is held down.

M and N may be held down simultaneously to produce a line at the original diagonal angle of the 1, 3, 7 or 9 keys. However the line will be dotted, that is, alternating pixels will be on or off.

Z and X will display the left and right halves of the screen area in double-wide view mode, respectively, as long as they are held down. While each key is held down, that portion of the graphic on the screen will be as close as possible to what it will look like on printout (the aspect ratio is corrected). When the key is released, there will be a few seconds lag till the pixel cursor returns. These keys will allow you to get a better idea of what your graphic will look like on paper when printed in normal resolution and ultra-high resolution mode (high resolution print mode simulates the same aspect ratio as the screen) (see Printing your Graphics on the Lineprinter, below)

P sets PIXEL mode. When this is pressed along with any of the cursor movement keys on the numeric keypad, only the pixel cursor will move. No line will be drawn. In the upper left hand corner of the screen three numbers will be displayed. These are the pixel's X,Y coordinates within the screen area. The X coordinate range will be from 0 to 127 while the Y coordinate will

range from 0 to 47. The third number will be the relative distance moved by the pixel from its last position. That is, whenever you let go of the "P" key, this value will be set back to 0. For example,

X-087 Y-33 D-17

This modifier key has a number of uses. It can be used to move the cursor without affecting any pixels which may be set (turned on) or reset (turned off); however, text characters will be erased (to relocate the cursor without destroying any text characters on the screen, see Character Edit mode, below).

The P key can also be used to measure a particular section of your graphic and match it up with another, such as when constructing character sets.

You can also use this to toggle the state of the pixel beneath the cursor. If when you press P the pixel beneath the cursor goes OFF, pressing P again will turn it back on, and vice versa. Whatever state the pixel beneath the cursor is in will switch whenever P is pressed.

F will display the X,Y coordinates of your present position within the file. This will work even if part of your file has already been written to disk, or if part of your file is still on disk.

Other Movement Keys

The four arrow keys will scroll the screen up, down, left or right. This action is dependent on two things: (a) the cursor's position within the buffer, and (b) the width that was specified for

the graphic drawing. If the cursor is located such that any further scrolling in a particular direction would overrun the LIMITS of the page, then that particular arrow key will have no effect. This is easily observed by defining a graphic file with WIDTH=64 (i.e., one screenful). You will note that in this case, only the up and down arrows have any effect; the left and right arrows have no effect, because movement in either direction would result in exceeding the left and right boundaries of the graphic as you defined them.

When using the arrow keys, you should be careful to let go of all other keys first. Any graphics drawn on the screen are saved to the appropriate location in the memory buffer when the arrow key is pressed, before the screen is scrolled. However, certain combinations of keys may fool the Dot Editor into not saving the screen correctly.

When scrolling with the arrow keys, the pixel cursor will not move. It will remain in the same relative location on the screen while the contents of the memory buffer are scrolled around it. However, if you change the location of the cursor of the screen then pressed any arrow key again, certain actions will occur. If the cursor is left in a location different from its location the last time an arrow key was pressed, it will be turned off when an arrow key (any arrow key) is pressed again. Any pixel which may have been beneath it and was ON in the original graphic will also be turned OFF as a result.

If you do not move the cursor, however, its state, and the state of any pixel beneath it, will not be changed when the screen is scrolled. Also, if you moved the cursor, but returned it to its exact same location before scrolling the screen

once more, it will be as though you had never moved it.

PowerDOT's Block Location Identifier

To help you identify your location when scrolling the screen, the B key may be pressed at any time. This will display the current block number and the offset from the left of the page to the center of the screen currently displayed. You will see a line that looks something like this:

*** BLOCK 00001 ********** OFFSET 00032 ***

A block is equal to sixteen lines of text times whatever width was specified for the file, so this line indicates that you are positioned in the upper left hand portion of the graphic page (block 1 being the very first block, and an offset of 32 from the left to the center of the current screen would indicate that you are within the first 64 characters (width) of the graphic.

A block is defined in PowerDOT as the smallest number of bytes that can be saved or loaded to or from disk files, and will be one screenful deep (16 lines) by however wide you have defined the file to be. For example, if you had defined the width to be 100, then a block would be 16 x 100, or 1600 bytes. The B command will calculate block sizes this way to give you a reading of your position within the graphic.

The reason that the B command displays the offset to the center of the screen instead of the offset to the right side or some other value is because most of the time you will be wanting to know when you are centered on a block. Thus you have to remember what value you specified for the

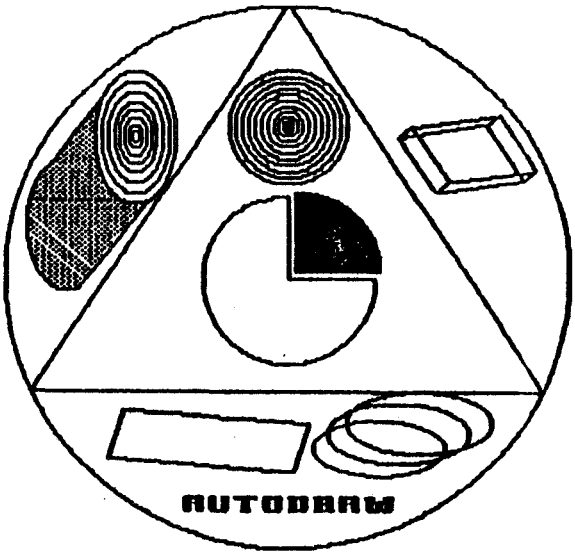
width. If you specified 100, then you are at the center when the offset displayed by B is 50.

The actual block display line will be positioned at the top line of the current block, so that you can easily tell where one block ends and the next begins. If you ever feel lost, just press B.

The AutoDraw™ Facility

When working with a graphic that is wider than can be shown on the screen, drawing a line between two points which are not on the same X or Y plane can be extremely difficult. PowerDOT Part 1 has a facility called AutoDraw which takes the pain out of this chore. To use AutoDraw, all you have to do is position the cursor at the starting point of your line and press S. Then move the cursor to the ending point (wherever it is) and press D. A line will be drawn between the two points automatically. You can then move the cursor to another location and press D again, and a line will be drawn from the original starting point to the new destination point.

Pressing E will ERASE the last line produced by AutoDraw, regardless of where the cursor is currently positioned. In other words you can move the cursor to anywhere else after drawing the line, then press E and the line just drawn will be erased.



The AutoDraw facility also has the capability to produce circles. In order to draw a circle, you must define its diameter. Press S to mark the one side of the circle. Then move the cursor to the desired diameter and press C. A circle will be drawn on the screen.

