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SUPER ZAP
Interactive Full Screen Disk Dump and Patch Utility

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Version 4.3 (CP/M)
Version 2.1 (IBM PC)
April 1984

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1. INTRODUCTION

One of the most useful aspects of a computer is the ability to store data on disks. A disk is organized into files which contain various types of information, such as executable programs, program source code, and text. In addition, other parts of the disk store a file directory and other operating system data.

For each type of information stored on disk, there are specialized programs, such as loaders, editors, etc., designed to deal with and manipulate that data. But sometimes it is necessary to deal directly with the data without regard to its type. You may want to:

- o Examine a text file for control characters, tabs, etc.
- o Patch the COM or EXE file of an executable program.
- o Repair or examine a damaged disk to recover information that might otherwise be lost.
- o Search a file or a disk for a particular byte or series of bytes.
- o Reconstruct a damaged file by saving individual disk sectors to another file.

SUPER ZAP lets you do all these things. It can display any sector in a file, or any sector on a disk. You can edit the displayed data directly on the terminal screen, allowing you to change any byte while continuing to view the whole sector.

IBM PC SUPER ZAP runs on the IBM PC, PCjr and compatible computers. CP/M SUPER ZAP may be configured for any terminal which has the following features:

- o Direct cursor addressing
- o Display height of at least 24 lines
- o Display width of at least 40 characters
- o Erase screen and erase to end of line

SUPER ZAP is completely menu driven. It uses the numeric keys (CP/M) or function keys (IBM) to select functions to be performed, and the cursor control keys to move the cursor to change data in Update Mode.

Data may be viewed and altered in Hexadecimal (Hex), Octal (Oct), ASCII (Asc) formats. On IBM, Decimal (Dec) is also available. You can easily switch among the different number bases. Powerful "GOTO" commands move you rapidly through files and disks. There is a Configuration Menu Screen which lets you change the default options (Section 5) for a session. Also provided is a configuration program which lets you select a terminal type, and change all default options permanently.

2. INSTALLING AND RUNNING SUPER ZAP

If you have a CP/M system, you may have to configure SUPER ZAP for your terminal before running it. (IBM SUPER ZAP does not have to be configured.) Depending on your disk format, SUPER ZAP comes configured for the following terminal:

Heath/Zenith 5" disk:	H89/Z89/Z19
8" CP/M disk:	Z19
Osborne disk:	Osborne 1*
Xerox or Kaypro disks:	Kaypro II (ADM-3)
Epson disk:	Epson QX-10
Apple CP/M disk:	Apple II with Softcard

* Osborne computers must be booted from the CP/M system disk, not WordStar, for the arrow keys to work.

If you have a different terminal than the one your disk is configured for, refer to Section 11.2 for instructions on how to configure SUPER ZAP to your terminal.

If SUPER ZAP is already configured for your terminal, you can simply copy the file SZAP.COM (or SZAP.EXE on IBM) from the distribution disk to one of your program disks. Then, to run it, give the command SZAP. If the SZAP file is not on the currently logged in disk (usually A:), specify the disk name in the command: for example, B:SZAP.

You may not need to read the rest of this manual in order to use SUPER ZAP. Because the various menus, or Screens, explain the functions available, you can simply follow the displays, using the numeric keys to select functions, and the cursor positioning keys or other control keys on your terminal to position the cursor for changing data.

You can refer to the remainder of the manual as you need detailed explanations of each SUPER ZAP Screen and function. Or you can read it through to learn about all of SUPER ZAP's capabilities.

3. SUPER ZAP SCREENS

SUPER ZAP is organized into four Screens, which allow you to perform different functions. On each screen, you can perform functions by pressing the command keys. Some functions get you to other screens; others change the display or do something with the data on disk.

On CP/M, commands are given by pressing the numeric keys 1 through 9, and 0. On the IBM PC, commands are given by pressing the function keys F1 through F10. You won't confuse the two, because the Screens will always tell you which keys perform which functions. In this manual, we will use the term command keys for whichever keys are used to perform functions.

