*Micro*Drive IDE Card

Low Cost Hard Disk Controller and Filecard
for MS-DOS Type IDE Hard drives

For Apple IIe and Apple IIGS Computers

User's Manual

MICDR US 1/2000

Limited Warranty

SHH Systeme warrants this product against defects in materials and workmanship for a period of one year. This warranty applies only for you, the original purchaser. This warranty applies only if the product was used under normal conditions.

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Help and support:

We will do our best to help you and we want you to be a satisfied customer. We want to hear from you. Please report any problems to us. We appreciate your comments and questions.

We will continue supporting the *Micro*Drive Card as long as the Apple II is alive and we can find a way to reach the Apple II community. Feel free to send e-mail for getting support for your purchase.

Apple II forever!

*Micro*Drive Card User's Manual

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About the *Micro*Drive Card

Congratulations! You have purchased the probably most inexpensive hard disk controller for the Apple II family!

*Micro*Drive is a very inexpensive solution to let all Apple II users take advantage of the simple and inexpensive interface design of IDE hard drives. Any known IDE hard disk controller for the Apple II family only supports a limited number of hard drives, whereas the *Micro*Drive supports virtually any drive available!

Features:

- ☐ Fully ProDOS and GS/OS compatible. Use all your Apple II applications with your *Micro*Drive Card.
- ☐ Compatible with Apple IIGS and Apple IIe enhanced.
- ☐ Compatible with all known hardware used today with Apple II computers.
- ☐ *Micro*Drive is a non-DMA device, so it cannot have DMA problems with certain memory cards.
- ☐ Compatible with the full range of Apple memory, up to 8 MB on the Apple IIGS.
- ☐ Fully compatible with all hardware such as: ZIP GSX, Transwarp GS, PC Transporter, RAM Cards from Apple, Applied Engineering, CV-Tech, Harris, Q-Labs, Sequential Systems etc.
- ☐ GS/OS driver with GS/OS caching support included.
- ☐ Can boot a minimum GS/OS System in twelve seconds, with accelerator in nine seconds.
- ☐ Low power design (all CMOS circuits) assures reliable operation.
- ☐ Wastes no time for self-initialization compared to standard SCSI interfaces! Gives a very short warm-up time.
- ☐ Allows to boot any partition.
- ☐ Up to 8 partitions on one drive, 16 partitions at a time on two drives.
- ☐ Universal controller replacement for the Vulcan & Vulcan Gold Controller Card, even for InnerDrive systems.
- ☐ The only IDE hard disk controller (except Turbo IDE Card) for the Apple II that supports two hard disks.
- ☐ The only IDE hard disk controller for the Apple II that allows to use virtually any IDE hard drive. Other controllers only support a very limited number of drives.

*Micro*Drive Card Design:

Hardware, firmware, installation software and GS/OS device driver

Getting Started with the *Micro*Drive Card

What you should have received:

- ☐ The *Micro*Drive Manual you're just reading.
- ☐ The green *Micro*Drive interface card with golden fingers.
- ☐ The *Micro*Drive utilities disk which is a standard Apple 800K disk.

In addition, depending on your order, you may have received:

- ☐ A mounting kit for putting the *Micro*Drive Card and a 2.5" notebook hard drive together. This kit also includes a short flat ribbon cable to connect your mounted 2.5" drive with your *Micro*Drive Card.
- ☐ A flat ribbon cable (3 ft.) for connecting an external 3.5" IDE hard disk..

What you should do first before doing anything else:

- ☐ Make a copy of the *Micro*Drive utilities disk and keep the original disk in a safe place!
- ☐ Delete the file PRODOS which can be found on this non-modified copy of the utilities disk.
- ☐ Use the Finder or an other GS/OS utility to copy ProDOS 8 (=P8, the 8-bit disk operating system found in the /SYSTEM folder on every bootable GS/OS System Disk) and the INSTALLER (located on the /INSTALL disk of GS/OS System 6) on your copy of the *Micro*Drive utilities disk.
- ☐ Rename the file P8 on your utilities disk to PRODOS (to make the disk bootable). Note: the disk is bootable "as is" (even if you don't copy ProDOS 8 to the disk), but you can only launch the installation program in this way.
- ☐ If you want to be perfect, you can do a printout of the README files that perhaps could be found on the disk (containing late news and additional program descriptions which could not be included with this document).
- ☐ Please be sure to read the whole manual carefully. Many hints can be found all over in this document, and there is no way to include all information on a single sheet of paper.

