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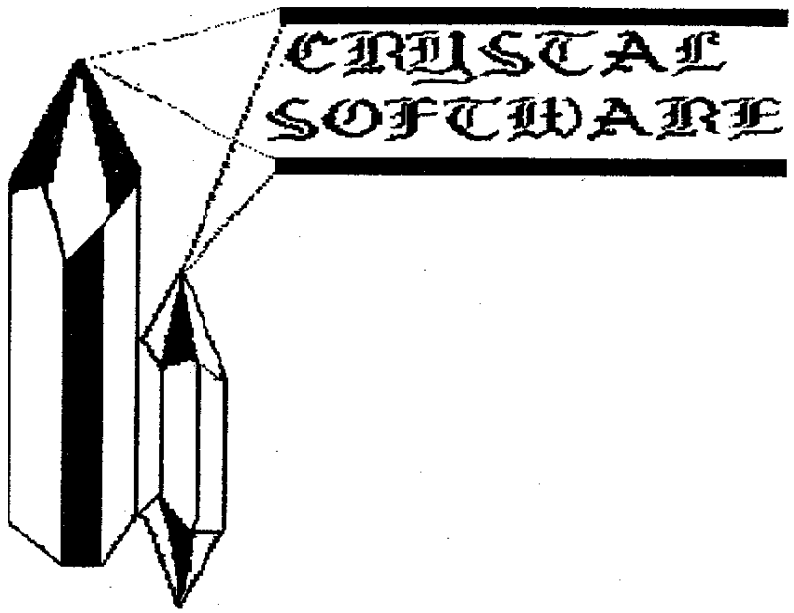
• C F O R M •

MDOS Hard Disk Format Utility

VERSION 1.3



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MDOS VERSIONS 1.23H & HIGHER

• LICENSED SOFTWARE •

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CFORM 1.3 documentation

CFORM version 1.3

HARD DISK FORMAT UTILITY

by

Michael J Maksimik
635 Mackinaw
Calumet City IL 60409-4014
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Exclusive world distribution

by

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CONTENTS

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PREFACE

CECURE ELECTRONICS INC. is pleased to bring you **CFORM**, the easy to use program for formatting, testing, and verifying HARD DRIVES from MDOS and last bit not least increases your total formatted memory by over **6%**. That right, you will get an additional 1.2 megabytes on a 20 meg. Hard Drive. This is possible by being able to format each Cylinder to 34 sectors instead of 32, which is the limit with MDM5.

And now a word from the Author of **CFORM ....Mike Maksimik:**

I would like to take this opportunity to thank the follow people for their efforts to the **CFORM** project:

9640 NEWS for WIN-DRIVE.

Al Beard and **LGMA** products, for the remarkable TIC C compiler, and the WINDOWS library (WINLIB).

CECURE ELECTRONICS INC. and their staff for facility usage.

Dan Eicher for information research.

Beery Miller for technical assistance and information research.

Clint Pulley for the TICRUN runtime support library (TICLI3).

Jim Schroeder for technical assistance.

Tim Tesch for BETA testing.

Don Walden for BETA testing.

Jeff White for technical assistance.

Above all, thanks go to you, the **CUSTOMER** for your support of me and **CECURE ELECTRONICS INC.** and the products they provide. I welcome your comments and suggestions on **CFORM**.

CFORM was written in TIC 1.67 version of the C language for the MYARC 9640 computer, with FLTLIB floating point library and TMS9995 assembly language interface to the Standard Microsystems HDC9234 Hard and Floppy Drive Controller Chip.

The author (Michael J Maksimik) can provide technical help when available at:

635 Mackinaw
Calumet City, IL 60409-4014
708 891-2513

Try also the Chicago TI Users Group BBS, where the author is also the SYSOP 708 862-0182. 8 bits, no parity, one stop bit. MNP 2-5 2400 baud.

