

**POVERSOFT**  
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**POWERDRAW**



## INTRODUCTION:

POWER DRAW is a highly sophisticated graphic screen editor written by Kim Watt, author of SUPER UTILITY, and other major programs. Graphics and Text may be intermixed. A Screen may be saved to any of several available memory buffers. Buffers may be saved to tape or disk in one of six available formats. Single and Double wide video are supported. Mod I and III are both supported. A Trace mode may be activated to constantly display cursor positioning on the screen. A Grid mode may be activated to aid in centering your figures on the screen. POWER-DRAW also supports the Alpha Products(tm) joystick. (If using the joystick, and you have the new version, set the switch setting to 5).

## LOADING THE PROGRAM:

POWER DRAW is supplied on diskette as a /CMD file. If you have 2 drives, insert the enclosed diskette into drive 1, and COPY the program to a diskette of your choice (use TRSDOS on either the Mod I or III). If you have 1 drive, insert the diskette into drive 0 and press the RESET button (Mod I and III). Follow the instructions on the screen to copy the program to another diskette of your choice (diskette must be previously formatted in TRSDOS format). PowerDraw works with all known major operating systems. When using LDOS(c), be sure to disable the type-ahead, or keyboard will be sluggish.

Once you have PDRAW/CMD on your diskette, from DOS READY, type PDRAW. After a short loading period the menu of options will appear on your screen. POWER-DRAW makes calls through DOS to load and save disk files, therefore your DOS system diskette must remain in Drive 0 if any disk I/O is used. POWER-DRAW is compatible with all major DOS's available on both the Model's I and III.

The following will explain in detail the various commands available while running POWER-DRAW.

From DOS READY, type PDRAW to load POWER-DRAW into memory. ROM is checked to determine if the program is running in a Mod I or III, and therefore only one version of the program is needed for both machines. Top of Memory is honored on both machines (4049H Mod I, 4411H Mod III), and anything above will not be disturbed. After POWER-DRAW is loaded, the menu will be displayed on your screen. Press <ENTER> to proceed.

There are two MODES of operation, GRAPHICS and TEXT. Initially, you are in the GRAPHICS MODE. You will see 1 pixel flashing in the upper left corner of the screen. You may now use the arrow keys to move the cursor anywhere on the screen.

The SHIFTED arrow keys will move the cursor three pixels at a time for rapid positioning. All of the routines available as displayed in the menu can be activated while pressing the corresponding letter key.

When you are in the TEXT MODE, you will see 1 character flashing in the upper left corner of the screen. Any control keys entered while in the TEXT mode must be made while holding down the CLEAR key (control key). Thus, to get the menu in the GRAPHICS mode, simply press M, but in the TEXT mode, you must HOLD DOWN the CLEAR key, and press M. Pressing M alone in the TEXT mode will enter the letter M at the cursor position. In the TEXT mode, the CLEAR arrow keys will enter the corresponding arrow symbol on the screen. Use the ARROWS to move the cursor, or the SHIFT ARROWS for rapid movement. All keys will repeat if held down.

**NOTE:** If a joystick is connected, it may be used interchangeably with keyboard commands to issue cursor movement commands. All 8 directions can be controlled by moving the joystick in the appropriate direction. The button on the joystick is equal to the shift key. Thus holding the joystick to the right AND pressing the button will result in the cursor moving rapidly to the right. The DRAW, SKIP and ERASE modes must be set from the keyboard.

The following features are available in POWER-DRAW, and are explained alphabetically:

(Remember, when in the GRAPHICS MODE, you may enter the LETTER ALONE to execute the command, but in the TEXT MODE, you MUST HOLD DOWN the CLEAR key while you press the letter.)

#### FEATURES:

##### A - SET ANGLES

POWER-DRAW can draw lines at angles using the I,O,K,L keys. This option will allow you to set at which angle the program is to draw. First you will be shown the current setting, and asked to supply the Horizontal Angle. This is the number of HORIZONTAL pixels the cursor should move with each key press. Next you are asked to supply the Vertical Angle. This is the number of VERTICAL pixels the cursor should move with each key press. Pressing ENTER alone for either question will leave the setting unchanged. The next question will be if the lines are to be SOLID or DOTTED. This specifies whether the dots in between the start and end are to be filled or left blank.

