deluxe OPTION BOARD

VERSION 5.4

PC-MAC DATA EXCHANGE

PROTECTED SOFTWARE BACKUP

Central Point Software INC

Deluxe
Option
Board

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Table of Contents

Introduction

The Deluxe Option Board - Disk Accessory package contains everything you need for your IBM PC, XT, AT and compatibles; I'S/2 Models 25 and 30 to

- Exchange data with Macintosh users if you have a supported 3.5" floppy drive
- Make archival backups of copy-protected PC software
- Make copies of Macintosh, Atari, Commodore, and other non-IBM disk formats (non-protected only)
- Use the Track Editor to look at and edit protection schemes yourself

The Deluxe Option Board Technology-An Overview

The Deluxe Option Board can be thought of as a disk accessory. It adds new capabilities to your existing disk drive by acting as an auxiliary floppy controller.

The standard floppy disk controller is actually a simple computer on its own. When the PC wants some information from the disk, it asks the floppy disk controller's "computer" to get it. The information that the PC receives is only the information contained in the data fields. You have no access to the information between the data fields. Using the Deluxe Option Board, this limitation is overcome. It can access all of the information contained on the disk bit-by-bit.

With these capabilities and special software, it is possible to simulate Macintosh 400K and 800K disk drives even though the formats are different. IBM drives run at a constant speed and contain the same number of sectors on each circular track. Macintosh disks run at variable speeds and they contain more information on the outside track than on the inside. The Deluxe Option Board compensates for these differences in format by basically reading and writing information faster or slower depending on the track. This control is what allows you to use your existing internal 3.5-inch floppy PC drive to read, write, format and copy Macintosh diskettes.

The Deluxe Option Board technology is the same that is used by many software duplication firms who add copy protection to disks. Therefore, it is possible to use the Deluxe Option Board to make archival copies of virtually all copy-protected PC

software. It is required because most copy schemes rely on quirks of the standard floppy disk controller. Since the Deluxe Option Board is not limited by the floppy controller's capabilities, it is possible to make backups of some of the newer protection schemes which software-only programs such as Copy II PC cannot.

Since the Deluxe Option Board is able to copy disks bit-by-bit, it does not require the disk to be of a particular format to copy. Therefore, you can make copies of Atari, Commodore and other non-IBM format disks that are not copy-protected. The software verifies the disks, but does not qualify them.

More sophisticated programmers can use the Track Editor to take a look at protection schemes since the Deluxe Option Board makes all of the data on the disk available to you.

A Note about Copy II PC

If you are already a registered user of Copy II PC, we will continue to send you notification of improvements. Copy II PC has several advantages over the Deluxe Option Board: It can be run on a PC without extra hardware; it works with external floppy drives, and it can run many popular programs from a hard disk without inserting the original floppy.

Those of you who use Copy II PC may notice as you use the Deluxe Option Board software that the Option Board doesn't fit as many tracks into memory as Copy II PC, even though the Option Board uses all available memory in your computer. This is because the Deluxe Option Board software doesn't just read the data, as does Copy II PC, it also reads (and stores) all the information between data fields. (This "information" is often called sector IDs, gaps, sync bytes, address marks, and clock bits.) Since the Deluxe Option Board reads the data on disks as well as reads and stores the information between data fields, it can easily handle many new protection schemes.

About this Manual

This manual has the following chapters:

Introduction: overview of the Deluxe Option Board, Copy II PC, and its technology.

System   requirements: hardware and memory specifications.

Installation: instructions for installing the Deluxe Option Board into computers that have one of the three types of floppy disk controller cable connections used by the Deluxe Option Board:

> Edge connection
> Pin connection
> Motherboard connection
>
> In addition, special instructions are included for the IBM PS/2 Models 25 and 30 and the Tandy 1000 series.

Software installation: the files contained on the Deluxe Option Board disk and installation procedures for the software.

File transfers: Macintosh/DOS data file transfers.

Making Backups of Copy-Protected Disks: how to make backups of DOS compatible protected software.

Making Backups of non-IBM Disks: how to make backups of Macintosh, Commodore, or high capacity disk formats.

Trouble Shooting: brief explanations for frequent problems.

Track Editor: a brief explanation of the Deluxe Option Board Track Editor.

Repairing the Deluxe Option Board: where to send the Deluxe Option Board if it needs repairs.

Technical Support: what we need from you when you contact us for technical support.

Other Products: a brief description of other Central Point Products.

Before You Start

Please allow about 30 minutes to read the manual thoroughly before starting the installation. You can then refer to the appropriate sections to guide you through installing and using the Deluxe Option Board.

You will need a standard screwdriver to install the board.

Before you start, take a moment to verify that your Deluxe Option Board package is complete. You should find the following:

1. This manual.
2. A disk labeled "Deluxe Option Board Software."
3. The Deluxe Option Board and cable.
4. A postage-prepaid Product Questionnaire (if purchased through a dealer).

Note: If you ordered directly from Central Point Software and specified a Compaq Portable, Tandy 1000, or HP Vectra, you should also have an extra drive cable that you purchased separately.

If you purchased the Deluxe Option Board from a dealer or mail order company, please take a moment now to fill out and send in the registration card and Product Questionnaire. If you purchased the Deluxe Option Board directly from Central Point Software, you are already registered as an owner. (You won't have a registration card included.) Being a registered owner entitles you to technical support and lets us tell you about product updates. When product enhancements become available, this is the only way we have to notify you of these improvements.

When this is done, you are ready to start.

Technical Support

If you need technical support for the Deluxe Option Board, please call (503) 690-8080. Dial 1 then extension 5705 anytime after the automated attendant has answered; you do not need to listen for the message to be completed. Our business hours are Monday-Friday, 8-5 PST.

A Note About Updates

While the Deluxe Option Board includes impressive hardware capabilities, it is possible to come up with a protection scheme that the current software shipped with the board cannot handle. In fact, we have anticipated this and have therefore deliberately not included the capability to copy anything we can imagine. Instead, we include only enough capability to duplicate software currently on the market.

If we did include everything from the beginning, the advancement of copy protection would accelerate. When software protection firm X buys one of our boards and

attempts to come up with a protection scheme to defeat it, we are able to ship you an update much sooner if what they come up with is something we have already anticipated. (This has actually happened several times.) On the other hand, had we put everything we knew into the first release of the product, software protection companies would develop ever nastier schemes much sooner and thus keep you from making all-important backups.

In other words, we do not wish to encourage the creation of newer protection schemes that make using your computer more difficult. Rather, we will continue to respond to the current market, always giving you the capability to back up new software. In so doing, we will contribute as minimally as possible to the "software arms race."

Updates to the Deluxe Option board software are affordably priced. We will notify you of any major improvements if you are registered with us.

System Requirements

The Deluxe Option Board is designed to perform disk duplication on all types of disks. Once you have installed the Deluxe Option Board, you should notice no interference between it and your usual DOS operations.

Comwters

The Deluxe Option Board has been designed to work with the IBM PC, IBM PC/XT, IBM PC/AT, IBM PS/2 Models 25 and 30 (8086 processor only), Compaq portable and Deskpro computers, Zenith 150, Leading Edge Model D or M, Magnum PC/XT, NCR PC 4, Tandy 1000, and HP Vectra.

The Option Board has not been tested with other brands, and while it may work with other computers, no installation instructions are provided, and we cannot guarantee its use with other computers.

Memorv

The Deluxe Option Board requires that the system have at least 320K memory.

Drives

The Deluxe Option Board works on either a 1 or 2 floppy drive system. It can use 360K, 720K, 1.2 MB, or 1.44 MB drives with the following conditions:

- Both the source and target drive must be physicaIIy configured as the A or B drive within the system (not logically configured with DOS).

- Both drives must be internal (not connected to the external drive port). The IBM PS/2 models 25 and 30 with IBM drive and adapter card are exceptions to this.

- The "track end" from the TC menu must be set to 4F to copy all 80 tracks when backing up 3.5" disks.

- The backup is not able to utiiize the extra disk capacity when copying from a 5.25" to a 3.5" drive. The end result will be a 360K format on a 3.5" (720K) disk.

- When using 1.2 or 1.44 megabyte high density drives, the disks' media must be 360K or 720K (both the original program disk and the blank target disk).

- To copy high capacity, non-copy-protected disks (1.2 or 1.44 MB) you must use the TCM program included on the Deluxe Option Board software disk.

- The Deluxe Option Board is not capable of copying copy-protected, high density disks. As these disks become more prevalent in the market, we may include this capability.

- Use the low density drive as the target when using a combination of high and double density drives. (The high density drive writes smaller tracks that are not reliable in regular, low density 360K drives.)

Installing the Deluxe Option Board

Overview

Most computers will allow one of three types of installation of the Deluxe Option Board. These three types of installation procedures are based upon the floppy disk controller and its connector:

Edge connection
Pin connection
Motherboard connection

Note: Although some systems may be labeled as an XT or AT type computer, you need to follow the instructions for the type of floppy disk controller you have (including instructions for the jumper block positions described later in further detail).

While installation into most computers is straightforward and will follow one of the "connection" types, installation into some compatibles is more involved, and we recommend that you have your dealer do it for you unless you are very comfortable with opening your computer and moving boards and cables. Detailed installation sections are provided later in the manual for the IBM I'S/2 Models 25 and 30 and the Tandy 1000 series computers. There is also a section entitled "Installation into Other Computers" which includes installation tips for other machines.

Below is a summary of the installation steps. We recommend that you follow the detailed installation procedures that follow rather than attempting to install the Deluxe Option Board based upon this overview.

1. Remove the cover of the computer.
2. Determine the type of connector you have.
3. Install the Deluxe Option Board.
4. Put the computer back together.

Removing the Cover

WARNING

Before **going any further, turn off all power to the PC and disconnect any attached power cables. Installing the Deluxe Option Board with the PC's power on could result in damage to the PC, the Deluxe Option Board, or you.**

This section describes removing the cover of the computer. For demonstration purposes, an IBM PC is used; however, the procedure is similar for all computers, except for the location of the screws you need to remove. If you have an IBM PC/AT, a Compaq computer, a Tandy or other computer, you should refer to their operating manuals for this procedure.

1. With the power off, unplug the monitor and the keyboard and set them aside. This will give you a little working room.

2. Position the computer or yourself so you can see the back panel as shown in Figure 1 below:
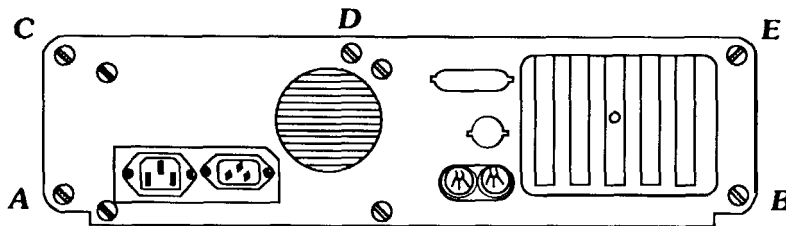
Figure 1
PC Back Panel

3. Remove the cover from the chassis by removing the screws on the back panel of the PC marked A – E above with your screwdriver. Put them aside for later.

    Note: On older PCs, you only need to remove the screws marked A and B.

4. Gently slide the cover of the computer toward the front until the inside circuitry is exposed (see Figure 2 below). It is not necessary to totally remove the cover from the chassis, although doing so makes installation of the Deluxe Option Board a little easier.
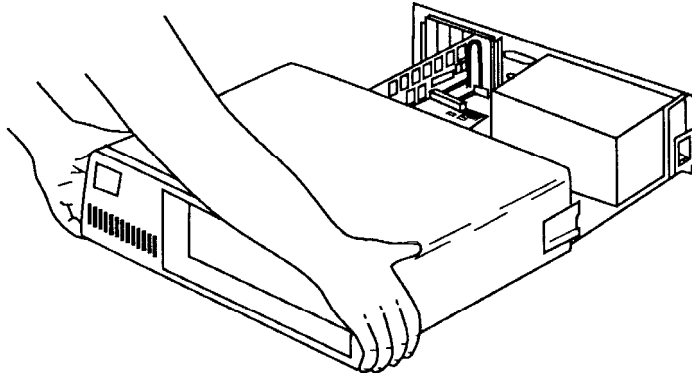
Figure 2
Removing the Cover of the PC

If you look down into the computer, you will see the insides of the PC: the computer's main circuit board (See Figure 3).
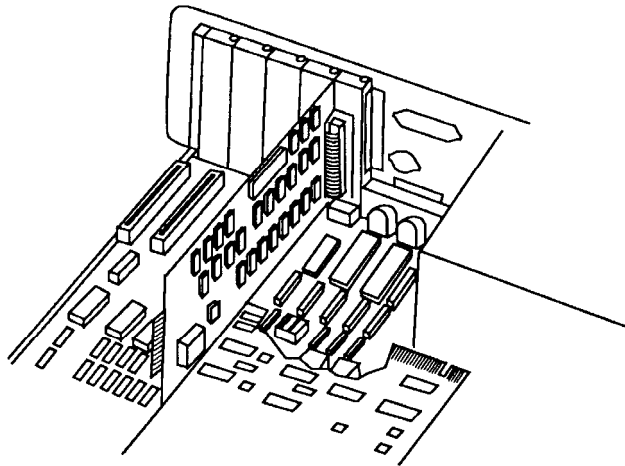
Figure 3
Inside the PC

On the right is either a silver or black box (the power supply); towards the front is the disk drive assembly; and near the rear panel, on the left side of the power supply, are five or eight connectors called expansion slots.

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Determining the Type of Connector

When installing the Deluxe Option Board into your computer system, one of the first things you need to do is determine what type of floppy disk controller your computer has.

1. Grasp the cable coming out of the floppy drives and follow it to where it is connected on the other end (the floppy disk controller). Some systems have the controller on the "motherboard" or base of the computer.

2. Once you have located the controller, carefully disconnect the drive cable from this connector.

3. Examine the connector on the end of the drive cable and compare it to the following figures to determine which installation procedure you need to follow.

    If the cable coming from your drives to your floppy disk controller has an edge--style connector that plugs into the edge of the board itself (see Figure 4), then follow the installation for the EDGE Connector.
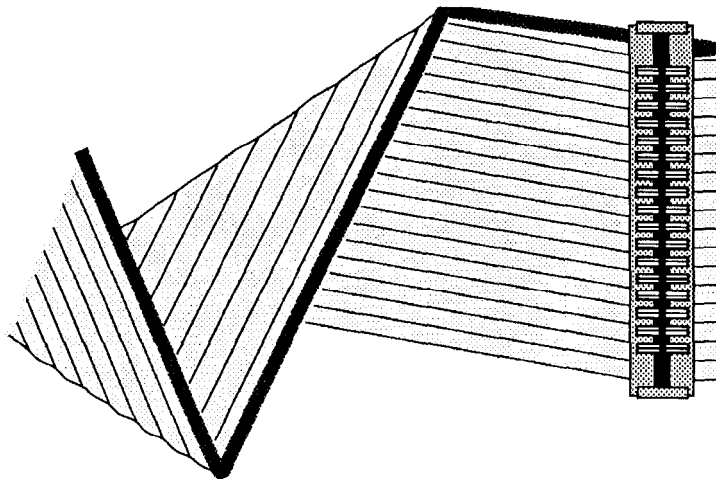
Figure 4
EDGE Style Connector

If the cable has a connector that plugs into two rows of metal pins on the board (see Figure 51, skip ahead and follow the instructions for the PIN Connector.
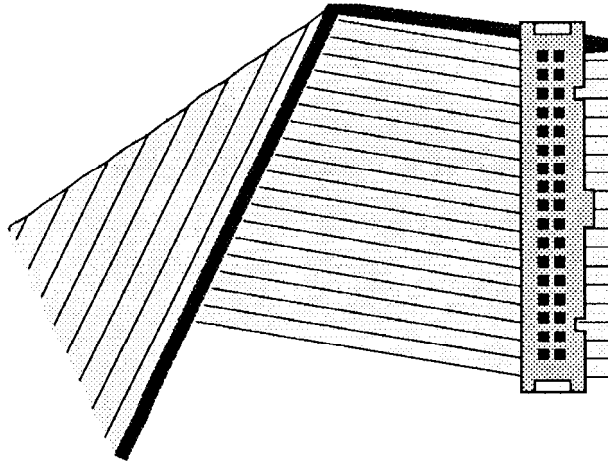
Figure 5
PIN Style Connector

If the controller is on the motherboard (see Figure 6), skip ahead and follow the instructions for connection to the motherboard.
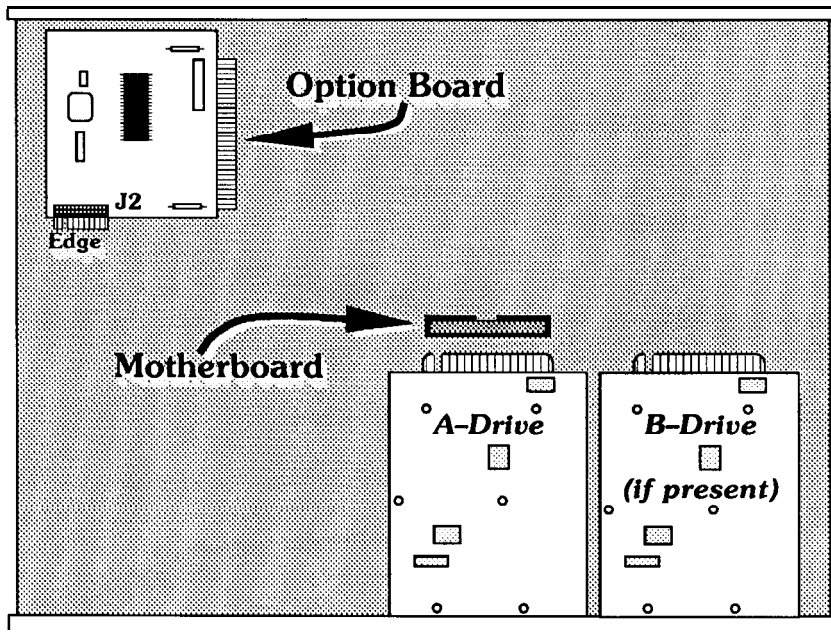
Figure 6
Motherboard Connector

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Installing the Deluxe Option Board: EDGE Connector

Below is an overview of the EDGE style connector installation:

1. Remove the Option Board from its box and note the position of the jumpers (J4 & J5 are in the PC/XT position).
2. Disconnect the floppy disk controller cable from the floppy disk controller, noting the position of the cable's red indicator line. (You've probably already done this when determining the type of connector you have.)
3. Plug the floppy disk controller cable into the EDGE connector on the Deluxe Option Board. Make sure the red line on the cable is UP.
4. Plug the Deluxe Option Board cable onto the floppy disk controller, duplicating how the original cable was connected (or generally, with the colored edge up).
5. Insert the board in an empty slot (avoiding the slot closest to the power supply).

For location purposes, let's call the slot nearest the power supply slot #l, and the slot nearest the left side of the PC slot #5 (or slot #6 on newer PC's). This numbering scheme ignores the short slots on PC systems.

Depending upon the setup of your PC, these slots may already be occupied by other expansion boards. Whatever else you've got working in your PC, in all probability, at least two of these slots are taken up with a video display card which sends information to your monitor, and a disk controller card which controls the operation of the IBM's floppy disk drives.

The Deluxe Option Board can be installed into any one of these expansion slots, as long as the drive cables can reach the Deluxe Option Board and the Deluxe Option Board cable can reach the floppy disk controller card.

