

## Return to MDOS

Option seven exits HyperCopy and returns you to the MDOS prompt. Use this to exit the program.

## Tips

When using the Copy Disk to Disk and Copy Disk to Disk(s) options on HyperCopy, the program attempts to load as much of the disk into memory as possible during each read. Copying will proceed faster if there is more available memory, as HyperCopy will not have to switch between input and output drives as often.

To maximize the amount of available memory from MDOS you should disable GPL mode (by not putting a TIMODE command in your AUTOEXEC file), disable the internal RAM Disk, and minimize the size of your print spooler. An easy way to accomplish this, is to keep a disk with MDOS on it and no AUTOEXEC file. Boot your 9640 using this disk when you plan to use HyperCopy so that as much memory as possible will be available.

Thanks to...

Jeff Guide for his great financial support of this endeavor, Jerry Coffey for testing this on his many system configurations, Scott Darling for testing it and lending the author his disk controller card, Peter Hoddie for testing and user interface design; and John Johnson and Al Beard for testing. Finally, great thanks must be given to Paul Charlton for his IMMENSE technical help towards this project. Without his help, this program would not have been possible.

**Genial Computerware**  
**P.O. Box 183**  
**Grafton, MA 01519**

# *HyperCopy*

©1988 Mike Dodd

Distributed by Genial Computerware

## Table of Contents

The Theory of HyperCopy .....	3
Physical versus Logical Disk Drives .....	3
Interlace and Skew .....	4
Loading the Program .....	6
The Main Menu .....	7
Copy Disk to Disk .....	7
Copy Disk to Disk(s) .....	8
Format Disk .....	9
Read Interlace and Skew .....	10
Catalog Disk .....	10
Configure Defaults .....	10
Return to MDOS .....	12
Tips .....	12

## HyperCopy

Program ©1988 by Mike Dodd  
Documentation ©1988 by J. Peter Hoddie  
All Rights Reserved

HyperCopy is a disk copy program designed to deliver optimal performance and convenience for the 9640 owner.

To make use of HyperCopy you must be using MDOS version 1.06 or later. If you are using an earlier version of MDOS contact your MYARC dealer to obtain the latest version.

### The Theory of HyperCopy

HyperCopy has been designed to provide the best possible performance for all types of disk access. In order to take complete advantage of this power there are two ideas with which you should be familiar. These are the distinction between physical and logical disk drives, and the ideas of track and skew on a physical disk. These ideas are explained in the following sections.

### Physical versus Logical Disk Drives

HyperCopy makes a distinction between two different kinds of disk drives. These are "physical" and "logical" disk drives. The difference is quite easy to understand.

A "physical" drive is an actual disk drive, such as the one in the drive slot in your classic "TI Peripheral Expansion Box." A "physical" drive is attached to your disk controller. Another way of looking at it is that a physical disk drive is one into which you physically put floppy disks.

A "logical" drive is anything that acts like a disk drive, but is not a "physical drive." The most common example of a "logical" drive is a RAM disk such as the internal one on the 9640, or the Horizon card. Another logical drive is the "emulate" file available on the MYARC HFDC.

You may treat a physical drive as a logical drive by entering its MDOS name (such as A: for DSK1.). This approach is not

recommended as you then lose all the speed advantages of HyperCopy.

HyperCopy reads and writes to physical drives by communicating directly with the disk controller in your system. This allows it to read and write data much faster than normally possible. When accessing logical drives, HyperCopy reads and writes by communicating through MDOS. For devices like a RAM disk this allows great speed. However, for a floppy disk the speed of communicating through MDOS is much slower, thus the advantage of using physical drive access.

Whenever HyperCopy prompts for a drive number to Format, Copy From, or Copy To, you can enter either a physical or logical drive. HyperCopy uses a very simple method for determining whether you want to access a physical or logical drive. If you enter a number, such as "1" or "3", HyperCopy assumes you wish to use physical drive access. If you enter a letter, such as "A" or "E", HyperCopy assumes you wish to use logical drive access.

As an example, say every time you start up your 9640 you want to copy an entire floppy disk of files to your RAM disk. Using HyperCopy, you would use the Copy Disk to Disk option (explained further below). If your RAM disk was assigned to drive "E" and you have the disk you wish to copy in drive 2, you would enter "2" for "Copy from" disk and a "E" for "Copy to" disk. Using HyperCopy to load your RAM disk will almost always be faster than using MDOS to copy the files, even if you include the time it takes to load HyperCopy.