The Screens are as follows:

o Main Menu Screen

The Main Menu Screen is the one you see first when you run SUPER ZAP. From the main menu, you can move to the other Screens, print a file, list a disk directory, remove file flags, and exit from SUPER ZAP.

o Sector Access Screen

The Sector Access Screen is where the data from a disk sector is displayed and altered. Using the functions on this Screen, you can position the file or disk to a particular location. The displayed sector may also be printed. The File Sector Access and Absolute Sector Access functions use this Screen.

o Absolute Sector Menu Screen

In absolute mode, you look at the sectors on the disk by track and sector number, without regard to their organization into files. You do this through the Absolute Sector Menu Screen. You can change the default drive, and open and close an optional Save File for saving displayed data on disk. When you actually start looking at disk sectors, you go to the Sector Access Screen. On termination of the Sector Access function, control is returned to this Screen.

o Configuration Menu Screen

The Configuration Menu lets you change some of the options affecting SUPER ZAP's operation and display. The changes made are in effect for the current session only.

4. STARTING UP: MAIN MENU SCREEN

The Main Menu Screen has six functions available. Each function is selected by a command key.

1 File Sector Access

This function lets you look at the sectors in a file. First it asks you for the file name, then enters the Sector Access Screen. If the file is not found or an error was in the the format of the file name, then control returns to the Main Menu with an explanatory message displayed at the bottom. While in File Sector Access mode, you are bound by the limits of the starting and ending sectors on the file.

2 Print File

You can print a file out, in the same format as it would be displayed by the Sector Access Screen. You can change the base(s) used by changing the current display base (Sections 6, 7). If you are using a 40 column display, the print will also be in 40 column format. You can abort the print at any time by pressing CTRL-C on CP/M, or CTRL-A on IBM.

3 List Directory

This function lets you list all the files on any disk. If there are a lot of file names, you may need to press RETURN to see them all.

4 Remove Flags

This function is only available on CP/M. It will ask you for a file name and, if the file is found, will remove all flags (system and read only) associated with the file.

5 Absolute Sector Access

This function lets you look at the sectors on a disk by absolute sector number, using the Absolute Sector Menu Screen. In this mode, you are not restricted to any particular file but may look at and change any sector on the disk.

6 Configure SUPER ZAP

Control passes to the Configuration Menu Screen. Default options (Section 5) may be changed in this Screen.

0 Exit SUPER ZAP

The program returns control to CP/M command level.

5. DEFAULT OPTIONS

SUPER ZAP has three default options which control the current disk, the base used to display data, and whether the printer ejects after printing a sector. The current setting of these options is shown at the bottom of the Main Menu Screen.

In addition, on color IBM systems, the foreground and background colors on the display may be specified.

These options can be changed temporarily, using the Configure Super Zap function on the Main Menu, or permanently using the SZCONFIG program (CP/M) or SUPER ZAP itself (IBM). Section 11 describes how to make permanent changes.

To change the options temporarily, for the current SUPER ZAP session, select the Configure SUPER ZAP option on the Main Menu Screen. You will then be able to change the following:

- Default Base. This selects whether sectors are displayed and printed in Hex or Oct mode (or Dec on IBM). In Hex mode, data bytes are shown in both hexadecimal and ASCII. In Oct mode, bytes are shown in octal, and, on 80 column terminals, in ASCII.

- Form Feed. This option only affects printing sectors on the printer. When the Form Feed option is selected, a page is ejected after printing each sector. When it is set to No Form Feed, a page is ejected after printing two sectors. (The number of sectors per page can be changed permanently as described in Section 11, but not temporarily.)

- Change Drive. This is the drive SUPER ZAP will look at for Absolute Sector Acess, and for files unless you specify the drive letter in the file name. The initial value is "A".

- Change Color. On color IBM systems, you can select the foreground and background colors. Initially, the display is white on black.

6. VIEWING AND CHANGING DATA: SECTOR ACCESS SCREEN

The Sector Access Screen is where the sectors are displayed and altered. It contains the following information:

Current Sector Number. Shown in decimal. The first sector in a file or disk is sector 0. In Absolute Access mode on CP/M, the current track and sector number are also shown.