1. Remove the Deluxe Option Board from its box.

   The Deluxe Option Board is shipped to you with its cable connected to the J2 PIN connectors near the end of the board. (The third pin in the left row on J2 is missing by design.) The opposite end of the cable has an EDGE connector that will fit on the floppy disk controller connector. The red line on the edge of the cable should be in the UP position (see Figure 7).
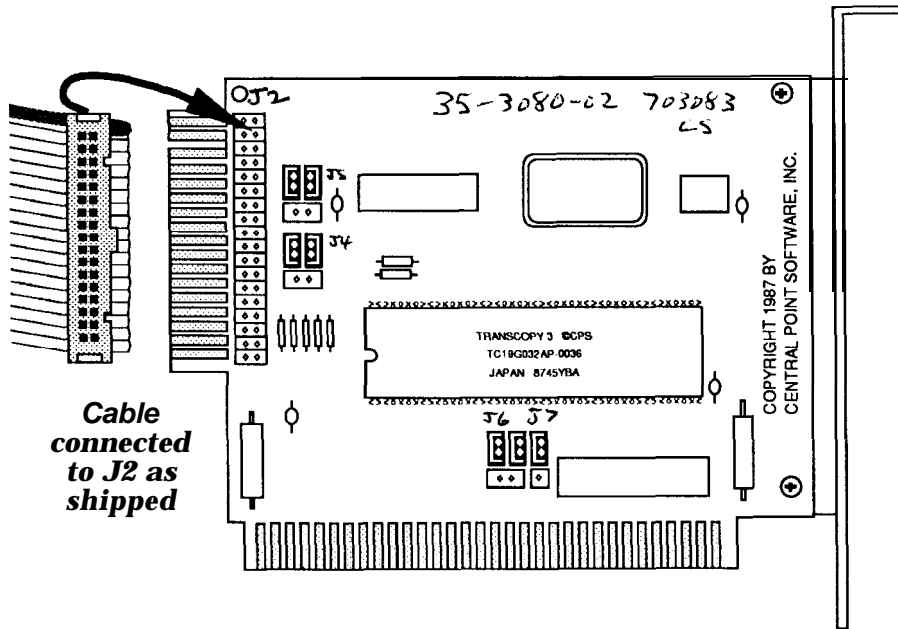
Figure 7
Deluxe Option Board as Shipped

Adjacent to the J2 PIN connector, you should see two sets of two small jumpers
labeled "PC/XT" at one end and "AT/Compaq" at the other. This jumper block
has several pins and plastic jumpers, each one connecting a middle pin and end
pin (see the following diagram). The Deluxe Option Board is currently
configured for the EDGE style connection. The jumpers are connected to the top
and middle pins closest to the PC/XT lettering.
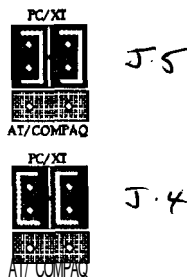
Figure 8
EDGE Style Jumper Block Position

Important: *Even* if your *computer is labeled "AT," if you have an EDGE* style **floppy disk controller, you need to leave the jumpers set** at the PC/XT position.

2. Find the floppy disk controller and disconnect its cable. (You've probably already done this when determining the type of connector you have.)

3. Connect the floppy disk controller cable to the gold edge connector on the end of the Deluxe Option Board, with the cable's red line in the UP position (See Figure 9).

Insert *floppy disk cable* here.
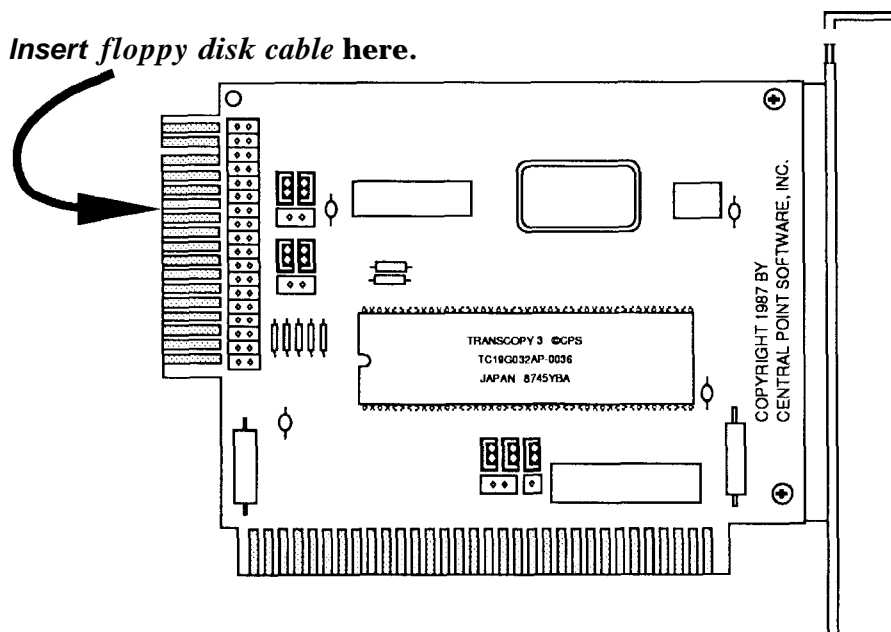
Figure 9
Deluxe Option Board

4. Connect the cable coming from the Deluxe Option Board to the floppy disk controller. This cable will plug into the edge connector on the floppy disk controller. The colored line on the cable should be oriented like the original when plugged into the floppy disk controller. You can fold the Deluxe Option Board's cable over the top of the Deluxe Option Board to make installation easier as shown in Figure 10:

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Red line should be up.
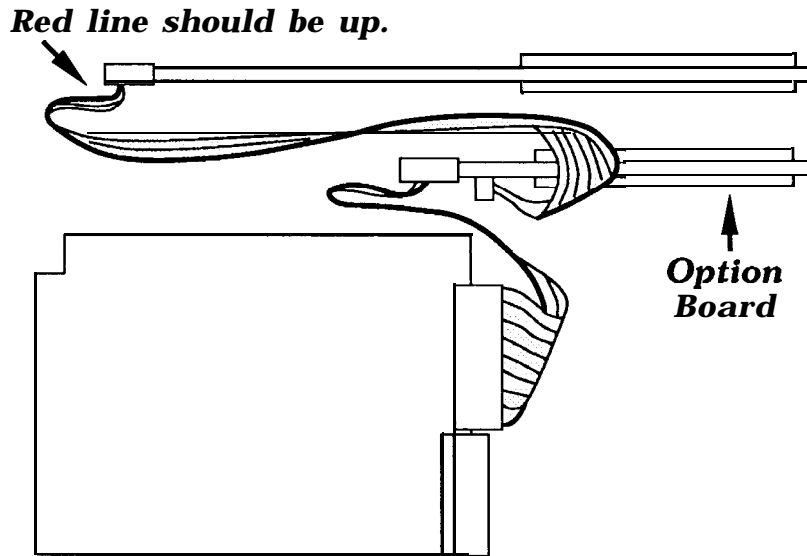
Figure 10
Folded Cable

When you are done, double check the connections. The cable coming from the floppy disk drives should connect to the Edge connection on the Deluxe Option Board. The Deluxe Option Board's cable should connect to the floppy disk controller.

5. Find an empty slot to insert the Deluxe Option Board into (avoiding the slot closest to the power supply), and using your screwdriver, remove the small screw at the top of the bracket. Be careful not to drop the screw into the computer.

6. Remove the blank metal bracket from the chassis of the PC behind the empty slot.

7. Insert the Deluxe Option Board into the slot.

8. Screw the Deluxe Option Board into the chassis using the screw you removed from the blank bracket.

    Double check that all the boards are firmly seated into their expansion slots. If they are not, you could damage them or the PC when it is turned on.

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Putting the Computer Back Together

The cover is replaced in the reverse order from which it was removed.

1. Gently slip the cover back over the lower chassis grooves and slide it back towards the rear panel. It should fit comfortably around the chassis with the cover just overhanging the rear panel. You can use the screwdriver to insert and tighten the back-panel screws removed in the beginning.

2. Reconnect the monitor and keyboard cables.

The Deluxe Option Board is now installed in your system. And your computer can now use the extra capability of the TC software that is included with the Deluxe Option Board.

Double check that everything has been correctly installed by turning on your computer and verifying that it functions normally. Try formatting a blank disk and doing a disk copy of the Deluxe Option Board software to make sure the board isn't inhibiting regular DOS functions. Your computer should operate no differently than it did before the Deluxe Option Board was installed.

If it doesn't, quickly turn off the power! Remove the cover, and verify that all the cables are installed correctly, and that the boards are seated tightly into their expansion slots. If everything looks OK, but you still can't get your computer to work, see the "Trouble Shooting" chapter for suggestions.

Installing the Deluxe Option Board: PIN Connector

Below is an overview of the PIN style connector installation:

1. Remove the cable from the J2 PIN connector on the Deluxe Option Board. Note: The third pin in the left row of the Deluxe Option Board is missing by design.
2. Connect the EDGE connector end of the cable to the gold-edged connection on the Deluxe Option Board.
3. Switch the jumpers to the AT/Compaq position.
4. Disconnect the cable from the floppy disk controller, noting the position of the cable's red indicator line. (You've probably already done this when determining the type of connector you have.)
5. Plug the floppy disk controller cable into the PIN (J2) connection on the Deluxe Option Board with the colored line up.
6. Plug the Deluxe Option Board cable into the floppy disk controller.
7. Insert the board in an empty slot, but not slot number 1.

For location purposes, let's call the slot nearest the power supply slot #l, and the slot nearest the left side of the PC slot #8.

Depending upon the setup of your AT type system, these slots may already be occupied by other expansion boards. Whatever else you've got working in your PC, in all probability, at least two of these slots are taken up with a video display card, which sends information to your monitor, and a disk controller card, which controls the operation of the IBM's floppy disk and hard disk drives.

The Deluxe Option Board can be installed into any one of these expansion slots, as long as the drive cables can reach the Deluxe Option Board and the Deluxe Option Board cable can reach the floppy disk controller card.

1. Remove the Deluxe Option Board from its box.

    The Deluxe Option Board is shipped to you with its cable connected to the J2 PIN connectors near the end of the board. The opposite end of the cable has an EDGE connector that will fit on the gold-edged connector of the Deluxe Option Board. Figure 11 illustrates how the Deluxe Option Board is shipped to you.

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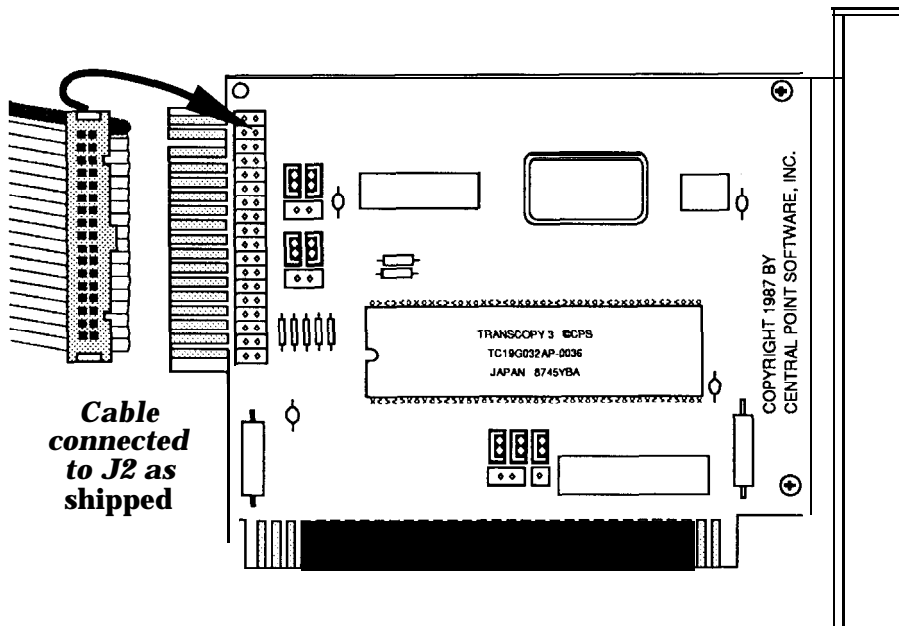
Figure 11
Deluxe Option Board as Shipped

2. Remove the cable that came with the Deluxe Option Board from the PIN connector labeled J2. (Please note that the third pin in the left row on J2 is missing by design.)

3. Slip the EDGE connector of the Deluxe Option Board cable onto the edge connection of the Deluxe Option Board. The red line on the edge of the cable needs to be in the UP position.

    Adjacent to the J2 PIN connector, you should see two sets of two small jumpers labeled "PC/XT" at one end and "AT/Compaq" at the other. This jumper block has several pins and plastic jumpers, each one connecting a middle pin and end pin. The Deluxe Option Board is currently configured for the EDGE style connection, you need to configure it now for the PIN style connector.

4. To configure it for your AT style computer, carefully remove each of the plastic jumpers one at a time and connect them to the middle and end pins

closest to the AT/Compaq lettering on the board. See the enlarged diagram below:

Figure **12**
PIN Style Jumper Block Position

When you're done, the Deluxe Option Board will look like Figure 13:
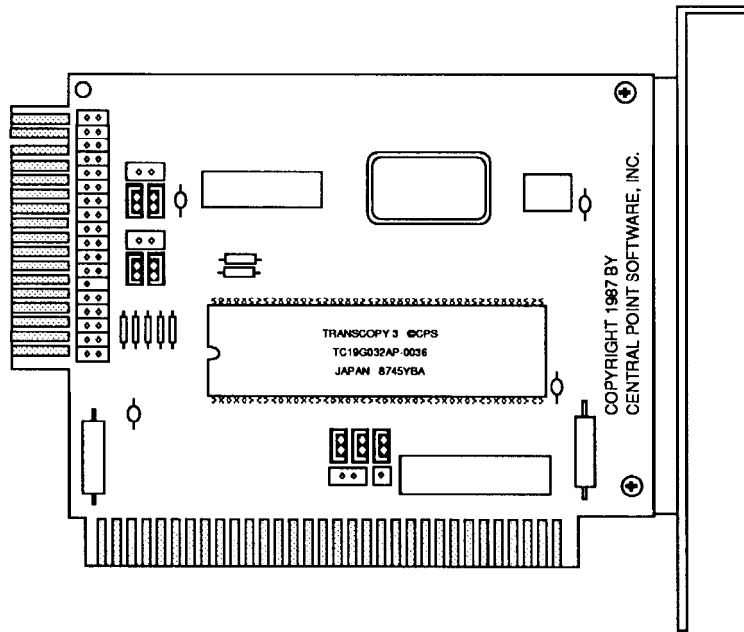
Figure 13
PIN Style Jumper Block Configuration

Important: *Even* if *your computer is labeled as an XT, if you have a PIN style floppy disk controller, you need to set these jumper blocks to the AT/Compaq position.*

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5. Disconnect the cable coming from the floppy disk controller, noting the
   position of the cable's colored indicator line. (You've probably already
   removed the floppy drive cable when determining the type of connector you
   have.)

6. Plug the floppy disk controller cable into the J2 PIN connector on the Deluxe
   Option Board with the colored edge in the UP position.

7. Plug the Deluxe Option Board cable (the cable leaving the EDGE connector
   end of the Deluxe Option Board) into the disk controller board (which is
   where the floppy disk drive cable used to connect). The red line on the cable
   should be positioned the same way the original cable was connected to the
   disk controller board (generally up).
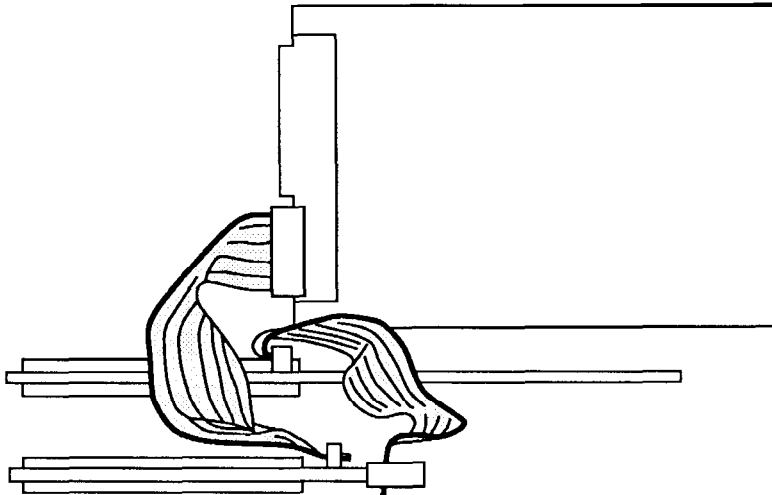
Figure 14
PIN Connection Cable Configuration

8. Double check the connections. The cable coming from the floppy disk drives
   should connect to the Deluxe Option Board J2 PIN connector, and the Deluxe
   Option Board's cable should connect to the floppy disk controller.

9. Find an empty slot, other than slot #1, to insert the Deluxe Option Board into,
   and using your screwdriver, remove the small screw at the top of the
   bracket. Be careful not to drop the screw into the computer.

10. Remove the blank metal bracket from the chassis of the PC behind the empty
    slot.

11. Insert the Deluxe Option Board into the slot.

12. Screw the Deluxe Option Board into the chassis. Make sure that all the boards are firmly seated into their expansion slots, if they are not, you could damage them or the PC when it is turned on.

13. Reinstall the cover on the computer and connect the power cord and any printer, modem, or other cables you disconnected to install the Deluxe Option Board.

The Deluxe Option Board is now installed in your system, and you can now use the extra capability of the TC software that is included with the Deluxe Option Board.

Double check that everything has been correctly installed by turning on your computer and verifying that it functions normally. Try formatting a blank disk and doing a disk copy of the Deluxe Option Board software to make sure the board isn't inhibiting regular DOS functions. Your computer should operate no differently than it did before the Deluxe Option Board was installed.

If it doesn't, quickly turn off the power! Remove the cover, and verify that all the cables are installed correctly and that the boards are seated tight into their expansion slots. If everything looks OK, but you still can't get your computer to work, see the "Trouble Shooting" chapter in this manual.

Installing the Deluxe Option Board: Motherboard Connection

Below is an overview of installation into the connector on the motherboard:

1. Remove the cable from the J2 PIN connector on the Deluxe Option Board.
2. Connect the EDGE connector end of the cable to the edge connection on the Deluxe Option Board.
3. Switch the jumper blocks to the AT/Compaq position.
4. Plug the floppy disk controller cable into the PIN connector on the option board.
5. Plug the Deluxe Option Board cable into the floppy disk controller on the motherboard.
6. Insert the board in an empty slot.

For location purposes, let's call the slot nearest the power supply slot #l, and the slot nearest the left side of the PC slot #8.

Depending upon the setup of your system, these slots may already be occupied by other expansion boards. Whatever else you've got working in your PC, in all probability, at least two of these slots are taken up with a video display card, which sends information to your monitor, and a disk controller card, which controls the operation of the PC's floppy disk and hard disk drives.

The Deluxe Option Board can be installed into any one of these expansion slots, as long as the drive cables can reach the Deluxe Option Board and the Deluxe Option Board cable can reach the floppy disk controller on your motherboard.

1. Remove the Deluxe Option Board from its box.

    The Deluxe Option Board is shipped to you with its cable connected to the J2 PIN connectors near the end of the board. The opposite end of the cable has an EDGE connector that will fit on the edge connection of the Deluxe Option Board. Figure 15 below illustrates how the Deluxe Option Board is shipped to you.
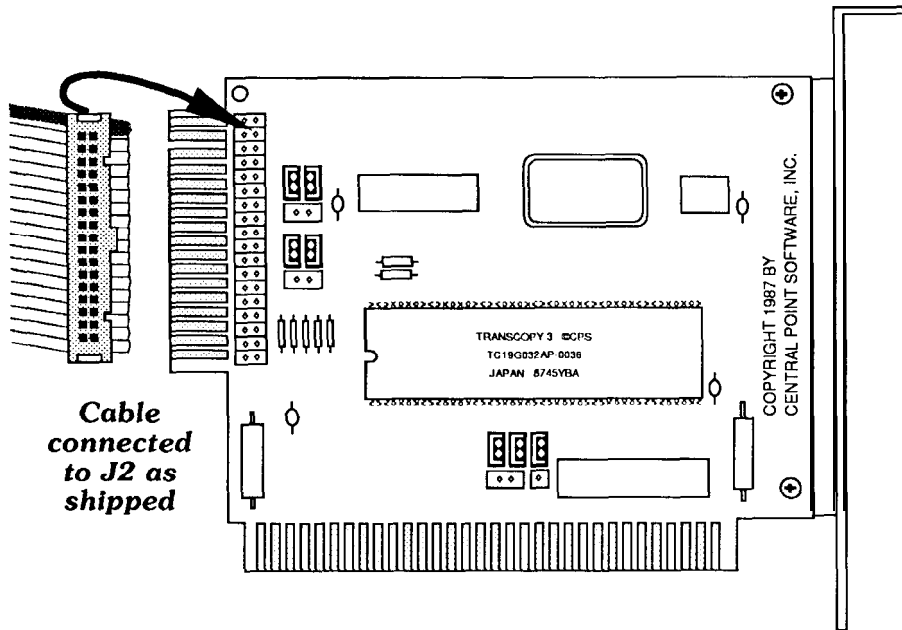
Figure 15
Deluxe Option Board as Shipped

2. Remove the cable that came with the Deluxe Option Board from the PIN
connector labeled J2. (Note that the third pin on the left row is missing by
design.)

3. Slip the EDGE connector of the Deluxe Option Board cable onto the gold
edged connection on the board. The red line on the edge of the cable needs
to be in the UP position.