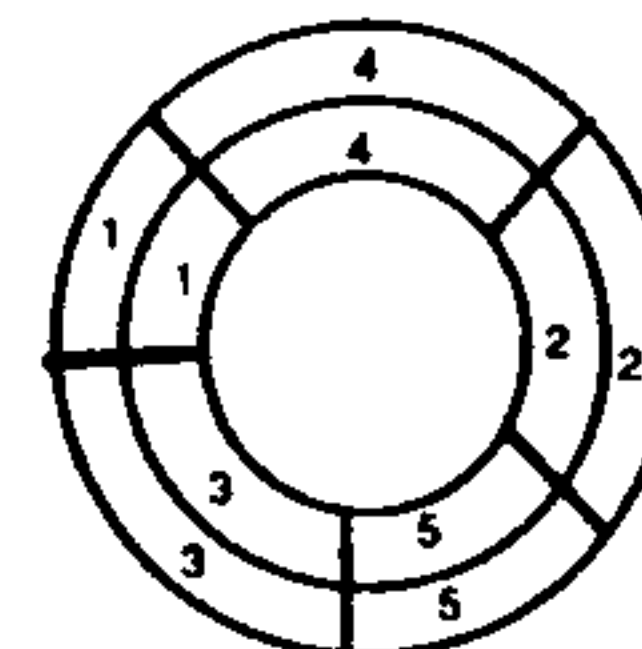
### Interlace and Skew

Interlace and Skew are two terms which describe how a physical floppy disk is formatted. By adjusting these two parameters when formatting or copying a disk with HyperCopy it is possible to drastically increase the speed of ordinary disk accesses.

To understand what Interlace and skew are, it is necessary to understand how data is stored on a floppy disk. As you probably already know, a disk is divided into "sectors" which hold 256 bytes each. The disk itself is arranged into concentric circles, called tracks. On a Single Density disk, each track contains 9 sectors. Most disk drives have 40 tracks. Some quick math reveals that a

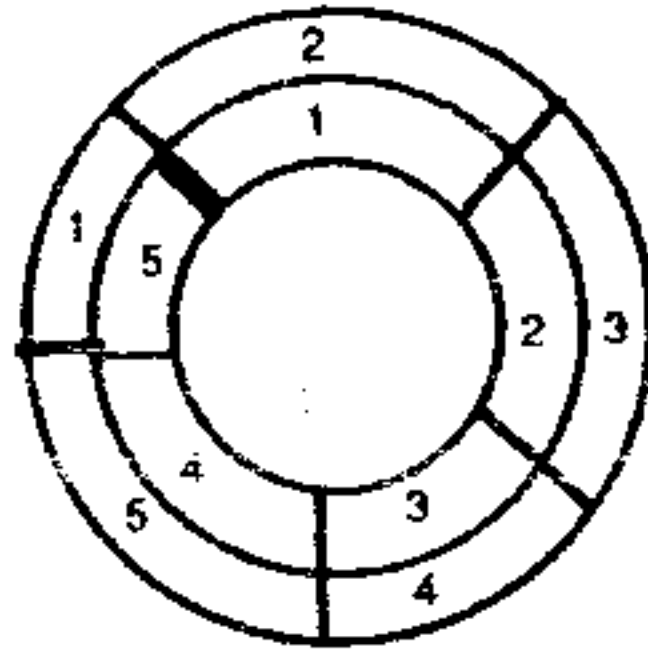
Single Sided Single Density disk must have 360 sectors (40 tracks times 9 sectors per track) which in fact it does. Double density disks contain twice as many sectors per track, 18 instead of 9.

Within each track, the sectors can be arranged in many different ways. The most obvious way is in order, so if the disk had 5 sectors per track (used only for these examples), the sectors would appear in the order 1,2,3,4,5. This is referred to as an interlace of 1. Unfortunately your 9640 is not usually able to move data around fast enough to read the sectors this quickly. What happens is that it will read the first sector from the track, and then move that sector around in memory. While doing this the second sector has already gone past. The computer must now wait for the disk to complete a complete revolution before reading the next sector. The solution to this is to put the sectors out of order on the disk. An interlace of 2 means that the sectors are separated by an out of sequence sector. This means that by the time the computer is ready for the next sector it will be in place, rather than being skipped over. For an interlace of 2 in our example, the sectors would appear in the order 1, 4,2,5,3. This is illustrated below.



