

Series  
**2000**

**AP-DOC-019**  
**Application**  
**Note**

**Using the DiskOnChip<sup>®</sup> 2000**  
**with Windows<sup>®</sup> 95**

---

Dimitry Shmidt  
Software Engineer

**Apr-98**  
91-SR-005-09-7L REV. 1.0

 **M-Systems**  
Flash Disk Pioneers

## 1. Introduction

The DiskOnChip 2000 hooks interrupt INT13h and uses it to emulate a hard disk. It is possible to use the DiskOnChip 2000 under Windows 95, just like any other hard drive. However, the capacity of the DiskOnChip 2000 should be large enough to contain Windows 95 operating system files, user's applications and data.

Being a memory mapped device, the DiskOnChip 2000 requires special attention when installing Windows 95 on it. This is required in order to prevent Windows95 from using the memory window in which the DiskOnChip 2000 resides. This is especially important when using the DiskOnChip in a "Multi DiskOnChip" configuration (more than one DiskOnChip 2000 emulating a single disk drive), as each DiskOnChip 2000 has its own upper memory window. Please refer to AP-DOC-013 ("Designing a Multi DiskOnChip 2000 Disk") for further information.

Using a small capacity DiskOnChip with Windows 95 can be done by cutting the size of the Windows 95 image. Please refer to section 3 of this application note for more information.

The terms "DiskOnChip 2000" and "Multi DiskOnChip 2000" are used interchangeably in this application note.

## 2. Installation

Follow the instructions below for installing Windows 95 on a DiskOnChip 2000. Please make sure to follow the instructions with caution, otherwise you might face unpredictable consequences.

### 1. Preparing the DiskOnChip 2000

#### 1.1 Performing Low-Level Format

If a single DiskOnChip 2000 is being used, nothing has to be done in this step.

When using the "Multi DiskOnChip 2000", formatting should be done according to the instructions in AP-DOC-013.

#### 1.2. Making the DiskOnChip 2000 Bootable

Follow the next steps in order to format the DiskOnChip 2000 in DOS and make it bootable. You will have to use a bootable floppy that contains the DOS system files and the *FORMAT.EXE* utility.

##### 1.2.1. Booting up the system

Place a bootable floppy in the drive and boot the machine. You will get a drive letter for the DiskOnChip 2000, typically "C:". If you have other hard drives hooked, the drive letter might be different.

### 1.2.2. Formatting the DiskOnChip 2000

Issue the DOS format command: *FORMAT C: /S*

The /S flag is required to make the DiskOnChip 2000 bootable.

Remove the bootable floppy from the driver and reboot the machine.

### 1.3. Copying CD-ROM Drivers (optional)

In case you want to install Windows 95 from a CD-ROM, make sure that the *autoexec.bat* and/or *config.sys* files on the DiskOnChip 2000 contain the DOS CD-ROM drivers.

Follow the instructions in your CD-ROM manual for installation of these drivers. Once installation is complete, reboot the machine and proceed to the next step. This step is necessary only for the first Windows 95 installation you do on the target platform.

## 2. Installing Windows 95 on the DiskOnChip 2000

### 2.1. Running the Windows 95 setup program

Windows 95 setup can be found either on floppies or on a CD-ROM. (Note that only old versions of Windows 95 are available on floppy disks)

Run the Windows 95 setup program and follow the instructions. When asked to select the installation type, select “Compact”. This will copy the minimal subset of Windows 95 files to the DiskOnChip 2000.

Proceed with the setup process until it reaches its final step, offering you to reboot the system. Before you continue, carefully read the following instructions.

It is crucial that the first boot after the Windows 95 setup will be done from a bootable floppy and not from the DiskOnChip 2000. Before rebooting, Windows 95 checks to see that there is no floppy in the drive. You will have to keep the floppy half inserted, then immediately after pressing “Reboot”, fully insert it into the drive. The screen will vanish at this time as the reboot process begins.

### 2.2. Changing the Windows 95 Initialization File

Once the system has come up, you will get the “A:” prompt. Change the current directory to *C:\WINDOWS* and edit the file *SYSTEM.INI*. Add the following line to the *[386enh]* section:

```
emmxclude=D000-DFFF
```

This will prevent Windows 95 from accessing the DiskOnChip 2000 memory window.

Note: If your DiskOnChip 2000 is located in a different address range, change the above address range accordingly.

After you finished changing the initialization file, remove the bootable floppy and reboot the machine.

### 2.3. Finishing the Windows 95 Setup

After the system is up, Windows 95 will continue the setup process. Follow the instructions on the screen until it is finished. From this point on you can freely use Windows 95 installed on the DiskOnChip 2000.

## 3. Minimizing the Win95 Footprint for the DiskOnChip 2000

The core facilities of Windows 95 occupy just a fraction of its overall code. By stripping away facilities that are not required for the target system, it is possible to cut the size of the Windows 95 image in half, producing relatively small configurations.

For additional information please refer to the article "Minimizing the Windows 95 Footprint for Embedded Systems Applications" by Sean Liming, AnnaSoft Corp., Microsoft Embedded Review, September 16, 1996.

## 4. Additional information and Tools

Document/ Tool	Description
AP-DOC-10	Designing with the DiskOnChip 2000
AP-DOC-17	Using the DiskOnChip 2000 with Windows CE
AP-DOC-16	Using the DiskOnChip 2000 with QNX
AP-DOC-11	Write Protecting the DiskOnChip 2000
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

M-Systems assumes no responsibility for the use of the material described in this document. Information contained herein supersedes previously published specifications on this device from M-Systems. M-Systems reserves the right to change this document without notice.

USA - M-Systems Inc, Phone: 510-413-5950, Fax: 510-413-5980, email: [info@m-sys.com](mailto:info@m-sys.com)

Taiwan - M-Systems Asia, Phone: 886-2-25501741, Fax: 886-2-25501745

Europe - M-Systems BV, Phone: 31-20-69-69-586, Fax: 31-20-69-61-266

Israel - M-Systems LTD, Phone: 972-3-647-7776, Fax: 972-3-647-6668

<http://www.m-sys.com>