You will immediately note that the circle is not perfectly round. This is because the aspect ratio of the TRS-80's video screen is roughly 2:1, and PowerDOT Partt 1 assumes a 1:1 ratio. This can be changed, however. Press BREAK to return to the main menu, and select option 8, "Define Circle Parameters." This will bring up a further sub-menu which looks like this:

0 Return to the Dot Editor
1 Change Circle (50% - 200%) - 00100
2 Change Quadrant 1 - ON
3 Change Quadrant 2 - ON
4 Change Quadrant 3 - ON
5 Change Quadrant 4 - ON

Selection 1 of this sub-menu allows you to change the aspect ratio of your circle. You will note that it is currently set at 100%, or a 1:1 ratio. If you select this option, you will be presented with a further prompt:

<ENTER> % of X,Y distortion

The allowable range is from 50% to 200%. Setting the X,Y distortion to 200% will produce a round circle on the screen. HOWEVER, what you see on the screen may not be what comes out on the printer!! You will have to experiment with different values to get a true circle on your printer (HINT: If you are using an EPSON 80-column printer, try 87%).

The other selections on the Define Circle Parameters submenu allow you to control the printing of each of the four quadrants of your circle. This permits the easy creation of pie charts, for example. Pie chart slices can be created easily with Autodraw by simply drawing two lines from a common starting point and then drawing the appropriate quadrant of a circle (turning the other three OFF).

As with line produced by AutoDraw, the E key will serve to erase the last circle drawn.

When a circle is drawn by AutoDraw, it may be truncated if it is located near one of the boundaries of the graphic. For example, if you define a large circle while positioned to Block 1 (top of your graphic area) the top of the circle may be truncated when it meets the boundary.

Note that if you define a circle diameter using the keys 2, 8, 7, 9, 1 or 3, the vertical component of the diameter will be ignored. Circles are drawn using the horizontal displacement from the starting point only. This means that a circle diameter can be defined only with the keys 4 and 6, for horizontal motion.

Character Edit Mode

The preceding discussion showed you how to create graphics. However, PowerDOT Part 1 also has the capability of intermixing text and graphics. To enter text, you must be in the character edit mode. This mode is entered with the ● key. When this key is pressed, the cursor will change. At this point, the arrows will no longer scroll the screen, and the numeric keys used for controlling the graphics cursor direction will no longer work. Instead, the arrow keys will now position the character cursor, and the rest of the keyboard becomes "live." If any key is pressed, then the corresponding character will be entered into the graphic buffer at the current cursor location.

While in character edit mode, the following keys have special functions:

LEFT ARROW	Moves cursor left one character space
RIGHT ARROW	Moves cursor right one character space
UP ARROW	Moves cursor up one line
DOWN ARROW	Moves cursor down one line
SH. LEFT ARROW	Deletes one character at the current cursor location. The entire buffer is affected; all succeeding characters are moved up one place toward the cursor.
SH. RIGHT ARROW	Inserts a space at the current cursor location. The entire buffer contents are shifted right one space to make room for a new character.

(The main use for the insert/delete keys is to move portions of the graphic left or right on the page. If, however, you hold the keys down long enough you will eventually delete or insert an entire line -- remember that the entire memory buffer's contents are being shifted by these commands!)

SHIFT @	"Code Mode." Pressing these keys will place you in a special mode. You may type in ANY three-digit ASCII value from 0 to 255 and the character represented by that code will be displayed at the current cursor location. For example, pressing Shift @ 140 will place a small graphic block

	at the current cursor location. Pressing shift @ 013 will insert a carriage return, and so forth. In this way you can insert characters not normally found in the TRS-80™ keyboard. You can also use this mode to insert printer commands into your graphic. Note that as soon as you have entered three numeric digits, you will be back in character edit mode. In other words, "Code Mode" lasts only long enough for you to enter the code for <u>one</u> character.
SHIFT-CLEAR	Clears the screen area. Be careful with this key!
ENTER	Terminates character edit mode and returns to normal draw mode.
BREAK	Enters <u>graphic character mode</u> (See below).

By using the SHIFT-@ control to enter "code mode," you will be able to generate the special Model III character set using ASCII codes 1 through 31 and 191 through 255. These characters can be reproduced on your printer by PowerDOT Part 2. If you are using a Model I, these characters will display as graphics, but on printout the actual special character that they represent

will be created. Below is a table showing what ASCII codes represent which characters, using the Model III character set.

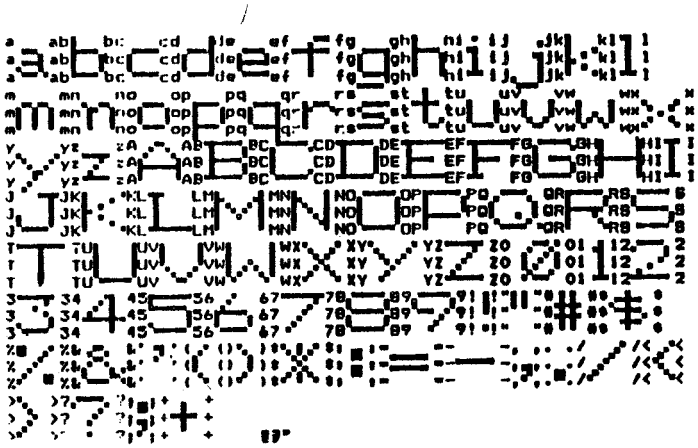
001	=	017	=	192	=	208	=	224	=	240	=
002	=	018	=	193	=	209	=	225	=	241	=
003	=	019	=	194	=	210	=	226	=	242	=
004	=	020	=	195	=	211	=	227	=	243	=
005	=	021	=	196	=	212	=	228	=	244	=
006	=	022	=	197	=	213	=	229	=	245	=
007	=	023	=	198	=	214	=	230	=	246	=
008	=	024	=	199	=	215	=	231	=	247	=
009	=	025	=	200	=	216	=	232	=	248	=
010	=	026	=	201	=	217	=	233	=	249	=
011	=	027	=	202	=	218	=	234	=	250	=
012	=	028	=	203	=	219	=	235	=	251	=
013	=	029	=	204	=	220	=	236	=	252	=
014	=	030	=	205	=	221	=	237	=	253	=
015	=	031	=	206	=	222	=	238	=	254	=
016	=	032	=	207	=	223	=	239	=	255	=

Creating and Using Graphic Character Sets

PowerDOT Part 1 has the ability to make use of specially-constructed graphic character sets while in character edit mode. When a graphic character file (extension /CHR) is supplied to PowerDOT Part 1 while in this mode, pressing any key on the keyboard will cause the character set file to be searched and the corresponding character to be pulled in.