If, for example, the Horizontal Angle is 4, and the

Vertical Angle is 3, and SOLID is selected. If you now press the 0 key, the cursor will move 4 pixels to the right, and then 3 pixels upwards and all dots will be filled (when DRAW MODE is set as explained further). If DOTTED was selected, the cursor would make the move, but none of the in between pixels would be lit. You would, in this case, press D to draw a dot where the current cursor is. The ANGLE feature may seem complicated at first, but offers a wide variety of control and is mastered quickly with use of the program.

### B - BUFFERS

There are several buffer areas available in the POWER-DRAW program, each with a specific use. There is a 256 byte Input Output buffer used when loading/saving files to disk or tape. Following that, there is a 1024 byte buffer which is the current WORKSPACE. A duplicate of this buffer is what you see on the screen, and therefore, when the MENU is being displayed, the workspace buffer can restore the screen contents. Following the workspace buffer to the top of memory are additional HOLDING buffers that may store from 1 to 34 screen images.

When the B command is executed, a display of the contents of the holding buffers is given. The buffer number, followed by an = sign will be shown for all the available buffers. If a buffer contains data, a graphics block will follow the = sign. You will then be prompted for one of six possible commands involving the buffers.

### C - CLEAR ALL

This will load 80H into ALL holding buffers. THERE IS NO SECOND CHANCE, so be careful when using this option. It is recommended using this option once the first time you run the program to start with a clean slate. The contents of the workspace buffer are not affected. The cursor position is not changed, use the H command to re-home the cursor if needed.

### E - EXCHANGE

This will exchange the data in the workspace buffer (the one you see on the video) with any of the holding buffers. This will serve 2 purposes. It saves the current workspace, and brings in a previously stored buffer to be operated on.

### R - RECALL

This will move the contents of any of the holding buffers into the workspace buffer. The workspace buffer will be destroyed.

#### S - STORE

This will save the contents of the workspace buffer to any of the holding buffers. The contents of the workspace buffer are not changed.

#### Z - ZERO

This command will load 80H into all bytes of any SINGLE holding buffer. The workspace buffer is not affected.

#### M - MERGE

This command will take any specified holding buffer and merge it with the workspace buffer. This is a character orientated move. Any character locations in the holding buffer that are not 20H (space) or 80H (graphic block with all pixels off) are moved to the holding buffer.

Once you have selected any of the above commands, it will immediately be executed, and you will be return to the graphics or text entry mode you came from. If you do not wish to execute the command, then answer the prompt with ENTER or BREAK.

#### C - CLEAR BUFFER

This command will clear the contents of the workspace buffer. All bytes are set to 80H (graphics byte with all bits off). In order that the screen is not accidentally executed, you MUST enter this command TWICE. The second time, the CLEAR key MUST be held down. Thus, if you really want to clear the workspace buffer (the video screen), hold down the CLEAR key and press C TWICE. If the screen contents were NOT previously moved to a holding buffer, the data CANNOT be recovered.

#### D - DRAW MODE

When you are in the *GRAPHICS sub-mode*, you may move the cursor with the arrow keys. There are 3 sub-modes while in the graphics mode: DRAW, SKIP, and ERASE. Selecting D will set the DRAW mode. When this is set, any pixels the cursor is over will

be LIT. Therefore, to draw a line, press D to set the draw mode, then use the arrow keys to move the cursor. When D is first pressed, the current pixel at the cursor will be lit. If you press D to set draw mode, then S to set skip mode, a single pixel will be lit.

When in the *TEXT sub-mode*, 2 special keys are active to SET and RESET a complete character. SHIFT SPACEBAR will CLEAR the current character, and SHIFT @ will SET the current character.

#### E - ERASE MODE

Similar to the above mentioned DRAW mode, except that pressing E will set the ERASE mode. Here any pixels the cursor is over will be turned OFF. When E is first pressed, the current pixel will be turned off. Moving the cursor over any other lit pixels will turn them off also.