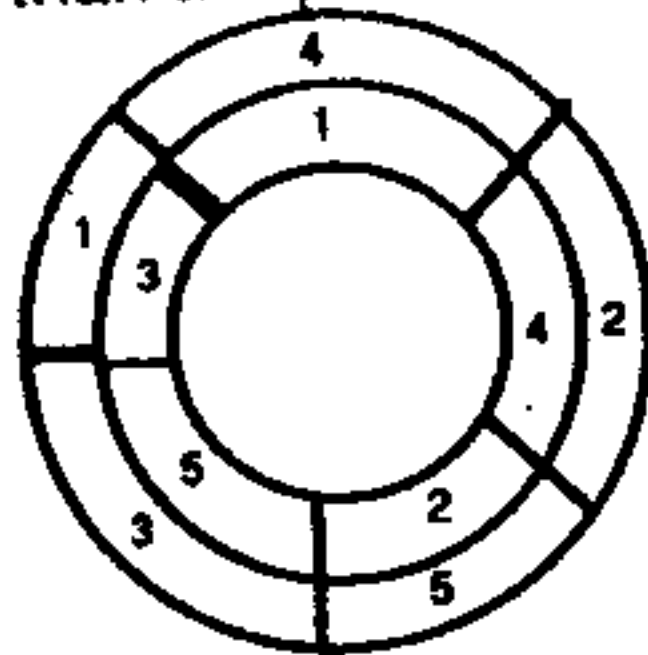
Interlace 2, Skew 0

As you can see, each track (only 2 in these examples), starts at the same point in the disk (indicated by the dark line). The skew parameter lets you adjust the start of each track. This allows you to compensate for the time it takes the disk head to step from one track to the next. If a skew of zero is used (as above) it is possible that by the time the head has moved to the desired track, that the start of track signal will have passed and the disk will have to spin another extra revolution before reading or writing can begin. Below is an example of a disk formatted with a skew of 1, which means that each track starts one sector later than the previous one.,



Interlace 1, Skew 1

Finally, below is an example combining the above two examples. It has an interlace of 2 and a skew of 1. Note that within each track the sectors are numbered in the same order, but that each track begins one sector later than the previous one.



Interlace 2, Skew 1

Most disk controller software have default values for interlace and skew that you cannot change. These disk controllers can all read any combination of interlace and skew that is put into their drives, however. The optimal values to use for interlace and skew vary from system to system depending on the disk controller and the speed of your drives. HyperCopy has defaults which are generally good for most systems. However to achieve the best performance you will have to experiment with your own system. Once you have determined these values, you may set them as the default values for formatting with HyperCopy by using the Configure option described below.

### Loading the Program

To use HyperCopy start up MDOS as usual. When you see the

A> prompt, insert your HyperCopy disk into drive one, and type the name of the program. There is a separate version of HyperCopy for each major disk controller currently in use. The filenames are as follows:

TI Controller	HC-TI
CorComp	HC-CC
MYARC	HC-MY

Once loaded the program will automatically start. You are presented with a title screen. Press any key to proceed to the main menu of HyperCopy.

### The Main Menu

There are seven options on HyperCopy's main menu. These are described in order below. The main menu screen is pictured below. While reading the discussions of each option it is important to keep in mind the distinction between logical and physical disk drives, and the ideas of interlace and skew.

1. Copy disk to disk
2. Copy disk to disk(s)
3. Format disk
4. Read interlace and skew
5. Catalog disk
6. Configure defaults
7. Return to MDOS

### Copy Disk to Disk

This option is the easiest way to make a single copy of a disk. First you are prompted for an "Input drive." HyperCopy then reads that disk to determine its name, number of sides, density, number of tracks (40 or 80), interlace and skew. If you enter a logical drive name, interlace and skew cannot be determined so this information is not shown. This information is all filled in on the screen after it is read. Below is an example of what the screen might look like at this point.



```
Copy disk to disk

Input drive:      1
Name: JUMPBOOT   DSDD/18-80
Input interlace:  3
Input skew:       3

Output drive:     _
```

This screen indicates that the disk name is "JUMPBOOT", that the disk is Double-Sided/Double-Density, that it was formatted with 18 sectors per track, and that it is an 80 track disk.

Next you are prompted for an "Output drive." Enter the drive number to output to. If you entered a physical drive for output, you are asked for the "Output interlace" and "Output skew." Default values for these are provided. The defaults are taken from the values saved with the "Configure defaults" option, described below. To use the defaults, just hit Enter twice. If you are select a logical drive for output, the interlace and skew options are not available.