Constructing a Character Set File

Graphics characters can be built while in normal draw mode. The characters may be constructed in any order. Each character should be surrounded by the letter that it represents. The figure below shows exactly how such a file is put together:



(You can load an example character set file from the distribution disk into the Dot Editor by using Option 6 from the main menu, "ASCII file I/O")

You will notice that to the immediate right and left of each graphic letter, are the actual letters it represents. Each graphic character must be bordered on left and right by the letters. When this character set is searched by PowerDOT Part 1, the search will be for the ASCII letters. Once the corresponding ASCII letter is found, bytes immediately following are pulled into memory until the ASCII letter is again encountered, whereupon the search continues on the next line. When the entire character has been read from the file, it is then placed on the screen. If the letter pressed is not in the file, then it will be ignored.

To save a character set file to disk, use Option 6 from the main menu, "ASCII File I/O," and give the file the extension /CHR.

You must also make sure that your character graphic file is terminated with the special PowerDOT EOF marker. This marker consists of the three bytes 244, 245,and 246. If these three bytes are not present, you will not be able to save the graphic buffer. The ASCII File I/O option will fail without those three bytes.

This scheme allows for a great amount of flexibility. For one thing, the graphics surrounded by each letter need not itself be a letter! It can be anything, as long as it does not contain any other non-graphic characters. An entire picture, diagram, blueprint, etc. can be keyed to a single letter on the keyboard! This gives you a "boilerplate" capability whereby you can construct standard drawings, key them to a letter, and recall them as needed.

Specifying the Character Set File

When in character edit mode, a graphic character file can be enabled by pressing BREAK. This will produce the following prompt on the screen:

Press < BREAK > to turn off file .... or
< ENTER > filespec of character file .....

Pressing BREAK again will cancel graphic character mode and disable searching of any currently open character file. To ENABLE searching of a file, enter its filespec. If you do not supply an extension the extension /CHR will be used. Once the file is found you will be returned

to character edit mode, and at this point pressing any key will cause a search for the appropriate graphic character in the file instead of entering an ASCII character into the screen. The file is turned off by pressing BREAK twice. NOTE: you must be sure to turn character set access OFF before removing or swapping any disks, as the character set file remains in an open condition until this is done.

To see how graphic character mode works, try specifying the example character files on your PowerDOT distribution disk. These are called CHAR1/CHR, CHAR2/CHR and CHAR3/CHR (note that that CHAR3/CHR only contains uppercase letters only. To see how a non-character graphic can be "boilerplated," load the example file called POWERDOT/CHR from your distribution disk. It is invoked with the "A" key while in graphic character mode.

Saving and Loading Files from Disk

Since PowerDOT Part 2 always prints disk files, it is necessary to save your graphic files to disk before exiting PowerDOT Part 1. The commands to do this are under main menu option 4, **Save/Load Graphic Buffer**. When this option is selected, you are presented with the following sub-menu:

1 Save Memory to Disk
2 Load Memory from Disk

To save the graphic buffer to disk, you would press 1. This will bring up further prompts:

0 Proceed with Disk I/O
1 Change Filespec - filename/ext
2 Change Starting Block Number - 00001
3 Change Number of Blocks - 00008

Let us say you had previously defined the file "MYGRAPH/DOT" and assigned it a width of 256. When this prompt screen comes up, the name **MYGRAPH/DOT** would be displayed at the second line, beside "Change Filespec." At this point you could if you wished change that filespec. This would naturally involve creation of a new graphic file. If you had gone straight to the Dot Editor without initializing a file, this line would show the phrase, "No name in buffer."

If you select Option 0 only, you will save the entire graphic buffer to disk. However, the amount saved to disk can be altered through the other options. For example, if the file MYGRAPH/DOT only occupies the first 3 blocks of the buffer, you can select option 3 and change the number of blocks to be saved to 3. This will result in only

the first three blocks of the buffer being saved to disk, achieving a savings of about 20 kilobytes of disk space.

Option 2 lets you change the block position of the disk file that the buffer will be saved to. For example, after saving MYGRAPH/DOT to the first 3 blocks you could select option 2 and change the starting block position to 4 and save the file again (using option 0). You now have a disk file 6 blocks in length, with the first three blocks and the second three blocks duplicating each other.

It is possible that you will be creating dot graphic files that are twice as large as the graphic buffer in memory. Option 2 will permit this to be done very easily, by allowing you to specify the the starting point in the disk file where the second graphic buffer will be saved, so that it concatenates correctly with the first half.

NOTE: to visualize how many blocks you need to save, position the screen to the bottom of your graphic and use the B command (see above) to get a readout of how many blocks have actually been utilized. Note also that this option does NOT recognize the PowerDOT EOF marker consisting of the bytes 244, 245 and 246 (those are valid only for the graphic character files and for the ASCII disk I/O routines -- see below). The Save/Load Graphic Buffer option performs block-oriented disk I/O only.

The number of blocks is dependent on the width you previously assigned to the graphic. The block size is first calculated, then divided into the amount of available memory in the computer. If MYGRAPH/DOT had a width of 256, then the total number of blocks that could be saved would be 8.

If the width assigned was 64, then there would be a total of 33 blocks that could be saved. Remember that the width determines the size of a block.

When you have made all the necessary changes (or if you have made no changes at all), select option 0, "Proceed with Disk I/O." This will cause the graphic buffer to be written out to the disk file, and you will be returned to the main menu.

To load a disk file into memory, you would select option 2 from the save/load submenu, "Save/Load Graphic Buffer." You will get the same identical prompts as above. In this case, however, you will be loading from a disk file instead of saving to it. The graphic buffer will be loaded with as much of the file as will fit into it. If a graphic file is larger than can fit into memory, not all of the file may be loaded into memory. For example, the example file on your disk called SUPERDOT/DOT is larger than will fit into the graphic buffer at one time. To see the rest of this file, change the starting block number to 3 and load the file.

Remember that when you initialize a previously existing file with option 2 from the main menu, the contents of that file will automatically be brought into the memory buffer, so loading a file from disk under the Save/Load Graphic Buffer option would normally be used if (a) you wanted to bring in the contents of another file, or (b) you decided you did not like the changes you just made and wanted to restore the contents of the buffer to the original.

Saving and Loading Screens

It will sometimes happen that you have created a fairly complex design on the screen that you want replicated at other locations in the memory buffer. With PowerDOT Part 1 this is a fairly easy process. Simply use the arrow keys to position the buffer so that your design is on the screen, then press BREAK to exit to the main menu. From the main menu, then select option 5, "Save/Load Screen." You will be asked whether you wish to save a screen to disk, or load a screen from disk. If you select Save, you will be asked for a filespec. This filespec should be different from the one you used for the main graphic file. If you do not supply an extension the default extension "/SRN" will be appended to the filespec.

That portion of the graphic buffer which was visible on the screen at the point when you exited to the main menu will be written out to the new file, and you will immediately be returned to the dot editor mode. You can now reposition yourself within the buffer, using the arrow keys, and again exit to the main menu and select option 5, but this time load the screen from disk to the new location. The screen will be added into the buffer at the new location. Experiment with this capability. It can provide you with quite a bit of flexibility in preparing large graphic designs.

