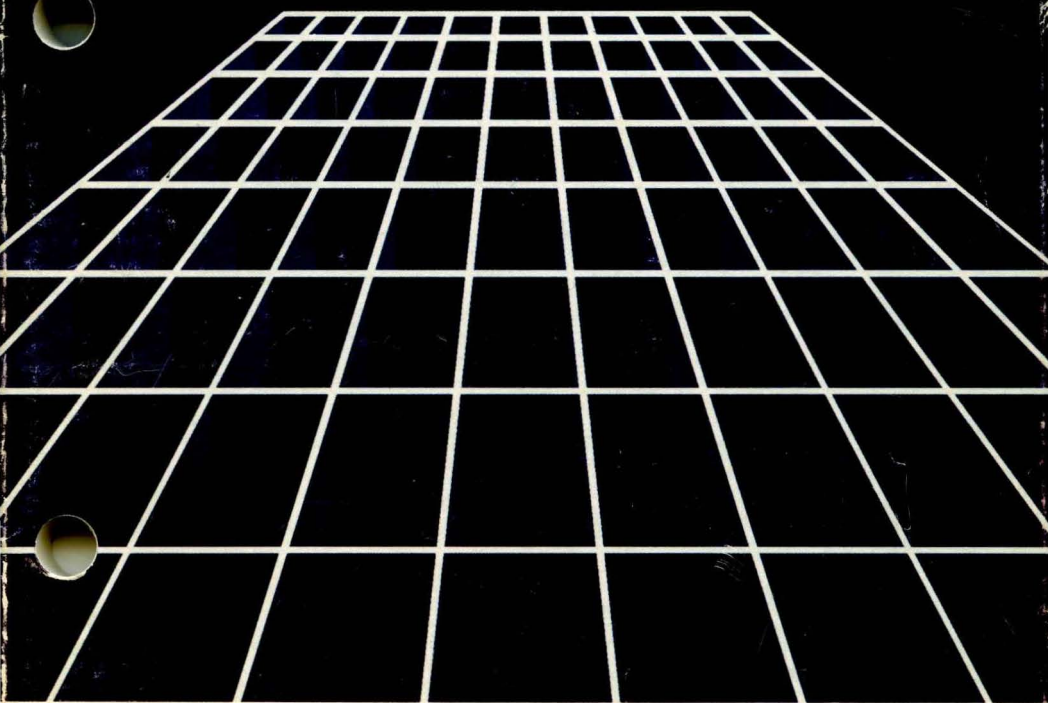


**QIC-60
Tape Backup
Installation Manual
User's Guide**

The Answer.



TECMAR



QIC-60
Tape Backup
Installation Manual
User's Guide

FCC Required Instructions

This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the operating instructions, reference manuals, and the service manual, may cause interference to radio or television reception. It has been tested and found to comply with the limits for a Class B computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a residential installation.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the equipment with respect to the receiver.
- Move the equipment away from the receiver.
- Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

“How to Identify and Resolve Radio-TV Interference Problems”.

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. It is the responsibility of the user to correct such interference.

You must use a shielded cable with any device connected to the QIC-60



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Read This First

Introduction

Tecmar's QIC-60 tape backup is an easy, reliable, and speedy means of preserving your important data files on magnetic tape. The main function of any backup system is to backup your permanent storage and to insure against a possible disastrous data loss. The QIC-60 does this quickly and efficiently and, as you will find with your continued use, it does much more.

Features

- Reliable backup of an entire hard disk up to 60 megabytes.
- Choice between the versatile file-by-file backup or the speedy mirror-image total backup.
- Easy-to-follow menu-driven operations for backup/restore procedures.
- Command-driven operations providing you with added options and greater versatility.
- De-fragmenting of your files to increase the speed and improve the efficiency of your whole system.
- Enhanced reading capabilities that make QIC-60 tape cartridges completely interchangeable among other QIC-60 tape drive units.
- Utilities programs to take care of “housekeeping” functions for QIC-60.
- Help screens accessed from nearly anywhere in the program to answer questions that might arise during your initial backup/restore routines.
- High impact plastic and aluminum tape cartridges that provide a resilient, convenient, and portable medium for backup/restore.
- Easy installation into an IBM PC, AT, XT, or compatible.

Purpose

The purpose of this manual is to explain how to:

- Install the QIC-60 into your personal computer.
- Install the QIC-60 software.
- Explain the backup/restore operations.
- Explain menu-driven and command driven operations.
- Provide information on the care and maintenance of the QIC-60.