Adjacent to the J2 PIN connector, you should see two sets of two
small jumper blocks labeled "PC/XT" at one end and "AT/Compaq"
at the other (see the enlarged diagram below). This jumper block has
several pins and plastic jumpers, each one connecting a middle pin
and end pin. The Deluxe Option Board is currently configured for
the EDGE style connection, you need to configure it now for the PIN
style connector.

4. Carefully remove each of the plastic jumpers one at a time and connect them
to the middle and end pins closest to the AT/Compaq lettering on the board.
See the enlarged diagram below:

Figure 16
PIN Style Jumper Block Position

When you're done, the Deluxe Option Board will look like Figure 17:
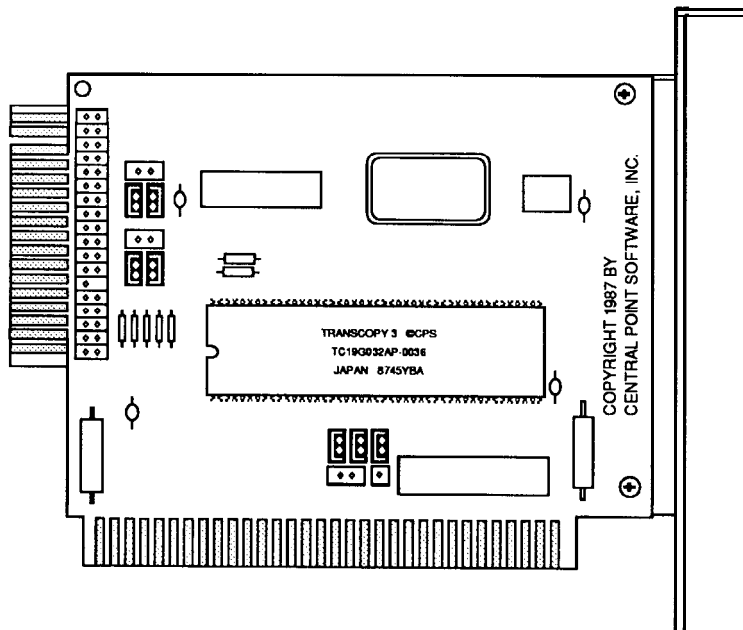
Figure 17
PIN Style Jumper Configuration

Important: *Even if your computer is labeled as an XT,* **if you have a** *PIN style connector on the motherboard, you need to set these jumpers to the AT/Compaq position.*

5. Disconnect the floppy drive cable from the motherboard and plug it into the J2 PIN connector on the Deluxe Option Board, duplicating how the original cable was connected, or generally with the colored edge up. (You've probably already removed the floppy drive cable when determining the type of connector you have.)

6. Plug the cable that leaves the edge connector end of the Deluxe Option Board into the motherboard (which is where the floppy disk drive cable used to connect). The red line on the cable should be up, towards the top of the motherboard.

7. Double check the connections. The cable coming from the floppy disk drives should connect to the Deluxe Option Board, and the Deluxe Option Board's cable should connect to the motherboard.

8. Find an empty slot to insert the Deluxe Option Board into, and using your screwdriver, remove the small screw at the top of the bracket. Be careful not to drop the screw into the computer.

9. Remove the blank metal bracket from the chassis of the PC behind the empty slot.

10. Insert the Deluxe Option Board into the slot.

11. Screw the Deluxe Option Board into the chassis. Make sure that all the boards are firmly seated into their expansion slots, if they are not, you could damage them or the PC when it is turned on.

12. Re-install the cover on the computer and connect the power cord and any printer, modem, or other cables you disconnected to install the Deluxe Option Board.

The Deluxe Option Board is now installed in your system, and you can now use the extra capability of the TC software that is included with the Deluxe Option Board.

Double check that everything has been correctly installed by turning on your computer and verifying that it functions normally. Try formatting a blank disk and doing a disk copy of the Deluxe Option Board software to make sure the board isn't inhibiting regular DOS functions. Your computer should operate no differently than it did before the Deluxe Option Board was installed.

If it doesn't, quickly turn off the power! Remove the cover, and verify that all the cables are installed correctly and that the boards are seated tight into their expansion slots. If everything looks OK, but you still can't get your computer to work, see the "Trouble Shooting" chapter.

Installation: IBM PS/2 Model 30

Note: The jumper blocks on the Deluxe Option Board remain at the PC/XT and DMA 1 positions.

1. Follow the procedure in the Model 30 operating manual to remove the cover of the PC.

2. Remove the cable from the back of the internal floppy drive(s) and disconnect it from the motherboard of the Model 30.

3. Using the following diagrams as a guide, connect the Deluxe Option Board cable to the back of the internal floppy drive(s) and to the motherboard of the Model 30.
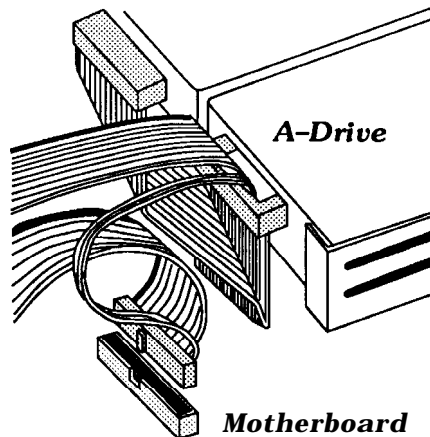
Figure 18
Cable Connected to Model 30 Floppy Drives

4. Connect the two remaining ends to the J2 and edge connectors on the Deluxe Option Board as shown, making sure the red line on the cable goes to the right (towards the outside of the computer).

   Note: The cable shown in Figure 19 is included with the Deluxe Option Board only when ordering specifically for the PS/2 Models 25 and 30.

To Option Board
Edge Connector

To A-Drive
(internal)

To **B-Drive**
(internal)
(3 1/2" drive only
−not hard disk)

To Motherboard

To Option Board
J2 Connector

Figure 19
PS/2 Model 25 and 30 Cable

Note: If you have an IBM 5.25" external drive and an external drive adapter card,
follow the connections illustrated in Figure 20:

To Option Board
Edge Connector

To A–Drive
(internal)

To B-Drive
(external)
This connector
hookup to the
external drive adapter

To Motherboard

To Option Board
J2 Connector

Figure 20
PS/2 Model 25 and 30 Cable connected to External drive

5. Insert the Deluxe Option Board into any one of the three slots in the Model 30.

6. Double check the connections. The cable coming from the floppy disk drives should connect to the Deluxe Option Board, and the Deluxe Option Board's cable should connect to the floppy disk controller on the motherboard.
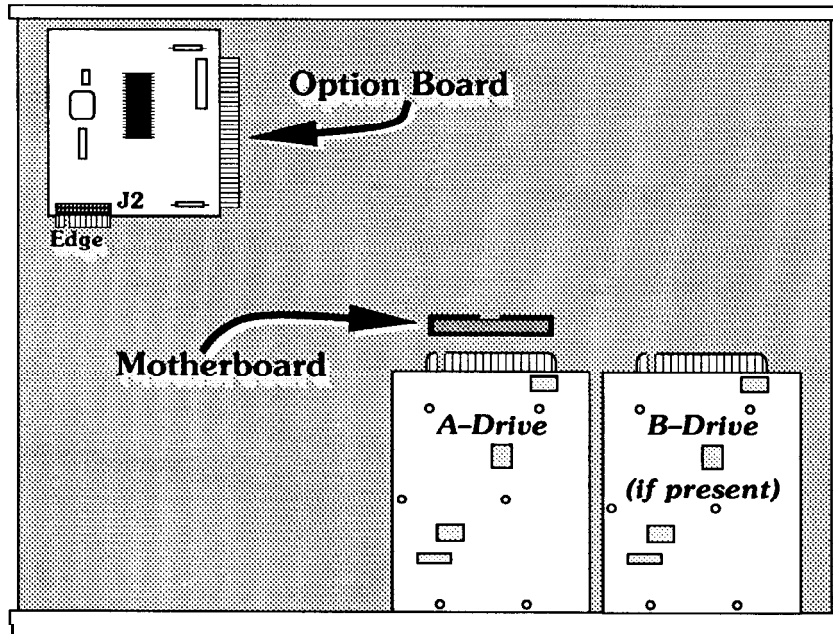
Figure 21
Deluxe Option Board Connected to Model 30

7. Make sure that all the boards are firmly seated into their expansion slots, if they are not, you could damage them or the PC when it is turned on.

8. Re-install the cover on the IBM Model 30 and connect the power cord and any printer, modem, or other cables you disconnected to install the Deluxe Option Board.

The Deluxe Option Board is now installed in your system, and you can now use the extra capability of the TC software that is included with the Deluxe Option Board.

Double check that everything has been correctly installed by turning on your computer and verifying that it functions normally. Try formatting a blank disk and doing a disk copy of the Deluxe Option Board software to make sure the board isn't

inhibiting regular DOS functions. Your computer should operate no differently than it did before the Deluxe Option Board was installed.

Note: If the drive spins all the time when you turn on the machine, reverse the cable connecting to the J2 PIN connector on the Deluxe Option Board.

Installation: IBM PS/2 Model 25

Note: Because we provide a universal cable for the PS/2 Models 25 and 30, installing the Deluxe Option Board in the Model 25 will reassign the floppy drives. Drive A will be recognized as drive B, and drive B will be recognized as drive A. Other than this change, operation of your computer will not be affected.

The jumper blocks on the Deluxe Option Board remain at the PC/XT and DMA 1 positions.

1. Follow the procedure in the Model 25 operating manual to remove the cover and "tilt mechanism" of the PS/2.
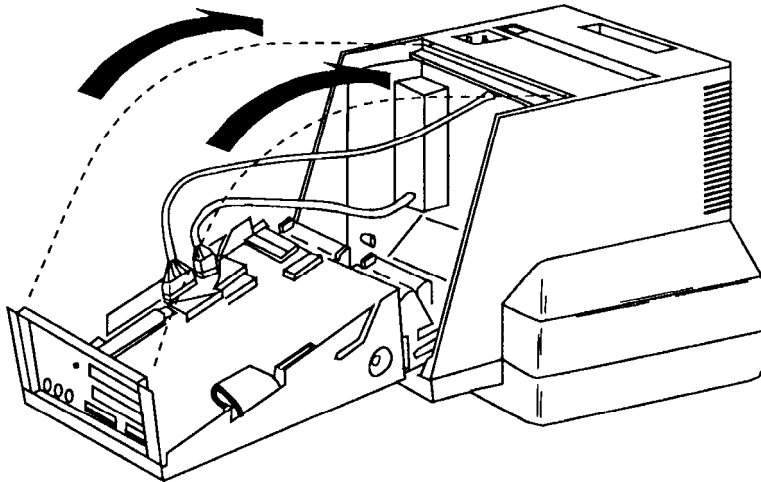
Figure 22
Cover Removal of PS/2 Model 25

2. Remove the cable from the back of the internal floppy drive(s) and disconnect it from the motherboard.
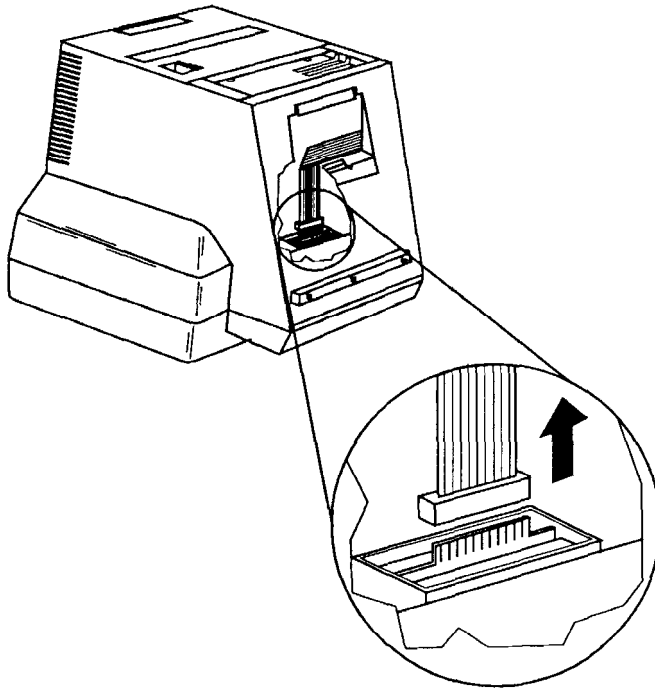
Figure 23
Cable Removal of Internal Floppy Drive

3. Connect the Deluxe Option Board cable to the back of the internal floppy drive(s).

4. Route the Deluxe Option Board cable up through the small opening on the right and make the connection to the motherboard. (See Figure 24)
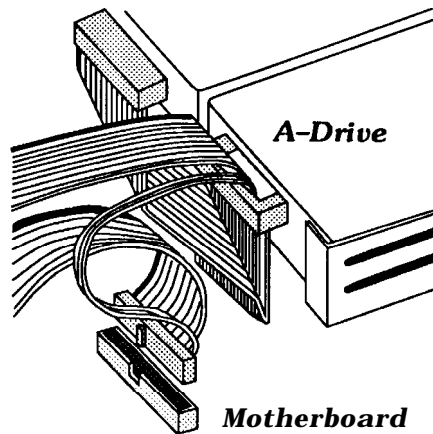
Figure 24
Cable Connection on Model 25

5. Connect the two remaining ends to J2 and the EDGE connector as shown, with the red line on the cable to the right (to the outside of the computer).

    (Note: The following cable is included with the Deluxe Option Board only when ordered specifically for the PS/2 Models 25 and 30.)
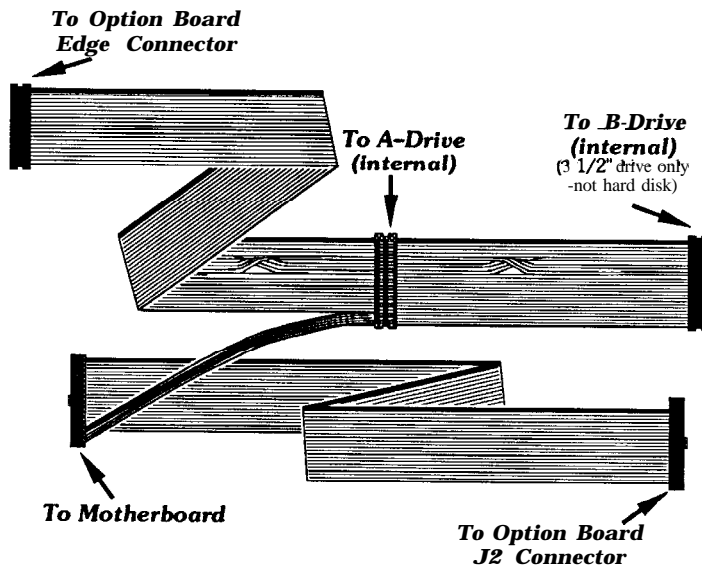
Figure 25
PS/2 Model 25 and 30 Cable

Note: If you have an IBM 5.25" external drive and an external drive adapter card, follow the connections illustrated in Figure 26:
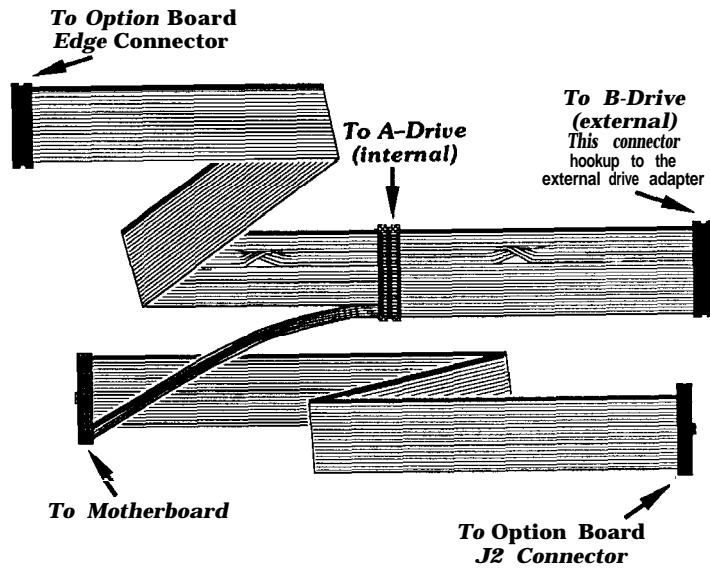
Figure 26
PS/2 Model 25 and 30 Cable connected to External drive

6.   Insert the Deluxe Option Board into one of the two slots in the Model 25.
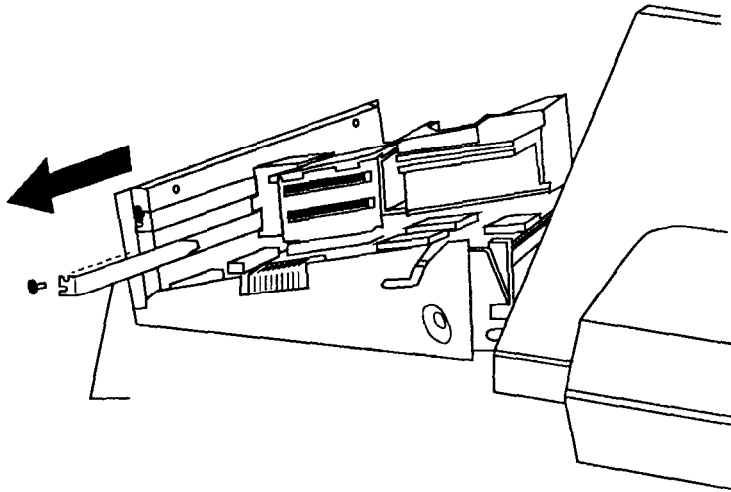
Figure 27
Model 25 Slots

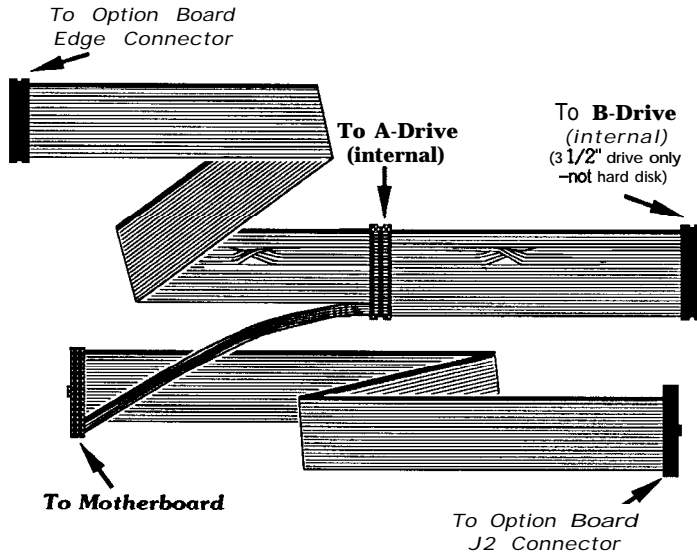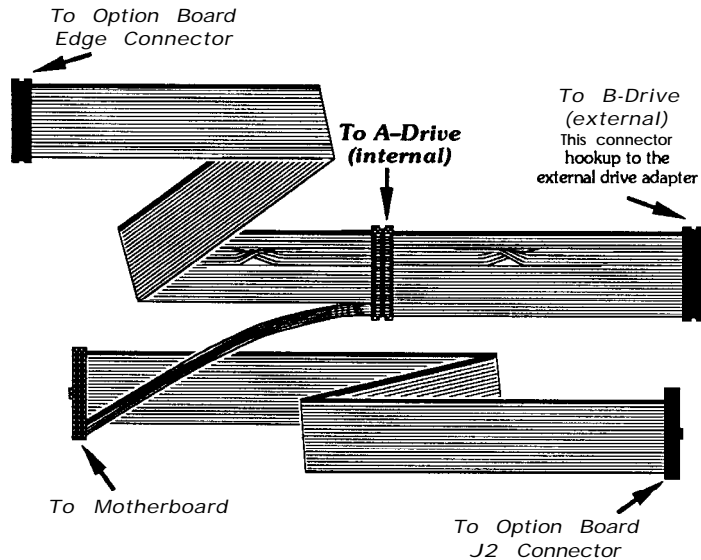*7.* Double check the connections. The cable coming from the floppy disk drives should connect to the Deluxe Option Board, and the Deluxe Option Board's cable should connect to the floppy disk controller on the motherboard.

8. Make sure that all the boards are firmly seated into their expansion slots, if they are not, you could damage them or the PC when it is turned on.

9. Re-install the cover on the IBM Model 30 and connect the power cord and any printer, modem, or other cables you disconnected to install the Deluxe Option Board.

The Deluxe Option Board is now installed in your system, and you can now use the extra capability of the TC software that is included with the Deluxe Option Board.