#### F - FLASH SPEED

This option will allow you to set the speed at which the cursor flashes. You may set the speed of the GRAPHICS and TEXT sub-modes separately. Enter a number from 1 to 9 in response to the prompts.

#### G - GET FILE

This option allows loading the holding buffers. You are first asked if the data is to come from DISK or TAPE.

If you select DISK, you will be asked for a FILENAME. Enter the filespec in standard DOS format. A default extension of /DRW is added to your filename if one is not specified.

If you select TAPE, you will be asked one of the following questions. If the program is running in a Mod I, you will be asked if tape deck number 1 or 2 is to be used. If running in a Mod III, you will be asked to load at 500 or 1500 baud. (Mod III LDOS users be sure to load in HITAPE/CMD if you plan to use 1500 baud cassette I/O). You will then be prompted to prepare the cassette deck.

The data will then be read from the specified media. The data read in must be in COMPRESSED FORMAT (explained under the P command). If it is not, you will be issued an "Invalid File Format" message, and all buffers will remain undisturbed.

If the file is valid, the corresponding buffers will be

loaded. When the file was first saved, only the buffers that HAD DATA were included. When the file is being re-loaded, only the indicated buffers will be affected. Thus, if you have one file that contains buffers 1-5, and a second file that contained buffers 6-10, and currently in memory you have buffers 11-25, then loading BOTH files will leave buffers 11-25 undisturbed. Using this technique, you can MERGE several files. In all cases, the contents of the workspace buffer are unaffected.

#### H - HOME CURSOR

This option will move the cursor to the top left (starting position) of the video.

#### I - UP / LEFT

When in the GRAPHICS or TEXT sub-modes, this key will move the cursor up and left the number of pixels as set with the ANGLES command.

#### J - DISPLAY GRID

Selecting this option will toggle the GRID pattern to either the on or off states. When it is ON, a series of graphics blocks will appear on your screen. These can help you align or center your pictures.

#### K - DOWN / LEFT

This key moves the cursor down and left the number of pixels specified in the ANGLES command.

**NOTE:** When a joystick is connected, all of the cursor movements commands may be entered by moving the joystick in the appropriate direction. All 8 directions are supported.

#### L - DOWN / RIGHT

This key moves the cursor down and right the number of pixels specified in the ANGLES command.

#### M - MENU

Pressing this key will display the power-up menu. Press



ENTER to resume the current mode you came from. The contents of the workspace buffer (the video) are not affected.

#### N - FLIP SIDES

This option will flip the right and left half of the buffer. This feature is useful when working on double wide screens, as it will bring the 'hidden' side of the buffer to the video screen.

#### O - UP / RIGHT

This key moves the cursor up and right the number of pixels specified in the angles command.

Remember, the *HORIZONTAL* moves are made first, then the *VERTICAL* moves. Therefore drawing a line up and left will be the opposite of drawing it down and right. Try it out to see the effect.

#### P - PUT FILE

This option will allow you to store the current holding buffers. First you will be asked to supply the format that you desire the data to be in. There are six options.

##### 0 - COMPRESSED FORMAT

This will save the contents of *all* ACTIVE holding buffers in a minimal amount of storage space. This is the *only* FORMAT that may be read back in with the GET BUFFER command, so if you plan on using one of the following formats, be sure you also save it in *this* format for future loading. This is also the *ONLY* format where *all* the holding buffers are written out. If the file is going to disk, a default extension of /DRW is added to the filename if one is not supplied.

##### 1 - EDAS FORMAT

This saves a file that is compatible with the EDAS editor assembler. The DB opcode is used, and 8 data bytes are stored per line for less overhead. Line numbers will start with 1, and be incremented by 1. If the data is going to disk, a default extension of /ASM is added to the filename.

##### 2 - EDTASM FORMAT

The resulting file is compatible with the EDTASM editor assembler. The DEFW opcode is used, and 2 data bytes are stored per line for less overhead. Line numbers are the same as EDAS format. A default extension of /ASM is added to the filename if

the data is going to disk.