*Micro*Drive DIP Switch Setting

Read this manual carefully before attempting to install your *Micro*Drive Card. Please be very careful when working with your computer and the *Micro*Drive Card. Do not touch the gold fingers and do not bend the gold pins of the header connectors. Note that we cannot be responsible for malfunctions due to careless handling on any kind of connectors.

There are different kinds of DIP switches, depending on the manufacturer. Some DIP switches are marked **on/off**, others **open/closed**. Here is the "official" translation table:

open has the same meaning as **off**
closed has the same meaning as **on**

□ **DIP switches 1, 2 and 3** determine the slot number for the *Micro*Drive Card (representing the inverse bits 0, 1, 2 of the slot number) The *Micro*Drive Card must be located in the slot that you choose by the DIP switch setting. Your system will crash during boot time if the setting is not correct! If you ever want to use a different slot, never forget to adjust the DIP switch setting accordingly.

	DIP switch			
Slot	1	2	3	
n/a	on	on	on	(card disabled)
1	off	on	on	
2	on	off	on	
3				slot 3 not allowed!
4	on	on	off	
5	off	on	off	
6	on	off	off	
7	off	off	off	

□ **DIP switch 4** : No configuration required if present. Some cards only have three DIP switches.

On the Apple IIGS, be sure to set the *Micro*Drive slot to "Your Card" in the Control Panel.

Once again, please keep in mind: If you ever want to use a different slot, never forget to adjust the DIP switch setting accordingly.

Installing Your *Micro*Drive Card

□ Set the DIP switches and jumpers correctly as described before.

□ If you have an external hard disk, connect the hard drive cable to the *Micro*Drive Card. Do not bend the connector pins!! Be very careful especially when removing the cable from a connector!

□ Turn off the Apple's power switch. Never insert or remove a card while your computer is turned on. You should, however, leave it plugged in to allow the power supply to absorb any static electricity from your body. Also, be sure that any other power supply involved (e.g. the hard drive's) is turned off!

□ Remove the cover from your Apple.

□ Touch the power supply case in the Apple to discharge any static electricity from your body. Make sure you do this because static can cause a great deal of damage to the computer chips on interface cards and in your computer.

□ Select the slot into which you are going to install the *Micro*Drive Card. Align the card edge with the slot and use the heel of one hand to slowly push the card down into the slot.

Setting up the Hard Disk

(for external hard drive usage)

Important Note: Configuring a hard drive requires a user's manual. If you don't have purchased your hard disk with the *Micro*Drive Card, we cannot be responsible for the lack of a manual for your hard disk. If you have purchased a hard disk without manual and you don't know how to set it up correctly, please don't expect that we can help you! We won't. There may be a ten thousands of hard drives and you really can be sure that we don't know anything about your specific drive.

Don't buy a hard disk drive shipped without manual!!

You can use two IDE style hard drives with your *Micro*Drive Card. Both drives must be connected in the same way with only one cable which has two plugs on the hard drive's cable end. The total cable length should be no more than about 3 ft.

☐ If something doesn't work as expected: first try to find out whether your hard drive works on a MS-DOS machine.

☐ Power supply for the hard disk drives

External hard drives attached to the *Micro*Drive Card must be supplied by an external power supply. You must not supply those drives via the card's power connector. The *Micro*Drive Card was intentionally designed to not supplying power for the disk drives. Due to excessive current flow, the data integrity and proper functioning of the *Micro*Drive Card would suffer if power would be drawn via the slot connector. This is a matter of precaution, nevertheless you can use your Apple's power supply (using the lines coming out of the case directly) to supply one single hard disk. The Apple's power supply is not powerful enough to supply two hard drives!

If you are using an external power supply, be sure to use the same wall outlet as your Apple computer does (to avoid ground loop problems).

