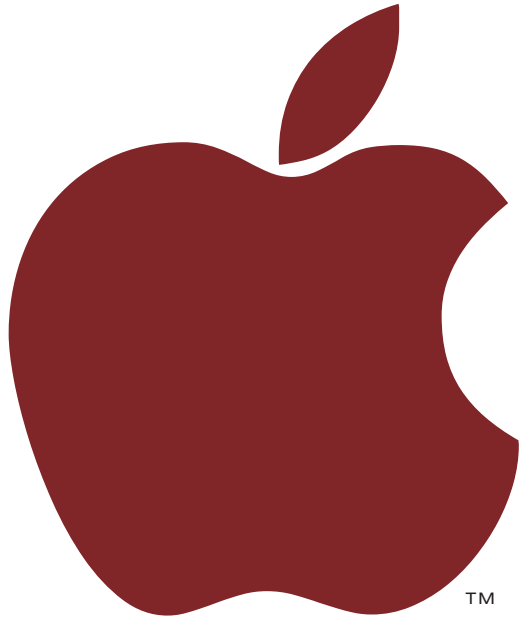
DISK II
FLOPPY DISK SUBSYSTEM

INSTALLATION AND OPERATING MANUAL



Apple Intelligent Subsystems

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PRELIMINARY

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APPLE DISK II

INTRODUCTION AND UNPACKING INSTRUCTIONS

The APPLE DISK II is a "floppy" disk unit which allows you to store and retrieve information much more quickly and conveniently than you can with tape. The information is stored and retrieved from a "diskette". The diskette is a small (5 inch diameter) plastic disk coated so that information may be stored on and erased from its surface. The coating is similar to the magnetic coating on recording tape. The diskette is permanently sealed in a square plastic case which protects it, keeps it clean and allows it to spin freely. This package is never opened.

The term "floppy" comes from the fact that the diskette is flexible. Older computer information storage devices that worked on similar principles used rigid disks. While the Diskette (and its plastic case) are somewhat flexible, actually bending the diskette will damage it.

One of the most important advantages to using DISK II is that information is stored and retrieved by a name under which it is filed. A program that catalogs phone numbers might be saved with an instruction such as
SAVE PHONE NUMBERS
and retrieved with an equally simple command. The name under which something is filed is the file name.

A single diskette can hold over 116,000 characters of information. Typically, files are much shorter than this, and a number of files (up to 82) can be stored on a single diskette. To help you (and the APPLE II) find files, a catalog of all the files currently residing on the diskette is kept on each diskette. The programs that automatically maintain this catalog, and that save and retrieve information (as well as do a multitude of other housekeeping tasks) are called the Disk Operating System, or DOS.

There are six items that comprise your DISK II system. The disk drive (the main box), a circuit card (the controller) that plugs into the APPLE II, a "DISK II MASTER" diskette, a blank diskette, the warranty card, and this manual. The disk drive is connected to the controller by a flat ribbon-like cable. The cable must be attached to the upper set of pins on the controller. They are marked "DRIVE 1". Connect it very carefully as the pins are easily damaged. One possible error is co not center the connector. Be careful and see that all the pins are going into holes, and not to one side of the connector or the other. The connector can only go on one way, as the cable prevents it from being put on backwards.

If you have purchased a drive only (for example, as a second drive on your controller) your system will include the disk drive, the diskettes, a warranty card, and this manual. You will connect your second drive co the lower set of pins on your controller. Take the same care attaching this connector as you did with the first.

Save the packing material in case you wish co transport your disk--or in the unlikely event it has to be returned to the dealer or co the factory. Send in the warranty card--not only does this put the warranty in effect, but it allows us to keep you informed of updates and new produces.

HOW TO INSTALL THE DISK CONTROLLER

To install the DISK II, you will simply plug the controller board into a socket inside the APPLE II, and then replace the top so as to hold the cable in place, as follows:

1. Turn the APPLE II off. This is important co prevent damage to the computer.

2. Remove the cover from the APPLE II. This is done by pulling up on the cover at the rear edge (the edge farthest from the keyboard) until the two corner fasteners pop apart. Do not continue to lift the rear edge, but slide the cover backward until it comes free.

3. Inside the APPLE II, across the rear of the circuit board, there is a row of eight long, narrow sockets called "slots". The leftmost one (looking at the computer from the keyboard end) is slot #0, and the rightmost one is slot #7. BE SURE THE POWER IS OFF BEFORE YOU INSERT OR REMOVE ANY BOARD FROM THE COMPUTER. Insert the "fingers" portion of the controller into slot #6, one socket to the left of the rightmost socket. The "fingers" portion will enter the socket with some friction and will then seat firmly. Since the fingers make electrical contact, it is a good idea to keep your fingers from touching them. They may be cleaned with rubbing alcohol before installation. The controller board may be placed in any slot except slot #0, the leftmost. However, APPLE's standard location is slot #6, and most APPLE software (and this manual) is written with that location in mind.