Finally you are prompted "Press F6, F8 or <ESC> to abort." Pressing F6 will begin the copy. Pressing F8 will allow you to re-enter the information on this screen. Pressing Escape returns to the main HyperCopy menu. This prompt is used throughout the program, and its behavior is always the same unless noted otherwise on screen.

After the copy is complete, you will be returned to the main menu. If an error occurs you will be notified on the screen.

### Copy Disk to Disk(s)

The Copy Disk to Disk option is useful if you need to make multiple copies of a single disk. This option will load as much of the disk into memory as possible. In many cases (particularly SS/SD disks) the entire disk can be loaded into memory. If the entire disk can be read into memory at once, HyperCopy will immediately load

it into memory after you enter the Input Drive number. If the entire disk cannot be loaded the message

Multi-pass copy required. will be displayed near the bottom of the screen. Multiple reads will be required from the input drive, so you cannot use the input drive as an output drive as is possible with a single pass copy.

When prompted for "Output drives" you can enter up to 10 letters and numbers for drives. This allows you to copy to multiple drives in succession without having to press any more keys. If any of the the drives you enter for output drives are physical drives you will be prompted for an Output Interlace and Output Skew, as in the Copy Disk to Disk section.

The following screen shows HyperCopy ready to make a copy of the disk in drive 1 to drives 2 and 3.

```
Copy disk to disk(s)

Input drive:      1
Name: TRIAD       DSDD/18-40
Input interlace:  3
Input skew:       5

Output drives:    23
Output interlace: 3
Output skew:      3

Press F6, F8 or <ESC> to abort
```

After setting all the required information, you are prompted to begin. Press F6 to begin, F8 to re-enter the information, or ESC to return to the main menu. After copying is complete you will be returned to this prompt so that you can make more copies using the same data.

### Format Disk

HyperCopy's Format Disk command is a very fast way to format a disk, and it gives you the added ability to set the interlace and

skew on your blank disks. Formatting a disk is very straight forward. You are prompted for a drive. Either a logical or a physical drive may be entered here. After you enter the drive, HyperCopy attempts to read the disk to see if it is currently formatted. If it is, the "Disk name" is filled in. Otherwise a blank Disk name appears. After entering the disk name, enter the number of tracks. This is usually 40, unless you are running an 80 track disk controller. Next you are prompted for sides: enter S for single, or D for double sided. For the density prompt enter S for single and D for double density. If you selected double density you are prompted for Sectors per track. Generally this is 18, although sometimes you may use 16. If you are formatting a physical drive you are prompted for interlace and skew. Once this data is complete, press F6 to begin formatting. When the format is complete, you can press F6 again to format another disk with the same data. Press F8 to re-enter the data, or ESC to return to the main HyperCopy menu.

### Read Interlace and Skew

Because there is no other program currently available which allows you to easily determine the interlace and skew of disk, this option has been made available. It only works on physical drives. Simply enter the drive number at the prompt. HyperCopy will check the disk and report the disk format, interlace, skew, and disk name just like in the Copy Disk commands.

This command provides no information that isn't available from the Copy Disk commands, however it is more convenient to use when you merely want to check the characteristics of a particular disk.

### Catalog Disk

For your convenience a disk catalog feature is provided. You are prompted for a device name. Any valid MDOS device name may be entered. The catalog will scroll up in the window. Press any key to pause the catalog, and any other key to continue.

### Configure Defaults

HyperCopy lets you set certain configuration parameters about your system. This information falls into three categories described below. The following is what the configuration screen looks like.

Configure Defaults				
	1	2	3	4
Sides:	D	D	D	D
Density:	D	D	D	D
		9	16	18
Interlace:	2	3	3	
Skew:	1	0	3	
Verify (Y/N):	N			
Press <ESC> to exit, F6 to save				

You move the cursor by pressing Enter or using the arrow keys.

For sides and density, enter the information for each of your physical disk drives. D stands for double, and S for single.

The default values for Interlace and Skew may be entered here. 9 is the interlace and skew for single density disks, 18 is for most double density, and 16 is for "MYARC" double density.

When HyperCopy makes a copy of a disk or formats a disk, it can verify that the operation was successfully completed by reading back the information it just wrote. This takes a considerable amount of time, and is usually not necessary. If you set Verify to Y(es), HyperCopy will verify all disk copies. Selecting verify will increase copy time considerably.

To save these defaults into your copy of HyperCopy, press F6 and you will be prompted for the filename you wish to save these defaults to. This should be the filename that you typed to load HyperCopy, such as HC-TI for the TI version. By saving the defaults in this manner, your settings will automatically be available every time you use HyperCopy.