Preparing Your Hard drive

In this section, you will find a description how to install a hard disk "from scratch", i.e. if you have a new or used hard disk that isn't yet known to your Apple II system. If you have received the *Micro*Drive Card complete with hard disk, you will only have to install your System software on your hard disk. *Micro*Drive hard drive systems always come fully prepared for work, i.e. the hard disk is partitioned and every partition is pre-formatted. Here is how to start "from scratch":

☐ Make a copy of the *Micro*Drive Card Utilities disk as described in the introduction of this manual. Use this copy now (we call it installation disk).

☐ Copy the GS/OS driver from the installation disk to your GS/OS boot volume (disk or hard disk or what else). Use any copy program to copy the driver to the **/your.disk/SYSTEM/**DRIVE**RS** folder (**your.disk** is the name of your GS/OS boot disk, for example /INSTALL if the System 6 installer disk will be used) The driver is not required now, but later it will speed up the installation process of GS/OS on the IDE drive (everything works fine even without a GS/OS driver, but somewhat slower).

□ Boot the installation disk to run the configuration program MICRO.INSTALLER. Do not use a GS/OS program launcher.

□ After you have launched the program, the screen gets blanked. If your hard disk is "virgin", you will notice a short time of hard disk activity while the screen says "one moment please....". At this time, the installation program scans your hard disk to find the operating parameters (number of cylinders, number of heads and number of sectors per track)

□ After this primary and automatic setup process, you will find the parameters of your hard disk displayed on the top of the screen, right below the screen title. The only work that is left for you is to setup the number of partitions and their sizes. Press the <E> key to enter the partition editor. Now you can press <A> to add a partition or <D> to delete the current partition highlighted. Note that you cannot add a new partition as long as the last partition created is still zero blocks large. If the number of blocks is greater than zero, the partition is considered as valid, and a new one can be added. Use the left and right arrow keys with or without the Open-Apple and Closed-Apple Keys to adjust the sizes of the partitions. The up and down keys let you choose the partition to be modified. While you are setting up the partition sizes, you will find the total free number of blocks for your hard disk being growing or shrinking. You can add as many blocks as you like until the total free number of blocks is zero. You can hear a small beep if something is out of range. When you have finished creating your partition set, press <ENTER> or <ESC> to leave the partition editor. The light bar goes back to the menu list.

□ Now it's time to save the information you just created. Use menu item <Write Configuration> to write your partition map and operating parameters to hard disk. The program should report success.

□ Leave the Installer program by pressing ESC or using the menu item <QUIT> and confirm quitting. This is the only way you should shutdown this program.

□ Reboot your Apple (this is required before the IDE drive(s) can be recognized by your card). At this time, trying to boot from the *Micro*Drive Card ends in the message "Volume not formatted" or "Unable to load ProDOS". This is OK. So you will still have to boot from an other System volume such as a System Disk or an other hard disk.

□ Use any formatting utility to format your partitions. You can use GS/OS and the FINDER, the Advanced Disk Utilities or PROSEL-16 for formatting the your volumes. The default boot volume is volume (partition) number one. Holding down the OA key or the Option key while booting lets you choose an alternate boot volume by pressing the corresponding key for the volume number.

□ After a complete GS/OS system has been installed on the first partition, the *Micro*Drive Card is ready for booting. To install GS/OS correctly you must use the GS/OS Installer, the Finder or another 16-bit program (such as ProSel-16) which is able to copy resource forked files. Please do not forget to copy the GS/OS driver from the installation disk to the */System/Drivers folder on any of your boot volumes (* stands for the name you choose when formatting the volume). Only with the GS/OS driver installed you will get optimum performance out of your *Micro*Drive Card.

□ If you want to use two drives with your *Micro*Drive Card, you must repeat those steps listed before for your second drive. Just boot the *Micro*Drive Installer program and press <ENTER> after highlighting menu item DRIVE CHANGE. After this, continue setting up the partition map and repeat the other steps.

Changing Your Hard Disk Configuration

If you want to change anything, first boot the *Micro*Drive Card installation disk and run the MICRO.INSTALLER
The installer automatically reads the configuration block from your hard disk. Now you can make changes on your partitions or on the boot volume for example.