System Requirements

One floppy disk drive

One hard disk drive

256K of RAM for Menu-driven operation

192K of RAM Command-driven operation

60MB 1/4" Tape Cartridge; 3M DC-600A or equivalent
DEI cartridge.

Chapter 1

The QIC-60 Tape Backup



The QIC-60 Tape Backup Unit

The QIC-60 tape backup offers you the ultimate in the preservation and protection of information from your mass storage devices. In certain backup/restore modes, the QIC-60 gives you the fastest backup of any system offered.

A backup system is only useful if it is quick, reliable, efficient, and secure. The QIC-60 gives you all these features in a compact cabinet. It features durable and portable tapes that add to the safety and security of the system.

QIC-60 provides the security of having important files permanently stored on compact magnetic tape cartridges. QIC-60 is not simply a backup/restore device. It offers many other features in addition.

The versatile QIC-60 gives you the option of performing two separate types of backup/restore routines in two different ways. The QIC-60 allows you to do either file-by-file backups or mirror-image backups. You can do either of these types of backup using menu-driven operations or command-driven operation.

The file-by-file backup lets you backup, file-by-file, your entire disk, individual files, groups of files, or directories. The QIC-60 software lets you backup only those files that you need at that specific time. File-by-file backup will give you a directory of the files that have been backed up. When the time to restore the files to disk arrives, you can select which files to restore. You can choose only to restore files that would be required for a specific application. The file-by-file backup will allow you to restore a single file or many.

The mirror-image backup is a good option to use when you want to backup your whole disk and want to do it very quickly. The mirror-image backup is probably the quickest backup available today. Choosing this option means that you will have to backup all of the data on your disk.

During the restore operation, you will likewise have to restore every file that was backed up. There is no selectivity with the mirror-image backup. Unlike many other backup units which offer a mirror-image option, the QIC-60 allows you to restore your mirror-image backups onto any disk which has the correct size and format. You are not limited to restoring only to the disk from which the original backup was made.

The QIC-60 also lets you perform your backup/restore routines in one of two different modes of operation. You can use the simple and easy-to-follow menu-driven-mode or the powerful and more complex command-driven mode.

The menu-driven mode of operation provides you with the easiest way to back up and restore. With the menu-driven operations, you do not have to learn or memorize complex commands or formats. Everything that you have to do to backup or restore will be shown to you in a series of screens and menus. QIC-60 will prompt you to perform the correct sequence of operations to accomplish your task.

The extreme versatility of QIC-60 is seen in the power you are offered in the command-driven mode of operation. Although the menu-driven mode is very powerful and easy to use, a more advanced programmer might want other options for controlling his backup/restore routines that are not offered in the menu-driven mode. This is what the command-driven mode provides. Command-driven operations can be used in batch processing and can be used from within other programs. At first, this mode of operation might seem a little more difficult. With practice, it becomes a powerful and very useful tool to the programmer.

The QIC-60 can also be used to speed up the performance of your entire system by "de-fragmenting" your files. Often when you enter files into your computer's memory, these files are stored in sectors which are not continuous (non-contiguous). When using these files, computer time is used in searching for these diverse sectors. When you backup with the QIC-60, the backup is done in a contiguous fashion, that is all files are put on continuous sectors so that the entire file is stored in one place. When you restore these files to your disk, they are restored contiguously, and because of this, they increase the speed and efficiency of your system. For de-fragmenting to occur, you must restore your files to a reformatted disk.

Any backup tape made on a QIC-60 will be able to be used with any other QIC-60 unit. Even if mechanical alignment were different for each QIC-60 unit, the tapes are still completely interchangeable. This feature is not often seen on other tape backup units.

The QIC-60 drive unit is compact and durable. It easily fits on top of most systems. It is an attractive and reliable addition to any computer system. The QIC-60 cartridges are made of high impact plastic fastened to an aluminum base plate. They are resilient and offer you a convenient means of storing and transporting data.

You can get a QIC-60 with an internal hard disk drive to further increase the power of your system. If you have a QIC-60 without a hard disk drive, kits are available so that you can upgrade your system as the need arises.

You can easily install the QIC-60 yourself into an IBM Personal Computer, XT, or AT. The QIC-60 will also work with most of the compatibles. You can find a list of these compatible computers in the **Guide to Cover Removal and Replacement** that came with your QIC-60.