Redefining Graphic Width

The width of your graphic must be defined when a file is initialized. However there are times when you find that the width is not right after all for what you want to do, or perhaps you went

straight into the Dot Editor without initializing a file at all. The graphic's width may be redefined without having to initialize a new file by exiting to the main menu and selecting option 7, **Define Graphic Buffer**. When this option is selected you will be prompted for the new width, and the graphic buffer will be adjusted accordingly to deal with the new width. Under most circumstances, you should locate the cursor to the far left of the buffer before redefining the width, or proper screen scrolling may not be possible afterward. This is not a bug; see the section on Special Tricks, below.

NOTE: To change the width of a previously existing file, you must initialize it again.

Extending the Graphic File

You may be working on a very large graphic when you realize that there just isn't enough room in memory to hold your graphic. Does this mean you have reduce the size of your drawing? Certainly not. You can exit to the main menu and select Option 3, **Extend Graphic File**. The action of this routine is as follows: the first part of the graphic buffer (one block's worth) is written out to the file. The rest of the graphic buffer is then shifted downwards by one block and the resulting block at the top of memory freed up for use. At the same time, the file block pointer is updated so that if you go to save the graphic buffer, the starting block number will accurately reflect the fact that part of the graphic is already on disk.

It is important to note that only the first block is saved to the disk. You must use option 4 to save the rest of the buffer. This method can be

used to scroll through a file larger than the graphic buffer. If a file was 10 blocks long, for example, and the buffer was loaded with only the first 8 blocks then selecting this option would resave block 1 to its proper position in the disk file and allow you to display blocks 2 through 9. Selecting it again will resave block 2, and allow you to view blocks 3 through 10. If you selected "Extend file" one more time block 3 would be resaved, and you would have blocks 4 through 10 in the buffer with space for a new block at the end.

This facility will allow you to create graphics which are larger than what can be held in memory. By successively extending the graphic file, you can create a drawing whose size is limited only by the amount of available disk space.

Loading Character Set and Non-PowerDOT Files

PowerDOT Part 1 also has the ability to read in other kinds of files, including ASCII files, BASIC program files, and machine-language files. This mode is selected with main menu option 6, ASCII File I/O, so called because it is intended primarily for reading in ASCII files. When this option is selected, you will be given two choices:

1 Save ASCII file
2 Load ASCII file

If you select either one, you wil be prompted for a filespec. CAUTION: if you select option 1, do not give it the name of an existing file on the disk unless you don't care about that file! Be carefull

The entire file will be read into the graphic buffer as soon as the filespec is entered. PowerDOT Part 1 will not check for the presence of a header. If the graphic buffer width was not previously specified, it will default to 240. It is a good idea to set the width to 64 before reading in any non-PowerDOT files.

In this mode you can make any alterations you wish to the file and write it back out (Make sure the three EOF marker bytes mark the end of the file!). This is easy to do with readable ASCII files, but non-ASCII files will be difficult to interpret because each byte will be displayed as its graphics equivalent. Unless you know what you are doing, we suggest that if you make any alterations to a non-ASCII file, that you do not save it to the same place on the disk. Supply another filespec just in case.

PowerDOT EOF marker

Whenever you save the contents of the graphic buffer to disk using the ASCII File I/O routine the segment to be saved must be terminated by the three sequential byte codes 244, 245, and 246 which PowerDOT Part 1 uses as an EOF marker. These bytes may be inserted using "code mode" in character edit (see above).

If these bytes are not present, then the program will default to the main menu without saving anything.

When a file is read by PowerDOT Part 1 into the graphic buffer under ASCII File I/O, the three marker bytes are automatically appended to it, and will remain in the buffer unless deliberately removed.

DOS Error Handling

If a disk I/O error occurs at any time the appropriate error message will be displayed along with the following menu:

1 - Ignore error
2 - Return to Menu

Option 1 will cause the program to proceed, ignoring the error condition. This should be used only at your own risk. Option 2 will return you to the main PowerDOT menu.

"DISK SPACE FULL" errors do not update the file. What you can do when this occurs is to mount a new formatted disk in the drive, change the starting block number for the save to 1, and save the file to the new disk. If you get the disk space full error in the middle of saving to a previously created file, you can mount a new disk and save the graphic to the new disk. You will be asked for the width and a header for the file on the new disk. The buffer will then be saved to the new file. The two disk files may then be printed sequentially if you wish.

Printing Your Graphics on the Lineprinter

To this point we have been mainly concerned about the creation of graphics and the I/O operations necessary to save them to disk. But there comes a point when you will want to see how the graphic looks on paper. This is the job of PowerDOT Part 2, the **DOT Addressor**. This is the actual print module itself, and is specialized for each of the printers supported by PowerDOT. Consult the list provided with this manual for the correct module to use with your printer.

Remember that all printing **must be done from disk**. It is not possible to print a graphic directly from memory, so your graphic drawing must be saved to disk first before invoking PowerDOT Part 2.

When using PowerDOT Part 2 it is important that you be familiar with your printer's capabilities. Much of this information can be found in the manual that came with the printer. One thing you have to know is the number of dots that can be printed on a single line. The width of the graphic printed **may not exceed one half of the total number of dots possible per line.** For example, a 9x9 dot matrix printer such as the popular EPSON MX-80 will have a maximum of 960 dots per line. This means that the maximum character width of any graphic that can be printed cannot exceed 480. When printing low-resolution graphics and text, the maximum character width must not exceed the column width of the printer. For an MX-80 printer that would be 80; for an

EPSON MX-100 with the 15" carriage, the limit would be 132.

Again, make sure that high memory usage is reduced to a minimum before running PowerDOT Part 2. If the program finds that it does not have enough memory to create the print buffers it needs, you will be notified. You will have to exit the program, reduce the amount of high memory used, and rerun it.

To execute PowerDOT Part 2, type in the name of the file appropriate for your printer from DOS Ready. Epson or compatible (PC) printers should type EPDOT. ProWriter users should type PRODOT. Okidata users should type OKIDOT, and Tandy printer users should type RSDOT or DMPDOT (see appendix). The program will execute and display a logo for a few seconds, then the main menu will appear (some options not supported on all printers):

0 Return to DOS Ready
1 Print Character Graphics
2 Print Character Graphics (Bold)
3 Print Dot Graphic
4 Print Dot Graphic (Bold)
5 Print Dot Graphic (Hi-res)

The modes are as follows:

Print Character Graphic

This mode allows you to print the TRS-80 block graphic set in its normal low resolution mode. Standard ASCII characters may be freely intermixed with the block graphic characters and special characters and they will also be printed. PowerDOT Part 2 will "manufacture" the TRS-80 block graphic set, so that they will be produced even if your printer is not capable of producing them on its own. Printer commands embedded in the graphic

file will be acted upon in this mode, but if you change print style or print size you must make sure NO wrap around occurs. This may mean inserting carriage return characters in the graphic file.