CFORM

In bringing you **CFORM**, we have attempted to provide you with an excellent bargain. Your honesty will help us remain in business and provide you, our customer, other software and hardware in the future.

LICENSE STATEMENT

CFORM ("this software") is licensed for the exclusive use of the original purchaser ("you") for use on one computer only, that you normally own.

This software is not copy protected. **CECURE ELECTRONICS INC.**, authorizes you to make backup copies of the software for your archives only, for the sole purpose of protecting your investment from loss.

You are free to move this software from one computer, you own, to another you own, as long as there is no possibility of its being used at more than one computer at one time, unless you have purchased a **SITE LICENSE** that allows multiple usage.

You may not **LEND, RENT, LEASE, SELL, TRADE, DISTRIBUTE** and/or **GIVE** this software to any person, business, machine, computer etc.

If this software is **STOLEN**, you **MUST** file a Police Report and notify **CECURE ELECTRONICS INC.**, by Certified Mail and include a copy of the Police Report.

You may not **FORMAT, TEST** and/or **VERIFY** any HARD DRIVE as a service for others, unless you have purchased a **SERVICE LICENSE.**

You may not **REVERSE ENGINEER, DISASSEMBLE** and/or **EDIT** the software, except as provided in the setup menu in the main program.

If you sell your computer, you may not allow the **CFORM** program to go with the computer. ie it must be removed from the HARD DRIVE, any backup copies, and/or the original disk in such a way it would be impossible to recover. This may be done by either reformatting and/or bulk erasing.

Any violations of the **LICENSE** will terminate the **LICENSE AGREEMENT** and may subject you to criminal penalties and costly civil damages. Please understand that you only own the disk, not the software on it. If you have questions as to what you may or may not do, write **CECURE ELECTRONICS INC.**

N O T I C E

CECURE ELECTRONICS INC. reserves the right to make improvements in the product described in this manual at any time and without notice.

LIMITED WARRANTY ON MEDIA

CECURE ELECTRONICS INC. warrants the diskettes on which **CFORM** is recorded to be free from defects in materials and faulty workmanship under normal use for a period of 30 days after the date of original purchase. If during this 30 day period a defect in the disk should occur, the disk may be returned, prepaid, for replacement, provided that you have completed the enclosed registration form and returned it to **CECURE ELECTRONICS INC.** Your sole remedy in the event of a defect in a disk, is limited to replacement of the disk. **F.O.B. MUSKEGO WI.** ie: You pay shipping both ways.

THIS WARRANTY IS VOID IF THE SOFTWARE HAS BEEN DAMAGED BY ACCIDENT, UNREASONABLE USE, NEGLECT, IMPROPER SERVICE OR OTHER CAUSES NOT ARISING OUT OF DEFECTS IN MATERIALS OR WORKMANSHIP.

DISCLAIMER OF LIMITED WARRANTY

We have made every effort to verify that **CFORM** is an effective HARD DISK FORMAT UTILITY program. However, you must be aware that **CFORM** is sold to you "as is" without any warranty of any kind.

ANY IMPLIED WARRANTIES ARISING OUT OF THIS SALE, INCLUDING BUT NOT LIMITED TO EITHER EXPRESS OR IMPLIED WARRANTIES WITH RESPECT TO THE SOFTWARE, ITS MERCHANTABILITY OR ITS FITNESS FOR ANY PARTICULAR PURPOSE, ARE "AS IS" THE SOFTWARE IS LICENSED SOLELY ON AN "AS IS" BASIS.ENTIRE RISK AS TO ITS QUALITY AND PERFORMANCE IS WITH YOU. IN NO EVENT SHALL CECURE ELECTRONICS INC. OR MICHAIL J MAKSIMIK BE LIABLE OR RESPONSIBLE FOR ANY PROBLEMS, DAMAGE OR LOSS OR OTHER INCIDENTAL OR CONSEQUENTIAL COST, EXPENSES, OR DAMAGES INCURRED BY THE PURCHASER OR ANY OTHER USER, THAT ARISE BECAUSE OF IMPROPER USE OF AND/OR DEFECTS WITH CFORM. YOU USE THIS PROGRAM AT YOUR OWN RISK! SINCE SEVERE LOSS OF DATA IS POSSIBLE WITH THE IMPROPER USE OF CFORM, BACK UP ALL DATA ON YOUR HARD DRIVE!