Double check that everything has been correctly installed by turning on your computer and verifying that it functions normally. Try formatting a blank disk and doing a disk copy of the Deluxe Option Board software to make sure the board isn't inhibiting regular DOS functions. Your computer should operate no differently than it did before the Deluxe Option Board was installed.

Note: If the drive spins all the time when you turn on the machine, reverse the cable connecting to the J2 PIN connector on the Deluxe Option Board.

Installation: Tandv 1000 Series

In order to install the Deluxe Option Board in the Tandy 1000, 1000A, and l000SX, you need to order the special Tandy cable from us ($15).

Note: The Tandy 1000 TX and TL may require a more involved installation procedure. Please contact our technical support staff for the most current information for installing the Deluxe Option Board in these two models.

1. Remove the Deluxe Option Board from its box.

    The Deluxe Option Board is shipped to you with its cable connected to the J2 PIN connectors near the end of the board. The opposite end of the cable has an EDGE connector that will fit on the gold edged connector of the Deluxe Option Board. Figure 27 below illustrates how the Deluxe Option Board is shipped to you. Please note that the third pin in the left row on J2 is missing by design.
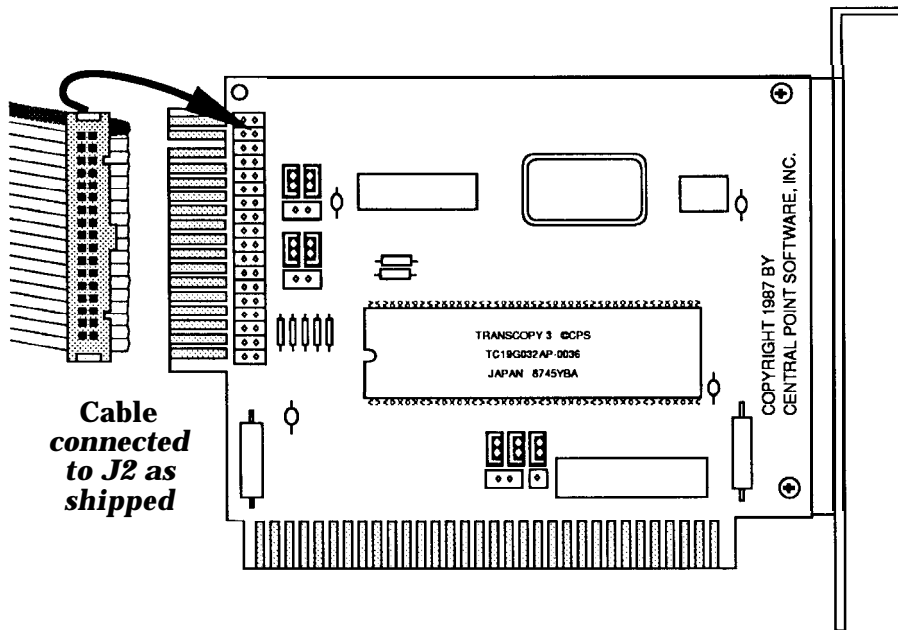
Figure 27
Deluxe Option Board as Shipped

2. Remove the the Deluxe Option Board cable from the PIN connector labeled J2-

3. Slip the EDGE connector of the Deluxe Option Board cable onto the EDGE connector on the board. The red line on the edge of the cable needs to be in the DOWN position.

   Adjacent to the J2 PIN connector, you should see two sets of two small jumper blocks labeled "PC/XT" at one end and "AT/Compaq" at the other. This jumper block has several pins and plastic jumpers, each one connecting a middle pin and end pin. The Deluxe Option Board needs to be reconfigured for the Tandy.

4. Carefully remove each of the plastic jumpers one at a time and connect them to the middle and end pins closest to the AT/Compaq lettering on the board (see the enlarged diagram below).

Figure 28
PIN Style Jumper Block Position

When you're done, the Deluxe Option Board will look like Figure 29.

TRANSCOPY 3 ©CPS
TC19G032AP-0035
JAPAN 8745YBA

COPYRIGHT 1987 BY
CENTRAL POINT SOFTWARE, INC.
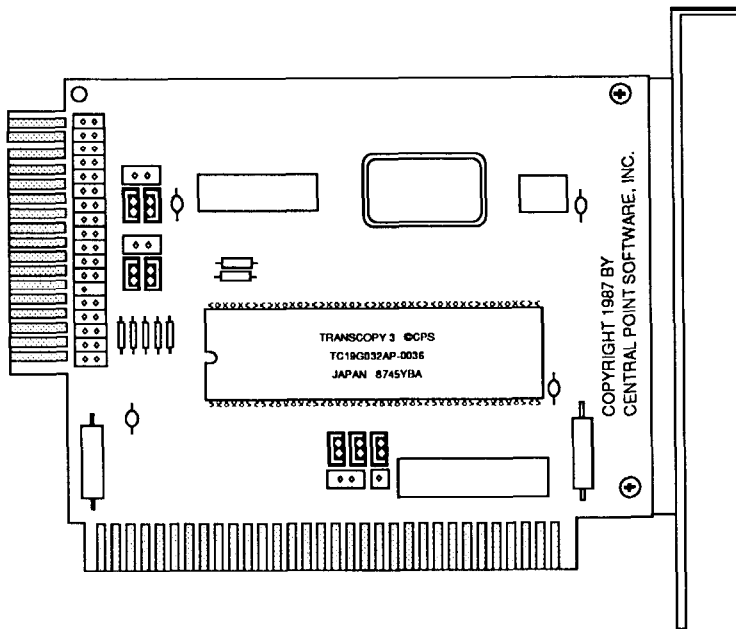
Figure 29
PIN Style Jumper Configuration

Important: *Even if your computer is a Tandy, if you have a PIN style floppy disk controller, you need to set these jumpers to the AT/Compaq position.*

5. Remove the cable connecting the floppy disk drives to the motherboard and set it aside. This cable is no longer needed.

6. Connect the EDGE connector on the Tandy cable to the back of the floppy drives with the red line facing right (towards the outside of the computer).

7. Connect the PIN connector of the Tandy cable to the Deluxe Option Board's J2 PlN connector with the red line in the DOWN position.

8. Connect the cable that leaves the EDGE connector end of the Deluxe Option Board into the PIN connection on the motherboard. The red line on the cable should be towards the right of the connector on the motherboard (towards the outside of the computer).
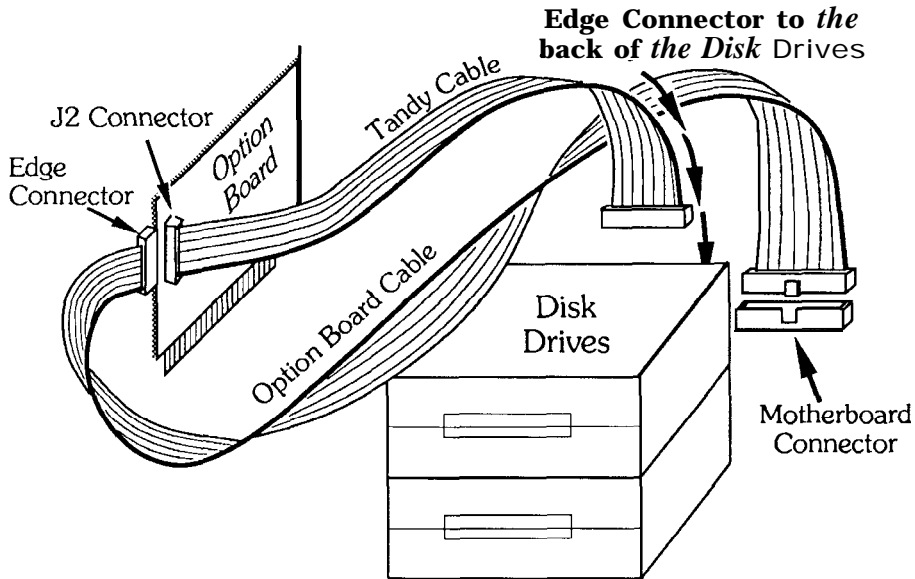
Figure 30
Tandy 1000 Cable Configuration

9. Double check the connections. The Tandy cable coming from the floppy disk drives should connect to the Deluxe Option Board, and the Deluxe Option Board's cable should connect to the floppy disk controller on the motherboard.

10. Find an empty slot to insert the Deluxe Option Board into, and using your screwdriver, remove the small screw at the top of the bracket. Be careful not to drop the screw into the computer.

11. Remove the blank metal bracket from the chassis of the PC behind the empty slot.

12. Insert the Deluxe Option Board into the slot.

13. Screw the Deluxe Option Board into the chassis. Make sure that all the boards are firmly seated into their expansion slots, if they are not, you could damage them or the PC when it is turned on.

14. Reinstall the cover on the computer and connect the power cord and any printer, modem, or other cables you disconnected to install the Deluxe Option Board.

The Deluxe Option Board is now installed in your system, and you can now use the extra capability of the TC software that is included with the Deluxe Option Board.

Double check that everything has been correctly installed by turning on your computer and verifying that it functions normally. Try formatting a blank disk and doing a disk copy of the Deluxe Option Board software to make sure the board isn't inhibiting regular DOS functions. Your computer should operate no differently than it did before the Deluxe Option Board was installed.

If it doesn't, quickly turn off the power! Remove the cover, and verify that all the cables are installed correctly and that the boards are seated tight into their expansion slots. If everything looks OK, but you still can't get your computer to work, see the "Trouble Shooting" chapter.

Installation: Other Computers

The Deluxe Option Board may be successfully installed into many other computers; just remember the following points:

- If the floppy disk controller has an "edge" style connector (it has gold-edged fingers that the cable plugs onto), then follow the cable routing and jumper block positions for the EDGE style connector.
- If the floppy disk controller has a "pin" style connector (a connector with a double row of metal pins), then follow the cable routing and jumper block positions for the PIN style connector.
- If the system does not have a floppy disk controller board but rather the floppy drives connect directly to the motherboard, then follow the cable routing and jumper block positions for the motherboard connection.

Note: The Deluxe Option Board does not work in the IBM PS/2 Model 50, 60, 70, and 80 or the Tandy 1000 EX or HX.

Below are notes on other computer models and the special installation instructions needed for them:

Compaq Portable

If you wish to install the Deluxe Option Board into a Compaq portable, you need to order a special cable from us. Please specify the computer when ordering.

HP Vectra

The HP Vectra has been tested by Hewlett Packard. They tell us that you need to watch carefully how you remove the cables since the red line isn't always toward the top as it is in other computers. Also, you will need the Compaq portable cable because the existing cables are not quite long enough.

Zenith 150 and Sperry IT

The Zenith 150 and Sperry IT computers may require you to break off a pin on the J2 connector of the Deluxe Option Board. It is fine to do this, as all the pins on the left side of this connector are unused. (One is broken off already as needed by the AT style computers.)

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Installing the Software to a Hard Disk

While the Deluxe Option Board software can be used with a floppy disk system, it operates more efficiently if you transfer the software to your hard disk. By doing so, you will not need to keep your floppy disk handy every time you want to back up a program or transfer files to or from a Macintosh disk.

Deluxe Option Board Files

The disk supplied with the Deluxe Option Board contains the following files:

TC.EXE: Provides the Deluxe Option Board with the latest copying capabilities as well as the ability to buffer to a hard disk on single drive systems.

TCM.EXE: Used to make copies of unprotected disk formats (such as Macintosh, Atari, 1.2 MB etc.). TCM indicates if the target disk is good or bad, and if enough memory is available, the master disk will be read once and duplicated from memory.

TCS.EXE: Has all the features of TC except the ability to buffer to the hard disk. Because TCS does not buffer, it is not as prone to interference with memory resident software.

TE.EXE: Track Editor – Displays the data on any track in both HEX and ASCII. Modifications to that data can then be made. TE is provided for those who already understand how such an editor might be used. It is provided on an "as-is" basis and because of its highly technical nature, technical support is not available.

MCP.EXE: Transfers data into and out of Macintosh format.

GW.HLP: Help file.

OBSETUP: Setup program.

The Deluxe Option Board disk is not self-booting. You can copy the files on the Deluxe Option Board disk to any other disk or hard disk that is convenient for you.

The Deluxe Option Board, however, must be installed in the computer when you use TC. The Deluxe Option Board does not need to be in the computer that runs the copy, only in the computer that makes the copy.

The Deluxe Option Board disk also contains a number of batch files that will execute MCP for you. The commands are almost exactly like their DOS counterparts you're already used to, except there is an "M" in front of each one. Here's a list of these batch files:

MDIR	Displays all the files in the current folder
MTREE	Displays all the folders on a disk
MTYI'E	Lists a file to the screen
MCOI'Y	Transfers files between IBM and Macintosh disks
MFORMAT	Formats a Macintosh disk
MCD	Changes the current folder
MDC	Copies a Macintosh disk
MDEL	Deletes files from a Macintosh disk
MMD	Creates a new folder
MRD	Removes a folder

Using OBSETUP

OBSETUP automatically creates a subdirectory on your hard disk called OBTOOLS and transfers all the Option Board files to it. OBSETUP also modifies your DOS PATH statement so the Option Board programs can be found no matter what directory you are presently in.

To install the Deluxe Option Board software on your hard disk, perform the following:

1. Turn on the computer.
2. Enter the date and time if DOS prompts for them.
3. Put the Deluxe Option Board disk in a floppy disk drive.
4. Type A: (or the name of your floppy drive) and press Enter.
5. Type OBSETUP and press Enter.
   Follow the instructions on the screen. Once the OBSETUP program is complete, reboot your computer. Your are ready to begin using all of the Deluxe Option Board features.

Transferring Macintosh Files

Overview

The Deluxe Option Board allows you to transfer data files between an Apple Macintosh and a PC or PS/2. File transfers, however, do not provide the ability to run Macintosh programs on a PC system.

In order to use this feature, all you need is an internal 3.5 inch disk drive in your PC or PS/2. The Deluxe Option Board will transform your IBM 720K or 1.44M 3.5" drive into a dual-purpose IBM/Macintosh drive.

Understanding File Transfers

MCI' enables you to transfer files between the Macintosh and IBM versions of popular programs such as Microsoft Word, PageMaker, dBase Macintosh, Microsoft Excel, and Lotus l-2-3. For example, many word processing programs support a standard file exchange protocol called DCA. By saving a document in DCA format, you can load it into a different program with minimal disruption of formatting information.

However, most file transfers do not transfer all information between computer types. For example, when saving a Microsoft Word document on the Macintosh in MS-DOS format, style sheet information is lost. Therefore, if you edit the document on the PC, then take it back to the Macintosh, you may have to re-enter some formatting information.

These limitations occur regardless of whether the file was translated by MCI', a network, or any other means. In other words, "successful" transfers may not work the way you expect because of the application, not MCP. Fortunately, most software publishers are working to remove these limitations, so as new releases are made available, these problems should disappear.

MCP

The MCP program supplied on your Deluxe Option Board disk accomplishes this file exchange. MCI' stands for "Macintosh Control Program," which describes what it does: MCI' controls the flow of information into and out of Macintosh format.

Whenever you wish to transfer an IBM file to the Macintosh or from the Macintosh to the IBM, you will use MCI'. If you are copying standard IBM files, you will continue to use the standard DOS commands. To make matters easy, MCI' uses a series of small batch files which makes the command format almost identical to DOS.

MCI' supports two Macintosh data formats: 400K (MFS) and 800K (HFS). The 1.44 megabyte high density disk format is not supported. MFS disks are the older, single-sided format (they hold half as much data). HFS disks are the newer, "Hierarchical" format that uses both sides of a disk and have sub-folders which are very much like the PC's subdirectories.

You don't need to worry which type of Macintosh disk you are using — MCP will determine which type of disk is in the drive before transferring any data.

F ile **Formats**

Important: Before you use MCP to transfer files between Macintosh and IBM versions, consult your software manual or contact the software publisher for their recommended method of saving and loading documents created by different software and to determine any limitations in these transfers.

Some of the common data-exchange formats for importing and exporting files are listed below:

DCA (Document Content Architecture)
DCA is a format used by many word processing programs. The advantages of this format are that it is supported by many IBM PC programs and word processors as well as MacLink Plus and Apple File Exchange. However, when exporting or importing files between the two computers, font, style, and size information is lost.

RTF (Rich-Text Format)
RTF is Microsoft Word's internal format. It retains most formatting information, such as font, styles and sizes, and it is also supported by both IBM and Macintosh versions of PageMaker. It is not, however, supported by most other Macintosh word processors.

TIFF (Tag-based Interchange File Format)
   The TIFF format is used by many graphics programs to handle bitmapped objects
   and scanned art. It is supported by many IBM PC and Macintosh scanners, but
   the files can be large and take a long time to load.

PICT
   The PICT file format is an object-oriented graphics file format (often called
   "Draw") that is supported by the IBM PC version of PageMaker, but very few
   other IBM PC programs.

EPSF (Encapsulated PostScript)
   EPSF (ESP on the Macintosh) is a device-independent graphics format based on
   the PostScript language. Adobe Illustrator, PageMaker, and numerous other
   applications support it.

DIF (Data Interchange Format)
   The DIF format is used by many spreadsheet and database applications, but cell
   formatting and column widths are lost in file transfers.

SYLK (Symbolic Link)
   SYLK is also used by spreadsheet and database applications and retains some
   formatting information such as commas, column widths, and cell alignment, but
   loses font, style and size information in a file transfer.

ASCII (or Text Only)
   All personal computers use the ASCII character set and can exchange basic
   formatting (tabs and carriage returns). Some applications (like Microsoft Word
   on the Macintosh) allow you to save files as Text Only or Text Only with Line
   breaks. The format you choose depends upon the target program's required
   format.

Macintosh and IBM File Names

Before you start using MCI', you should be familiar with the difference between
Macintosh and IBM DOS file naming conventions. On an IBM PC, file names can be
from 1 to 8 characters with an optional 3 character extension. Macintosh names can
be much longer, but no extensions are required. Furthermore, Macintosh file names
can use upper and lower case letters (DOS takes either and converts them to upper
case) and can contain many characters that are not valid in DOS file names, such as
periods and spaces.

What this means is that MCI' has to translate the names of files as well as the data in many cases. For instance, if you wanted to copy your Macintosh data file called "My Financial Data for 1988" to a PC disk, MCP would do two things for you:

- Shorten the name to 11 characters (8 plus 3).
. Convert invalid characters (spaces to underlines, periods to exclamation points, etc.)

To make things easier, MCP will do part of the file name translation for you when you do a directory of a Macintosh disk. (MCP doesn't actually change the name on the disk – it just shows the name on the screen with the invalid characters changed to exclamation marks and spaces changed to underline characters.)

In the above example, the "My Financial Data for 1988" file would be displayed as "My_Financial_Data_for_l988" by MCI'.

If you copy this file to an IBM disk, you have two options: let MCI' automatically shorten the name for you, or enter a new name yourself. If you let MCI' come up with a new name, it will take the first 8 characters and put them into the file name and take the last 3 characters and put them into the file extension. The file, "My Financial Data for 1988," would appear on your IBM directory as MY_FINAC.988. Note that if the Macintosh file name was less than 11 characters, no changes would be made in the file name.

Since all IBM file names are valid Macintosh names, no translation is done when copying from IBM to Macintosh.

Using MCP

Your Deluxe Option Board software disk includes the main MCP.EXE program plus several batch files that will execute MCI' for you. The commands are almost exactly like their DOS counterparts, except there is an "M" in front of each one. Here's a list of the batch files:

MCOPY	Transfers files between IBM and Macintosh disks
MDIR	Displays all files in the current folder
MTREE	Displays all folders on a disk
MTYPE	Lists a file to the screen
MFORMAT	Formats a Macintosh disk
MCD	Changes the "current" folder
MDC	Copies a Macintosh disk
MDEL	Deletes files from a Macintosh disk
MMD	Creates a new folder
MRD	Removes a folder

A folder is the Macintosh term for a subdirectory.

Note: When using any of the following commands, syntax is very important. Incorrectly inserting a space or misspelling a file name may produce the error message, "Mac disk not found." If you receive the "Mac disk not found" error message please verify that your command, file name and any parameter entries are correct.

The following section describes each command in detail.

MCOPY (Macintosh to IBM File Transfer)

MCOPY is the command used to transfer files to and from Macintosh disks. It works very similar to the DOS COPY command. However, it is important to understand that there are three levels of translation that can be used in transferring files between Macintoshes and PCs. Each level of translation has its purpose because data is stored on a Macintosh disk differently than on an IBM disk.