You should read through this manual before trying to install QIC-60. After you have read it, go to Chapter 6 to learn how to install your unit.



Chapter 2

Menu-Driven Operations



Menu-Driven Operations

For an easy, quick, and convenient means of backup/restore, the QIC-60 provides the menu-driven mode of operation. You can use the menu-driven mode without having to learn and remember intricate commands, syntax, and format statements. Every bit of information you will need to perform your daily backup and restore routines will be presented simply and clearly in a series of screens and menus.

Using the Menu-Driven Modes

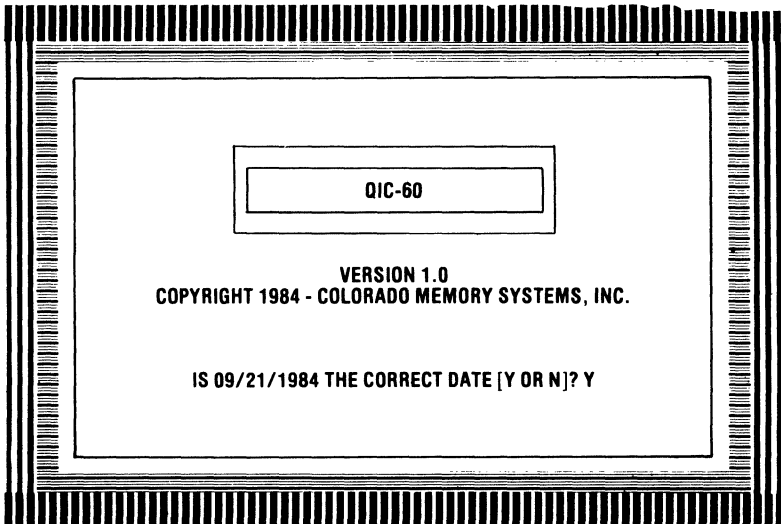
To use the menu-driven mode, you have to access the QIC-60 software. This should have been installed after you installed your QIC-60 board(s) (see Chapter 6). At that time you created a directory for the software. You will have to go into that directory to perform menu-driven backup or restore.

- Type `cd\` (name of the directory that contains QIC-60 software).

An example would be to type:

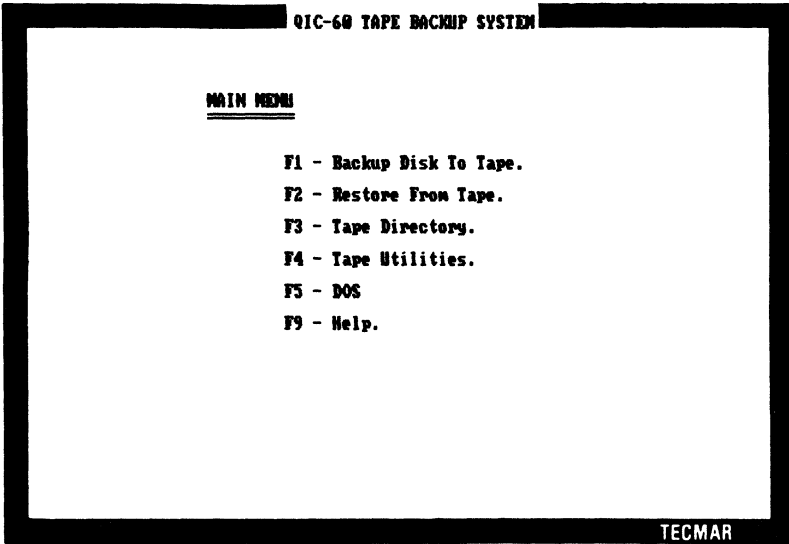
`cd\qic`, if `qic` is the directory you chose for your software.

- Load the program "QIC".
- A screen should appear like the one below.



- The screen will display a date and ask if it correct. If it is, press RETURN (Y is the default response). If it is not, press N, press RETURN, and type in the correct date. Press RETURN.
- The screen will display a time and ask if it is correct. If it is, press RETURN. If it is not, press N then press RETURN. Type in the correct time and press RETURN.

The screen will look like the one below.



The Main Menu gives you six options, each with a specific purpose.

Backup Disk to Tape.

Choose this option if you want to do a backup.

Restore From Tape.

Choose this option if you want to restore a backed up volume.