Total Sectors. The decimal number of 128 byte logical sectors in the file (File Access Mode) or on the disk (Absolute Access mode).

Drive or File Name. The current drive and, in File Access mode, the full file name.

Read Only. On CP/M, in File Access Mode if a file is read-only, the indication R/O is shown.

Transient Program Area Address. On CP/M, when a COM file is being displayed, the system TPA load address (100 hex) is displayed. This reminds you that the addresses shown for the data bytes are addresses in memory, not in the file.

Data. The data bytes in the sector are displayed in a large rectangle, reading across. If the current base is Hex, the data is also displayed in ASCII in a second rectangle. In Oct (and in Dec on IBM), the data is displayed in octal, but is not displayed in ASCII except on 80 column terminals. If a data byte is not a printing character, it displays as a dot in the ASCII area.

The starting address of each line is shown to the left of the line, in the current base. The offset of each data byte in the line is shown at the top. In Absolute Access mode, and on all IBM files, the address is simply the position of the first byte in the sector. For CP/M COM files, the address is the memory address of the byte. For other CP/M files, it is the byte number in the file.

NOTE: On CP/M, Octal addresses are shown in split octal; that is, two 8-bit bytes. For example, the split octal number following 000377 is 001000.

7. FUNCTIONS ON THE SECTOR ACCESS SCREEN

The functions available on the Sector Access Screen are displayed in a brief menu at the bottom. They allow you to move forward and backward, go to a sector number, search for data, change the data on the screen, change the current base, and print the screen. The functions available are:

1=+ Advances to the next sector. The RETURN key does the same thing.

2=- Backs up to the previous sector.

3=Goto Enters the "GOTO" sub-function (see below). The Sector Access Menu is replaced by the GOTO Menu. The Data Display Area is not changed.

4=Chg bbb Enters the Update Mode for the current base, Hex, Oct, or, on IBM, Dec. The Sector Access Menu line is replaced by the Update Menu (Section 9).

5=Chg Asc Enters the Update Mode to change data in ASCII format (Section 9). On terminals with fewer than 80 columns, this mode is only available in Hex base.

6=Prt Prints the current sector on the line printer. Use CTRL-C (CP/M) or CTRL-A (IBM) to abort print operation.

7=bbb or
8=bbb Switches the display to the base bbb indicated.

8=Sav or
9=Sav In Absolute Access mode, saves the current sector in the Save File. This function is not available in File Access mode, or if you have not opened a Save File. In this case, the menu shows "N/A" instead.

0=End Exit. Control will return to the Main Main or the Absolute Access Menu.

8. SEARCHING AND MOVING ABOUT: GOTO FUNCTION

The GOTO function on the Sector Access Menu let you move quickly through a file or disk in various ways. You can go to:

- o A sector number (in decimal).
- o An offset in a file, or specific address in CP/M COM file (in current base).
- o A sequence of data bytes (in current base or ASCII).

You do this by selecting the GOTO function on the Sector Access Menu. SUPER ZAP will display the GOTO Function Menu at the bottom of the screen. You now have the following functions available:

1=Go Sector Asks you for a sector number, in decimal, from the beginning of the file (File mode) or disk (Absolute mode) and then goes there.

2=Go Hex (IBM only). Same as the previous function, but the sector number is in hexadecimal.

3=Go bbb Asks you to type a data pattern of one or more bytes in the current base "bbb", and then searches the file or disk for that pattern. You may type as many bytes as can fit on the line, with no spaces or separators between the bytes. Then press RETURN (or Enter on IBM) to start the search.

The first sector containing the match is displayed. The address of the first match in the sector and the total number of matches in that sector are shown. Each match is indicated by the ">" character at the beginning of the match. Matches extending across sector boundaries are located.

If no match is found, SUPER ZAP says so and redisplays the current sector. The search may be aborted in the middle by typing CTRL-C (CP/M) or CTRL-A (IBM).

If you press RETURN (or Enter) but don't enter any data bytes, SUPER ZAP searches for the previous data pattern entered, starting at the next sector. (Any intervening GOTO function will make SUPER ZAP forget the previous data pattern.)