### 3 - BASIC ARRAY

The resulting file will be a series of BASIC statements in which each of the 16 lines of the screen are placed into an element of a string array. The array ZZ\$ is used. It is first dimensioned (DIM ZZ\$(15)) and then each line of the screen is assigned to each element, ZZ\$(0) to ZZ\$(15). The strings are PACKED GRAPHICS. This means that you cannot use the BASIC Edit function to modify them. However you can manipulate them using the BASIC string functions, LEFT\$, MID\$ and RIGHT\$.

### 4 - BASIC STRING FORMAT

The file created will be loadable by BASIC. It will consist of all print statements followed by packed graphic strings. The file is in ASCII format. A default extension of /BAS is added to a disk filename if one is not specified.

Note that you may not use the BASIC Edit function to modify these lines without altering the packed graphic strings drastically.

### 5 - BASIC DATA FORMAT

This file can also be loaded by BASIC. It differs from the above in the fact that the buffer bytes are put into the program in the form of DATA statements. Eight bytes are placed on each line to conserve memory. This file is also in ASCII. A default extension of /BAS is added to disk filenames.

### 6 - LOAD FILE FORMAT

This file will be in standard DOS load file format. The resulting file can be executed from DOS READY. The program will ORG at 3C00H (video memory), and exit is made via 402DH (back to DOS READY). A default extension of /CMD is added to disk filenames.

In option 0, compressed format, ALL the holding buffers are written out. With options 1 through 5, only A SINGLE BUFFER is selected to be written out. In ALL cases, the workspace buffer is NOT written. When writing the file to tape, and format 1 through 5 is selected, the workspace buffer is destroyed. Thus when writing to tape in non-compressed format, be sure to save the workspace buffer to one of the holding buffers. Be sure to SAVE the workspace buffer to one of the holding buffers via the B command before writing to disk or tape if you want it included.

When the above file format has been selected, you will be prompted for disk or tape. The same applies here as it does in the GET FILE instructions. Be sure to remember that the workspace buffer (the one on the video) is NOT used in the PUT BUFFERS command, and ONLY the compressed format may be

re-loaded. REMEMBER, always save the workspace buffer to a holding buffer prior to ANY disk I/O.

#### Q - QUIT

This will terminate the program via a jump to 402DH and return to DOS READY. In order that you do not execute this command accidentally, you must enter it TWICE, the second time as a control key (see C command for similarity). Thus, to exit the program, hold down the CLEAR key, and press Q TWICE.

If you STILL accidentally exit to DOS, you may recover all your buffers intact as long as no memory has been disturbed above 5200H. Just HOLD DOWN the R key while the program loads in. The buffer table and the current workspace buffer will be left intact.

#### R - REVERSE

This command will reverse the contents of the current workspace buffer. All pixels that are LIT, will be turned off, and vice versa. Only GRAPHICS will be affected. Any TEXT on the screen will be left unaffected.

#### S - SKIP MODE

This sets the SKIP sub-mode while in the GRAPHICS MODE. When this is set, and pixels that the cursor moves to will be left UNCHANGED. (See D and E for the balance of sub-mode commands)

#### T - TEXT ENTRY

This toggles back and forth between the GRAPHICS mode and TEXT mode. If you are in the graphics mode, simply press T to enter text mode. If in text mode, you must hold down CLEAR and press T to enter graphics mode. In text mode, all NON-CONTROL keys (CLEAR key is NOT pressed), are entered into your screen. The CLEAR ARROW keys will also enter characters. To move the cursor while in TEXT mode, ARROW moves it slowly, and SHIFT ARROW moves it quickly.

#### U - CURSOR POSITION

This toggles the CURSOR UPDATE option. When ON, the current location of the cursor will be displayed in the upper right

hand corner of the screen. The cursor locations of the graphic and text entry modes are independent of each other. A '>' symbol will appear next to the coordinates that are currently active.

#### V - VIDEO WIDTH

This toggles the video width from the 64 character mode to the 32 character mode, and vice versa. The left half of the buffer in the 64 char mode will be displayed in the 32 char mode. If the cursor lies beyond the edge of the screen when changing modes, it will be repositioned.