Tape Directory.

Choose this option if you want to see the names of the volumes you have backed up on tape. This directory will appear on the screen.

Tape Utilities.

Choose this option to perform certain "housekeeping" chores on tapes. These have to be done from time to time and include: tape retensioning, tape verifications, tape erasure, and changing the default configuration file.

DOS.

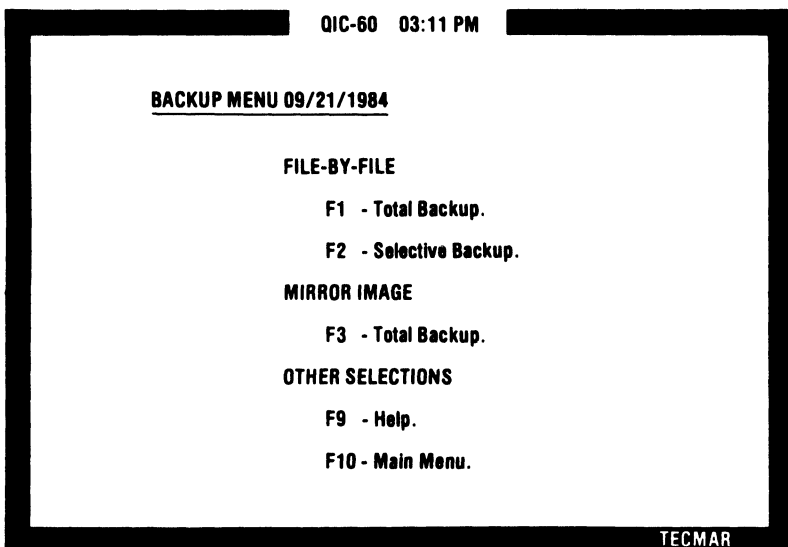
Choose this option to return to the operating system.

Help.

Choose this option to get a help menu and help screens. These explain concepts used by QIC-60.

Backup Disk to Tape

The first operation on your Main Menu, Backup Disk to Tape, can begin by pressing the F1 function key. You will see a backup menu displayed like the one below.



Look at the backup menu. You can see that a number of backup options are open to you.

File-By-File Backup

A file-by-file backup is the most versatile type of backup you can have. It copies each file individually onto the tape and makes a directory of the copied files. You can use this directory later as an index when you decide which files to restore.

■ Total Backup

By pressing the F1 key, you will have a file-by-file total backup of your disk. In this case, the tape records each file individually, overwriting all existing data on the tape. With Version 2.0 software or greater, you will be able to add files to existing files on the tape without destroying the existing files. After you have pressed the F1 key, the screen will ask for the drive letter of the disk that has the information you want to backup. Then you will be asked to give a name to the volume on the tape where information will be backed up to. By doing a file-by-file total backup, all files are copied. All of these files do not have to be restored. You can choose which files you want to restore even though the backup was total.

■ Selective Backup

By pressing the F2 key, you will be able to selectively decide which files you want to backup. With this option, all of the files on your disk will not be backed up as in the Total Backup. Only the files you specify will be backed up using this format. Here you can still get a directory of the files and access each one for restore at a later time. You have only a partial backup of your disk, but you can include any files you want. You can copy files to tape for a specific purpose, or you can backup only those files that have changed since a certain date.

After you have pressed the F2 key, the screen will prompt you to enter the letter of the drive from which you want to make a partial copy. You can enter a logical drive letter for any device that has one assigned to it. (RAMdisk, floppy drive, etc.).

The QIC-60 system will then display a directory of all of the files from the drive that you specified. It allows you to choose those files that you want to backup. These files will be listed alphabetically according first to directories and then individual files. The diagram below shows the listing of files and directories for the selective backup.

PATH: c:\		SELECTIVE BACKUP		
FILENAME	DATE	TIME	SIZE	
L	01/01/80	12:02 AM		[DIR]
LC	01/01/80	12:01 AM		[DIR]
MAINWORD	10/01/84	08:42 AM		[DIR]
MDBS	01/01/80	12:06 AM		[DIR]
MITCH	01/01/80	12:01 AM		[DIR]
OPTOMET	01/01/80	12:08 AM		[DIR]
PLINK	01/01/80	12:05 AM		[DIR]
SCREENS	01/01/80	12:02 AM		[DIR]
STDLIB	01/01/80	12:04 AM		[DIR]
STREAMER	01/01/80	12:12 AM		[DIR]
WP	09/11/84	11:17 AM		[DIR]
AUTOEXEC.BAK	09/10/84	03:24 PM	267	
AUTOEXEC.BAT	09/18/84	11:38 AM	146	
BAT.PRF	10/03/84	12:41 PM	313	
COMMAND.COM	10/20/83	12:00 PM	17,792	
CONFIG.SYS	05/30/84	12:43 PM	23	
SETPATH.BAT	10/03/84	12:41 PM	69	

SEARCH FOR FILE OR DIRECTORY [F OR D]?