Embedded printer commands will not affect the shape of the graphics printed; however, you should avoid toggling double-strike ("bold face") mode on your printer to avoid producing distortion of the graphics. Remember that these block characters are being built up dot by dot, and in some printers, double-strike mode causes a horizontal or vertical offset by one dot width on the second pass. This could result in poor vertical alignment on succeeding lines.

Print Character Graphics (Bold)

This routine is the same as the one above except that both the graphics and ASCII characters will be double-struck, thereby filling in the gaps between dots with additional dots. You may not want to use this routine with a new ribbon, but you will probably want to use it with an average or worn out ribbon to produce dark print.

NOTE: When printing files under Options 1 and 2, above, all special character codes (1 through 31) will produce the Model III special characters (see figure 4). If these characters are to be interpreted as printer commands, then hold down the SPACEBAR while selecting the appropriate option from the PowerDOT Part 2 main menu.

Print Dot Graphics

This routine will print the graphic file in dot (bit-image) mode. Each block graphic character in the file will be translated to a single dot on output. All ASCII characters in the file will be

ignored. The spacing will be one dot-width in all directions. The maximum character width that can be printed in this mode will be 25% of the maximum allowed by the printer. Thus if a printer allows 960 dots per line, the maximum possible width in this mode would be 240.

Print Dot Graphics (Bold)

This routine is the same as the one above except that four dots will be printed for every block character in the file. The additional three dots will be placed one-half dot-space to the left and below the first, effectively filling in all the space between dots. The outcome will be tiny squares instead of tinier dots. You may not want to use this routine with a new ribbon, but it would produce dark printing with an old one.

Print Dot Graphics (Hi-Res)

This routine is similar to Print Dot Graphics (Bold) except that only one extra dot will be furnished by the routine. It will be placed one-half dot-space down from the first. Dot spacing across the width of the paper will be one-half dot space, so in this mode you can achieve a maximum possible character width of 50% of the total dot-width per line on your printer. On a 960-dot wide printer, this maximum will be 480.

Print Dot Graphics (Ultra-Res)

This routine produces the highest possible resolution on your printer. Dot spacing in all directions is one-half dot. This means that one dot can be printed for each half-dot space. Creating full-page graphics with this routine would require multiple files or a hard drive system. It can be used to produce miniature graphics, however. As with the hi-res option, the maximum character

width will be 50% of the total dot-width per line of the printer.

IMPORTANT NOTE: You need to observe caution when printing large graphic files. Do not print large inverted (white-on-black) files. This will most likely be more than your printer can handle. Whenever duty cycle information has been published by the printer manufacturer, they will have been observed. Unfortunately not all manufacturers have published information on the maximum duty cycle of their printers. You should use your judgment when creating LARGE graphic printouts in options 2, 4, 5 or 6. As a rule of thumb, you should avoid situations which would require your printer to fire all of its pins over 50% of the time per page of printout. Also, pay attention to the heat being generated by your print head and shut the printer down if it begins to overheat. We have observed no damage to print heads from creating high density graphics, but it can happen if you overdo it. Make sure you read your lineprinter's manual and observe the manufacturer's duty cycle recommendations, if any.

After selecting the print mode, you will be prompted for the filespec of the graphic file. Enter the name you gave your graphic file. If you do not type in an extension, the program will use the extension /DOT. You will next be prompted as follows:

1 PRINT GRAPHIC CENTERED
2 PRINT GRAPHIC CENTERED (LEFT)
3 PRINT GRAPHIC CENTERED (RIGHT)

The paper is divided by the program into thirds, and this sub-menu allows you to choose how your graphic will be placed on the paper. As soon as

you make your selection the graphic disk file will be opened and the contents will be printed. When the entire file has been printed you will see the message End of file appear on the screen. At this point you may press 2 to return to the main menu and continue by supplying another filename to the program, or do a form feed. Because the printer is set to nonstandard linespacing, you must hold down the 1 key to formfeed the paper completely. You should use PowerDOT Part 2 to formfeed the paper at least once at the end of printing. If you do not do so, the printer will be left in a non-standard line-feed mode and it will be necessary to turn it off and then back on to reset it.

Configuring the Printer

If you have a 132-column printer, you can change the program so that it adapts to this carriage width. The last choice on the main PowerDOT Part 2 menu handles this change. This will alter the calculations for centering, as well as the calculations for the maximum number of dots printable under each graphic mode.

You will notice that when this option is selected, it will disappear from the main menu display. There is no way to reconfigure PowerDOT Part 2 back to 80-column operation. If you wish to do this, you must select option 0, return to DOS Ready, and then re-execute PowerDOT Part 2 from disk.

Most printers have internal DIP switches for configuration. If your printer has such static switch settings, they should be set to the most flexible condition (probably the settings which you normally use) with automatic linefeed on carriage

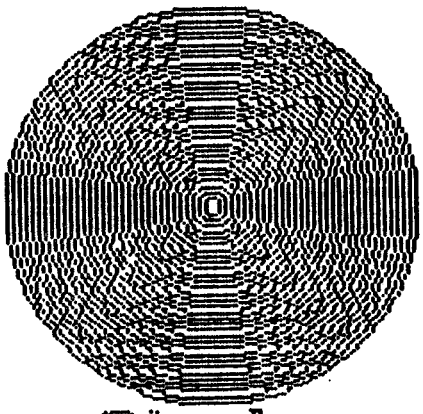
returns. You should also be using the proper cable for your lineprinter. For example, if you are using an EPSON printer with a Radio Shack cable, this program will not operate correctly because the Radio Shack cable makes it impossible to separate carriage returns and linefeeds. PowerDOT Part 2 will operate correctly if you use an EPSON cable.

PowerDOT can and will push your printer to the maximum resolution it is capable of. At times your printer will be required to perform one dot-height line feeds and multiple line feeds accurate to one-third dot height. We have noticed that some printers (not related to any specific brand or model) will occasionally misfire on the position of a dot or a line of dots. This is not the fault of the program and may not (probably won't) occur on your printer. If it does, experimentation will tell you how to correct for it. If it was possible to know what each printer would do under all circumstances, the program would have corrected for it; unfortunately this is not possible. Bugs common to all of a specific printer or model (if any) are already corrected for in the appropriate PowerDOT Part 2 modules.

To minimize any undetectable errors you should adjust your tractor feeds as accurately as possible and make sure your paper feeds into the printer freely and straight. We also recommend that you leave the top cover of the printer open if this does not interfere with printing, when producing intricate graphics. Very few printer manuals make mention of what heat can be produced by the print heads during long printing sessions, but it would seem to us that the cooler you keep the print head the longer it will last.