4. Replace the cover of the APPLE II, remembering to start by sliding the front edge of the cover into place. Press down on the two rear corners until they pop into place. The cover will hold the cable.

5. The DISK II controller is now installed. Place the disk drive in a convenient location, usually alongside of or on top of your APPLE II, which may now be turned on.

INSTALLING MULTIPLE DISK DRIVES

If you have a second drive, it is better to attach it to the lower set of pins (marked DRIVE 2) on the controller board than to use a second controller. The third drive would be attached to the DRIVE 1 position on the second controller, the fourth to the DRIVE 2 position on the second controller and so forth.

If you have multiple drives, it is a good idea to label each with its slot and drive number since your programs will refer to the disks by those numbers.

IF IT DOESN'T WORK

This isn't likely, but if your unit was shipped in an old truck or some such, the connectors inside the disk drive may have worked a bit loose. If you are at all squeamish about handling the insides of your drive, your dealer will be glad to check it out. Your dealer is also the person to see if first aid doesn't get things working. One last trick, that cures 90% of all problems--re-read the manual carefully. If you enjoy getting your fingers into the works (and don't mind voiding the warranty) , you can turn the computer off, and disconnect the drive from the controller. Loosening the four screws on the bottom of the drive allows the mechanism to slip forward out of the case. Tighten the connectors by pushing them gently onto the circuit boards. Re-assemble the unit and it will probably now work.

INSERTING AND REMOVING DISKETTES

While there is nothing difficult about using a disk drive (it is far easier than using a cassette recorder), some care is necessary to protect the diskettes. The drive itself must also be handled with some care. The drive door is opened by pulling up its bottom edge. The diskette is then slipped in the slot with the label upwards. This should be done gently until the diskette is entirely into the drive. Do not bend the diskette! If it is pushed in too hard it can be permanently damaged. Close the door by pushing it down again. Two metal fingers (which can be seen just inside the slot) should just clear the diskette as the door closes.

A diskette is removed by opening the door and pulling it carefully out of the drive. However NEVER REMOVE A DISKETTE WHILE THE "IN USE" LIGHT IS ON. This can permanently damage the diskette, and is almost sure to destroy the information on the diskette even if the diskette is still usable.

CARE OF DISKETTES

Diskettes hold a tremendous amount of information. An individual bit of information on the diskette is therefore very small. An invisible scratch on the surface of the diskette, or even a fingerprint, can cause errors. Never let anything touch the brown surface of the diskette itself. Handle the diskette by the black plastic case only. When a diskette is not in use, keep it in the paper sleeves that it is supplied with. These sleeves are treated to minimize static build-up which would attract dust. If you wish to write on a diskette label, use a FELT TIP pen. Do not press hard. It is better to not write directly on the diskette package, but to use separate labels. Write on these labels and then stick them on the diskettes.

Keep diskettes away from magnetic fields. This means to keep them away from electric motors, magnets, and that they should not be placed on electronic devices such as television sets. They may be temporarily laid on the APPLE II or DISK II. Keep diskettes out of the sun, and away from other sources of heat that can cause them to warp. Car trunks on hot days can be diskette killers. Do not place diskettes on dirty or greasy surfaces. Do not let them collect dust. It is best

if they are stored vertically between use.

This may seem like a lot of "don't's", but with reasonable care, each diskette will give you almost unlimited service. With just a little bit of carelessness, they may give you no service at all.

The DISK II drive, unlike the APPLE II, is a mechanical device. It has motors and moving parts. Therefore it is somewhat more delicate than is the computer. Rough handling, such as dropping the drive, or having things drop on it, can cause it to malfunction. The drive should not be used on top of a TV set for the same reason that diskettes should not be placed on or near a TV set. The strong magnetic fields put out by TV's can cause damage to the magnetic properties of the drive.

PREREQUISITES TO USING THE DISK OPERATING SYSTEM

The next few sections assume that you are familiar with using the APPLE II computer. If this is your first use of the APPLE II computer, begin by learning how to use the BASIC language described in the APPLE II BASIC PROGRAMMING MANUAL. You do not have to know how to program to use the disk, but the material in the first chapter should be mastered so that you are familiar with the keyboard and with the commands to get the BASIC prompt character (>).

Many of the facilities of the DISK II will not be of any great utility (nor will they make much sense) if you have not learned the capabilities of the computer first.