Macintosh files consist of two parts and thus can have two sizes. These "parts" are known as a data fork and a resource fork. Most data files (as opposed to program files) put the data in the data fork, as you might guess. However, quite often, additional information is put into the resource fork as well. If a file has information in the resource fork, you will see a number greater than 0 in parenthesis next to the file size when you do a directory of the disk.

The use of the data and resource forks in terms of file translations is explained below.

Important: The MCOPY command does not do any verification of the files it writes. If you want to verify files, you need to turn on the DOS Verify flag first. Type VERIFY ON at the DOS prompt before running MCOPY.

Binary

This is the standard type of transfer. When MCOPY does a binary file transfer, it does no translation. The file is copied straight across. Only the data in the data fork is copied. This method is most useful when copying between Macintosh and IBM versions *of the same program.* In this case, the program (such as Microsoft Word, or PageMaker) does the translation between the two type of files, so MCOPY doesn't need to do any. Where it can be used, this is the most effective type of file transfer as the maximum amount of information (such as text formatting) is retained.

Text

Text translations are used when you wish to transfer files between different programs, and these programs do not understand each other's file formats. (Note

that many programs offer a universal file format. You should use text file transfers only as a last resort when the Macintosh program and the IBM program have no file formats in common.) In this type of file transfer, MCOPY makes some minor changes in the file to make the file conform to the standards for the target computer. For example, if you are transferring a word processing document from a Macintosh disk to your PC in text mode, MCOPY will add line feed characters after all carriage return characters it finds in the Macintosh file. This is done as Macintosh documents do not store the line feed characters needed by PC DOS to display the file properly. As with binary file transfers, only the data in the data fork is transferred.

Unaty

This file conversion method is usually referred to as MacBinary and is only used when you want to transfer a program from a Macintosh disk to a PC disk that can later be copied back to a Macintosh and run. The term "unary" comes from the fact that both the data and resource forks of the Macintosh file are copied into a single (unary) file format. This is a special Macintosh file type with a 128 byte header followed by the data and resource forks. When copied back to the Macintosh disk by MCOPY, the Macintosh file will be returned to its normal state, with the proper data put back into the data and resource forks. This translation is generally only used to transfer files via modem or a network where you have PCs and Macintoshes.

Saving Word Processor Files

Note: These guidelines can also be applied to other types of programs (database, spreadsheet, graphics, desktop publishing, etc.) that have both Macintosh and IBM versions of the program. However, you must consult the software owner's manuals to see which universal file format is recommended.

Transferring Word Processor files between the Macintosh and PC without losing formatting information often requires saving the original file to be transferred in the right format.

You can use any word processor on either the PC or the Macintosh. The amount of formatting information (such a fonts, paragraphing, tabs, style sheet, etc.) you can transfer between the PC and Macintosh will depend upon the File Save options your word processor supports. As a rule of thumb, choose the first File Save option your program offers from this list:

- Select the name of the Macintosh program (if you are on a PC) or the PC program (if you are on a Macintosh). For example, if the word processor you are using has both a Macintosh and a PC version, it might present you with the name of the other version as a File Save type. When using MCP to transfer the file to or from Macintosh format, use the BINARY transfer method.

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• Select the MS-DOS option if you are running on a Macintosh or the Macintosh option if you are running on a PC. Many programs (such as Microsoft Word on the Macintosh) offer an MS-DOS file format. This is their way of translating the file to the PC version of their program. In this case, Microsoft Word will save the Macintosh document in the IBM Word file format. When using MCP to transfer the file to or from Macintosh format, use the BINARY transfer method.

• Select the DCA option from either the Macintosh or PC program. This format retains some of the file formatting. Consult your word processor's manual for more information. When using MCI' to transfer the file to or from Macintosh format, use the BINARY transfer method.

• Select the TEXT or ASCII File Save option. If this is the only option that is available, you will be able to transfer your text, but you will lose most of the file formatting. When using MCP to transfer the file to or from Macintosh format, USC the TEXT transfer method.

Transferring Files

Once the file has been saved in the correct format, here is a general rule of thumb for selecting which transfer method to use with MCI':

• If the file is to be used on the PC, and it contains formatting information (such as a word processing document), and the file was saved in the target computer's format or DCA, select the BINARY transfer method with MCOPY. This is the default method, and you don't need to do anything extra.

• If the file is to be used on the PC, and it does not contain formatting information, or the program that created the data file does not support DCA or the target computer's format, select the TEXT transfer method with MCOPY (add a /T to the command line). This is useful for program source files (Pascal, C, Basic, dBase, etc.) and data files from simple text editors.

• If the file is to be stored (not used) on the PC, and it will be used only on a Macintosh, select the UNARY transfer method with MCOPY (add a /U to the command line). This is useful for Macintosh programs and data files that are being transferred to a PC hard disk for later downloading to a Macintosh (on a network, for example).

Transferring Macintosh MDS or MPW Files

If you want to transfer your Macintosh "C" or Pascal source files to the **PC,** use the TEXT transfer method with MCOPY. This adds the missing line-feed characters to the file so they can be used properly on the PC.

If you want to transfer your source or object files to the PC for downloading and later use on a Macintosh, select the UNARY transfer method with MCOPY. When you use the Unary method, the files can be copied to a PC and later copied back to the Macintosh without losing any information (including file type, creator and the full Macintosh file name).

Again, the manual for most programs covers file conversion. Please follow the publisher's recommendations. The above list is provided as a general guideline.

Copying a File from a Macintosh Disk to the PC

To copy a file from a Macintosh disk (for example, in drive A) to your PC's hard disk (drive C), type the following at the prompt:

```
MCOPY  A:MAC_FILE_NAME  C:
```

Where you replace MAC-FILE-NAME with the name of the file you wish to copy. This transfers the file in the normal binary method.

Copying a File using the Text File Translation

If you want to transfer the file as a text file, you would type:

```
MCOPY  A:MAC_FILE_NAME C:/T
```

The /T means use the text method described earlier.

Copying a File using the Unary File Translation

If the Macintosh file you want to copy to your PC is a program file to be downloaded later back to a Macintosh, you need to use the unary method.

```
MCOPY A:MAC_FILE_NAME C:/U
```

The /U means use the unary method described earlier.

Copying Files from a PC to a Macintosh Disk

You can use "wildcards" with MCOPY just as you would with DOS. If you want to copy all the files with an extension of .DOC from your PC's hard disk in the subdirectory WORD to a Macintosh disk in drive A, you would type:

```
MCOPY  C:\WORD\*.DOC  A:
```

The "*", just as in DOS, is the "wildcard" which means match anything. You can also use question marks to match single characters.

The following example demonstrates how to copy all the document files from the Word subdirectory with the letter "D" in the second position of the file name from your hard disk Ⓒ to the Macintosh disk in drive A:

```
MCOPY  C:\WORD\?D*.DOC  A:
```

In addition, MCP has a parameter which allows you to specify the Type and Creator to assign to a file being copied from a PC to a Macintosh. Its format is

/Cxxxxxxxx

where xxxxxxxx is an eight character string; the first four characters specify the Type and the last four specify the Creator. The string must be exactly eight characters long and is upper/lower case sensitive. There must not be any spaces between the /C and the xxxxxxxx.

Example:

`/CTEXTmdos`   sets the Type to "TEXT" and the Creator to "mdos"
`/CabcdXYZq`   sets the Type to "abcd" and the Creator to "XYZq"

/Cxxxxxxxx overrides any automatic determination of Type and Creator. For example, if the IBM file extension is .SEC, the Macintosh file will be given a Type of "DesC" and a Creator of "DesE." However, if the /C parameter is specified, the Type and Creator will be set to the user specified values.

Transferring Macintosh Text files to your Printer

You can also use MCOPY to transfer Macintosh text files to your printer, as shown below:

```
MCOPY C:\NOTES\SCHEDULE_FOR_MARCH PRN:
```

This example transfers the text file called SCHEDULE_FOR_MARCH in the folder called NOTES to your printer (the PRN: is the name DOS uses for your printer).

MDIR (Mac Directory)

The MDIR command is used when you want to use your PC to see what files are stored on a Macintosh disk. Both HFS (800K) and MFS (400K) disks are supported.

If your 3.5 inch drive is drive A, and you want to see a directory of a Macintosh disk in drive A, you would type the following:

                        MDIR A:

You will see a listing of all the files on the Macintosh disk in the current folder, their size and the date they were last modified. It will also display the total amount of space on the disk, the amount of space remaining, and the volume name of the disk.

The two Macintosh file sizes represent the number of bytes in both the data and resource forks. If a file has information in the resource fork, you will see a number greater than 0 in parenthesis next to the file size.

Note that if you have done a directory of an 800K HFS disk, you only see the names of the files in the root-level directory and the names of the folders (sub-directories) in the root. If you want to see file names within a folder, you can type:

                  MDIR d:\<folder name>

Where <folder name> is the name of the folder whose files you want to see. If this folder is inside of another folder, this command lists all the folder names in between it and the root as well, separated by back slashes (similar to the PC's "PATH" command).

For this example, suppose you have a disk with a root level folder called FINANCES and two sub-folders called 1988 and 1989 and you want to see a list of all the files in your 1988 folder. Your 3.5 inch drive is drive A. Type the following:

                  MDIR A:\FINANCES\1988

MCD (Macintosh Change Current Folder)

The MCD command sets the current directory (folder). This command is helpful if you want to work with files in a particular folder. Once set, all subsequent

commands will know to look at this folder. MCD operates just like the DOS command to change directories (CD).

Continuing the earlier example, if you want to look at the files in your *1988* folder which is inside your FINANCES folder, you would type:

```
MCD A:\FINANCES\1988
MDIR A:
```

The MCD command sets the current folder to FINANCES\1988. When you type the MDIR command, it knows to look in the folder you had just specified.

MTREE (Macintosh Tree Command)

MTREE works very similar to the PC DOS TREE command. It displays a list of all folders on a Macintosh disk.

Using the earlier hypothetical disk with a folder called FINANCES which in turn contained subfolders called 1988 and 1989, the following MTREE command:

```
MTREE A:
```

would display the following list of folders:

```
\
\FINANCES
\FINANCES\1988
\FINANCES\1989
```

The first line is present on all disks. This just means that all disks have a least one directory. In IBM terminology, this is known as the "root" directory.

The next line displays the name of your FINANCES folder and shows that it is inside of your root directory.

The next two lines are the names of the two folders inside your FINANCES folder, called 1988 and 1989.

The MTREE command has an option that will list all the file names inside each folder. This is helpful if you want to get a complete picture of all files on your disks and what folders they are in. To see the files as well as the folders, type:

```
MTREE A:/F
```

The /F parameter means display Files, too.

MMD (Create a New Macintosh Folder)

MMD (Mac Make Directory) allows you to create new folders on a Macintosh disk. For example, if you have a disk with a folder called FINANCES that has sub-folders called 1988 and 1989 and you wish to create a new folder for 1990, you can do so with MMD. Type the following at the prompt:

```
MMD A:\FINANCES\l990
```

This command creates a new folder called 1990 inside your existing FINANCES folder on your Macintosh disk in drive A.

MDEL (Macintosh File Delete)

The MDEL command erases files on a Macintosh disk. You should use this command with caution: it is equivalent to throwing a file in the trash and emptying the trash. It is very difficult to recover data once it is deleted. (If this happens to you, you may wish to purchase a copy of our Copy II Macintosh program which contains a program that will help you recover accidentally erased files on your Macintosh.)

The main use for the MDEL command is to make room on a disk for new files. For example, if you typed the following:

```
MCOPY  C:\WORD\*.*  A:
```

to copy all your Microsoft Word data files to the Macintosh disk in drive A, you may end up copying more than you wanted. For example, Word (and most other word processing programs) creates backup files for you with an extension of .BAK. You may not have enough room on your Macintosh disk to hold both the document files (with an extension of .DOC) and the backup files (with an extension of .BAK).

You can use the following command to get rid of the .BAK files on your Macintosh disk, thus making room for all the final document files you want to copy:

```
MDEL A:*.BAK
```

This deletes all the backup files (file names that end with .BAK) in the current folder on the Macintosh disk in drive A.

MRD (Remove Macintosh Folder)

This command removes existing Macintosh folders. The folder to be deleted must be empty of files and sub-folders. To delete the 1990 folder we created in an earlier example, type the following:

```
MRD A:\FINANCES\1990
```

This removes the empty folder called 1990 within the FINANCES folder on the Macintosh disk in drive A.

MTYPE (Type a Macintosh File to the Screen)

MTYPE works just like the DOS TYPE command to display the contents of a text file to the screen. For example, to display the file SCHEDULE_FOR_MARCH in your NOTES folder on the screen, type the following:

```
MTYPE A:\NOTES\SCHEDULE_FOR_MARCH
```

MFORMAT (Macintosh Disk Formatter)

This command initializes (formats) a new disk. Formatting must be done before a new disk can be used. MFORMAT can format both 800K HFS disks and 400K MFS disks. The default is an 800K HFS format. For example:

```
MFORMAT A:
```

Formats the disk in drive A as a Macintosh 800K HFS disk. If you want a 400K disk, type the following:

```
MFORMAT A: /4
```

The /4 stands for 400K. 400K formatted disks are always MFS and cannot have folders.

If you want the format verified, you need to turn the DOS Verify flag on before starting the format. To do so, type VERIFY ON at the DOS prompt before running MFORMAT.

MDC (Macintosh Disk Copy)

The MDC command copies an entire Macintosh disk. We recommend that you do this often; in case any damage happens to your original disk, you will always have a

backup. Always make sure you have a backup of an important disk before you add new files to it or erase any files.

MDC automatically recognizes the type of disk (400K or 800K). To copy a Macintosh disk in your A drive, type the following:

<div align="center">

MDC A: **A:**

</div>

This says that you want to make a single drive copy. MDC asks you to remove the original disk and insert the backup as required.

Note: MDC does NOT do any translation between IBM and Macintosh formats. The backup disk will be in Macintosh format just like the original. If you want to transfer all the files on a Macintosh disk to IBM format, you will need to use the MCOPY command.

MDC does not do any verification of the copy it makes unless you turn the DOS verify flag on before you start the MDC program (type VERIFY ON at the DOS prompt).

Future Versions

We arc working on future versions of software that will offer additional file translation features (such as automatic conversion between different programs). Please give us your feedback on what you like about this software and what you would like to see added or changed in future releases.

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Making Backups of Copy-Protected Disks

Overview

TC is used to create backups of nearly all IBM PC compatible, copy-protected disks. "TC" stands for Transition Copier, which describes the nature of the Deluxe Option Board. In general terms, TC copies the magnetic transitions from one disk to another without looking for anything in particular. Because TC simply copies magnetic transitions from one disk to another, it is not too concerned with how those transitions are created or ordered. As such, it is a simple, but powerful type of copying device, as it does not have to operate under the normal limitations of the standard disk circuitry. (If you have Copy II PC, you will already be familiar with the concept of TC.)

Note: Do not use high capacity disks to make copies of 360K or 720K originals. TC does not support high capacity disks; use TCM.

Hard Disk Buffering

The Deluxe Option Board software has an additional feature useful to single drive users: It will buffer data to any free RAM or EMS memory (for example, the Intel Above Board) or to the hard disk to reduce the number of disk-swaps that would otherwise be necessary. What this means is that during the copy process, you may see the hard disk light turn on periodically. When this happens, the Deluxe Option Board software is simply creating or reading a temporary file it made to reduce the number of times you would have to pull out the original disk and insert the backup, then insert the original disk again.

When doing a two-drive copy with EMS, data is buffered to it. Because the Deluxe Option Board reads all of a disk--the gaps, sync bytes, etc., not just the tracks, to buffer a 360K disk entirely (on a 640K machine), you need approximately 1 megabyte free EMS or hard disk space. (Double that amount for a 720K disk.) EMS needs a device driver in the CONFIG.SYS file, so if booting off DOS in the A drive, that driver won't get loaded. You can, however, copy this driver to a copy of your DOS disk and boot with this disk.

When the copy is complete, TC automatically erases the temporary file it created so that space is not wasted on your hard disk. You do not need to tell TC to look for a hard disk, RAM disk, or Intel Above Board. It does this automatically every time it is run.

Important: Even though TC is using the hard disk, this does not mean it can copy a program to the hard disk where it will run (it can't). If you need the ability to transfer protected software to a hard disk, we recommend our Copy II PC program, which includes the ability to transfer many popular programs to a hard disk, bypassing the need to have a key disk or go through lengthy install/uninstall procedures.

Making Backups of Non-IBM disks

TC can be used to create backups of nearly all IBM PC compatible disks. It can also duplicate many other formats. When you want to make copies of non-standard disk formats, TC will prompt you to use TCM if it detects a non-standard disk. See the next chapter for how to make backups with TCM. Disk formats can be grouped into three basic types:

MFM	IBM PC, Kaypro, Amiga
FM	Atari
GCR	Apple, Macintosh, Commodore

The Deluxe Option Board and TC can copy all of the above formats. (Although other formats are copied readily, the TC software may not be able to copy all protected formats. It also can't copy the back side of "flippy" disks.) If you want to copy Macintosh and Commodore formats or IBM high capacity (1.2 and 1.44 MB) disks, you will be prompted to use TCM. It should be noted that not all IBM drives are capable of reliably reading and writing other formats. The only way to know is to try.

Note: The image files created by TC and TCM are not compatible.

Starting TC Using Command-line Options

When using TC, you will almost never need to use the optional parameters. You can duplicate over 99 percent of all copy-protected software just using the default (standard) mode of TC. With the optional parameters, you can, however, set the start and end tracks. This way if you should get any errors while copying a disk, you can select to copy only the tracks which had problems. (The errors are explained in the Trouble Shooting chapter.)

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Note: It is not necessary to format the target disk before making a backup.

All of the following parameters are optional. In fact, if you don't specify the drive parameters (d1: or d2:), TC displays a menu presenting you with all the available options (except color or b/w display). You can, however, enter the options on the command line:

TC dl: d2: /1 /Snn /Enn /Knn-nn /Wnn-nn /Ann /BW /Tn /NK /Vnn-nn

Parameter	Description
dl	Defines the drive containing the original disk (the source drive).
d 2	Defines the drive containing the blank disk be copied onto (the target drive). Note: The target disk does not have to be pm-formatted.
/1	Indicates single-sided copy. It is not necessary to use the /1 parameter on a single sided disk; it just speeds up the backup process.
/Snn	Specifies the start track (first track to copy). If you don't use this parameter, TC starts with track 0 (the first track).
/Enn	Specifies the end track (last track to copy). If you don't use this parameter, TC ends with track 28 (in HEX). Note: Before beginning the copy process TC will test both floppy drives. If TC determines that one or both drives cannot reliably step out to track 28, the track end will be changed to Track 27. (Some drives cannot step out beyond Track 27.) When backing up a 3.5" disk, the track end should be set to 4F.
/Knn-nn	Tells TC to preserve the length of the track (s) specified. If no tracks are specified after the /K, all track lengths will be preserved.
/Wnn-nn	Tells TC to look for and reproduce "weak" bits. Weak bits are bits read back differently each time and are used in some protection **schemes.**

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/Ann-nn	Turns off the "Copy Across Index" mode of TC. Copy Across Index is normally left on, but certain protection schemes require that the track splice be right at index. With the /A option, the splice point will remain exactly as it is on the original.
/BW	Tells TC to use black and white mode (no color).
/Tn	Sets the tolerance for the Keep Track Length option. This entry is specified in bytes. Therefore, a selection of /T4 will keep the track length to +/- 4 bytes per track. Values of 0 to F are allowed.
/NK	Disables some of the automatic "Keep Track Length" features recently added to the Deluxe Option Board software. These features may make backups unreadable in systems with marginal disk controllers.
/Vnn-nn	Specifies which tracks to verify.

Examples

Here are some examples of using TC with some of the parameters:

The following example specifies that the source disk is single sided. TC expects the original disk to be in drive A> and the duplicate to be in drive B>.

TC A: B: /1

The next example turns off the "Copy Across Index" mode of TC. In this mode, the track splice point will be left right at index. Since the /A option turns on this feature only on the track specified, it will be off on all other tracks. The example shows it off on all tracks. Since track 29 (hex) is not normally used, /A29 accomplishes this.

TC A: B: /A29

This example does a single drive copy using drive A> and checks for weak bits on tracks 7 to 9. It prompts you to insert the original and duplicate disks as required.

TC A: /W07-09

The following example expects the source disk (original disk) to be in drive B> and the target disk (copy) to be in drive A>. It copies up to track 29, which is available on some IBM disk drives.

T C B: A: /E29

Once you've started TC using the command line options, the track status line appears on the screen. See "Using the Track Status Line" below.