We recommend making hard disk backups for reason of data security. In the case something went wrong, it is also useful to have written down the complete setup parameters of your configuration.

You may change any item without the risk of loosing data, **except the parameters listed here:**

- The number of cylinders, heads and sectors
- The number of blocks assigned to each volume
- The number of volumes for your hard disk

When you have finished modifying your configuration, save the configuration block by writing it back to your hard disk (menu item Write Configuration).
Every time you want to do that, you will get a warning message to remind you that you may loose your data on the hard disk. The message appears whether or not you made changes to the cylinders, heads and sectors and the volume parameters. As mentioned before, there is no danger for your hard disk data **as long as you have not touched** these parameters.

Modifying Partitions

If you want to change a partition in size, the data on this partition will be lost. In addition, the contents of any partition with a number greater than the one you may want to change will be lost. So be **very** careful when doing changes and

!! make a backup first !!

If you reduce the number of partitions, the data on any partition greater than the new number will be lost.

After changing any partition size it is absolutely necessary to (high-level) format the modified partition and all the partitions with the higher numbers! (use the Finder, the Advanced Disk Utilities or another disk utility).
Do not forget this step, it is required even if you can still read the old contents of this partition! Only after re-formatting the volume directory reflects the actual size of the new partition.

A Different Look at the *Micro*Drive Installer

The MICRO.INSTALLER is a PRODOS 8 system file which is designed to run under any circumstances (i.e. it can be launched under ProDOS 8 or GS/OS without the need of any further accessories. The MICRO.INSTALLER can be launched from any environment without the need of BASIC.SYSTEM. It even can be launched directly by booting the *Micro*Drive installation disk.

The MICRO.INSTALLER also can be run from any program launcher that supports launching SYS files (for example the built-in PRODOS 8 launcher or the GS/OS Finder).

After the program's startup, it tries to read the configuration data from the first hard drive and displays it on the 80-column screen. Now you can change any parameters as you like. The program should be self-explanatory. After you have changed any parameters, please don't forget to save your new configuration using <W>RITE CONFIGURATION TO HARD DISK. However, you have the option leaving the program without saving anything.

New Hard Disk Setup

When there is no valid configuration data found at start-up, the program assumes that a new hard disk was connected and needs to be configured. In this case, the program automatically does all the necessary things to set up a valid configuration including default operating parameters (It is basically the same thing as pressing CTRL-R, re-read configuration parameters from hard disk). The only thing you have to do is to set up one or more partitions by entering the partition editor and to save your configuration data on the hard disk. As the last step, use a formatting utility like the FINDER, the Advanced Disk Utilities or PROSEL-16 to format your partitions.

The MICRO.INSTALLER does not check your second drive (slave) if it is present. If you need a second drive to be configured, choose menu item CHANGE drive and the program will behave just like it has when dealing with the first drive.

The MICRO.INSTALLER saves itself on hard disk

(not yet implemented, please ask for program upgrades)

Once you have run the MICRO.INSTALLER to create a new hard disk configuration, there is no need to launch it again from the installation disk. The program writes itself on your hard disk into a safe area which cannot be accessed from any PRODOS or GS/OS program. At any time when you boot from your hard disk, you can choose launching the utility program first. When you reboot your computer, just hold down the Apple key or the Option Key and press <I> to run the MICRO.INSTALLER.

If you prefer to run the MICRO.INSTALLER from a program launcher, you can keep a copy on your hard disk.

Several additional options for setting up operating parameters can be found in this program. The functions are not implemented yet and won't be of any use for correct hard disk operation. These options will be added in a later revision of the card's software.

Installing the GS/OS Driver

For best performance and versatility it is recommended to install the *Micro*Drive's GS/OS driver on your System volume (the floppy disk or the hard disk partition you boot from). If you don't install the driver, your *Micro*Drive Card won't give you the fastest speed you could expect. However, the card also works fine with no GS/OS driver installed.