#### W - WATCH BUFFERS

Selecting this option will bring all the holding buffers that are currently flagged as 'active' to the video one at a time. The current buffer number that is being displayed is shown at the top right of the screen. Press the SPACEBAR to advance to the next buffer. When all the holding buffers have been displayed, the previous screen contents will be restored and control will return to the ENTRY mode. The workspace buffer is not disturbed with this command. Press BREAK to abort this command if desired.

#### X - MIRROR IMAGE RIGHT / LEFT

This option will perform a mirror image reversal of the buffer ON A CHARACTER BASIS.

#### Y - MIRROR IMAGE TOP / BOTTOM

This option performs a mirror image reversal of the buffer ON A CHARACTER BASIS.

#### Z - MOVE

This option will allow you to move the contents of the buffer in any direction ON A CHARACTER BASIS. Follow this key with any of the 4 arrow keys for movement in the corresponding direction. This feature is useful in adding motion to your creations.

#### ' - SPECIAL KEY

This command is available only in the text entry mode. First, position the cursor anywhere on the video that you wish, and press **CLEAR** '. You will be prompted to define the area at the bottom of the screen. Two keys are required to define an area. The first key must be one of the arrows. This defines the area of the video in the corresponding direction from the current cursor location. The second key further defines the area. In addition to the arrows, two letters, A and L are acceptable as the second key.

If the two keys are UP and RIGHT arrow, then the area to the upper right from the cursor is indicated. If the entry is UP arrow and A, then ALL the screen from the cursor up is defined. If the entry is RIGHT and L, then a LINE starting at the cursor and going to the right is indicated. Pressing the same arrow for the second entry as the first will indicate the same as A being specified. Thus RIGHT arrow RIGHT arrow is the same as RIGHT arrow A.

Once an area is defined, one of several actions may be specified:

**C - CLEAR**

Selection of this option will load B0H (all bits off) to the specified area.

**F - FILL**

This will load BFH (all bits on) to the specified area.

**R - REVERSE**

This will reverse (lit pixels are turned off, unlit pixels are turned on) all characters defined by the area that are graphics. Any ASCII characters in the area are not affected.

**D - DUPLICATE**

This will duplicate the character that the cursor is located over to all characters in the defined area.

### SCREENPRINTER

Three screenprinter drivers have been provided in the program to assist you in obtaining hard-copies of your displays.

**CLEAR ENTER** activates the screenprinter where the bytes are printed via an internal printer driver (parallel only).

**CLEAR SPACEBAR** activates the screenprinter where the bytes are printed via calls to 3BH. If any printer drivers are located in high memory, they will be called to. Press **BREAK** at

any time to abort the routine.

**CLEAR 0** (zero) activates the **EPSON MX-80** screenprinter driver. Works with or without **GRAFTRAX-80(tm)**.

**NOTE:** Your printer must be capable of printing the **TRS-80** block graphics set in order for this option to function correctly. All bytes are sent to the printer **EXACTLY** as they appear in the buffer. A **C/R** (ascii 13) will be sent following each of the 16 video lines. If the internal driver is not being used, be aware that your printer driver may alter the bytes being sent. Be sure that your printer driver will print lowercase and graphics. **ALSO BE SURE THAT SWITCH SETTINGS ARE CORRECT.** We cannot and will not take phone calls on how to get **YOUR** printer set up. Please read your printer and/or **DOS** manual.

#### **ADDITIONAL FILES:**

Several additional files have been added to the diskette to aid you in incorporating your screens to your programs.

#### **PDRAW/CMD**

This is the **POWER-DRAW** program as explained above.

#### **PLAY/CMD**

This is a utility program that will display the contents of any **COMPRESSED FORMAT** disk file you have have created. Several files may be played one after another. You may supply the filenames at the **DOS READY** command level. Example:

**PLAY >3,PARTA,PARTB,PARTC**

This command will display 3 files, **PARTA/DRW**, **PARTB/DRW**, and **PARTC/DRW**, and 3 1/8 second delays will be issued between each display screen.