Some states do not allow the exclusion or limitation of implied or consequential damages, so the above limitations or exclusions may not apply to you in those states.

LEGAL REMEDIES

This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

CHOICE OF LAW

This statement shall be construed, interpreted, and governed by the laws of the state of Wisconsin.

S O F T W A R E P I R A C Y W A R N I N G

THE SOFTWARE COPYRIGHT PROTECTION ACT OF 1992, MAKES SOFTWARE PIRACY A FELONY! IF YOU RIP OFF THIS PROGRAM YOU NOW FACE UP TO 5 YEARS IN FEDERAL PRISON AND A MAXIMUM FINE OF $250,000. IN ADDITION, WE HAVE THE RIGHT TO BRING A CIVIL SUIT FOR ACTUAL OR STATUTORY DAMAGES UP TO $100,000 PER INFRINGEMENT.

R E W A R D

IF YOU ARE AWARE OF ANY ONE VIOLATING OUR COPYRIGHT ON THIS OR OTHER SOFTWARE WE PRODUCE, AND YOU ARE WILLING TO TAKE PART IN THE INVESTIGATION AND LEGAL ACTION, CECURE ELECTRONICS INC. WILL PAY 25% OF MONIES COLLECTED FROM THE CIVIL SUIT OR OUT OF COURT SETTLEMENT. IN THE EVENT THERE IS NO CIVIL SUIT AND/OR OUT OF COURT SETTLEMENT, CECURE ELECTRONICS INC. WILL PAY $1000 UPON THE ARREST AND CONVICTION OF THAT PERSON, TO THE PARTY OR PARTIES THAT HELP. THE MAXIMUM THAT WILL BE PAID IS $25,000 IF WE WERE TO COLLECT THE MAXIMUM AND IF MORE THAN ONE PERSON SUPPLIED THE INFORMATION RESULTING IN THE CONVICTION, THEY WOULD SHARE THE REWARD.

NOTICE FROM THE AUTHOR: Michael J Maksimik

It is illegal to copy and pirate software such as and including **CFORM**, and ultimately it will damage the TI and GENEVE software marketplace. To prevent such actions by unscrupulous members of the community, **CFORM** has a proprietary self-check which prevents alteration of the most critical program data, and it's identification. This identification (the name address and phone number,and serial number of the licensee) is displayed at all times and cannot be removed or altered by any method. Any attempt to modify the program will result in revocation of the license. It is hoped that the use of this method will deter the potential pirate else they make their name well known to the community by their own actions. It is unwise to alter any program data, as you may discover that alteration may sometimes lead to hidden, catastrophic problems which might not be visible right away!

DON'T SAY I DIDN'T WARN YOU!

SYSTEM REQUIREMENTS FOR RUNNING CFORM:

1) Myarc 9640 Personal computer, minimum available memory 128k.

2) WIN-DRIVE public domain windows driver for single tasks by Beery Miller (included with the program)

3) Myarc HFDC (Hard and Floppy Disk Controller). The controller must have the 62256 Static RAM chip; all HFDC's with the 6264 Static RAM chip will have to be upgraded to the 32k chip.

4) One or more floppy disk drives, and one or more hard disk drives.

5) Color display monitor (monochrome may make menus hard to read)

OPTIONAL EQUIPMENT

1) Myarc mouse or Logitech Bus/Serial mouse with Bruce Hellstrom's mouse driver program.

2) Printer and RS232 interface.

3) Technical reference on your hard disk drive, giving the drive's format parameters.