To install the GS/OS driver, just use any file copy utility and copy the driver from the utilities disk to your

/my.disk/SYSTEM/DRIVERS/

folder. "my.disk" is the place holder for the name of your boot volume. This can be an Apple system disk, your hard disk, or a RAM disk. If you are planning to use more that one volume as a bootable system volume, please be sure to copy the driver into every SYSTEM/DRIVERS/ folder. The driver's functions are available after the next reboot of a GS/OS system volume. You also can use the INSTALLER to install the driver a bit more conveniently. For this purpose, a copy of the INSTALLER (present on the GS/OS system disk /INSTALL). should be launched from the *Micro*Drive utilities disk.

Please note that a GS/OS driver is never available under ProDOS 8 operation (in fact this is why it is called GS/OS driver). The driver is active only as long as GS/OS is active. If you launch a ProDOS 8 application, the driver "sleeps" until you return to GS/OS operation. This is true for any block device driver under GS/OS, this is not a fault or a special feature of the *Micro*Drive Card driver.

Miscellaneous

□ Using Two Hard Drives

In the world of AT clones (as it is with the IDE drives connected to the *Micro*Drive Card) you can have two drives connected to an IDE interface. drive one is called the MASTER drive, and drive two is also called the SLAVE drive. The master/slave condition is determined by the hard disk's jumper setting. There is no difference in connecting the hard disk to the IDE interface - same cable, same plug.

□ Setting the hard drives' jumpers

In a one-drive configuration your drive should be jumpered as MASTER, and NO SLAVE PRESENT.

In a two-drive configuration: the first drive should be configured as MASTER (with jumper SLAVE PRESENT set). The second drive should be jumpered as SLAVE. In some cases you need to set additional jumpers as HOST SLAVE PRESENT or drive SLAVE PRESENT. Be sure to power up both drives at the same time. Please be sure to get a data sheet for the drives you are using, otherwise you will be lost if you don't know how to jumper your drives.

□ IDE Cable

The IDE cable must not be longer than 3 (three) foot. The IDE standard dictates this restriction. Do not fold the cable to get a "U" (regarding the cross section). Otherwise the signals cannot be transferred properly over the lines. A second drive must not be located more than about 4 (four) inches from the first IDE hard disk connector.

□ Booting from a different volume

Using the *Micro*Drive Card, you can choose any volume for the boot volume. Just hold down the Open Apple Key or the Option Key at boot time. At the bottom of the screen you can see a message which tells you how many volumes you have. Now press any number "1" through "9" and "A" through "G" for the corresponding volumes 1...16. Be aware that you must have a bootable operating system on the desired boot volume. At any time, when no key is pressed, rebooting will use the default boot volume as specified in the utility program.

The default Boot Volume can be stored on both drives with different values. The boot volume parameter only takes effect when coming from drive number one. This is for reason of compatibility in the case you want to exchange the drives (yes, you can do that with no problems) or you once prefer to use only one drive (this could also be your second drive). Be aware that although you can boot from a partition on drive two, the operating parameters from drive one will be used.

□ Software Compatibility

Some programs (especially copy protected games and programs that will not run from the Finder or require their own boot process) are not aware of the Apple IIGS Memory Manager and therefore will not run from hard disk because the *Micro*Drive Card requests memory from the Memory Manager. When the memory is overwritten by those programs, the *Micro*Drive Card software will crash (examples: The Immortal, PHOTONIX). We do not feel responsible for such a situation. Please complain at the people who did not want to write Apple IIGS software that adheres to the standards published by Apple Computer.

If you can find a program that doesn't work with the *Micro*Drive Card and it proves to be OK with Apple's guidelines, you will receive a free update on any software or firmware part of the *Micro*Drive Card that requires updating.

□ Using the Macintosh HFS File System

You may have noticed that the *Micro*Drive Card does not allow partitions greater than 32MB. This is the upper limit for the ProDOS File System. The size is limited by the *Micro*Drive Card software, and this will remain as it is in the future. The only reason to open the 32 MB limit would be using HFS partitions. There are several important reasons which should keep you back from using the HFS File System for regular hard disk usage:

1) The HFS partitions don't give you any other advantages but the larger size.

2) Due to GS/OS design limitations, you never can boot from HFS partitions.