4=Go ASCII Searches file or disk for pattern entered in ASCII. This is the same as function 2, but the data is entered in ASCII.

5=Go Offset Goes to a byte number in the file, entered in the current base. Offsets greater than FFFF hex (377377 octal) are not allowed.

6=Go Address Goes to an address in a COM file, entered in the current base. Valid only on CP/M in File Sector mode for COM files.

0=End Leave the GOTO function without doing anything.

9. CHANGING DATA: UPDATE MODE

Changing data is quite easy in SUPER ZAP. You enter Update Mode, in which you can move the cursor about on the data display directly to the byte you want to change. You then type your changes right on the display.

To get to Update Mode, you first display the sector you want to change, either in Sector or Absolute Access Mode. You then enter Update Mode by selecting function 4 or 5 on the Sector Access Menu.

Function 4 is "Chg bbb", where bbb is the current base. When you enter this mode, the cursor moves to the first data byte on the screen.

You can use control keys to position the cursor at any byte. If your terminal has cursor positioning keys (arrow keys), these keys will control the cursor. If there are no arrow keys, tab and backspace will be used. On IBM, if the arrow keys display numbers instead, press the Num Lock key. In addition, RETURN (Enter on IBM) will move the cursor to the beginning of the next line. You may change the cursor control keys by configuring SUPER ZAP (Section 11).

When the cursor is at the beginning of a byte, you can type your changes right over the old data. Your changes are highlighted (on terminals that can).

Before you have finished typing a byte, the backspace key can be used to restore the old data. To change a byte, you must type all the digits in the byte. If you have typed some of the digits, you will have to either backspace out or type the rest before you can do anything else.

If you discover a mistake after changing a byte, you can press CTRL-X on CP/M, or F10 on IBM, to exit Update Mode without changing the disk. To make the changes and exit from Update Mode, press CTRL-W on CP/M, or F1 on IBM.

Function 5, "Chg Asc", is identical to the function described above, except that it changes the data in ASCII format, using the ASCII display to the right of the screen. It only works if the ASCII display is present, so if you have a screen smaller than 80 columns, you will need to be in Hex mode.

In ASCII update, you can only enter printing characters, not control characters. This means that some byte values can

only be entered in Hex or Octal update.

WARNING: Because all bytes on a file or disk can be changed in Update Mode, it is possible to destroy an entire file or disk. We suggest that you copy your disk before using SUPER ZAP.

10. ABSOLUTE ACCESS AND SAVING SECTORS

Absolute Sector Access is similar to File Sector Access (Section 6). However, you have two capabilities not available in File Access. You can look at any sector on the disk, including system and directory areas and unused sectors. And you can open a Save File and use it to save the data from individual sectors.

All the functions of File Access Mode are available in Absolute Access Mode, with the exception of "Go Address". You can use the search and GOTO functions to examine the entire disk.

From the Main Menu, you can select the Absolute Sector Access Menu Screen from the . The commands on this menu are:

1 Access Current Drive

2 Open Save File

3 Close Save File

4 Change Current Drive

5 Track 0 is Single Density (CP/M only)

6 Track 0 is Standard (CP/M only)

0 Exit Absolute Sector Access

The Save File lets you save sectors viewed in the Sector Access Screen by writing them into a file, which can be on the same or another disk. You enable it by opening a Save File on the Absolute Sector Access Menu. You will be prompted for a Save File Name. If the file previously existed, it will be erased and a new file created in its place.

Once a Save File has been opened, the Sector Access Screen will give you the "Sav" option. By pressing the corresponding command key, you can write the sector being viewed onto the end of the Save File.

The currently opened Save File may be closed at any time and another file opened. If you do not close the Save File prior to exiting from the Absolute Sector Screen, then it will be closed automatically. If no sectors were written to the file, then the file will be deleted. The current drive in use and the name of the open Save File are displayed at the bottom of the

Absolute Sector Screen.

The extra steps of hitting RETURN before and after Absolute Access are to allow the operating system to adapt in the event you use disks of different formats.