One thing you must always be aware of is the duty cycle of your printer. If your printer is not capable of producing high-density graphics on a continuous basis (some printers require a certain amount of down time per hour) you should not force it beyond its limits. This can cause severe damage to the printer. Always be familiar with what your printer can and cannot do.

If you have any questions about the way your printer should be set up to do dot graphics, please contact the store where you purchased the printer from, or the manufacturer. PowerSOFT cannot and will not answer questions concerning your printer's operation. If you feel that only we can answer your question, then please inquire by mail and include a self-addressed stamped envelope for our reply.



Circles

Special Tricks

This section describes a few tricks you can use with PowerDOT to produce special effects.

Shading in areas: shading can be done a lot easier than you think. A shaded area on the screen can be created by filling in the area with alternating dots and spaces. The way to shade is simply to draw a series of diagonal lines in the area to be filled in. As long as you don't press any of the horizontal or vertical direction keys on the keypad you will never have two dots side by side. Try this and you will see how easy it is. The effect will be alternating dots and spaces throughout the shaded area.

Where to start drawing: This is a valid question, and is simply answered. You should start with the main part of the graphic located as near as possible to the correct portion of the page. If you have difficulty deciding where that location is you can create a file with grid lines, similar to a page of graph paper. This can be done simply by using the line draw routine. Each square of your grid should encompass (roughly) the screen area. Then print the file in the mode you wish to use. You can then pencil in your idea on the resulting grid and use it as a reference when you go to create the actual graphic. Alternatively, you can also leave notes throughout your graphic. As long as you don't print the graphic in the two character modes (see above) any notes you left will be replaced with spaces. You won't even have to erase them.

Drawing with PowerDOT gets easier and easier as you use it and become accustomed to its features.

Setting up standard templates: This technique was mentioned above but it bears repeating. You can create a graphic file consisting of standard designs surrounded by a particular keyboard key. Then whenever you want to call in a particular template, all you would need to do is enter graphic character mode, and press the key to which that particular template has been associated, and it will be brought in from disk and placed on the screen starting at the cursor position. This is an extremely powerful feature of PowerDOT and should not be overlooked.

Adding Graphics to BASIC Programs: Although programs like PowerDRAW are better suited to this kind of thing because of their ability to save graphics as BASIC program statements, you can also use PowerDOT to add graphics to BASIC programs. First, create a BASIC program with a series of lines (16 per screenful) with print statements or A$= statements such as the example below:

```
10 PRINT "     -- 64 spaces here ---     ";
11 PRINT "     -- 64 spaces here ---     ";
                    .
                    .
                    .
15 PRINT "     -- 63 spaces here --      ";
```

Notice that the last line only had 63 spaces instead of 64 between the quotes. This is so the final screen position is left empty, to prevent the screen from scrolling. You can do the same thing with A$=" -- sixty four spaces -- ". Notice also

that the line numbers must take up the same amount of space, that is, each is two digits wide.

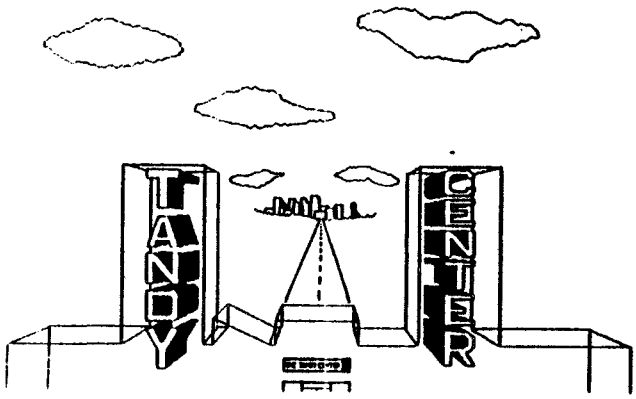
Once you have created the program, save it to disk. Exit BASIC and execute PDOT1. Clear memory before you start by selecting option 9 from the main menu. Then use the ASCII File I/O routine to load in the BASIC program you just saved. Now redefine the graphic width to 256 and then select option 1 to enter the editor and view the program. Don't worry about the stuff that doesn't make sense. What you want are the spaces between the quotes. Use the arrow keys to line up the first line of the program with the 64 spaces on the screen. When you have it lined up, return to the main menu and reset the width to 71. When you re-enter the editor the quotes should now all be lined up. If not, experiment with different widths until you get them so.

Once they are lined up, then you can use draw mode to create your graphic in the area bounded by the quotes. After you are done, exit back to the main menu and save the file using the ASCII file I/O routine (DON'T use the Save/Load Graphic Buffer option!!!). When you load the program into BASIC, it will have the graphics as part of the program.

It is important to clear memory before loading a non-PowerDOT file with the ASCII file I/O option. PowerDOT utilizes its own end-of-file marker in the memory buffer. When writing out a file to disk under the ASCII file I/O routine it looks through the memory buffer for the EOF marker, writing everything out to disk until the marker is encountered.

PowerDOT uses a 3-byte EOF marker which consists of the ASCII codes 244, 245 and 246 in sequence. On a Model III, these three codes produce a graphic symbol that looks like a pointing finger.

Perspective Drawing. Perspectives can be created by using the AutoDraw™ routine to draw lines from a common starting point. This is shown in the graphic below, which was done almost entirely using AutoDraw™. The "city" in the background was used as the starting point for each line. After all the lines were drawn, extra portions were simply erased, creating a perspective drawing. (NOTE: an easy way to erase numerous unwanted lines is to position the graphic on the screen properly, then go into character edit mode and press SHIFT-CLEAR to erase everything in the screen area. This can be used to erase a screenful at a time)



Quick Reference Guide to PowerDOT

PowerDOT Part 1 - The Dot Editor

MAIN MENU

0 - Return to DOS Ready
Exits PowerDOT Part 1 and executes a return to DOS command level.

1 - The Dot Editor
Enters the editor portion of PowerDOT Part 1. The screen will display the contents of the graphics buffer at its current position. The pixel cursor (used for drawing) will be in the center of the screen and will be blinking.

2 - Initialize Graphic File
Allows you to specify a filename to be used for your graphic. If the file already exists on disk, it will be loaded. If the file does not yet exist on disk, you will be asked to supply a WIDTH value and a HEADER MESSAGE (max. 200 characters). The file will then be created and you will be transferred to the Dot Editor main menu.

3 - Extend Graphic File
Writes out the first block of the graphic file to disk, then moves the rest of the graphic buffer down by one block. If you are working on a previously created file which was LARGER than the graphic buffer, this will have the effect of also reading in the next available block of graphic data from disk and placing it at the top of the graphic buffer. In all other cases, EXTEND FILE

will open up one additional block at the top of the graphic buffer for your use.