3) If something goes wrong with a misbehaving program, and your HFS partition gets damaged, you don't have any chance to repair the directory structure (there aren't any utilities which can do that). The only choice you have is to re-format the damaged partition, with a complete loss of data.

4) Writing to a HFS partition is very slow, and such, any speed advantage has gone with using a hard disk (writing to a HFS volume is also slow when using diskettes and other storage media).

5) Using a HFS partition at read operations is not faster than using a partition with the ProDOS File System.

As a summary, we cannot recommend using the HFS feature at all. There are even reports that the HFS FST doesn't always work reliably. For the Apple IIGS, it's a nice feature when moving data between different computers, but not much more.

Using Your Vulcan or InnerDrive Hard Drive

This section is intended for Vulcan users and InnerDrive/OverDrive users (including other Applied Ingenuity hard drive products with IDE drives) who want to upgrade their system with the *Micro*Drive Card. If you have any IDE drive other than a Vulcan or InnerDrive you don't need to follow these instructions.

Back Up!

If you are planning to replace the Vulcan Controller Card or the InnerDrive Controller, first make a complete backup of your hard disk data! The partitioning scheme of the *Micro*Drive Card is not compatible with these drives. You will have to begin like just having purchased a new drive.

We cannot give you much recommendation about backup programs, but the cheapest way to make backups is to use the Archiver from GS/OS System 6. When you want to backup your data, you should be sure to make **file-by-file backups**. Only this kind of backup guarantees that you can restore your data on a different hard disk with different volume sizes (this will most likely occur).

Setting Up your hard disk

After you have made the necessary backups and the *Micro*Drive Card is connected to your Vulcan, you can run the program MICRO.INSTALLER on the *Micro*Drive Card Utilities Disk. Just go ahead as it is described in the section "Preparing your hard drive" in this manual. It is possible that you cannot follow these instructions because some old hard drives cannot be setup automatically. If you are getting error messages after the MICRO.INSTALLER has tried to find the hard drive's operating parameters, you must set the parameters yourself by using menu item <MANUAL SETUP>.

You must enter the **native hard disk parameters.**. If you are not sure about what kind of hard disk your Vulcan or InnerDrive has built in, you will need to contact us. Please let us know the hard disk model you are using (manufacturer, model number and capacity) and we will try to find the correct operating parameters. In many cases you can use menu item GET HARD DISK INFO to find the correct parameters.

Troubleshooting

We have tested each card thoroughly before it went to our customers, so your card should work flawlessly. And we have tried to cover every aspect of the installation process here in this manual. Our records show that most problems are related to hard drives which have been configured incorrectly. A few problems occurred because some users didn't follow our hints in the manual. A few problems are remaining due to hidden firmware bugs on several old hard drives (note that the IDE "standard" is not a standard as you might expect, and several early IDE hard drives had serious problems).

We don't claim to be the perfect company, so in rare cases problems may occur which cannot be solved by the customer. Please check out if you have done your installation according to the guidelines found here in this manual. If we receive hardware to be repaired and we find it is OK, we'll have to charge you for checking out that it is OK.

So before you come up and complain that your new hardware doesn't work, please check out once again:

- ☐ Did you read this manual completely? Is there anything you didn't read at the first glance?
- ☐ Does your "third party hardware" (hard disk) work correctly? Check the drive in question in an MS-DOS computer if possible. Please double check the connections from the *Micro*Drive Card to your hard disk.
- ☐ Be sure to try out the manual setup (MICRO:INSTALLER program) if the automatic setup doesn't work or if the setup process gave you any strange impressions.

Describe as detailed as possible !

If your problems cannot be solved in this way and you don't know how to continue, please send us e-mail via GEnie or write via snail mail. Please do not send anything back to us without an RMA number. SHH Systeme will refuse to accept any shipment without RMA number.