On CP/M systems, functions 5 and 6 select the density of track 0 on the disk. You can generally ignore these options, which are used only in rare cases. In some disk formats, (e.g., some Heath/Zenith 8" formats), a double density disk can have a single density track 0. This can cause the operating system to hang up when accessing nonexistent sectors on track 0. Function 5 allows you to tell SUPER ZAP not to attempt to read these sectors.

11. CONFIGURING SUPER ZAP

You may need or want to configure the SUPER ZAP program for several reasons. If you have a CP/M system or terminal other than the one your copy of SUPER ZAP is set up for, you may need to configure SUPER ZAP to your terminal. You can also set SUPER ZAP to come up in the display base you prefer, and set it for your preferred print options and, on color IBM systems, display colors.

Section 5 describes the options that SUPER ZAP can be configured for during a session, and all of these can be configured permanently as well. You can also configure two print options permanently that can not be configured during a session. These are number of sectors per printed page, and number of lines spaced between sectors.

If form feed on print is selected, a form feed is printed after each sector. In this case, one sector is printed per page and the other print options are irrelevant.

If form feed on print is not selected, normally two sectors are printed per page, with four blank lines between sectors. You can change the number of sectors per page, and the number of blank lines between sectors.

The way SUPER ZAP is configured depends on whether you have CP/M or an IBM system. IBM configuration is described in Section 11.1. CP/M configuration is described starting in Section 11.2.

11.1. CONFIGURING IBM SUPER ZAP

On IBM systems, you can modify the following SUPER ZAP options:

OPTION	DEFAULT	ALTERNATIVES
Base	Hexadecimal	Decimal, Octal
Drive	A	any valid drive
Form Feed	Yes	No
Lines between printed sectors	4	1-255
Sectors per printed page	2	1-255
Foreground color	White	any color
Background color	Black	any color

To change an option, you use the SUPER ZAP program itself to alter the corresponding byte in the SZAP.EXE file.

To locate and modify the available options, follow these steps:

1) Run SUPER ZAP. Select F1 (File Sector Access) in the Main Menu.

2) When asked for a file name, enter SZAP.EXE. If SZAP is not on the default drive, enter d:SZAP.EXE where d is the letter of the drive containing SZAP.

3) The Sector Access Screen will display. Press F3 to enter the GOTO subfunction.

4) Select F4 (Search Asc).

5) When asked for the search string, enter "-->". (Do not enter the quotes.)

6) SUPER ZAP will search for and locate the search string. In the Hex display area on the screen, a '>' sign will point to the byte 2D, which is followed by the bytes 3E 3E. The bytes immediately after these three bytes are the bytes which determine the options. In order, they are:

OPTION	DEFAULT	HEX VALUE
Base	Hex	10
Drive	current	FF
Forms Feed (Yes/No)	Yes	01
Lines between printed sectors	4	04
Sectors per printed page	2	02
Foreground color	White	07
Background color	Black	00

7) Press F4 to enter the Update Mode in the current base (probably Hex).

8) Position the cursor at the byte to be changed, and enter the new value from the following table:

OPTION	HEX VALUE	OPTION	HEX VALUE
Hex	10	Black	00
Dec	0A	Blue	01
Oct	08	Green	02
		Cyan	03
Yes	01	Red	04
No	02	Magenta	05
		Yellow	06
		White	07

9) When all changes have been made, press F1 to update the sector on disk.

10) Press F10 repeatedly to exit from SUPER ZAP.

11.2. CONFIGURING CP/M SUPER ZAP

Your CP/M SUPER ZAP distribution disk contains a program SZCONFIG.COM, which lets you change SUPER ZAP to run on your terminal with the defaults you prefer. You can select a terminal type, edit the current terminal definition, and change the current base, drive, forms feed option, sectors printed per page, and number of lines skipped between sectors when printed. The selection of all of these options is provided in six main menus. The six main menus are:

- Configure SUPER ZAP Menu. From this menu, you can get to the other three menus, and back out to the operating system. Any changes you make on the other menus are held back until you explicitly make them using the Update Super Zap function on this menu. If you try to exit without doing the update, the changes will be lost, but SZCONFIG will check to make sure you are doing that on purpose.