4) CFORM runs faster when video wait states are turned off (VIDEO ON) And, it is set to run in Static RAM (zero wait state memory.) For the most optimal speed, make sure SRAM is available. You may consider having you geneve fitted with 64k static RAM instead of the standard 32k Normally, TIMODE does not rob fast memory, but if you have loaded CFORM from Windows or Genbench, it will be slower than if you run it straight from the command prompt.

SETTING UP THE SYSTEM

1) Make a backup copy of your CFORM disk. This is only to protect you from accidentally erasing or damaging your original disk. After making your backup copy, place the original disk in a safe place.

2) If you haven't installed the WIN-DRIVE driver software, do so now by placing WIN-DRIVE in your root directory of your boot disk, and place the command WIN-DRIVE in your AUTOEXEC file. This way the WIN-DRIVE driver will load when you boot your system. If you are going to use a mouse, you should have the current version of Bruce Hellstrom's mouse driver. This is a commercial program, and is not required to run this software. If you are going to use a mouse, it is required, though. After installing the WIN-DRIVE, reboot your geneve. Set the date and time on your geneve, if you haven't already.

Place MDOS System in Drive 1
Disk - when prompt comes up A>

Place - CFORM Disk in Drive 1
Load - WIN-DRIVE
A> WIN-DRIVE
When Prompt A> returns Load
CFORM A>CF

SETTING UP THE SYSTEM CONTINUED

3) Place the CFORM disk in a drive (or, if you have installed CFORM on a hard drive subdirectory:) get the MDOS prompt to be "in" that directory or drive. Example: You have placed CFORM in disk drive 2. Disk drive 2 is called B:. Therefore, you should change your DOS prompt to be B:\>.

Second Example: You have CFORM in a directory HDS1.C.HDISK. do the following:
A:\>H: (ENTER)
H:\>CD \C\HDISK\ (ENTER)
H:\C\HDISK\>

4) Execute the program by typing CF at the MDOS prompt. It is critical that you run CFORM in the same directory as your DOS prompt because CFORM needs to find it's support files in the current drive and directory.

5) CFORM does it's initialization, and presents a signon screen. Alternatively, you may not get a signon screen, especially if the program has been altered somehow. If this occurs, you must contact CECURE ELECTRONICS INC. for information on how to recover your program.

6) CFORM is finished loading when you get the menu bar and the main screen. At this point, you can remove your program disk, unless you wish to use the online information which requires access to your program disk.

7) Continue with the operating procedures, or press ESC to exit the program.

OPERATING PROCEDURES

Once you have successfully loaded CFORM, you are ready to use the program. (note: the options are in menu order, but you should proceed first to SETUP to make sure the program is set for your HFDC card address)

CFORM consists of several menu styles, from the main menu bar, to the submenus, to dialogue boxes and simple input prompts.

OPERATING THE MENUS

I. The main menu bar.
All keys are valid in CFORM, but some keys have special functions. When the program first loads, you are in "Menu Bar" mode, and the menu bar operates with the mouse or arrow keys, the ESCape key, and the ENTER key. The Highlighted option on the menu bar is in black-background video, with the "active" letter being the one in red. Pressing this letter selects the option. Pressing the arrow keys to "get to" an option, and then selecting it will also work. Selecting an option is by:
If in the EXIT option or the FORMAT option, press ENTER.
If in the VERIFY, INFO, SETUP option, press the down arrow.

The mouse may be used to point to an option, it is a shortcut method for using the arrow keys. The left mouse button does not act as an enter key, but it acts as a down arrow key in this mode.

II. **Sub-menus.**

Some options such as VERIFY and INFO, present sub-menus. A sub-menu
lists related options under the main heading. When you are at the sub-menu level, you can go "sideways" to other submenus, or "up" to other options, or the menu bar. Pressing ESC at the sub-menu level goes to the menu bar, and pressing ESC at the menu bar level will exit the program.