If no parameters are issued with the command line, you will be asked to enter a filename(s). Enter the filenames exactly as you would have at the command level, using a comma or a space to separate the names. Entering the **>** symbol followed by a **DECIMAL** number from 0-255 will set the number of 1/8 second delays to be issued between screens (0=256). If **NO** delay is specified, each screen will be 'frozen' on the screen. Press **SPACEBAR** to advance to the next screen, or **BREAK** to cancel the routine.

### PLAY/BAS

This is a BASIC program that will read in a SINGLE COMPRESSED FORMAT file, and display its contents to the video screen. Press ANY KEY to advance to the next screen.

There is a demo program provided on the disk and you can "PLAY" it with the following commands:

#### PLAY DEMO <enter>

"this will "play" the pictures one at a time, using the <space bar> to advance frames.

or

#### PLAY >3 DEMO <enter>

"this will "play" all the frames continuously with a speed setting of "3". (like a movie, of sorts)

### PMERGE/CMD

This utility will merge several COMPRESSED FORMAT files together. The buffers may be overlapping, and the resulting file created may be longer than can be held in memory. If the resulting file is longer than memory can hold, then the only way it can be viewed is via one of the PLAY utilities provided. The only reason one would want to create huge files is if you want to watch a "movie". It is suggested that the destination file be different than the source files so they are not destroyed.

The command syntax of this program is:

#### PMERGE >PARTD,PARTA,PARTB,PARTC

Where PARTA/DRW, PARTB/DRW, PARTC/DRW are the source files, and PARTD/DRW is the destination file (as indicated by preceeding the filename with > ).

If no filenames are supplied with the dos command, you will be prompted for them. Enter the names exactly as you would at the command level, separating the names with commas or spaces.

## NOTES



## NOTES

## NOTES



# POWERDRAW

\*\*\*\* POWER-DRAW \*\*\*\* version 1.3 \*\* by Kim Watt  
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<ARROWS> move cursor

<SHIFT><ARROWS> move cursor rapidly

<LETTER> = function

<CLEAR> + <LETTER> = function in text mode

<A> = set angles

<B> = buffers

<C> = clear buffer

<D> = draw mode

<E> = erase mode

<F> = flash speed

<G> = get file

<H> = home cursor

<I> = up / left

<J> = display grid

<K> = down / left

<L> = down / right

<M> = menu

<N> = flip sides

<O> = up / right

<P> = put file

<Q> = quit

<R> = reverse

<S> = skip mode

<T> = text entry

<U> = cursor position

<V> = video size

<W> = watch buffers

<X> = mir img L/R

<Y> = mir img T/B

<Z> = move

<@> = special key

Key <ENTER> to continue!

\*\*\* Buffers 1-30 Available \*\*\*

01=	02=	03=	04=	05=	06=	07=	08=
09=	10=	11=	12=	13=	14=	15=	16=
17=	18=	19=	20=	21=	22=	23=	24=
25=	26=	27=	28=	29=	30=		

C>lear ALL, E>xchange, R>ecall, S>tore, Z>ero, M>erge ?

\*\*\* Saving Buffers \*\*\*

Data in 09 buffers.

0> = Compressed

1> = EDAS

2> = EDTASM

3> = BASIC Array

4> = BASIC Strings

5> = BASIC DATA

6> = Load file

?0

D>isk or T>ape ?

Filename ?



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### PowerDraw Version 1.5 - New Features

Screens may now be saved as as a BASIC array. This will write out an ASCII file which consists of a line-numbered DIM statement and 16 line-numbered assignment statements which may be merged into a BASIC program. The array variable ZZ\$ is used. Note that these statements may not be edited with the EDIT function of BASIC without destroying the packed graphics. The statements may be manipulated with the LEFT\$, RIGHT\$ and MID\$ string functions in BASIC. Also, make sure that the program CLEARS enough string space to accomodate the string array (1024 minimum) before it is run.

New command: CLEAR-/ (Clear-Slash) will display current buffer status.

Recovery Mode: If you accidentally exit to DOS Ready, the command PDRAW \* will reload PowerDRAW into memory without clearing the screen buffer area. Any graphics or text that may have been in that area before the accidental exit will be preserved and re-displayed. NOTE: This assumes that no other program was executed which may have overlaid this area of memory.