F1: ^ F2: v F3: SUBDIR F4: PARENT DIR F5: BACKUP F10: MENU

In the bottom border of the screen you will see

F1: ^ F2: v F3: SUBDIR F4: PARENT DIR F5: BACKUP F10: MENU

Each of these represents one of the different functions in a file-by-file selective backup.

F1 and F2 keys are used for scrolling up (F1) or down (F2) through the list that appears on your screen. As you scroll, a different file or directory will appear in the selection window (the darkened rectangle in your diagram). You can also use the scroll keys on the right side of your keyboard to place an item in the selection window. The up arrow and down arrow keys are used as the F1 and F2 respectively. The Home key goes to the first entry in the directory, or to the top of the directory. The End key moves the bottom or last entry of the directory.

The F3 key is used when you have chosen a directory and want to look at the items in this directory.

The F4 key is used when you choose a subdirectory and then want to get back to the directory. If you press the F4 key, you will get the previous list of files or directories.

The F5 key allows you to back up the file or directory you have selected with the selection window. Pressing this key will begin the backup.

When the backup has been completed, you can press the F10 key to return to the Backup Menu. Actually, you can push the F10 key and return to the Backup Menu at any point except while the backup is being done.

The entries on your screen are organized into two groups: directories (listed first) and files. You can note the difference by looking in the size column for each entry. Directories will be represented by <DIR> and files by their sizes in bytes. You can scroll through the entries by using your F1 or F2 keys or the down/up arrow keys. You will notice that the listing will change. It will scroll past the selection window. If you place a directory in the selection window, you can press the F3 key to look at all the files and subdirectories under that directory. The name of the directory will be shown in the upper left hand corner of the screen as part of the path. If you look at the files in a subdirectory, the name of the subdirectory will be added to the path that you are following.

PATH: c:\		SELECTIVE BACKUP	
FILENAME	DATE	TIME	SIZE
BAT	01/01/80	12:11 AM	[DIR]
BECKWORK	09/06/84	01:30 PM	[DIR]
CSS	01/01/80	12:05 AM	[DIR]
DOS2.1	01/01/80	12:01 AM	[DIR]
DUMMY	01/01/80	12:07 AM	[DIR]
H	01/01/80	12:06 AM	[DIR]
L	01/01/80	12:02 AM	[DIR]
LC	01/01/80	12:01 AM	[DIR]
MAINWORD	10/01/84	08:42 AM	[DIR]
MDBS	01/01/80	12:06 AM	[DIR]
MITCH	01/01/80	12:01 AM	[DIR]
OPTOMET	01/01/80	12:08 AM	[DIR]
PLINK	01/01/80	12:05 AM	[DIR]
SCREENS	01/01/80	12:02 AM	[DIR]
STDLIB	01/01/80	12:04 AM	[DIR]
STREAMER	01/01/80	12:12 AM	[DIR]
WP	09/11/84	11:17 AM	[DIR]

SEARCH FOR FILE OR DIRECTORY [F OR D]?

F1: ^ F2: v F3: SUBDIR F4: PARENT DIR F5: BACKUP F10: MENU

If you have chosen a subdirectory and have pressed the F3 key the names of files and subdirectories in that subdirectory will be displayed on the screen. If you find that this is not the set of files you were in need of, you can press the F4 key and go back to the previous list of files and/or directories. These will again be displayed.

To start the backup, you must position either a file or directory in the selection window. Once you have chosen a file or directory to backup, you have to press the F5 key. At the bottom of the screen you will see a statement that asks you to verify that the chosen file is the one you want to backup. Since Y for yes is there by default, if you do want to backup you merely press the RETURN key to begin the process. If you do not want to backup this file, you must type in N and RETURN . If you have chosen a directory for backup, you will be asked to verify that the files in the directory in the selection window are the files that you want to backup. You will be asked if you want to include all the files in subdirectories of that directory.