III. **Dialogue boxes**

A dialogue box appears when the program needs information from you to operate properly. For example, in the SETUP/Hardware dialogue box, which appears when you press "down arrow" on SETUP, and then press ENTER when the "Hardware" option is highlighted, you get several input spaces on the screen, most of them already loaded with data. You can enter new data in the spaces, or use the up/down arrow if you see the double arrow symbol at the start of the input field. In a Dialogue box, you can use TAB to move the highlight around the box, to "activate" any input field you choose. Example, in SETUP/Hardware, look at the HFDC CRU Base field. Use the up and down arrows to choose the proper value for your HFDC, and press enter, or use TAB. Entering data is done by typing in the data in the field. Numbers will be automatically right-justified against your cursor, so if other values exist be sure to eliminate them with the space bar. Entering text is done by typing the text. Example: The report devicename is defaulted to PIC.CR but you can type any devicename, such

III. **Dialogue boxes** continued

as DSK1.REPORT1 or similar. Only Alphanumerics will be accepted here, and certain special characters. Control characters will not be accepted. TAB through the input fields until you have the box completed with all needed data. Press ENTER on the last field and the box will close. The mouse can be used to "activate" an input field: Point to the field you want to enter data at, and press the left mouse button. The red highlight background will follow. You may also press ESC on a dialogue box to abort it and close it.

IV. **Input Prompts**

Some prompts, such as in INFO/Catalog, will ask for a device name. These prompts are not sensitive to control characters and can accept almost any data. Type a valid MDOS device name, such as A:, or HDS1 or even just C, and the catalog routine will run a catalog. Don't use the down arrow here, and ESC will not work on an Input Prompt. If you make a mistake, press ENTER, CFORM will recover! You can always try again. The mouse is not active during input prompts.

V. **Error /Informational Windows**

Some windows only need you to press any key, and will vanish when you do so.
They are there to notify you of a program or device error, such as trying to open a report file to a non-existent device. The mouse is not active during an error condition. When in INFO/menus or INFO/hardware, you will see the online help menus. Use your PAGE UP and PAGE DOWN to roll between the pages of help text. Pressing ESC will exit the help text. The mouse is not active here.

OPERATING THE PROGRAM

CFORM consists of several program tasks in one. Here are the tasks and their options for operation.

I. **FORMAT**

This option allows you to format your hard disk. It asks for some hard disk parameters which you must enter before it will format. Please refer to the included HARDSPEC files for manufacturer information on your hard drive; most are included. If in doubt, call the manufacturer and ask for the drive parameters. In addition to the drive number (1 or 2), here are the format parameters you need to know:

A) Cylinders on the drive. This is the number of concentric tracks on the disk. The number is usually from 306 to 2048, common numbers are: 306, 615, 1024, 1170, 2048. Again, refer to your drive make and model.

B) Heads on the drive. This can be from 1 to 16. Most drives have less than 8 heads, unless it is a high capacity drive.

C) Write Pre-compensation. This is a cylinder on the drive which is the start of write pre-compensation. Write pre-compensation is a shifting of the flux transition early or late of the normal clocked flux transition. It is meant to improve performance on lower-Oersted drives. Many 5 1/4" hard drives require it, for example, Seagate's ST-225 requires it at cylinder 424. CFORM rounds this number to the nearest multiple of 64.

D) Reduced Write Current. This is a cylinder on the drive which is the beginning of reduced write current. It is a decrease in current to the write head, producing less of a magnetic moment on the media. It is meant for lower-Oersted drives and high-track density drives. This value usually follows Write Pre-compensation, although this is not the rule. CFORM rounds this number to the nearest multiple of 16.