Starting TC Using the Menu

You can use the TC menu to set the source and target drives, as well as to specify a single drive copy or set the starting and ending tracks to copy.

To Start TC:

1. Type TC.
   You will see a short message concerning the copyright law.
2. Press Return.
   The following screen is displayed:

```
                    ┌─────────────────────────────────────┐
                    │          TRANSCOPY V5.3              │
                    │ (C) 1985-1989 by CENTRAL POINT SOFTWARE,INC. │
                    └─────────────────────────────────────┘

  Source drive:      A                   ┌──────────────────────────┐
  Target drive:      B                   │         MESSAGES         │
                                         ├──────────────────────────┤
  Starting track: 00                     │ Enter letter (A - E) of  │
  Ending   track : 28                    │ drive that will contain  │
                                         │ the source diskette.     │
  Track increment: El                    │                          │
                                         └──────────────────────────┘
  Number of sides: 2                        DMA Channel: 1    Port: 0268

  Keep track length? N
  Copy weak bits? N
  Copy across index? Y
  Verify write?     Y

              - INSERT DISKETTES -

        SPACE to Begin        Q to Quit
        ESC  t o  Restart     ENTER to Accept
```

   On the left side of the screen are prompts for each of the options. The Messages box displays a short description of each option.
3. Press the Enter key (or Return) to move through and change any of the following options:

   Source drive: defines the drive (A - E) containing the original disk.

   Target drive: defines the drive (A - E) containing the blank disk to be copied onto.

   Starting track: specifies the first track to copy. Track 0 (the first track) is the default.

Ending track: specifies the last track to copy. Track 28 (in HEX) is the default.

Note: Before beginning the copy process TC will test both floppy drives. If TC determines that one or both drives cannot reliably step out to track 28, the Track End will be changed to Track 27. (Some drives cannot step out beyond Track 27.)

Track increment: specifics the space between tracks. An increment of 2 would mean to copy every other track. One is the default.

Number of sides: specifics single-sided or double-sided copy.

Keep track length?: preserves the length of the track(s). Y preserves all tracks: N preserves no track lengths; or you can enter a range of tracks.

Copy weak bits?: specifies whether TC will look for and reproduce "weak" bits. Weak bits arc bits read back differently each time and arc used in some protection schemes. Changing this option to Y automatically turns off the Verify write option.

Copy across index?: specifies whether the "Copy Across Index" mode is used. Normally this option is set at Y, but certain protection schemes require that the track splice be right at index. With this option set to N, the splice point will remain exactly as it is on the original.

Verify write?: verifies the data is correct as it is copied.

4. Press Enter to accept the change and advance to the next option.
5. When you are done making your selections, insert the source and target disks in the appropriate drives.
6. Press the Spacebar to begin copying the first disk. If you make a mistake, press Esc (escape) to restart. If you decide not to make a copy at this time, press Q (for Quit).

Using the TC Track Status Line

You will see a track status display on the bottom of the screen while making a backup:

```
HEX      000000000000000011111111111111112222222222
TRACK    0123456789ABCEDF0123456789ABCDEFO123456789
---------------------------------------------------
SIDE 0:
SIDE 1:
```

The tracks are numbered in hexadecimal. If you don't know what "hexadecimal" is, don't worry. You won't need to know to make backups.

As each track is read, you will see a "R" then an "A" appear briefly on the screen. The R means reading, and the A means analyzing. The more parameters you have selected, the longer the A stays on the screen for each track, as it has to do more work. TC first reads side 0 of each track, then moves to side 1 before stepping to the next track (unless you have told it you are making a single-sided copy).

As each track is written, you will see a "w" then a "•". The W means writing and the • means the track has been written and verified (unless you have turned off the Verify write option from the menu mode of TC or selected the Copy Weak Bits option which also turns off the Verify write option).

If a "V" is displayed for any track, it means that a write verify error occurred on that track. A write verify error can indicate that the target disk is bad. If you see some Vs on the track status line display after the backup is done, try the duplicate disk before deciding it is bad. Some computers tend to report more spurious V errors than others. You might also occasionally see a K error left on the screen. A K error is a warning only and means that TC could not keep the track length exactly.

As each track is copied using the menu mode, you will see the word "Length" and some numbers appear in the upper middle of the screen. This is the length in number of bytes on each track. The numbers usually start with 18. Understanding them isn't necessary; we occasionally use them to help us figure out new protection **schemes.**

Using an Image File on a Hard Disk

TC can also make copies of the master disk from an image file on your hard disk. This is extremely useful since the read portion of the Deluxe Option Board does not verify. Using an image file, you can read the master disk onto your hard disk, then make a copy from the hard disk back to a floppy disk. Once you have verified that this first copy is correct, you can continue to use the image file you created on your hard disk with confidence, since a copy made from it will be identical to the first copy. (The Deluxe Option Board does do full bit-for-bit verification of the copies it makes.)

To Create an Image File

A note about image file size: Image files can be large. In fact, a standard 360K IBM PC floppy disk is over 1 megabyte as an image file. This is because the clock bits, IDs, gaps, etc. that are all part of a disk but normally transparent since they are handled by the floppy disk controller chip in the IBM PC are part of the image file. For this reason, we suggest that you use a 20 megabyte or larger hard disk.

1. Start TC at the DOS prompt by typing:

    TC

    After a note about copyrights, the following screen appears:

```
                        TRANSCOPY V5.3
              (C) 1985-1989 by CENTRAL POINT SOFTWARE, INC.


   Source drive:     A                      ┌──────── MESSAGES ────────┐
   Target drive:     C                      │                          │
                                            │ Enter letter (A-E) of    │
   Starting track: 00                       │ drive that will contain  │
   Ending   track: 20                       │ the target diskette,     │
                                            │ This may be the same as the│
   Track increment: El                      │ source drive,            │
                                            └──────────────────────────┘
   Number of sides: 2
                                               DMA Channel:1    Port: 0260
   Keep track length? N
   Copy weak bits?    N
   Copy acmss index? Y
   Verify write?      Y

                         – INSERT DISKETTES –

              SPACE to Begin           Q to Quit
              ESC   to Restart         ENTER to Accept
```
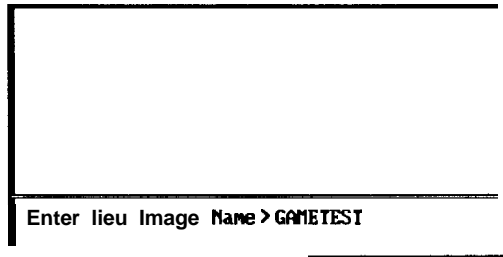
    On the left side of the screen are prompts for each of the options. The Messages box displays a short description of each option.

2.   Specify the letter of the drive your master disk is in and press Enter.
3.   Specify your hard disk drive as the duplicate drive and press Enter.
     TC will detect that you are trying to copy to a hard disk and that you
     want to create an image file. A small window appears on the screen
     for you to enter a name for your image file:

```
┌──────────────────────────────────────┐
│                                       │
│                                       │
│                                       │
│                                       │
│                                       │
│                                       │
│ Enter lieu Image Name > GAMETEST      │
└──────────────────────────────────────┘
```

     Note: If you have any existing image files in the current
     subdirectory on your hard disk, the names of these files will appear
     in the upper portion of this window.

4.   Enter a file name up to 8 characters long and press Enter. TC will add the
     extension of .IMG to the image file. You can also enter two lines of
     comments. We suggest that this include the full software name, the
     publisher, the version, and any other comments that will help you recognize
     this file at a later date.
5.   Press Enter to accept your file name and comments and to send the window
     away.
6.   Specify any other options you want to make and press the Spacebar.
     When you start the copy process, the track status line appears as the
     image is copied to the disk.

```
┌─────────────────────────────────────────┐
│               TRANSCOPY V5.3             │
│  (C)1985-1989 by CENTRAL POINT SOFTWARE,INC.  │
└─────────────────────────────────────────┘
```

Source drive: A   LENGTH: 183D.8   ┌──────── MESSAGES ────────┐
Target drive: C:GAMETEST   │   │
                                                      │   │
Starting track: 00   │   │
Ending   track: 28   │   │
                                                      │   │
Track increment: 01   └──────────────────────────┘

Number of sides: 2   DMA Channel: 1   Port: 0268

Keep track length? N
Copy weak bits? Ii
Copy across index? Y
Verify write?   Y   Disk type: MFM

   HEX   00000000000000001111111111111111122222222222
TRACK   0123456789ABCDEF0123456789ABCDEF0123456789

SIDE 0: AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
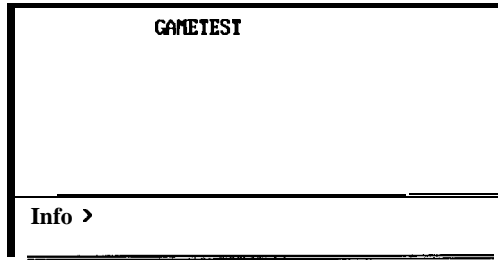SIDE 1: AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

When the image file has been created on your hard disk, the message
changes:

```
┌──────── MESSAGES ────────┐
│                          │
│ Press Q to quit or       │
│ Press ENTER to continue... │
│                          │
└──────────────────────────┘
```

To Make Copies using the Image File

Simply reverse the above process:
  1. Enter your hard disk drive letter as the master drive and press Enter.
  2. Enter a floppy drive letter as the duplicate drive and press Enter. Again, you
      will see the image window appear, this time with the names of the image
      files on your hard disk in the current directory.

```
                     ┌─────────────────────────────┐
                     │          GAMETEST           │
                     │                             │
                     │                             │
                     │                             │
                     │                     ────────│
                     ├─────────────────────────────┤
                     │ Info >                      │
                     │                             │
                     └─────────────────────────────┘
```

3. Press the arrow keys on the keyboard to select the image you wish to copy. Once selected, the image window will again disappear and the copy process begins.
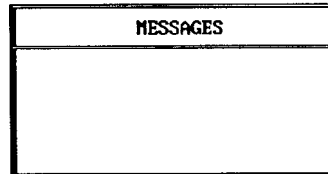
```
              ┌──────────────────────────────────────────┐
              │            TRANSCOPY V5.3                  │
              │ (C) 1985-1989 by CENTRAL POINT SOFTWARE, INC.│
              └──────────────────────────────────────────┘
```

Source drive: C:GAMETEST LENGTH: 18B2.7   ┌──────────────────────┐
Target drive: A   LENGTH :18B2.9   │   MESSAGES   │
                                                       │   │
Starting track: 00   │   │
Ending   track: 28   │   │
                                                       │   │
Track increment: E1   └──────────────────────┘

Number of sides: 2

Keep track length? Y
Copy weak bits? N
Copy across index? Y
Verify write?   Y   **Disk type: MFM**

```
   HEX  0000000000000000111111111111111122222222222
   TRACK 0123456789ABCDEF0123456789ABCDEF0123456789
   ───────────────────────────────────────────────
SIDE 0: 111111111111111111111111111~11111 U
SIDE 1: .............................
```

Making Backups of Multi-Format Disks

Overview

TCM is used when you want to make copies of non-IBM format master disks. If you are using TC to make a backup and a non-IBM compatible disk is in the drive, TC will prompt you to use TCM.

TC can copy IBM, Apple 5.25" and FM formats. You must use TCM to copy Macintosh and Commodore formats. The Deluxe Option Board and TCM can copy IBM high capacity (1.2 and 1.44 MB) disks as well. However, do not use high capacity disks to make copies of 360K or 720K originals. If you are making copies of 1.2 or 1.44 MB originals, then you must use high capacity disks.

Note: TCM is basically designed for multiple format duplication; it is not designed to make backups of copy protected software; we make no guarantees about the reliability of copy protected backups you make with TCM.

TCM keeps track of good and bad disks, and if you have enough memory, only reads the master once and writes each duplicate from memory instead of rereading it each time.

Using an Image File on a Hard Disk

TCM can make copies of the master disk from an image file on your hard disk. This is extremely useful since the read portion of the Deluxe Option Board does not verify. Using an image file, you can read the master disk onto your hard disk, then make a copy from the hard disk back to a floppy disk. Once you have verified that this first copy is correct, you can continue to use the image file you created on your hard disk with confidence, since all copies made from it will be identical to the first copy. (The Deluxe Option Board does do full bit-for-bit verification of the copies it makes.)

To Create an Image File

A note about image file size: Image files can be large. In fact, a standard 360K IBM PC floppy disk is about 1 megabyte as an image file. This is because the clock bits, IDs, gaps, etc. that are all part of a disk but normally transparent since they are

handled by the floppy disk controller chip in the IBM PC arc part of the image file. For this reason, we suggest that you use a 20 megabyte or larger hard disk.

1. Start TCM at the DOS prompt by typing:

                                    TCM

    The following screen appears:

                    Transcopy MultiFormat Version 5.3
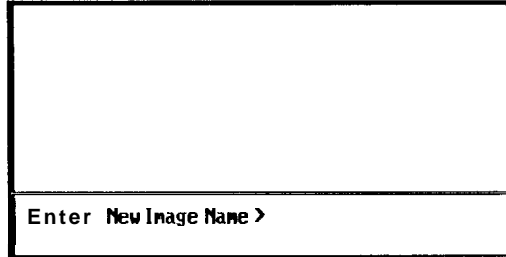   **Copyright 1987-89 by Central Point Software, Inc.**
    ――
                                        DMA Channel: 1   Port: 0268

    Master drive   = A
    Duplicate drive = B
    Number of copies = 1

    ┌─────────────────────────┐
    │ Enter letter (A – E) of │
    │ drive that contains the │
    │ master diskette or image │
    │ file.   │
    └─────────────────────────┘

    F1 **Help**   F2 **Begin**   F4 **Change Options**   F9 **Restart**   F10 **Quit**

    On the left side of the screen are prompts for each of the options. The Messages box displays a short description of each option.

2. Specify the letter of the drive your master disk is in and press Enter.

3. Specify your hard disk drive as the duplicate drive and press Enter. TCM will detect that you are trying to copy to a hard disk and that you want to create an image file. A small window appears on the screen for you to enter a name for your image file:

```
┌─────────────────────────────────────┐
│                                      │
│                                      │
│                                      │
│                                      │
│                                      │
│                                      │
├──────────────────────────────────── │
│ Enter  New Image Name >              │
│                                      │
└─────────────────────────────────────┘
```

Note: If you have any existing image files in the current
subdirectory on your hard disk, the names of these files will appear
in the upper portion of this window.

4. Enter a file name up to 8 characters long and press Enter. TCM will add the
extension of .IMG to the image file. You can also enter two lines of
comments. We suggest that this include the full software name, the
publisher, the version, and any other comments that will help you recognize
this file at a later date.

5. Press Enter to accept your file name and comments and to send the window
away.

6. Enter the number of copies you want to make and press Enter.
You may enter any value from 1 to 9999. Entering a value of 9999 means that
the number of copies is unlimited. The program continues to make copies
until you stop it.

7. Press *F2* to start the copy process.
When you start the copy process, the regular menu appears, showing
you the progress of the disk copy on the track status line.

Transcopy MultiFormat Version 5.3
Copyright 1987-89 by Central Point Software, Inc.

DMA Channel : 1   Port: 8268

Master drive   = B
Duplicate drive = C:MACTEST
Number of mpies = 1

Disk type: Apple 3.5"

Tracks to copy   = B00-79
Tracks to Qualify master   = AUTO
Tracks to Uer ify copy   = ALL
Retries per track   = AUTO (3)
Tracks to Ignore index   = ALL
Tracks to Align ta index   = NONE
Copy-protected tracks   = NONE

```
┌─────────────────────────────┐
│                             │
│     Press ESC to abort.     │
│                             │
└─────────────────────────────┘
```

Good disks: 8
Bad disks: 8

```
        1         2         3         4         5         b         7
0123456789012345678901234567890123456789012345678901234567890123456789
---------------------------------------------------------------------
QQQQQQQQQQQQQQQQQ
QQQQQQQQQQQQQQQQQR
```

As the **master** disk is read, each track of the disk is qualified. A "Q"
is displayed if the track is good, or a "B" is displayed if it is copied
blind. (Blind means it is either bad or qualify has not been selected.)
A "C" means TCM is comparing tracks, and the C will remain if it
doesn't compare properly. This is equivalent to a "V" when using
TC.

When the image file has been created on your hard disk, the message
changes:

```
┌──────────────────────────────┐
│ Master disk was GOOD .       │
│                              │
│ Press any key to return      │
│ to Main Menu.                │
└──────────────────────────────┘
```

To Make a Copy using the Image File

Simply reverse the above process:
   1. Enter your hard disk drive letter as the master drive and press Enter.
   2. Enter a floppy drive letter as the duplicate drive and press Enter. Again, you
       will see the image window appear, this time with the names of the image
       files on your hard disk in the current directory.

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```
┌─────────────────────────────────────────┐
│  ┌────────────────────────────────────┐ │
│  │  MACTEST                           │ │
│  │                                    │ │
│  │                                    │ │
│  │                                    │ │
│  │                                    │ │
│  └────────────────────────────────────┘ │
│  Enter New Image Name >                  │
│                                          │
└─────────────────────────────────────────┘
```
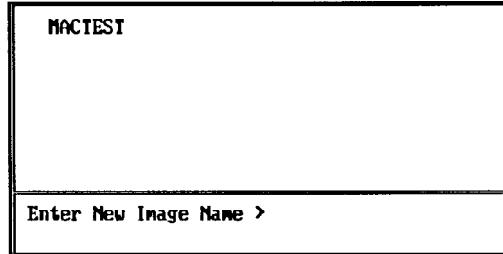
3. Press the arrow keys on the keyboard to select the image you wish to copy. Once selected, the image window will again disappear and the copy process begins.

To Change Options

Normally, for most of the disk duplication you will need to do, the default settings are adequate. However, the standard settings may not be correct for all formats and protected disks. When setting parameters, remember that many are interrelated and the setting of one may affect the others.

<div align="center">Important</div>

Even though the Deluxe Option Board with TransCopy software has good qualification and verification capabilities, it cannot always protect against hardware failures such as bad disk drives or faulty memory chips. Because such failures are a very real possibility, it is extremely important that you fully test one or more disks from each duplication run. This is especially important when duplicating protected or blind copied disks, which in some cases cannot be qualified or verified by the TCM.

To change any of the settings, perform the following:

1. Press F4.
   The screen changes to show the following options:

```
                    Transcopy MultiFormat Version 5.3
               Copyright 1987-89 by Central Point Software, Inc.