4 - Save/Load Graphic Buffer

Allows you to save or load the graphic buffer to or from a /DOT file on disk, either partially or in its entirety. You can also control the position of the file to which data is to be saved, or loaded from.

5 - Save/Load Screen

Allows you to save or load a SCREEN of graphics to or from an /SRN file. When saving a screen, the area which is on the display at the time you exited to the main menu will be saved. When re-loading a screen, the screen graphics will be added to the contents of the buffer at the current cursor location.

6 - ASCII File I/O

Permits the loading of non-PowerDOT format files into the graphic buffer. Normally used for loading ASCII text files, this routine will actually load any type of file, including machine-language /CMD files or compressed BASIC program files.

7 - Define Graphic Buffer

Prompts for a new width value for the graphic buffer.

8 - Define Circle Parameters

Permits the adjustment of the aspect ratio to be used for the AutoDraw™ circle routine. The acceptable values are from 50% to 200%. This menu option also allows you to define which circle quadrants should be drawn by AutoDraw™, thus permitting the creation partial circles.

9 - Clear Graphic Buffer

Sets the entire graphic buffer to blanks. This may be necessary when starting a session, since PowerDOT Part 1 does not zero out the graphic buffer when it loads. Also permits you to start over. If 9 is pressed, you will be asked to confirm your choice. To bypass the confirming prompt, press SHIFT-9.

SAVE/LOAD GRAPHIC BUFFER SUB-MENU

0 - Proceed with Disk I/O

Proceed with the disk I/O operation. This MUST be selected in order for the contents of the graphic buffer to be saved to disk.

1 - Change Filespec - filespec/ext

Allows you to supply a new filespec to be saved or loaded. If no filespec has been defined, this will display "No name in buffer." Default extension is /DOT.

2 - Change Starting Block Number - 0001

Allows you to change the position in the file that the graphic buffer will be saved to, or loaded from. When saving, note that the entire graphic buffer is always saved unless altered through option 3, below.

3 - Change Number of Blocks - 0008

Allows you to change the number of blocks to be saved to the file. Default is the entire graphic buffer. By saving only those portions of the buffer which actually contain graphics, you can minimize the use of disk space.

DEFINE CIRCLE PARAMETERS SUB-MENU

0 - Return to the Dot Editor
Exits the sub-menu and returns directly to Dot Editor mode, bypassing the main menu.

1 - Change Circle (50% - 200%) - 100%
Permits changing the aspect ratio of circles drawn by the AutoDraw™ routine to adapt to differnt printers. Default value is 100%, or a 1:1 ratio.

2 - Change Quadrant 1 - ON
Turns drawing of quadrant 1 on or off. Default is on.

3 - Change Quadrant 2 - ON
Turns drawing of quadrant 2 on or off. Default is on.

4 - Change Quadrant 3 - ON
Turns drawing of quadrant 3 on or off. Default is on.

5 - Change Quadrant 4 - ON
Turns drawing of quadrant 4 on or off. Default is on.

CURSOR MOVEMENT KEYS

The numeric keypad is used to move the pixel cursor within the SCREEN AREA. Directions are defined by the numbers relative to the 5 key. Moving the cursor will draw a line in the indicated direction unless CLEAR is held down simultaneously.

The ARROW KEYS are used to scroll the GRAPHIC BUFFER around the pixel cursor. The pixel cursor's position relative to the edges of the screen does not change. Movement in any direction is dependent on the WIDTH setting for the graphic buffer.

N or M, when held down simultaneously while pressing the diagonal movement keys (1, 3, 7 or 9) will change the angle of the cursor movement. When both N and M are held down, the cursor's angular direction will be restored to normal, but the line drawn will be dotted.

Z and X will display the left and right halves of the screen in double-wide mode, respectively. Viewing the screen in this mode will also result in adjustment of the X,Y aspect ratio to a value as close as possible to what will appear on the lineprinter when the graphic is printed.

POSITIONING KEYS

B - Displays the current block position, offset to the center of the screen. Aids in determining how many blocks of the current graphic buffer are used up.

P - Allows movement of the pixel cursor within the screen area without affecting the graphics already displayed (however, any text on the screen passed over by the pixel cursor will be erased). Also displays the current X,Y position of the cursor within the screen area. The values displayed will range from 0 to 127 for X and 0 to 47 for Y.

F - Will display the absolute X,Y coordinates of the pixel cursor relative to the total size of the file. The coordinates will be correct EVEN IF part of the file has already been saved on disk.

THE AUTODRAW™ FACILITY

S - Defines the starting point for AutoDraw™.

D - Draws a line from the position marked by S to the current position of the pixel cursor. Lines may be drawn even if the starting point is outside the screen area.

C - Draws a circle with the diameter as defined by the starting position, S, to the current pixel cursor position. The currently defined aspect ratio is used.

E - Erases the last line or circle drawn by AutoDraw™, regardless of the current cursor position.

CHARACTER EDIT MODE

@ - Switches to Character Edit mode.

ARROW KEYS - moves cursor one character space in the indicated direction.

Shift-Left Arrow - Deletes one character at the current cursor location.

Shift-Right Arrow - Inserts a space at the current cursor location.

Shift @ - Activates "code mode." The next three characters must comprise a numeric ASCII code in the range 0 through 255. The character

defined by that code (using TRS-80 Model III conventions) will be displayed at the current cursor location.

Shift-Clear - Clears the SCREEN area.

ENTER - Terminates Character Edit mode and returns to normal draw mode.

BREAK - invokes graphic character mode. Supply the name of a graphic character file, or press BREAK again to cancel.

PowerDOT Part 2 - The Dot Addressor

MAIN MENU

0 - Return to DOS Ready
Exits PowerDOT.

1 - Print Character Graphics
Prints the indicated file in normal low-resolution graphics mode. In this mode, any text within the file will also be printed.

2 - Print Character Graphics (Bold)
Same as 1 except that double-strike mode will be used to produce darker characters.

3 - Print Dot Graphic
Prints the indicated file in bit-image mode.

4 - Print Dot Graphic (Bold)
Prints the indicated file in bit image mode, using 4 dots per location.

5 - Print Dot Graphic (Hi-res)
Prints the indicated file with one-half dot spacing throughout.

6 - Print Dot Graphic (Ultra-Res)
Prints the indicated file with one-half dot spacing in all four directions.

7 - Change for 132-column printer
Changes PowerDOT Part 2's centering calculations and width calculations to accommodate a wide-carriage printer.

CENTERING COMMANDS

PowerDOT Part 2 splits the paper up into equal thirds, and you can print your graphic centered within each third. When a filespec to be printed is specified, the centering sub-menu will be displayed:

1 - Print Graphic Centered
2 - Print Graphic Centered (LEFT)
3 - Print Graphic Centered (RIGHT)

Select the centering command to print your graphic file in the desired position.