You will always be able to tell your current directory by looking at the path in the upper left corner of your screen. Whenever you use F3, a new directory label will appear in the path. This will be the label of the directory you are currently looking through.

PATH: C:\MAINWORD		SELECTIVE BACKUP	
<u>FILENAME</u>	<u>DATE</u>	<u>TIME</u>	<u>SIZE</u>
NOTICES	10/04/84	11:38 AM	[DIR]
PERSONAL	10/04/84	11:37 AM	[DIR]
REPORTS	10/04/84	11:37 AM	[DIR]
ROMER.LTR	10/01/84	08:42 AM	[DIR]
STOFER.LTR	10/04/84	11:38 AM	[DIR]
FEARNOT.COM	10/04/84	11:40 AM	11,008
FEARNOT.OVR	10/04/84	01:54 PM	38,400
LETTER	10/04/84	01:55 PM	12
PRINT.TST	10/04/84	10:15 AM	3,968
TUTOR.INS	10/04/84	01:54 PM	512
WINSTALL.COM	08/14/84	11:50 AM	1,152
WINSTALL.OVR	08/14/84	11:46 AM	38,528
WS.INS	10/04/84	01:49 PM	43,776
WSCOLOR.BAS	10/04/84	01:53 PM	6,656
WSMSG.S.OVR	08/14/84	11:49 AM	29,056
WSOVLY1.OVR	10/04/84	01:56 PM	41,216
WST1.OVR	08/14/84	11:54 AM	48,896

BACK UP "PRINT.TST" TO TAPE [Y OR N]? Y

F1: ^ F2: v F3: SUBDIR F4: PARENT DIR F5: BACKUP F10: MENU

PATH: C:\MAINWORD

SELECTIVE BACKUP

<u>FILENAME</u>	<u>DATE</u>	<u>TIME</u>	<u>SIZE</u>
HOWES.LTR	10/04/84	11:43 AM	[DIR]
LEGAL	10/04/84	11:40 AM	[DIR]
LEVETT.LTR	10/01/84	08:42 AM	[DIR]
LEVY.LTR	10/04/84	11:33 AM	[DIR]
MEMOS	10/04/84	11:38 AM	[DIR]
NELSON.LTR	10/04/84	11:42 AM	[DIR]
NOTICES	10/04/84	11:38 AM	[DIR]
PERSONAL	10/04/84	11:37 AM	[DIR]
REPORTS	10/04/84	11:37 AM	[DIR]
ROMER.LTR	10/01/84	08:42 AM	[DIR]
STOFER.LTR	10/04/84	11:38 AM	[DIR]
FEARNOT.COM	10/04/84	11:40 AM	11,008
FEARNOT.OVR	10/04/84	01:54 PM	38,400
LETTER	10/04/84	01:55 PM	12
PRINT.TST	10/04/84	10:15 AM	3,968
TUTOR.INS	10/04/84	01:54 PM	512
WINSTALL.COM	08/14/84	11:50 AM	1,152

INCLUDE ALL FILES IN SUBDIRECTORIES OF "REPORTS" [Y OR N]? Y

F1: ^ F2: v F3: SUBDIR F4: PARENT DIR F5: BACKUP F10: MENU

If you have answered Y to the backup prompt, you will be shown another prompt asking you to enter the backup identification label. After you have typed in this label, press the RETURN key and backup will begin.

Comments will appear on the screen telling you what is happening before the process is completed. When the backup is completely finished, your screen will look like this:

SELECTIVE BACKUP

Loaded parameters.
Backup started on 01/02/1985 at 10:30 am

RAM Buffer Size: 320K

Writing Directory on Tape
3,968 bytes in 1 File[s] to back up

Writing File[s] on Tape

File by File Backup
3,968 Bytes
1 Files
Backup time : 0 min. 3 sec.
Total time : 0 min. 8 sec.

F1: RETURN F10: MENU

After the backup has been completed you can return to the previously displayed directory listing by pressing F1 key or you can go back to the Backup Menu by pressing the F10 key.

Using the Search

If you don't want to scroll through the listings of directories and files, you can use the search capability of the QIC-60.

At the bottom of the screen listing you find a statement: Search for file or directory (F or D)? By Entering one of these letters, you will be able to search for the directory or file you want without having to scroll through, a lengthy task if you have many files.