- SUPER ZAP Options Menu

  This menu controls:

  - Default Base Selection
  - Default Drive
  - Forms Feed Option
  - Number of sectors printed per page
  - Number of lines skipped between printed sectors

o Terminal Selection

One of eight pre-defined terminals may be selected, and an entry is left for you to define any other terminal. The terminals are:

- Televideo 950
- Televideo 920
- Heath/Zenith H/Z19
- ADDS Viewpoint
- BEEHIVE DM30
- IBM 3101
- SOROC IQ120 & 140
- OSBORNE
- User-Defined Terminal

The User-Defined entry is initially set up for an ADM-3A terminal, or Kaypro computer.

o Edit Terminal Definition

The selected terminal definition may be viewed and altered if necessary. SUPER ZAP can be configured for almost any terminal which has:

- Direct Cursor Addressing ability
- 40 or 80 column lines
- At least 24 lines
- Screen and line erasing ability

o Test Terminal Definition

After you have selected or edited a terminal definition, you can use this menu entry to run through all the control functions to make sure they have been entered correctly. This test explains itself as it goes.

o Disk Format Selection

This menu allows you to specify certain details of the disk format. It is generally not required unless you encounter errors in Absolute Access Mode reading the first or last sector of a track.

The parameters changed with the Options Menu is described more fully in Section 5 and at the beginning of Section 11. Configuring for your terminal is described in the following sections. Disk format is described in Section 11.5.

11.3. TERMINAL DEFINITIONS

You can change the sequences which define the currently selected terminal. SUPER ZAP requires some terminal features, and can make use of optional ones, as follows:

Feature	Required
Direct Cursor Addressing	Yes
24 line display	Yes
Minimum 40 character line.	Yes
Erase Screen	Yes
Erase to End of Line	Yes
Delete Character	Yes
High Intensity	No
Reverse Video	No

You can also specify Initialization and Exit terminal command sequences if you need to set up any terminal modes before execution, or reset them on exiting.

The following table shows the various terminal command options that SUPER ZAP can handle.

- o Direct Cursor Addressing
  - Row or Column may be sent first.
  - A constant can be added to the Row.
  - A constant can be added to the Column.
- o Cursor Control Keys
  - Cursor keys may have one prefix character (e.g., ESC).
  - Cursor keys may send only one additional character.
  - The cursor keys may actually exist on the keyboard or can be defined as any unused control key sequence.
- o All command sequences except Initialization and Exit may be up to ten bytes in length. The Initialization and Exit strings may each be up to twenty bytes in length.

SUPER ZAP has two line length categories: at least 78 characters per line, and fewer than 78 characters per line. All terminal with fewer than 78 characters are treated as 40 column terminals.

11.4. EDITING TERMINAL DEFINITIONS

To change a terminal definition, you select that terminal as the current terminal, and then use the Edit Terminal Definition function. When you choose to change a particular command, the original command will be displayed, along with the maximum number of bytes that may be entered for that command. All command data must be entered in a hexadecimal character string with no embedded blanks or commas. For example, if the current terminal defined is the Televideo 950, and the Direct Cursor command is to be altered, the display would appear as follows:

```
Direct Cursor Addr Cmd Edit

Current Command given below:
1BH 3DH


The new command must be entered in HEX,
with no embedded blanks or commas.

Max BYTES for this command is 10.

Include all padding characters.

To leave the command as is,
Press RETURN only.

Enter New Command String below:
```

In order to change the command from 1BH 3DH to 1BH 59H, you would enter

```
1B59
```

11.5. DISK FORMAT OPTIONS

The Disk Format menu allows you to specify certain details of disk format which SUPER ZAP can not determine for itself. You should not need to use this menu unless you run into problems in Absolute Access Mode.

If you get Read Error messages when trying to read the first or last sector on a track, you might try changing the sector numbering option. Some CP/M systems number their sectors starting at 0, others starting at 1. If the last sector on a track can not be read, try changing the numbering to 0. If sector 0 can not be read, try changing it to 1.

If you get Read Errors or the computer hangs up when reading the first track on a double density disk, try selecting the Track 0 is Single Density option. See the end of Section 10 for an explanation of this option.

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