                                    DMA Channel: 1     Port: 0268

Master drive     =B
Duplicate drive = A
Number of copies = 1


Tracks to copy          = AUTO        ┌─────────────────────────────┐
Tracks to Qualify master = AUTO       │ Enter ALL for all tracks,   │
Tracks to Verify copy    = ALL        │ NONE for verify only,       │
Retries per track        = AUTO       │ AUTO for automatic mode,    │
Tracks to Ignore index   = AUTO       │ or a track range.           │
Tracks to Align to index = NONE       │                             │
Copy-protected tracks    = NONE       └─────────────────────────────┘




      F1 Help      F2 Begin      F4 Change Options      F9 Restart      F10 Quit
```

2. Press the Enter key to move through and change any of the options:

Tracks to copy: specifics the tracks and sides of the disk to be
copied. The maximum range of tracks is 0 through 79. You can
specify either a single track or a range of tracks separated by a dash.
The number of sides is specified by prefixing the track range by an
'A' for single-sided or a 'B' for two-sided. For example, 'BO-39' means
to copy tracks 0 through 39, two-sided. 'O-34' means to copy tracks 0
through 34 with automatic number of sides selection. If not
specified, the TransCopy software will determine the number of
sides automatically.   In AUTO mode, TCM selects the standard
number of tracks and sides for the detected format. The Tracks to
copy option controls all other copy parameters. Tracks cannot be
verified, qualified, or processed in any way if they are not included
in the Tracks to copy option.

Tracks to qualify master: specifies which tracks on the master disk
to qualify. Qualification refers to making sure that the track which is
read conforms to the specifications for the detected format. This
includes making sure that the proper number of sectors arc present
and that each sector is free of CRC or checksum errors. For example,
for an Apple 5.25" format, TCM would check that the track has 16
sectors and that each sector has a proper checksum.   Qualify
currently supports only IBM MFM formats (360K, 720K, 1.2MB and
1.44MB) and Apple 3.5 inch formats (400K and 800K) for the
Macintosh and Apple / /.

Tracks to verify copy: specifies the tracks to be verified. Read after write verification increases reliability, but takes longer (approximately a 30 percent increase in duplication time). In AUTO mode, all tracks are verified. Verification may destroy some copy protection systems. In general, qualification and verification can't be performed on most protected tracks, it is extremely important that you fully test a duplicated disk on the target machine.

Retries per track: specifies the number of times TCM attempts to rewrite a track after an error is detected. Because transient errors occasionally occur, some number of retries should always be allowed.   Without retries, many disks would be unnecessarily rejected. The default number of retries is one.

Tracks to ignore index: specifies on which tracks to ignore index. This entry is usually ALL or NONE. Some formats, such as Commodore or Apple, do not use the index hole on the disk. By ignoring index, a slightly faster copy can be made. Other formats, such as IBM MFM, require that index not be ignored. If the target disk is the back side of a "flippy" disk, then Ignore Index must be set to ALL because there is no index present in this case. In AUTO mode TCM will choose the setting which is appropriate for the detected format. For example, NONE for MFM and ALL for Apple or Commodore.

Tracks to align to index: specifies which tracks need to have their timing relationship to index preserved. This entry is usually NONE, and in AUTO mode is set to NONE. The only time this is used is for a copy-protection method called "synchronized tracks."

Copy-protected tracks: specifies the tracks for which an extended copy-protection analysis should be performed. Since this analysis slows down the read-in process, only the tracks which are known to be copy-protected should be specified. If Copy-Protected Tracks and Tracks to Qualify master are both set to AUTO, then the extended analysis will be performed only on tracks which fail to qualify.

3.   Press F2 to begin copying.

A Note About Performance

The Deluxe Option Board duplicates disks just as fast as is possible within the limitations of the system it is installed into. If you find that it is not duplicating disks as fast as you think it should, here are some things to try:

- An Intel Above Board with 2 megabytes of memory installed will greatly help performance as it will replace hard disk reads with memory reads. The entire image file will be read into memory before the first disk is made and you will save the overhead of continuously m-reading the image file from the hard disk.

- A faster processor is helpful. The verify that is done after each track is written is done by the CPU in your computer. The faster it is, the faster this verify is completed. If your processor is too slow, 1 or 2 revolutions may be lost for each track. While this won't hurt anything, it can slow down the copy process. We recommend an 8 MHZ 8088, although a PC running at 4.77 MHZ will allow the Deluxe Option Board to run at full speed in most cases.

Generally, TCM (which is slightly faster than TC) can copy a track a second-assuming the disk is not copy-protected and the computer system has EMS memory (like an Intel Above Board). What this means is that TCM can copy a 360K disk in 40 seconds. (It also verifies the disk.1 Using TC without the verify option on an unprotected disk takes 40 seconds also. With verify on, TC takes about 70 seconds.

If you find your duplication needs are approaching high volume, we suggest you check with Trace Products for its SmartCopy software. Information is provided in the "Other Products" chapter at the end of the manual.

Using TCM Command-line Parameters

The options discussed in the section above can also be added to the command line, bypassing the menu mode of TCM. If you don't specify the drive parameters (dl: or d2:), TCM displays the menu. (The b/w option is not available in the menu mode of TCM.) Probably all of your duplication needs can be met by using the auto (or default) settings; however, if you wish to change any of the parameters and run TCM from the command line, enter the options on the command line as shown below:

TCM dl: d2: /Ann-nn /BW /DMA /Inn-nn /Nnnnn /Qnn-nn /Vnn-nn /Wnn-nn /?

The following descriptions for each parameter are intentionally brief. To read the full description, see the above section.

Parameter	Description
d1	Defines the drive containing the original disk (the source drive).
d2	Defines the drive containing the blank disk to be copied onto (the target drive). Note: The target disk does not have to be pre-formatted.
/Ann-nn	Specifies which inclusive tracks (where nn is the starting track and nn is the ending track) need to have their timing relationship to index preserved. The only time this is used is for a copy-protection method called "synchronized tracks."
/BW	Tells TCM to use black and white mode (no color).
/DMA	Direct Memory Access (DMA) is directed into EMS memory. This results in slightly faster copying.
/Inn-nn	Specifies on which tracks to ignore index.
/Nnnnn	Specifies the number of copies. You can make from 1-9999 copies; a value of 9999 means the program will make copies until you stop it.
/Qnn-nn	Specifies which tracks on the master to be qualified.
/Vnn-nn	Specifies which tracks to verify.
/Wnn-nn	Specifies the tracks for which an extended copy-protection analysis should be performed. Since this analysis slows down the read-in process, only the tracks which are known to be copy-protected should be specified.
/?	Displays the version number.

Trouble Shooting

After installing the Deluxe Option Board, if you experience problems, please review this chapter which contains solutions to some common problems, error messages and explanations, and hints for using the Delux Option Board and its software.

Installation Problems

Installation problems are easy to spot because the board won't work. Here are some problems and messages to look for:

If, after installing the Deluxe Option Board, both drives run all the time and the computer won't boot anything, double-check the cables. This usually means that one of the cables is plugged in upside down.

601 *Error*

If you get the message, *"601* error," this is a floppy drive error message from DOS. Check that the drive cables are connected snugly, the Option Board is seated firmly in the slot, and that you have not disconnected the cable at the back of the drives instead of the controller. This error also occurs when a PS/2 Model 30 cable is connected to drive A. If the B drive connector is connected to drive A, it works fine. This problem can be attributed to the way the PS/2 cable reassigns for a two drive system.

1701 *Error or Hard Disk won't boot*

This problem normally indicates that the Deluxe Option Board has been hooked up to the hard disk controller instead of the floppy disk controller. If you have connected to the hard disk controller by mistake, don't worry, you won't hurt anything; the board just won't work.

Note: The hard drive controller card has 2 cables with a 20 pin connector and a 34 pin connector.

F1 to Retry-Drive Mismatch Run-CMOS setup

CMOS is a battery-backed up RAM that remembers the drive configuration. This message indicates the drive doesn't match with the BIOS information. Most likely, the drive cables are not connected properly.

Parity Errors

Parity errors normally indicate bad RAM chips. Parity check 1 means the problem is on the motherboard, and parity check 2 means the problem is in the expansion board. Since the Deluxe Option Board uses all available memory, it more frequently detects this problem.

Problems with Jumper Block Position

Some of the problems you may experience with the operation of the Deluxe Option Board may be caused by errors in configuring the board.

Drives Won't Write to Disk

If your drives will not write to the disks (although your system "appears" to function normally), it may mean that the jumpers are not in the correct position. Remember: If your floppy disk controller has a PIN style connector, the jumpers need to be set to the AT/Compaq position. If your floppy disk controller has an EDGE style connector, the jumpers need to be set to the PC/XT position.

System "Hangs" or Won't Boot

Any of the following problems could mean a DMA conflict:
- Your computer hangs with an R on Track 0 while TC is reading the original disk
- Your system has difficulty booting
- Your system always gives a "Use TCM" message when trying to execute the TC file

A DMA conflict can occur with another card (such as a scanner card, mouse card, network card, etc.). Move the J7 DMA jumper block to the #2 position.

"Unable to find Deluxe Option Board"

If you see this message, make sure that you are not using the short slot nearest the power supply in the IBM PC/XT, the Compaq Deskpro and some other compatibles. The Deluxe Option Board does not work in this slot.

The Deluxe Option Board has four selectable port addresses. If you see the message "Unable to find Deluxe Option Board" or "Check disk in Source Drive," try moving these jumpers to a different port address and use the following parameters:

.J6

/P1   Both jumpers up   -268 through 26F

/P2   Left jumper down, right jumper up   -2E8 through 2EF

/P3 Left jumper up, right jumper down   -368 through 36F

/P4 Both jumpers down   -3E8 through 3EF

The port address the Deluxe Option Board is using will be displayed beneath the message box on the screen.

If you've checked all the problems listed above and you still can't get the Deluxe Option Board to work, give us a call at (503) 690-8080, extension 5705 (our hours are 8-5, PST). We have technical support people on staff who can often walk you through a confusing part of the installation and help you get everything running. Before you call, please double-check your installation to see if it is something simple and have all the requested information from the Technical Support Checklist.

Problems Making Backups

The Deluxe Option Board is able to back up nearly every program for the IBM quickly and easily using its standard default settings. If, however, your Deluxe Option Board is properly installed and backs up most programs by default, but seems stumped by a particular program, there are a number of steps to try that will probably accomplish the backup. Try the following individually and in conjunction with one another.

   ✔ Try using defaults. Or if both drives are the same type, try reversing drives, (copying from B to A instead of A to B).

   ✔ Set Weak Bits to Y.

   ✔ Set Keep Track Length to Y

   ✔ Set Copy Across Index to N.

   ✔ Set Track End to 29.

✔ If backing up to a 3.5" disk, set the Track End to 51.

TC should make working backups of virtually all IBM PC protected disks. If you can't make a backup, try it again. Since TC doesn't do any verification during disk reads, it might only be a glitch that caused the backup not to run. If this still doesn't work, try the following steps:

- Boot your system with a master DOS from the A drive (without the CONFIG.SYS and AUTOEXEC.BAT files being loaded) since the Deluxe Option Board software's reliability can be affected by other memory resident software and configuration system files.

- Reverse drives (if you have two that are the same type). For example, if you made the backup from drive A to drive B the first time, try it again using drive B as the source drive and drive A as the target. Some drives are better at reading or writing than others and this may do the trick.

- Make the backup using the TCS file. (It's also on the Deluxe Option Board disk.) TCS has all of the features of TC except the ability to buffer to a hard disk (to minimize disk swaps for single drive users). Because TCS does not buffer, it is not as prone to interference with memory resident software.

- Try making the copy using the Weak Bit option. You can do this by either entering "Y" at the Weak Bit option in the menu mode or using the /W parameter on the command line. For example,

                    TC A: B: /W

- Try making the backup after selecting 'Y" for the Keep Track Length option. This option is needed to copy some disks whose protection schemes try to defeat the Deluxe Option Board. The Deluxe Option Board software can detect most of these schemes automatically and will set the keep track length option for you. Occasionally, however, it cannot tell that this option is needed so you may have to select it. If you don't use the menu mode of TC, you can enter the Keep Track Length parameter on the command line as follows:

                    TC A: B: /K

  It might also help to select a tighter tolerance for the Keep Track Length option. This is done with the /T parameter. Try making the backup as follows:

                    TC A: B: /K /TO

This option will slow down the backup process, but will make as accurate a backup as possible as the track length will be kept exactly as the source disk.

- Try making the backup after selecting "N" for the Copy Across Index option and "Y" to the Keep Track Length option. This combination essentially turns off almost all of the Deluxe Option Board's analysis features. It also lets the disk drive itself determine the exact track start and end which might help for some disks. The following command line will accomplish this:

$$\text{TC A: B: } /\text{A29 /K /TO}$$

- Try making the backup again using a track end of 29. Most older IBMs have drives that could step out this far (two tracks beyond the normal end of the disk), and some very old protection schemes put the schemes they are looking for out there. We didn't make the default track end 29 as this can interfere with making single drive copies on newer drives that can't step beyond track 27. The following parameter on the command line does this:

$$\text{TC A: B: /E29}$$

- Try starting TC by typing in TC/NK (or TCS/NK). This parameter will disable some of the automatic Keep Track Length features recently added to the Deluxe Option Board software. These features may make backups unreadable in systems with marginal disk controllers.

If these suggestions still don't work, one of the following may be happening:

- The original disk may use a protection scheme that "modifies" the disk. As an example, it is possible to burn small holes in the disk, then check for the presence of these holes. The duplicate disk, of course, will not have the holes (as disk drives are not designed to put holes in disks), so the copy will not function. Unfortunately, the Deluxe Option Board cannot directly make backups of these disks as it can't bum holes in disks either.

Disks that use this protection scheme will frequently have a message on the label or in the documentation saying "DO NOT WRITE PROTECT THIS DISK" as they must write to the original as part of the verification process. Examples of programs that have used this type of protection in the past include DBASE /// Ver. 1.0 and Framework Ver. 1.0. The newer versions of these programs (Ver. 1.1) can be backed up with the Deluxe Option Board.

TC Error Messages

You may receive any of the following error messages while using the TC software:

"Check disk in Target Drive"

The disk in the target drive may be inserted incorrectly or the drive door may be open.

"Check disk In Source Drive"

The disk in the source drive may be inserted incorrectly or the drive door may bc open. Also, you may want to change the J6 port addresses, which may clear up this problem.

"Disk Full Error in Target Drive"

This error means there is not enough room on the hard disk to hold the entire image file.

"Incompatible image file "

The image files created by TCM are not compatible with those created by TC and vice versa.

Marginal Disk Controller Error

This error occurs only if you have set the Keep Track Length option to YES in the menu mode or it came on automatically during the copy process. TC checks to see if the disk controller can write a large (4K) sector on the last track of the copy and then it does a Keep Track Length check on the writing of the last track to see if it is accurate. This check is only done on the first copy--all additional copies will not repeat this test unless you've exited the program. If the resulting backup doesn't work, try using the /NK parameter.

Marginal Timer Logic Error

The timer on the motherboard is read, and if TC is not able to get an accurate reading, it estimates the timing measure. This error should only occur if Keep Track Length was set to YES on the menu or came on automatically during the copy process. The resulting backup may not boot reliably. This should not affect TC's ability to back up most software.

"Target Disk is Write Protected"

The disk in the target drive is write protected. Remove the write protection and try again.

"Use TCM **to copy this disk"**

The disk being copied is in a format that TC cannot handle. TC can copy low density IBM, Apple 5.25" and FM formats. You must use TCM to copy Macintosh, high density IBM, and Commodore formats. If the disk is an IBM double density disk and you still get this message, try changing the J7 DMA channel to 2.

TCM should be used when copying Apple II, Atari FM, Commodore, Amiga, Macintosh, and high-density IBM disks. TCM can also be used to copy low-density IBM disks; however, it does not perform as well as TC for copying copy-protected disks. Its copy-protection capabilities are limited because it is designed to make fast backups. The 'copy-protected tracks' option applies only to low-density IBM disks.

Problems with MCP

If you encounter any of these problems or error messages when transferring Macintosh files, try the following solutions:

Macintosh application doesn't recognize the file type and creator

If you've copied a file from a PC to a Macintosh with MCOPY and the Macintosh program doesn't recognize the file, most likely it's because the file doesn't have the correct type and creator for your application. Try using the /C option with MCOPY and specify the required type and creator.

A word processor file has missing or extra line feeds

If you transfer a word processor file from a PC to a Macintosh or vice-versa and the file has extra or missing line feeds, try copying the file with MCOPY and the /T option. If you used the /T option, try the transfer without it.

"Chk err"

AT&T 6300 machines (and possibly some other compatibles) require that a special parameter: /A follow each MCI' command. (for example, MCOPY a: b: /A) If you see the message "chk err" when using MCP, please use this parameter.

"Sector not Found"

If MCI' gives the message "Sector not Found," it could mean you need to try a different DMA channel. In addition, TCM is not able to write to disk if there is a DMA conflict.

"Mac disk not found"

If you receive the "Mac disk not found" message, you need to carefully check the syntax in your command.

Note: If you experience problems with MCP functions, you can try the /G non-standard gap size parameter and also the /A parameter even if you do not have an AT&T 6300 machine.

TIP: When to use the /U option with MCOPY

The /U option should be used only if the file being copied will be stored, but not used, on a PC. For example, a Macintosh file that is downloaded to the PC via modem is most likely in MacBinary format. You will need to use the /U option to transfer this file.

When copying from PC to Macintosh, the /U option tells MCP that the file being transferred is in MacBinary or MacUnary format. MCP then converts the file into separate data and resource forks. Normally, you would use the /U option if the file on the PC was obtained via modem or over a network.

When transferring files from the Macintosh to the PC, the /U option tells MCI' that the file being copied should be converted into MacBinary format. MCP will then combine the data and resource forks of the Macintosh file and create a MacBinary file on the PC. Normally, this would be done only if you intend to transmit the file via modem or are storing it on a network.

Using the Deluxe Option Board Track Editor

The Deluxe Option Board includes a track editor called TE.EXE (TE stands for Transition Editor) which allows you to see the format of the original disk before it is (optionally) written.

Important: TE.EXE will not help you copy disks that TC.EXE can't. In fact, it is not necessary to understand or use TE.EXE to make backups. TE has been provided for people with experience working with disk drives and copy-protection schemes. Do not feel you have to understand it to use the Deluxe Option Board effectively. We have provided it solely for those people who already understand how such an editor might be used and provide it on an as-is basis. We're sorry, but because of its highly technical nature, no phone support is available.

TE.EXE enables you to do the following:

- Look at the data on any track in both HEX and ASCII.

- Modify the data on any track. If data is changed within a sector, the corresponding CRC bytes will also be recalculated so the sector can be read without an error.

- Inspect a track. All sector IDs found on the specified track will be listed on the PC's screen. They will be displayed regardless of any errors in the ID or data fields and will show all ID information including CRC errors and data address marks.

- Look at both data and clock bits. Any byte with invalid clocks is highlighted when displayed for easier reading.

To use **TE.EXE:**

. Type the following at the DOS prompt:

    TE d: /bw

"d" is the drive which contains the disk to be edited or viewed, and is optional. If not specified, TE.EXE will use drive B. The /bw parameter is also optional and instructs the editor not to use color mode. The only time you will need to use /bw is if you use the IBM color display adapter with a non-color monitor.

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Once TE.EXE has been started, you should see a screen similar to the one below:

```
Using drive A        Track llh (17)     Side 0    VIEW DATA    Media IBM  L O
Track Start: 0000     Track End: 18B8    Track Length = 18B9    Index: 18B8

0000 ==  84 84 84 84 84 84 84 84    86 84 04 4E 4E 4E 4E 4E   s   ..........NNNNN
0010     4E 4E 4E 4E 4E 4E 4E 4E    4E 4E 4E 4E 4E 4E 4E 4E        NNNNNNNNNNNNNNNN
0020     4E 4E 4E 4E 4E 4E 4E 4E    4E 4E 4E 4E 4E 4E 4E 4E        NNNNNNNNNNNNNNNN
0030     4E 4E 4E 4E 4E 4E 4E 4E    4E 4E 4E 4E 4E 4E 4E 4E        NNNNNNNNNNNNNNNN
0040     4E 4E 4E 4E 4E 4E 4E 4E    4E 4E 4E 4E 4E 4E 4E 4E        NNNNNNNNNNNNNNNN
0050     4E 4E 4E 4E 4E 4E 4E 4E    4 E  00 00 00 00 00 00 00     NNNNNNNN.  .  .
0060     00 00 00 00 00 a  a  a     FC 4E 4E 4E 4E 4E 4E 4E       ,,,,,TTT"NNNNNNN
0070     4E 4E 4E 4E 4E 4E 4E 4E    4E 4E 4E 4E 4E 4E 4E 4E       NNNNNNNNNNNNNNNN
0080     4E 4E 4E 4E 4E 4E 4E 4E    4E 4E 4E 4E 4E 4E 4E 4E       NNNNNNNNNNNNNNNN
0090     4E 4E 4E 4E 4E 4E 4E 4E    4E 4E 4E 00 00 00 00 00      NNNNNNNNNNN.  .
00A0     00 00 00 00 00 00 00 A1    A1 A1 FE 11 00 01 02 67     ........iii.,,,²
00B0     7C 4E 4E 4E 4E 4E 4E 4E    4E 4E 4E 4E 4E 4E 4E 4E      !NNNNNNNNNNNNNNN
00C0     4E 4E 4E 4E 4E 4E 4E 00    00 00 00 00 00 00 00 00     NNNNNNN.........
00D0     00 00 00 A1 A1 A1 FB  D  D  01 DF FF 03 FF FF 01 FF    ...iiiJ.".  . .
00E0     FC 01 1D DD 01 DD DD 01    DF FF 01 FF FC 01 15 51     ".,|.|l."  . ".,.Q
00F0     02 55 55 01 0D DD 01 D D    D D 01 DF FF 01 FF FF 01   .UU..|.|l." .  .
                    Pointer = 0000
```

```
F1=help 2=drive 3/4=data/clock 5/6=start/end 7/8=set start/end 9=edit 10=quit
```

This is the main display. The first column of numbers on the left is the offset into the track buffer (in hex). The second and third groups of numbers from the left are the actual track bytes. (You won't see anything but zeros here until you read data from a track – see the R command below.) The last group of characters on the right are the ASCII representations of the track data.

On the bottom of the screen are listed the function key commands. Pressing the F1 key displays a complete list of commands as shown:

```
                    TRANSEDIT U5.3 HELP SCREEN

        F1    Display this help screen
        F2    Select drive number
        F3    Display Data bytes
        F4    Display Clock bytes
        F5    Move pointer to track start
        F6    Move pointer to track end
        F7    Set track start to current pointer position
        F8    Set track end to current pointer  position
        F9    Toggle between Edit and View
        F10   Exit to DOS