Please describe your complete configuration (this is a very important thing, otherwise we cannot fix problems):

- ☐ Your *Micro*Drive Card's firmware revision and revision numbers from software on the utilities disk.
- ☐ Your computer: Apple IIe, Apple IIGS, which ROM # and the serial number printed on the motherboard (located at the upper right corner, beside slot 7).
- ☐ Any card which is installed in your Apple IIe or IIGS, slot number of each card, revision number and software revision number.
- ☐ The hard disk manufacturer and model number you are using.
- ☐ Apple IIGS Control Panel slot setup (internal/your card) for each slot.
- ☐ Give us exact information about what kind of memory expansion card you are using (revision number and serial number required).
- ☐ Describe the symptoms where the error occurs. What software did you use? Describe the steps in detail to duplicate the problem.

If you have any problems and you don't know how to get any further, send us e-mail or write via snail mail. Please do not send anything back to us without a RMA number.

Known Problems

At the time of this printing, the following hard drives were found being not fully compatible with the IDE Standard or having bugs in their own operating system firmware.
(this does not imply that all drives not mentioned here are OK)

Conner: CP30204: Universal translation mode does not work correctly, replaced by CP30254.
CP30104, 105 Mbytes Version:Universal translation mode does not work correctly.
The 120Mbyte version of this drive (CP30104) works fine.

Seagate: ST1144A: unable to read or write 256 sectors at a time. This is required for the *Micro*Drive Card, but not for any MS-DOS computer.

Western Digital: many older mechanisms that are also used in the early versions of the Vulcan hard drives. These drives do not support the IDENTIFY HARD DISK command. This command is not required for operation with the *Micro*Drive Card and the drive will work correctly. However due to poor performance of these old drives, we recommend using only Western Digital drives manufactured in 1994 or later.

In general you may encounter problems when using drives with a size of 2 Gigabytes or more because these drives do have bugs when using the CYL/HEAD/SECTOR mode (which is used with the MicroDrive cards).

Error Messages at Boot Time

To boot from the *Micro*Drive Card, the firmware must be able to access the first hard disk (master) connected to the card. Even if you want to boot from a volume on the second hard disk (Drive 2), the first hard disk must be powered up, must be configured as a master drive and must have a valid setup. The current operating parameters will always be the ones from the master drive (Drive 1), regardless of the volume number you may want to boot from.

If an error occurs during the very first part of the boot process, the *Micro*Drive Card informs you about the error by displaying one of the following error messages and gives you control over your computer at the Applesoft Basic prompt.

Drive 1 Error:

The *Micro*Drive Card cannot get access to the first hard disk. There are many reasons that may cause this error:

- there is no hard disk connected
- the hard disk is not powered up
- the hard disk is jumpered as a slave drive
- two hard disk are connected and both are set to a master drive
- the hard disk has a defect
- the first hard disk is not ready within 15 seconds after power up.

Missing configuration data

The *Micro*Drive Card cannot load a valid configuration from the first hard disk (master). A setup using the installation program MICRO.INSTALLER is required to create a valid configuration. Also, the sector on the hard disk containing the configuration data could be physically damaged..

Error reading boot sector

A read error occurred when trying to load the *Micro*Drive Card's private boot sector (not the ProDOS boot sector). This is because the boot sector is damaged (bad checksum) or has no valid code for the continuation of the boot process. This sector is always automatically written to the hard disk when writing a configuration file to the disk from where you started the configuration program (this feature can be used for a "refresh" if the boot sector has been destroyed occasionally).

Volume not formatted

The *Micro*Drive Card could load a configuration, but it could not find anything that looks like a PRODOS boot sector. This sector is usually present after a volume has been high-level formatted by a system utility like the Finder etc. Note that this error message is related to the volume you want to boot from.

Unable to load ProDOS

This message appears if the ProDOS boot routine (located on the boot sector of any PRODOS volume and loaded into the computer's memory at boot time) has found one of the following errors:

- the boot routine cannot find a directory structure on the boot volume (directory may be damaged)
- the boot routine cannot find a file with the name PRODOS in the root directory of the current boot volume. The file PRODOS usually is the PRODOS 8 operating system or the file that launches GS/OS.
- while loading PRODOS, a read error occurs because of a bad sector belonging to the file PRODOS.

Warranty Registration

Please fill out this warranty registration. You must return the completed form or we cannot give you warranty support or regular service.