If you enter either a D or an F you will then be asked to enter the file or directory name you're looking for. After you enter the name and press the return key, the selection window will be positioned on that entry. You can then back up this file or directory by pressing the F5 key.

Note: A write-protect sticker will stop you from backing up a floppy disk using the file-by-file method. If you want to backup this type of disk, remove the write-protect sticker during backup. Replace it after you have backed up.

Mirror-Image Total Backup

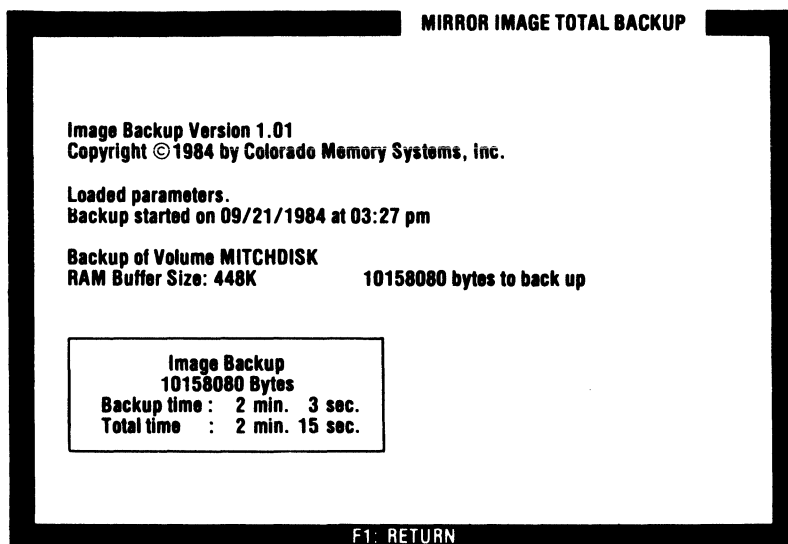
The mirror-image total backup is the fastest method of backing up an entire disk that is available today. It is extremely useful when you want to backup the whole disk and also want to restore all of the files at a later date.

Like the file-by-file total backup, the mirror-image total backup will copy everything from your disk or logical device onto tape. The major difference between the two is that of selective restore.

With the file-by-file technique, you can restore any files you wish to your disk after a total backup. With the mirror-image total backup, you must restore all of the files that were originally backed up. You have no alternatives. They must also be restored to a disk that has the same size and format as the disk it was originally backed up from. Also, with the mirror image backup, you will have no directory of the files included in the backup volume. To choose the mirror-image option, you must press the F3 key from the Backup Menu.

After you have pressed the F3 key, you will be asked for the logical drive that has the information you want to back up. Each logical device that contains data will have a letter, such as A, B, C, etc. Type that letter and then press the RETURN key.

Next, you will be asked to enter the backup identification label for this backup volume. This label can be a maximum of 44 characters. After you have typed this in, press the return key and the backup process will begin. As the backup continues, the screen will display various comments. The backup will end in a short time (a few minutes) and the final screen will look like the one below.



At the end of the backup you can press the F1 key. This will return you to the Backup Menu.

Restore From Tape

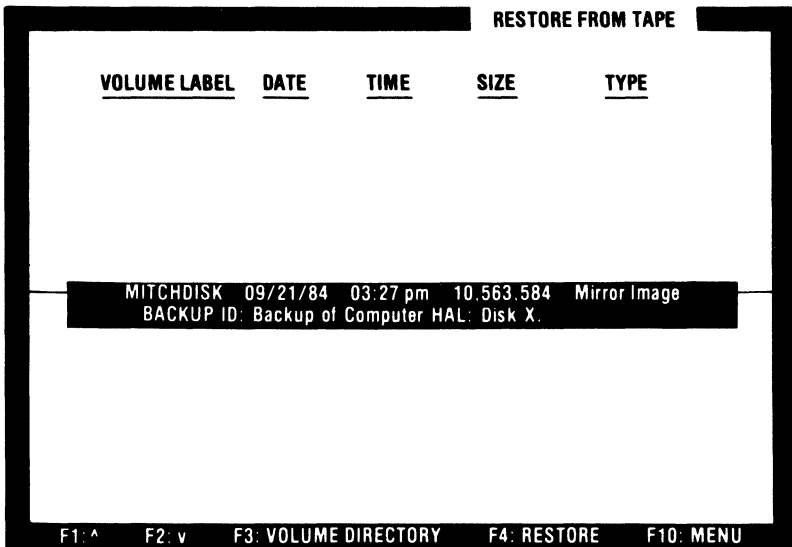
You use the restore operation to recover data that has been previously backed up onto tape. Depending upon how your disk was backed up, you can either restore with the mirror-image technique or the file-by-file technique. The mirror-image restore will destroy all data that may exist on your disk. It simply places a mirror image of the data on the disk. With the file-by-file restore, files are taken from the tape and restored to the disk individually. Any file on the disk with the same name as one on the tape could be overwritten, depending on whether or not you have enabled the overwrite capability by changing the configuration file. Any files that were not on the tape will be left unchanged on the disk.