Most of the tasks that the disk can do are similar to those the cassette interface can perform. Reading the section in the BASIC PROGRAMMING MANUAL on saving programs (page 76) is especially helpful. It is even more helpful if you've read the material that comes before that section.

STARTING THE SYSTEM

To begin with, you have to get the Disk Operating System (DOS) started. In computer jargon, this is called "booting the system". This procedure places a program (which is on the MASTER DISKETTE) into the APPLE II. This program adds the disk commands to BASIC.

To boot the DOS, insert the DISK II MASTER DISKETTE into the drive (or into Drive l if you have more than one drive) and close the door.

Using the familiar {RESET}{CTRL}B{RETURN} sequence, put the APPLE II into Integer BASIC. Assuming that you've put the controller in slot 6, as described above, type
PR#/6{RETURN}
the "IN USE" light will come on, and the disk drive will make clicking and whirring noises. After a few seconds this message will appear:

```
DISK II MASTER DISKETTE  VERSION 3
                         29-JUN-78
COPYRIGHT 1978 APPLE COMPUTER INC.
>
```

The version number or date may be different, as improvements are continually made in the system. At this point, DOS is booted and you are in Integer BASIC. To demonstrate that the DOS is booted type the instruction
CATALOG
and a list of the programs and data files that are on the MASTER DISKETTE will be written on the screen. Type the instruction
LIST
and you will see the program that writes the heading for the MASTER DISKETTE. It is just a few PRINT statements.

INITIALIZING NEW DISKETTES

You have just booted from the MASTER DISKETTE that was initialized by APPLE COMPUTER. When a new diskette is purchased it is not usable by the computer. It must be initialized. If you try to boot from a diskette that has not seen initialized, you will get the message:

***DISK: DISK I/O ERROR

Once you have booted the DOS from the MASTER DISKETTE, you can use the APPLE II to initialize new diskettes. These "slave" diskettes can then be used to save data and programs.

Before beginning the initialization process, there should be a BASIC program in the APPLE II. It need not do much, it can be as simple a program as this one:

```
NEW
10 PRINT "SLAVE DISKETTE CREATED 9-8-78"
20 END
```

This program is called the "INIT" program as it will be executed when you boot the slave diskette, and present the message on the screen. This has two purposes: when you see the message, you know that the DOS has been booted successfully; the message lets you know that you are using a slave diskette.

THE INITIALIZATION PROCEDURE (with one drive)

Remove the MASTER DISKETTE from the drive. Select a name for your INIT program. "HELLO" is a customary name since it is the first program to greet you when you boot. Place the blank diskette in the drive. Type the instruction

```
INIT HELLO, V254
```

or

```
INIT whatever name you choose, V whatever volume number you wish
```

When you press {RETURN} the disk is set up with a catalog, and the INIT program, and the entire surface is initialized. The process takes nearly two minutes. The usual chatter is heard from the disk drive during initialization.

When the process is complete, the disk makes one last click, and the prompt character (>) reappears. Remove the new diskette and label it as having been initialized. It is a good idea to label it with the date as well.

FANCIER INITIALIZATION

There are a number of options that are useful during initialization (and with other disk operations). The first option allows you to operate with more than one drive. Each controller has the ability to control either one or two disk drives. Normally, instructions refer to drive 1. This is the default drive selection. If you wish to specify drive 2, you use the notation D2 separated from the file name by a comma. For example, to initialize a diskette in drive 2, you would use the instruction

```
INIT HELLO, V254, D2
```

After drive 2 has been specified, all further disk commands refer to drive 2 unless drive 1 is specified.

If more than two drives are in use, then additional controllers are required. These are placed in different slots than the first controller (which is customarily in slot number 6). You can specify slot n (where n is a digit from 1 to 7) with the notation Sn separated from the other disk options by a comma. The default slot number is the one you used when booting the DOS. For example, to initialize a diskette in drive 1 attached to a controller in slot 5, you would use the instruction

```
INIT HELLO, V254, S5, D1
```

Once a slot number has been set, it becomes the default slot number until it is explicitly changed.

If you accidentally use a diskette with the wrong volume number, the system will reject it with the message

```
***DISK: VOLUME MISMATCH ERROR
```

Volume mismatch errors cannot occur when you ask to see the CATALOG. In case you wish to know the volume number of a diskette, it is given at the top of the CATALOG.

Specifying a volume number of zero disables checking of volume numbers.

Once a volume number has been set, that volume number becomes the default volume number until it is explicitly changed, or a CATALOG command is given. The CATALOG command changes the default volume number to the volume number of the diskette