Purchaser

Name :
Address :
City :
State, Zip :

Vendor

Company/Name :
Address :
City :
State, Zip :

Product

Name :
Date of purchase :
Serial number :

Misc. Infos

Computer type :

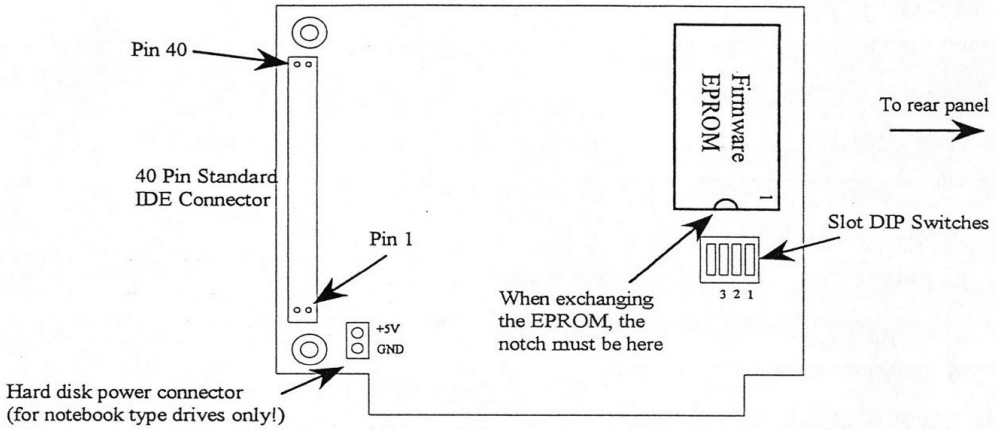
Other cards installed, slot number of each card :

comments, wishes, suggestions, improvements, bugs found

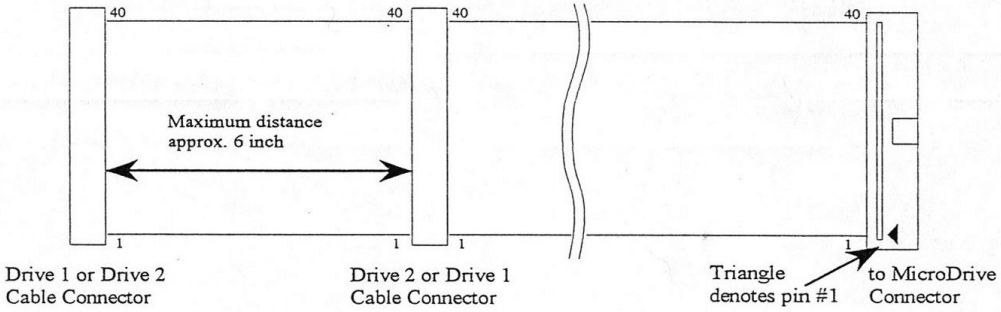
Please send this registration form to:

///SHH Systeme
Dipl. Ing. Joachim Lange
Bergstrasse 95
82131 Stockdorf
Germany

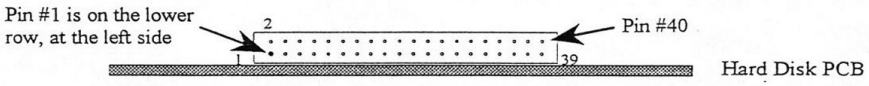
*Micro*Drive Card



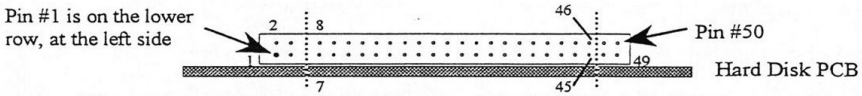
Cable configuration required when using external hard drives



(Maximum cable length approx. 3 ft.)



How to find pin 1 on a 3.5" hard disk connector



Pin assignments on a notebook style (2.5") hard disk connector

For use with any IDE controller, pin 7,8 to 45,46 corresponds to pin 1,2 to 39,40 on a standard 40-pin IDE connector (used on the MicroDrive Card as well as on the Turbo IDE Card). Pins 47, 48, 49, 50 are reserved for power supply purposes. Do not try to build your own power supply cable!