E) Step Rate. The step rate of zero is sufficient for most drives on the market since 1985. Older full height drives may have slow stepper motors. The rates are:

	VALUE	RATE	
(buffered)	0	21.80 us	microseconds
	1	0.05 ms	milliseconds
	2	0.10 ms	" "
	3	0.20 ms	" "
	4	0.40 ms	" "
	5	0.80 ms	" "
	6	1.60 ms	" "
	7	3.20 ms	" "

As you can see from the table, a step rate of 7 is slower than a 3 1/2" floppy rate. This is to accommodate older drives. Most drives nowadays have a buffered step circuit, and can operate with a value of zero (I have not come across any other drives!)

F) Number of sectors per track. This is a value from 32 to 34. The TI 99/4A and Myarc 9640 can both read and write hard disks with sector sizes of 32, 33 and 34. 34 is a value equivalent to the intention of the hard drive manufacturer ("17" sector per track in IBM PC format is the same as 34 sector per track TI format.) 34 and 33 use the same amount of space as 32, but 34 and 33 use unused "gap" areas on the disk for storage. There is still plenty of "gap" left over on a 34 sector per track format to accommodate nearly a 35th sector, but that would be pushing the limits! 33 and 34 have been tested, and the system I am running on now is 34 sectors per track. There is a small increase in speed of file processing because of less seek time involved. Any hard disk you format with CFORM with 33 or 34 sectors per track will be compatible with your TI 99/4A; the version H11 EPROM recognizes the new sector sizes.

G) Sector Interlace: This is an ordering of the sectors on the disk so that they are spaced such that each access to the disk will almost certainly read the next LOGICAL sector. Interlace is really dependent on your system software's speed. Current MDOS 1.50H recommendations are interleave 7. TI 99/4A should use interleave 22. Note that you will see an immediate result to your interlace value during the verification process. It will be slower to verify with a more radical interleave, and slower with a more conservative interleave. Try something close to moderate. Some applications can even use interleave 2 or 3, MDOS only applications which do file processing directly to CPU RAM, such as GENPROG, can take advantage of interleave 2 or 3. You can use the terminology interleave=interlace, as I have done here. They mean the same thing. Examples of interleave settings: interleave 1= all sectors on the disk starting at the index mark are consecutive. Interleave 2 = first sector is sector 1, then to get to sector 2, this disk must rotate and skip a sector, then sector 2, then skip, then sector 3, etc. For an interleave N: index..sector 1..(skip N-1 sectors)..sector 2...(skip N-1 sectors)...sector 3...etc. A high interleave may require many revolutions to the disk before the whole track of data can be read. A low interleave will not. With interleave 1, you can read the whole track in one revolution. There is no software yet to take advantage of interleave 1. Don't use interleave 1 unless you want a super slow disk system.

H) The computer will reserve a certain number of sectors for you automatically at the start of the disk for file headers and directory headers. This number depends on how big your disk is. Generally the larger the hard disk, the greater this number since you will use more files. Different from MDM5, this program does not ask you for this value, but assigns it according to the author's own experience with hard disk file processing and data management. It is generally a multiple of 128, the number of cylinders times the number of heads.

I) The final parameter is the name of the disk, it's label. You can change this after formatting with MDOS LABEL command. Enter up to 10 alphanumeric characters.

When you are ready to format, press ENTER on the main menu bar with the word FORMAT highlighted. A dialogue box will appear, prompting you for each of the above options. Use the TAB key to move between the fields, ENTER on the last option will close the dialogue box, ESC will abort it.

If you press ENTER on the last option, a dialogue box with a single option is displayed. This is the format code. Enter the word FORMAT to proceed with the disk format. Pressing just ENTER without typing anything will abort (the word "abort" is displayed for you!) or ANY input other than FORMAT will abort. Pressing ESC will also abort the format.

If you choose to FORMAT the disk, that dialogue box will disappear, and your disk will begin to format. The disk is formatted a head at a time, the program sweeps a cylinder BEFORE changing heads. Even heads go in the forward direction, odd heads in reverse.

