Series
2000

Designing with the DiskOnChip® 2000

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Flash Disk Pioneers

1. Preface

This application note describes how to integrate the DiskOnChip 2000 with PC compatible systems. The DiskOnChip 2000 is a single chip FlashDisk designed to plug into a standard 32-pin EEPROM socket. The DiskOnChip 2000 should be mapped into an 8KByte window in the BIOS expansion address space of the PC, which is usually located between address 0C0000H to 0EFFFFH.

The DiskOnChip 2000 contains a built-in copy of the M-Systems industry-standard TrueFFS software, which makes the DiskOnChip operate as a standard disk drive. The DiskOnChip 2000 can contain the operating system in it to allow systems to boot without a hard disk. The DiskOnChip 2000 can also be configured as the boot device in systems with a hard disk (see below "Configuring the DiskOnChip 2000 as the first drive").

The DiskOnChip is a self-contained device. The installation of the DiskOnChip does not require any software installation. The design of the DiskOnChip allows for full upward and downward compatibility. While available today in capacities of 2 to 72MBytes, future DiskOnChip devices with higher densities, will be fully compatible with standard DiskOnChip sockets. The basic design of the DiskOnChip actually supports an unlimited capacity.

2. Operating the DiskOnChip

2.1 Installing the DiskOnChip 2000

When installing or removing the DiskOnChip, be sure to first touch a grounded surface to discharge any static electricity from your body. Use the following procedure to install the DiskOnChip:

1. Align pin 1 on the DiskOnChip with pin 1 of socket.

2. Push the DiskOnChip into the socket carefully until it is fully seated.

3. Check to make sure the DiskOnChip is installed securely, and there are no bent pins.

   Caution: The DiskOnChip may be permanently damaged if installed incorrectly!

4. To install the DiskOnChip as drive C on a system without a hard disk, set the CMOS setup of drive C to "not installed" (indicating that no physical magnetic disk is installed), and reboot the computer. The DiskOnChip 2000 will install as drive C. The DiskOnChip needs to be formatted with the System files in order for it to be a bootable drive. See "Configuring the DiskOnChip as the BOOT device" below.

5. To install the DiskOnChip as drive D on a system with a hard disk, just reboot the system, and the DiskOnChip will install as drive D.

6. To install the DiskOnChip as Drive C on a system with a hard disk, see below "Configuring the DiskOnChip as the first drive".

2.2 Configuring the DiskOnChip 2000 as the Boot device

In order to configure the DiskOnChip as the boot device, the operating system files need to be copied into it. Copying the operating system files into DiskOnChip should be done like in any other hard disk. The following is an example of a typical initialization process:

1. Set the DiskOnChip as a regular drive in your system (not a boot drive).

2. Install a bootable floppy diskette in drive A and boot the system.

3. At the DOS prompt, type SYS C: to transfer the DOS system files to the DiskOnChip (assuming the DiskOnChip is installed as drive C).

4. Copy any files needed into the DiskOnChip.

5. Remove the floppy diskette and reboot the system. The system will boot from the DiskOnChip, and will allow you to run and access any files that have been copied into the DiskOnChip.