APPENDIX A
Using the PowerSOFT Joystick Interface with PowerDOT

NOTE: The joystick interface is available for the TRS-80™ MODEL III only.

PowerDOT has the capability of using a Radio Shack Color Computer joystick for drawing. The joystick must be plugged in via PowerSOFT's joystick interface called PowerSTICK™. The joystick interface is plugged into the 50-pin expansion bus of the Model III, and the joystick is plugged into either one of the two sockets. Power is supplied to the interface through a small DC transformer (included with the interface). The rotary switch on the side of the box will apply power to the interface when turned toward the joystick sockets. The switch on the side of the box should be pushed toward the rear (i.e., toward the ribbon cable). Additional peripherals (hard drives, etc) may be plugged into the card edge connector on the joystick interface's rear. Make sure the cable going to the peripherals exit upward from the connector, not down. Consult the instructions supplied with the interface for further details.

If you get problems with booting, make sure the joystick interface is turned OFF. Then hit the RESET button. Turn the joystick interface on after you have loaded PDOT1, the Dot Editor.

PowerDOT has two joystick modes: normal draw and XY mode. In normal draw, entered through option 1 on the main menu, the joystick is active in parallel with the numeric keypad. In other words, either the joystick OR the keypad can be used to control the direction and movement of the pixel

cursor. Pressing the red "fire" button will cause the screen to scroll if the cursor is positioned at any one of the screen boundaries. When using the joystick in this mode, you will be limited to the eight directions of movement available in this mode. Make sure the joystick is centered (upright) before entering draw mode, or the pixel cursor will not be centered.

To use the joystick in XY mode, use SHIFT-1 to enter the Dot Editor from the main menu. PowerDOT Part 1 will check to see the joystick interface is connected. If it is not, then the Dot Editor will revert automatically to normal draw mode. Otherwise, it will enter joystick XY mode. In this mode, X,Y coordinates are read directly from the joystick, and these determine the positioning of the pixel cursor. You can get finer placement of the cursor in this mode, but the numeric keypad will not be active. The first time XY mode is entered, you will be placed in the dot editor in joystick erase mode. That is, if you move the pixel cursor around the screen area with the joystick while holding down the red "fire" button, you will erase any graphic blocks that the pixel cursor passes over.

No graphic blocks will be affected unless you hold down the red "fire" button.

To go into XY draw mode, tap the "D" key on the keyboard. From this point on, any time you move the pixel cursor while holding down the red "fire" button, you will draw a line on the screen area. To return to erase mode, tap the "E" key.

When using the joystick, if you move the pixel cursor beyond the screen area, the screen will automatically scroll in the indicated direction (this

of course is dependent on the width set for the graphic when the file was initialized).

To exit joystick XY mode, just tap the BREAK key once. This will place you back in normal draw mode, with the numeric keypad commands active. Tap BREAK again to return to the main menu. If you then re-enter joystick mode via SHIFT-1 from the main menu, the previous setting of Draw or Erase will be maintained.

WARNING

If you have a hard drive connected in line with the joystick interface, it may cause the computer to lock up when the joystick interface is turned on. Alternatively, the presence of a hard drive may cause joystick mode to malfunction. This may not happen all the time, but if it does, disconnect the hard drive from the interface connector before applying power to the joystick interface.

Do NOT attempt to enter joystick XY mode if you are using a Model I TRS-80™, any Model I "workalike" computer, or a Lobo Systems MAX-80™. This mode is not supported on these machines. It is supported only on the Model III. Also, do not attempt to enter joystick mode if you are using a joystick with something OTHER THAN the Power-Stick joystick interface from PowerSOFT. Doing so may cause your computer to lock up.

PowerDOT II and Radio Shack Lineprinters

NOTE: The disk you have received is a 40-track disk. If you only have 35-track drives you will need to obtain a 40-track drive long enough to transfer the contents of this disk onto your own diskettes. Please consult the manual for installation procedures!

There are two print modules on your PowerDOT distribution disk, **DMPDOT/CMD** and **RSDOT/CMD**. DMPDOT/CMD is designed for use with the Radio Shack DMP-2100, and any other printer in the DMP series which responds to the special linefeed code ESC 49 (27,49). RSDOT/CMD is designed for use with the LP VIII, the Color Ink Jet printer, **and other Radio Shack brand lineprinters that are capable of bit-image graphics but do not respond to the ESC 49 linefeed code**. It is strongly recommended that you try both drivers to see which is best suited for your needs.

The **MAXIMUM** widths which can be printed using DMPDOT/CMD are 240 in 80-column mode, and 369 in 132-column mode, **REGARDLESS OF WHAT THE MANUAL SAYS!** (pp. 9,15,30,37-38) This is a limitation imposed by the printer hardware. You will notice also that as a result of this limitation, the HI-RES and ULTRA-RES modes (p. 38) are absent from the main menu. These two modes are not available with the Radio Shack DMP line of printers.

RSDOT/CMD is similar to DMPDOT except that special head positioning commands have been included to compensate for printer shortcomings. RSDOT will also work on DMP-series printers, however, **ONLY DOT GRAPHIC MODE** is available. Character graphic, Hi-res, and Ultra-res modes (pp. 36-38) are not available due to hardware limitations. This also precludes the intermixing of text with bit-image graphics (pp. 36-37). Normal ASCII characters may NOT be mixed with graphics under RSDOT/CMD.

The maximum width available for RSDOT/CMD cannot exceed 285 **IN ALL CASES**. Again, this is a hardware limitation imposed by the printer's capabilities and programming.

For both DMPDOT and RSDOT, please observe the following limitation:

If you plan to print a large graphic consisting of several consecutive files, the number of blocks in each file **MUST BE EVENLY DIVISIBLE BY 7** (i.e., 7, 14, 21, etc.). If this is not observed there will be an indeterminable number of blank lines printed between each file. This cannot be avoided short of manually deselecting or resetting the printer at the proper point.

We strongly suggest that you pay close attention to the duty cycle limitations of your lineprinter, especially if you are using a DMP-series printer. Overuse can easily damage the print heads, and those print heads are not cheap!!

New Feature:

Both DMPDOT and RSDOT now permit you to send printer commands from the main menu. You may use this to send alphanumeric strings (10 cpi mode ONLY) along with any other control codes to your printer. The string may be up to 255 characters long. Alphanumeric strings must be enclosed in quotes and control codes must be in decimal. Strings and control codes may be separated from each other by either periods (.), commas (,), or dashes (-). For example,

13.13,"Hello there!"-13.13,13

will cause two blank lines to be printed followed by the string "Hello there!" and three more blank lines. Note that this mode is separate from graphic printing and can only be selected from the main menu either before or after the graphic is printed; it cannot be selected in the middle of printing a graphic.