After the format mode is finished, the program enters verify mode. The disk is verified according to the way you have set up the verify. TURBO verify does NOT update the bitmap if it finds bad sectors: This verify method is simply used to quickly do a non-destructive test of readability of the sectors on the disk. FASTCOMP verify will read the entire disk, but will only display the current cylinder and it will use dots to indicate which head it is on. SLOWCOMP verify will read the entire disk, but will display all head, cylinder and sector information, and any error codes it gets.

No key aborts the format: It continues to completion. In emergency, CTRL-C will halt the program. This is not recommended but it will do no damage to your file system.

If the verify detects errors in Head 0, Cylinder 0 (any sector) it will abort the format immediately.

Sector errors, date and time of format, and other information is printed in the format report. You can print this out directly from the program, or direct it to a disk file. FASTCOMP and SLOWCOMP will show the actual sector which caused an error, TURBO will show the cylinder in this report. Details on the type of error are also printed.

When the format and verify modes are complete, the next step is the actual write of volume information block (VIB) to the disk. This includes your format parameters, the date and time of format, and a bad sector bitmap if you choose FASTCOMP or SLOWCOMP.
This concludes the FORMAT documentation

II. VERIFY

VERIFY is a way to test an already-formatted disk. Verify will not write any data to the disk, it is read-only. You have three choices: TURBO, FASTCOMP, and SLOWCOMP.

VERIFY/Turbo will do a hardware consecutive logical sector read for (SECTRK) sectors. (SECTRK) is the number of sectors per track on your disk. Since this is a hardware operation of your HFDC (SMC9234) it is fast and it reliably detects CRC errors and unrecoverable ECC errors, as well as gross data errors on the disk. It is especially helpful when you are concerned about "soft" head crash: When the system is writing data and you suffer a power loss. This can result in an entire track going bad. VERIFY/Turbo displays minimal information on the screen, the current cylinder is the only active variable.

VERIFY/Fastcomp will do a hardware single logical sector read for a single sector, (SECTRK) times. It displays the current cylinder and it displays a dot for the current head. Because it does not do a lot of screen writing, it is a fast alternative to slowcomp.

VERIFY/Slowcomp is identical to fastcomp except it will display the actual cylinder, head and sector, and possibly an error code if encountered.

You may obtain a report to your printer or to a disk file by setting up the program (in SETUP/Hardware/report devicename) and enabling it (in SETUP/Hardware/report enabled) to get a detail of your disk's parameters and any errors it encounters. TURBO will not display individual sectors, but FASTCOMP and SLOWCOMP will. This file is a Display Variable 132, and can be read by MYWORD, PI Writer, Peter Muys DOS Editor, etc. Or it can be TYPEd to a printer such as TYPE REPORT >PRN Any legal MDOS device/filename can be used for the report.

The verify procedure will abort if it encounters errors in the first head, first cylinder.

Note that if the verify procedure could not fetch disk parameters from your disk's sector zero, it will ask you for them in a screen similar to the FORMAT parameter dialogue box. This can be caused by a disk that was formatted properly, but it's sector zero Volume Information Block (VIB) was wiped out somehow. Also, it can be caused by an unformatted disk. If this is so, and you choose verify parameters, the verify procedure will normally abort because it will encounter read errors in the first cylinder. Press ESC on this dialogue box to abort the verify.

III. SETUP

Colors.

You can change the screen's object colors to suit your taste. Note that the main menu bar, the submenus, and the highlight red field cannot be changed. You can change the border, the dialogue box colors, the text colors, etc. Use the arrow keys to move through the color values. They only take place AFTER the dialogue box is closed.

System.

You need to tell CFORM specific information about your system.

A) CRU Base of HFDC. This is a value from >1000 to >1FC0, and it is the address of your HFDC which you set when you installed it. Most Dual-controller setups have the HFDC at >1000. Single controller setups have the HFDC at >1100. The up and down arrow keys scroll through the values, no other keys except TAB and ENTER will work.