         M    Media(IBM,APPLE, MCINTOSH, COMMODORE,AMIGA)

         R    Read track              W Write Track
         I    Inspect track           S Scan tracks
         +    Read Next Track         - Read Previous Track
         H    Hone (Recall Disk

        ^B    tloue pointer to beginning of buffer
        ^E    Move pointer to end of buffer

        Press ENTER to continue...
```

- Press Enter to continue.

The arrow keys on the numeric keypad move the current pointer position. The PgUp, PgDn, Home and End keys all perform their normal cursor movement functions.

Pressing R (for read) starts the Track Editor. When you press the R key, TE will ask you what track and side you want to look at (see the next section, Format of IBM PC disks).

You may see the letters "s", "e", and "i" between the Hex and ASCII display areas. The "s" means the start of the track. The "e" means the end of the track. The "i" means this is where the physical index hole was detected.

TE reads and analyzes a track when you tell it to read a track. TE separates the data from the clock bits and sets the start and end of the track. You can do more than just look. Pressing the F9 function key puts you into edit mode. Pressing it again takes you back to the view mode. If you want, you can use the W (write) command to re-write the track with your changes.

You can also specify which drive to work with by pressing the F2 key while you are in the editor. This allows you to read from one disk, edit the track, and write it to another disk if you like.

If you use the editor to change data in a sector, make sure you press the F9 key again to leave edit mode before writing the track. This will cause the editor to recalculate the sector's CRC. If you don't do this, the sector will be unreadable by DOS or any other program.

The mode command "M" toggles the editor between IBM (MFM) and Apple (GCR) formats. In Apple mode, the number of sync bits accompanying any data byte can be seen by toggling the display to show clock bits. All sync bytes (those bytes that have sync bits attached) are shown highlighted. The start and end pointers will be properly set so the track can be written. Please note that since Apple's GCR format encodes the data on the disk, the ASCII display will be meaningless – all the data is still GCR encoded.

If you plan to use the editor, we suggest you read the next section which will give you an introduction to the format of IBM PC disks.

Format of IBM PC Disks

An IBM PC 5.25" disk is divided into 40 tracks, numbered 0 to 27 (in hex). Each track normally has either 8 or 9 sectors, depending upon which DOS was used to create it. Each sector contains 512 bytes of data (although this can be changed and often is with protection schemes). Any disk can also use either 1 or both sides, resulting in up to 80 tracks of data for a 3.5" disk. Because the disk controller needs to be able to find any given sector of data very quickly, each sector is given a unique ID containing all the above information.

On an even lower level, the floppy disk controller needs to be able to distinguish IDs from data. For example, you might have a pattern of data in a sector that could also be interpreted as a sector ID. Special kinds of bytes are therefore needed to eliminate this potential confusion. These are called sync bytes. There are actually two kinds of sync bytes that you can see when you look at a track: a sequence of 00 bytes followed by three Als. The Als are a special kind of byte that have what is called "missing clocks." All this means is that they violate the normal recording rules. The editor will highlight these bytes to make them easier to find.

Note: You may see other highlighted bytes, especially right after sector IDs and data fields. These are normal and are the "splice points" caused by writing a data field. Because these splice points produce a few bytes of unreliable data, it is likely that they, too, will violate the normal recording rules and will therefore be highlighted by the editor.

Whenever you see the three highlighted Als in a row, you know one of two things is next: the sector ID or the sector Data. If it is an ID, the next byte, often referred to as an "address mark" will be a FE. If it is the data portion of a sector, it will be a FB.

If you take a look at a standard disk with the editor, you will see an equal number of both IDs and Data fields on the disk. In fact, they come in pairs, with the short ID field preceding each sector's data.

You should also see one last type of byte on the disk. Like sync bytes, they come grouped together, but serve a different purpose. They are called "gap" bytes and are usually 4Es. As their name suggests, they form a gap or buffer around the ID and data portions of a sector. They are needed to provide just a little bit of extra space in case something is written at not quite the right time. For example, your drive may be spinning slightly faster or slower than the drive that originally formatted the disk. Without gap bytes to take up the difference, one sector could partially overwrite another, making at least one of them unreadable.

In summary then, a standard sector looks something like this:

```
GAP  BYTES        4E 4E 4E 4E 4E 4E 4E 4E 4E 4E 4E 4E
SYNC BYTES        00 00 00 00 00 00 00 00 00 Al Al Al
SECTOR ID         FE 00 01 08 02 DB B9 4E 4E 4E 4E 4E
GAP  BYTES        4E 4E 4E 4E 4E 4E 4E 4E 4E 4E 4E 4E
SYNC BYTES        00 00 00 00 00 00 00 00 00 Al Al Al
SECTOR DATA       F B . . .
```

After the FB is the 512 (200 hex) data bytes stored in the sector. If the track contains a text file filled with ASCII characters, you can see them on the right side of the display in the editor. You should be able to recognize some of the data you have stored.

After both the ID and Data are a couple of bytes called CRCs. These special bytes form a type of check on the data that verifies that it is OK. Whenever you see the ominous message "Error Reading Drive n" from DOS, it is actually telling you that the CRC bytes didn't match what it expected for that sector. Both IDs and Data fields have CRC bytes. The editor will automatically recalculate them for you if you change any of the data in a data field.

Here's how to read the sector ID information: Immediately following the FE are 4 bytes. These store the Track, Side, Sector, and Size information described earlier. In the above example, these bytes are 00 0108 02. This means that it is the sector ID for sector eight on track 0, side 1. The last byte also tells us that it is a normal 512 bytes sector. Here's a simple table you can use to determine the size from the size byte in the ID field:

SIZE ID BYTE	ACTUAL SIZE
00	128
01	256
02	512
03	1,024
04	2,048
05	4,096
06	8,192

Actually, only slightly more than 6,000 bytes can fit on a track, so a size of 06 is impossible, although it is used in the IDs on some protected disks. Sometimes, the sector ID will say the sector is one size when in reality it is another. This is done only to allow the standard disk controller to read special data that might be imbedded in gaps (as part of a protection scheme).

You can use the editor's Inspect command to do a lot of the work of decoding sector IDs for you. Inspect looks through the entire track in memory, finds and decodes all the sector IDs it finds. It will even tell you if there are any errors in the ID or Data fields (usually a dead giveaway of either a protection scheme or damaged disk).

While this overview has been short, it should at least get you started using the editor. If you are curious enough to want to use it, the best way to start is to try it out on a standard disk. If your experimentations will include writing to a disk, make sure it is not one with important data or programs.

Repairing the Deluxe Option Board

The Deluxe Option Board is warrantied for a period of 1 year from its date of purchase against manufacturing defects. This warranty does not include damage due to accidents, misuse, or improper installation (including attempting to install the board into a non-supported computer). In addition, any user alterations to the Deluxe Option Board will void the warranty.

If you feel the board might be defective, give us a call before returning it. The problem might be something simple that our technical support department can help you with over the phone. If they can't get it working for you, they'll give you an RA (Return Authorization) number and instructions for returning the board for repair or replacement at that time.

If you need to return the Deluxe Option Board to us, please package it in its original box (or suitable container) including your original dated receipt and ship it prepaid (and insured!) to:

> Central Point Software, Inc.
> Repair Department
> RA # (write your RA number here)
> 15220 NW Greenbrier Parkway #200
> Beaverton, OR 97006

Please include $40 to cover the cost of replacing the board if it is out of warranty. Also include a short description of the problem. We'll repair or replace the board and return it to you.

Technical Support

Central Point Software is backed up by a technical support staff trained to provide you with fast, courteous service. If you need assistance beyond what the manual, Help feature, and README.TXT file (if included) can provide, please write or call us with the information listed in the following Technical Support Checklist.

Mail
Write to   Central Point Software, Inc.
             15220 NW Greenbrier Pkwy., Suite 200
             Bcavcrton, OR 97006
             Attn: Technical Support

FAX
You can also FAX the information about your problem.
Our FAX number : (503) 6908083

Phone
        (503) 690-8080.
Dial 1 then extension 5705 then press # anytime after the automated attendant has answered; you do not need to listen for the message to be completed. Our business hours are 8-5 PST, Monday-Friday.

It would help if you called from a phone next to the computer you're having problems with. Your computer should be turned on and ready to go.

Bulletin Board System

For the latest Deluxe Option Board updates and new information, dial into our BBS. The phone number is (503) 6906650.

If you also own PC Tools Desktop, there is a script file you can use for automatically logging onto the BBS once you have received a password.

Technical Support Checklist

Before contacting Central Point Software for technical assistance, please try to recreate the problem to provide us with an exact sequence of events. If the problem reoccurs, contact us by mail, FAX, or phone with the following information:

❑ 1.   Central Point Software product: the name, version #, and date of the application you are having difficulty with.

❑ 2.   System Information: along with the computer brand and model. Please include this information in your written correspondence or have it accessible when contacting us by phone.

❑ 3.   Disk drives: the brand names, sizes, partition sizes and partitioning software.

❑ 4.   Additional hardware: the brand names of additional hardware installed in your computer (particularly specialty video cards, expanded memory boards, turbo boards, etc.).

❑ 5.   AUTOEXEC.BAT and CONFIG.SYS contents: Type "TYPE C:\autoexec.bat" or "TYPE C:\config.sys". The contents of these files can be viewed with any text editor.

❑ 6.   Errors: Write down the exact wording of any error messages received from the Deluxe Option board software, DOS "CHKDSK," or any other application program.

Other Products

Ghostwriter II

GhostWriter II includes the following features:

- Supports most microcomputer disk formats.
- Copies up to 10 disks per minute (Apple II, Commodore 64) or 4 disks per minute (IBM PC 360K), with full verification!
- Includes full read verification of most formats.
- Has an external port for easy installation of a Trace disk autoloader.
- Fully supports 600 RPM (double-speed) drives.
- Can duplicate both sides of a disk simultaneously.
- Features variable window margins.

If you are looking for a disk duplication system and are considering one of the $20,000 systems now available, you may wish to compare them to the Ghostwriter II before you purchase one. Ghostwriter II easily competes with these systems and offers several features they don't, including:

Full Read Verify
Some duplication systems verify the master disk simply by reading each track twice and comparing the two track images. This is fine if the disk is marginal, but if it has gone completely bad (for example, a sector has a "hard" error), the system will not catch the error. The only way to reliably do read verification is to check that all the sector IDs exist on every track and that each sector's data is good. This requires some pretty fancy software, but is necessary unless you want to hand check every sector of every disk you ever duplicate. Ghostwriter II will completely verify Apple II, IIGS, Macintosh, IBM, Amiga, Commodore, Atari ST and most other formats during read-in.

Versatility and Price
Some disk duplication systems allow you to connect two autoloaders and run them simultaneously. This seems like a great idea until you look at the price of these systems. They typically cost about $10,000 without the autoloaders. Ghostwriter II lets you take advantage of the low prices of an IBM PC compatible system. For example, you can configure two Ghostwriter II systems for less than the price of a single stand-alone disk duplication system. Further, the stand-alone duplicator may

only duplicate a single master at a time (two autoloaders, but only one master). With two Ghostwriter II systems, you not only save money, but can duplicate different masters simultaneously. In addition, since a Ghostwriter II system is also a standard IBM PC or compatible, when you aren't duplicating disks, you can use it for other tasks.

Ease of Use
Ghostwriter II will automatically determine the format of the disk you are duplicating and set itself accordingly. In fact, making copies is as easy as typing:

```
GW
```

Then selecting the name of the master to be duplicated from the on-screen menu. The Ghostwriter software will take it from there, keeping you informed as it proceeds with the name of the master you are duplicating, number of good and bad copies, and the time to duplicate each disk displayed on the PC's screen.

Compatibility
Many high-cost disk duplication systems require custom drives. For example, they vary the speed to handle the various formats (such as Commodore and Macintosh) that require variable data rates. Unfortunately, this approach may mean that you must buy your disk drives from the supplier of your disk duplication system, and these drives are usually far more expensive than standard drives (e.g. $1,200 instead of $300).

Ghostwriter II can use standard drives. All the circuitry to handle the difficult GCR formats is in Ghostwriter II – not in the drive. This means that your cost is considerably less, but you still have the flexibility of using the custom 600 RPM, simultaneous double-sided (SDS) drives if you wish to increase your output. These drives typically provide extra quality control features such as the ability to detect and reject disks that do not meet minimum amplitude specifications. Ghostwriter II gives you the choice.

The Ghostwriter II copy board has a suggested retail price of $995. It works in most IBM PC compatible computers and supports disk autoloaders from Trace Products. Ghostwriter II is also available as a complete duplication system from Trace Products:

Ghostwriter II High Performance Copy System: This system copies over 210 disks per hour! It includes the Ghostwriter II copy board and software installed in a Trace High Performance XT compatible computer with a 20 megabyte hard disk and 1 megabyte of expanded memory. The High Performance system also features a 3.5" or 5.25" Tracer 'Plus' autoloader and high-speed SDS copy drive. The suggested retail price is $6995.

Please address all inquiries to:
> Trace Products
> GhostWriter Department
> 2190 Bering Drive
> San Jose, CA 95131
> PHONE: (408) 435-7800
> FAX: (408) 922-0219

> Ask for the Ghostwriter department when calling.

Central Point Software Products

Central Point Software also sells these other disk utility and software backup products:

PC Tools Deluxe is our complete DOS utility package for the IBM PC and nearly all compatible computers. PC Tools Deluxe combines all the popular features of the Norton Utilities, Fastback, XTREE, Mace, Sidekick and Disk Optimizer. When it comes to managing and protecting your data, nothing does it better than PC Tools Deluxe. It includes file undeletion, PC Format, PC-Cache, a disk optimizer, file encryption, PC Backup, and PC Shell. In fact, if you have a Deluxe Option Board installed, PC Backup will automatically utilize it during DMA backups, thus increasing the backup speed by 2040%.   Also included is a complete memory resident desktop manager with a word processor, outliner, database with autodialer, appointment scheduler with alarms, keyboard macros, and financial, algebraic, and programmers' calculators.   PC Tools Deluxe works with virtually all IBM compatibles with at least 256K of memory. ($129.00*)

PC Tools Deluxe for the Macintosh offers a complete utility package for all Macintosh computers.   Features include hard disk backup, data recovery, file encryption, track and block editor, fast disk copy, and disk optimizing.

COPY II PC is the most complete copy program available for the IBM Personal Computer. It backs up most protected disks with no parameter changes, and uses all available memory to make reliable copies fast. You can also run popular software such as Lotus l-2-3 and Symphony from your hard disk without inserting the original floppy disk. Copy II PC includes a disk speed test to help keep your drives in top running order. For IBM PC, XT, AT, 256K jr. ($39.95)

COPY][for the Apple Macintosh is a disk backup and utility package for Macintosh computers. Combining all the most needed functions, COPY][will let you make archival backups of your protected software easily. No parameters are needed. Copy][also includes our powerful utility program MacTools. MacTools can recover

some damaged disks and undelete files. It will also display all files on a disk, including invisible files, and will let you make them visible again. You can mark any file as protected, unprotected, locked, or unlocked. Its block editor shows you what is inside any Macintosh file, and allows you to change it. Our Copy][HARD DISK application, also included on the disk, can copy many popular protected programs onto a hard disk. ($39.95)

Copy II Plus for the 64K Apple //, //+, //e, //c, IIGS and Laser 128. A 2-time winner of A+ magazine's "Reader's Choice Award." Copy II Plus is the most comprehensive bit copy program for backing up 5.25" and 3.5" Apple software and is almost totally automatic. Also includes very powerful ProDos and DOS 3.3 utilities. ($39.95)

We update our software products regularly to handle new protection methods. Updates are always available to you as a registered owner at a reduced price. Protection methods do change frequently so it is a good idea to double check with us if you need to back up a brand new release of one particular program. For more information on our products, call or write:

<div align="center">

Central Point Software Inc.
15220 NW Greenbrier Parkway, #200
Beaverton, Oregon 97006

(503) 6908090

</div>

*Effective May 1,1989. All prices subject to change without notice.

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The Deluxe Option Board turns your internal 3½" **floppy** disk drive into a dual format IBM/Mac **dr**ive. It also provides the ability to make exact copies of virtually any copy-protected 3½" or 5¼" floppy disk.

PC-MAC DATA EXCHANGE

SIMPLE DATA EXCHANGE. To transfer data from a PC format to a Mac format simply insert a diskette into your PC's 3½" floppy drive, format it as a Macintosh disk and copy a file to it. This same disk can then be inserted into a Mac to be read or copied. The reverse procedure is also true.

USES EXISTING DRIVE. The Deluxe **Option Board** is a half-sized card that plugs into your PC's expansion slot and connects between your floppy drive and the floppy disk controller card. It is able to control the speed at which data is written-to and read-from the disk-converting your existing internal 3½" disk drive into a dual-format IBM/Mac drive. There are no additional drives required, external cables to connect, or networks to install.

FAMILIAR COMMANDS. The commands are as easy as placing an "M" in front of the DOS commands you already know:

MFORMAT Formats Mac 800K and 400K HFS and MFS diskettes.
MDIR: Displays a directory of a Mac disk.
MCOPY: Copies files from a Mac disk to an IBM disk and vice versa (supports wildcards).
MMD: Creates a directory (folder) on the Mac disk.
MTREE: Displays the Mac disk's directories (folders).
MRD: Removes a directory (folder) on the Mac disk.
MDC: Disk copies a 400K or 800KMac disk.

There's simply no easier, less expensive way to transfer data between PCs and Macs.

VERSION 5.4

WORKS WITH POPULAR PROGRAMS. Several software packages support the transfer of data in this way, including Microsoft Word, WordPerfect, Microsoft Excel, Aldus PageMaker and even Lotus 1-2-3.

DOWNLOAD MAC FILES FROM BBS. Macintosh files electronically downloaded into your PC from a Bulletin Board System can be stored on an IBM diskette for later transfer to a Macintosh format.

PROTECTED SOFTWARE BACKUP

MAKES EXACT COPIES. The Deluxe Option Board is the ultimate solution to backing up protected software. It employs the same advanced technology used by many disk duplication firms. With this technology, the user is not limited to the standard floppy controllers capabilities that many copy protection schemes rely on. Unlike the standard controller, it gives your computer access to all of the information on your disk and because of this it is able to make exact backup copies of virtually any copy-protected IBM 3½" or 5¼" floppy disk.

PROTECTS YOUR VALUABLE SOFWARE INVESTMENT. Making archival backup copies of your software protects your original disks from accidents or possible data corruption (copy-protected or not). It's a good practice.

REQUIREMENTS. IBM PC, XT/AT and compatibles or PS/2 Models 25 and 30.* Requires 320K RAM. The PC-Mac data exchange works with virtually any 720K internal 3½" disk drive or a Citizen, TEAC or Toshiba 1.44 MB drive.

*Note: IBM PS/2 Model 25 and 30, Compaq, HP Vectra and Tandy require an additional $15 cable specific to those computers.

RELATED PRODUCTS. PC Tools Deluxe: When the Deluxe Option Board is used in combination with PC Tools' PC BACKUP program, hard disk back-up time to unformatted disks is reduced by up to 40%.

Copy II PC: A software package that allows the backup of hundreds of the most popular copy-protected programs and allows the running of some software from a hard drive without a key disk.
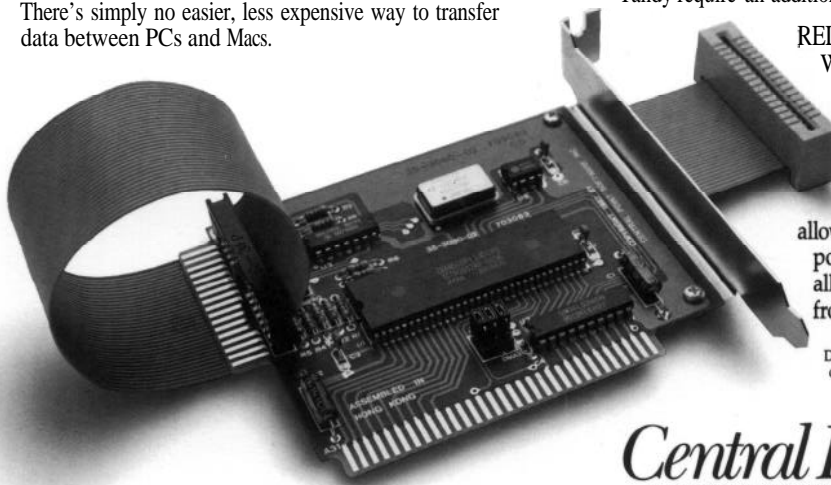
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