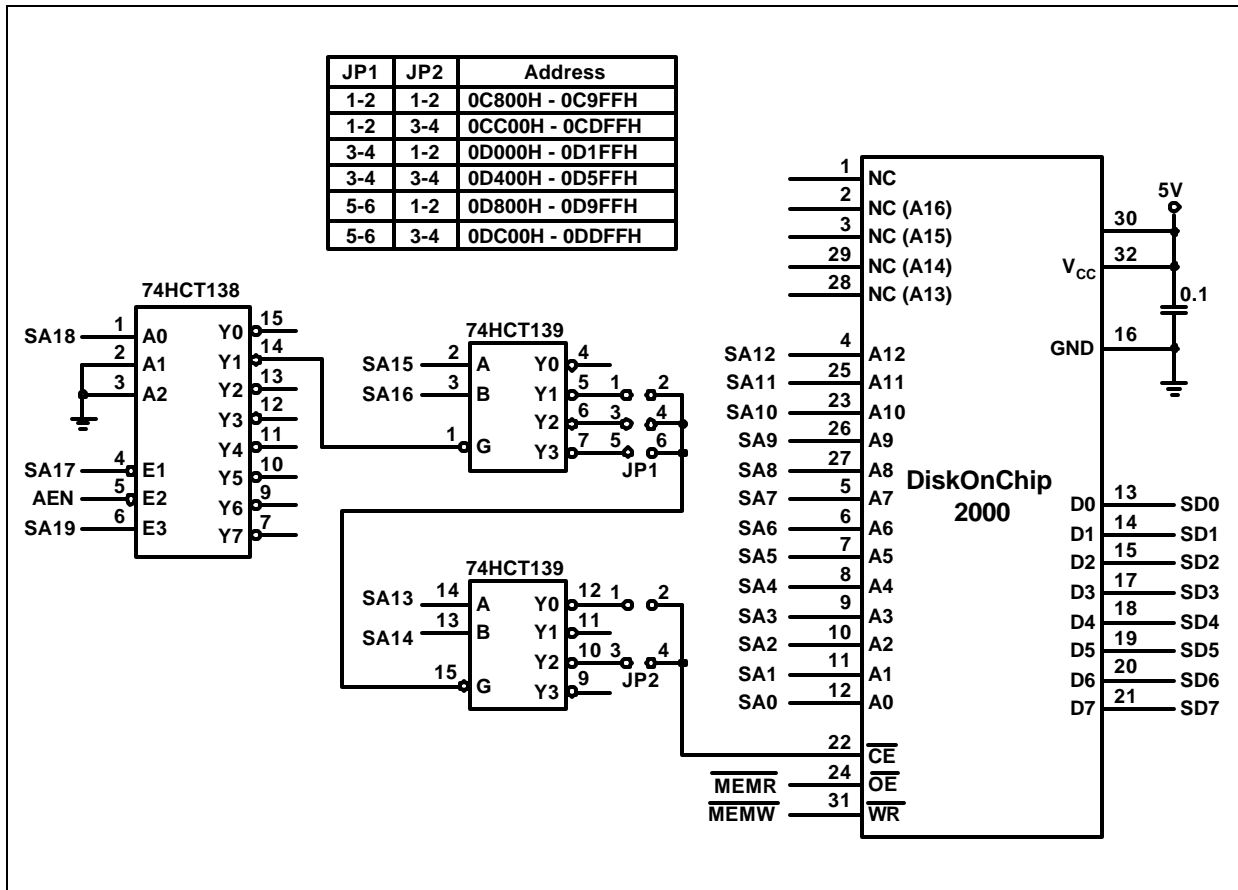## 2.3 Configuring the DiskOnChip 2000 as the first drive

The DiskOnChip can be configured to be installed as the last drive (default), or as the first drive in the system. When configured as the last drive, the DiskOnChip is installed as disk D if there is another hard drive installed, and as drive C if no other hard disk is installed. When configured as the first drive, the DiskOnChip is always installed as drive C. The DiskOnChip is shipped from the factory, configured to install as the last drive. To configure the DiskOnChip to be installed as the first drive, proceed as follows:

1. Boot the system and make sure the DiskOnChip is installed correctly as drive D

2. At the DOS prompt type: DUPDATE D: /FIRST /S:DOC2000.EXB

3. After re-booting the system, the DiskOnChip will appear as drive C:

3. DiskOnChip EVB - An Evaluation Board for the DiskOnChip

The DiskOnChip 2000 Evaluation Board (EVB) is provided by M-Systems as an evaluation tool for the DiskOnChip. The package includes an ISA board with a DiskOnChip socket, software and detailed documentation. The DiskOnChip 2000 EVB enables the evaluation and testing of the DiskOnChip in a standard PC environment.

4. DiskOnChip socket design example

JP1	JP2	Address
1-2	1-2	0C800H - 0C9FFH
1-2	3-4	0CC00H - 0CDFFH
3-4	1-2	0D000H - 0D1FFH
3-4	3-4	0D400H - 0D5FFH
5-6	1-2	0D800H - 0D9FFH
5-6	3-4	0DC00H - 0DDFFH

Notes:

1 The above design example shows a DiskOnChip 2000 mapped into an 8KByte window. The DiskOnChip 2000 is compatible with larger windows and will operate and BOOT properly with larger window sizes such as 32KByte and 64KByte windows.

2 Pin 30 connection to VCC is optional - to support 28 pin devices

5. Additional information and Tools

Document/ Tool	Description
DiskOnChip 2000 Data Sheet	DiskOnChip Data Sheet
DiskOnChip 2000 Utilities	DiskOnChip 2000 Utilities User Manual
DiskOnChip2000-EVB	DiskOnChip Evaluation Board
DiskOnChip2000-PIK	DiskOnChip Programmer and Integrators Kit
DiskOnChip-GANG	8 Socket Gang Programmer[1]

1 Contact M-Systems for availability