B) Mouse Active. This will cause the mouse's sprite arrow to vanish after program load. If you don't have a mouse and don't want to see the arrow, choose DISABLED. If you use the mouse, choose ENABLED.

C) Format Verify method. After a format, this method is used to verify. Note: TURBO will NOT update the sector bitmap if bad sectors are found. It should only be used to see if a certain interleave setting is good, or just to test if the drive is functional. Choose FASTCOMP if you don't care to view the head/sector progress, choose SLOWCOMP if you want to see all information displayed.

D) Printer Name. Choose any legal MDOS file or device name for this entry. It is the name of the report file you wish to print. Examples: A:\REPORT, PIO.CR, PRN, RS232.BA=2400, etc. If you choose just RS232, the baud rate will be taken from the MODE setting you have setup in MDOS (if at all). A non-existent device will cause an error and it will DISABLE the report (see option E)

E) Enable printout of report. This will enable the printout to occur. Note that if an error occurred during a prior format or verify, this value is set to DISABLED. Use the up and down arrow keys to enter a value here.

F) Setup String for printer. This is a hex string of values to send to your printer. It is intended to set your printer up for 132 column mode, but you can use it for other purposes. Enter Hex data separated by spaces, example 1B 4A 3F 1B 4B etc. Any other data will cause nulls to be sent to the printer instead.

Pressing ENTER on the last field will close the dialogue box with your selected values active.

After setting up, a new window opens and prompts you if you wish to save these defaults for next time. Pressing capital Y will save them, press capital N to not save them.

IV. INFO (INFORMATION / HELP)

Information is available about the program, it's menus, etc. at the touch of a key.

A) About. This displays the name of the program, it's author, and your name and serial number. Press any key after this is displayed, and you will return back to the info sub-menu.

B) Menus. This opens a disk file with help information. You can page through the help files with PAGE UP and PAGE DOWN. You cannot go past the last page in the file. ESC exits. The INFO/Menus option will display useful information on keys, menus, and general program operations.

C) Hardware. This is information (similar to INFO/Menus) which is more geared toward technical hardware information. This is an online source for how your hardware is supposed to be setup, possible hardware problems, and how to resolve them.

D) Catalog. This gives a disk catalog of any MDOS device name or subdirectory. You can also use the TI compatible device names. If you omit a period on TI device names, one will be appended for you. If you omit the colon on MDOS device names, one will be appended for you.

E) Volume. This is a quick look at a hard disk volume information block (VIB). Enter the number of the hard disk (1 or 2) and you will get a display of the drive's parameters. This is useful if you plan to reformat a hard disk, and you would like to see what it currently is set at, without going through the process of looking up the information.

V. EXIT

Pressing ENTER when this is highlighted will exit the program. All open files will be closed.

Note that you can exit the program by pressing ESC when you are at the main menu bar.

CTRL-C will also exit the program. This is not recommended, but it will properly close any open files. It will not restore the screen to the state in existence before program start. It may also terminate the batch file (if any) that loaded CFORM. CTRL-C can be pressed any time, however, it will not be accepted during the disk catalog input prompt.

V. **EXIT** continued

If a catastrophic lockup occurs, for example, you have a gross hardware error with a hard disk, and you wish to cancel, you can use CTRL-C safely.

This does not reset the hard disk drive, and it's light may remain on. If this is the case, just do a catalog (MDOS DIR) of any device on the HFDC card and the drive light will go out.

Or, press CTRL-ALT-DELETE to restart MDOS.

VI. **HARD DISK DOCUMENTATION**

Please read the files in the HARDSPEC directory on your program disk. They contain valuable information on hard drives of many different manufacturers. These are text files and can be printed out on a printer. Suggestion: Use a program like Directory Manager by Clint Pulley to view the text files, then use <Print Screen> key to print out the relevant information on your hard drives to the printer.

NOTES ON YOUR DRIVES