In order for you to do a mirror-image restore, the disk must be the same size and have the same format configuration as the disk that the backup was originally made from. When the QIC-60 restores a mirror-image to a disk, it performs a "smart relocation" of the bad sectors that existed on the original disk. On the new disk, the one used for restore, these bad sectors do not have to be the same as in the original. Since the two disks must be of the same size, there is almost no possibility of running out of space for the restore unless the disk used for the restore has more bad sectors than the original disk. It would be wise for you to make sure that your replacement disk has fewer bad sectors on it.

You could possibly run out of room with the file-by-file restore because you could be adding data to a full or partially full disk. It is a good idea to make sure that there is enough room on your disk to restore the files you need. If you do try to restore files to a disk that is already too full, the QIC-60 will restore as much as it can from the tape and then notify you. You will merely have to clear some old files from your disk before you can restore the rest of that tape.

Note: Read only files are not transferred with a file-by-file restore. For example, the two DOS system files (IBMDOS.COM and IBMBIO.COM) are read only files, and will not be restored under file-by-file operations.

To start the restore procedure from the tape you must start with your Main Menu. Pressing the F2 key will take you to your Restore screen which looks like the one below.



At the top of the restore screen is the title “RESTORE FROM TAPE”. This lets you know that you are in a restore mode. Near the top of your restore screen are the labels: volume label, date, time, size, and type.

Volume Label: This is the label of the volume that was backed up.

Date: This is the date of the backup.

Time: Time of the backup.

Size: The size of the backed up volume.

Type: The type of backup that was used, i.e., file-by-file or mirror-image.

The second line in the selection window shows the backup I.D. (if any) you used when you made the backup.

File-by-File Restore

To do a file-by-file restore, you must make sure that you have a tape in your drive that contains a file-by-file volume. From your Main Menu, press key F2 and this will produce the restore screen. The selection window will display the volume label, date, time, size, type, and comments for the volume in the tape drive. For a file-by-file restore, the type should read "file-by-file".

File-by-File Total Restore

If you choose to do a file-by-file total restore, insert a tape with a file-by-file backup volume on it.

Press the F2 key to get to your restore screen.

You should see a restore screen like the one below. It should list the name of the volume, the date and time of backup, the size, and that it was a file-by-file backup.

RESTORE FROM TAPE				
<u>VOLUME LABEL</u>	<u>DATE</u>	<u>TIME</u>	<u>SIZE</u>	<u>TYPE</u>
MITCHDISK 09/21/84 03:12 pm File By File				
BACKUP ID: Complete Hard Disk Backup - 96 Directories.				

F1: ^ F2: v F3: VOLUME DIRECTORY F4: RESTORE F10: MENU

If you want to know what is in this volume, push F3 to get a volume directory.

A screen should appear like the one below.

```
PATH: \ ██████████ RESTORE FROM TAPE
```

<u>FILENAME</u>	<u>DATE</u>	<u>TIME</u>	<u>SIZE</u>
BIN	01/24/86	9:42 AM	<DIR>
DOS	01/01/89	11:15 AM	<DIR>
ELAN	01/22/86	11:47 AM	<DIR>
ETC	01/22/86	2:20 PM	<DIR>
HARDDISK	01/27/86	3:42 PM	<DIR>
LIB	01/24/86	9:34 AM	<DIR>
PAINT	01/22/86	11:47 AM	<DIR>
PCTALK	01/22/86	11:44 AM	<DIR>
QIC	01/22/86	11:45 AM	<DIR>
RES	02/27/86	4:02 PM	<DIR>
TREAS	01/22/86	11:40 AM	<DIR>
UTILITY	01/22/86	11:40 AM	<DIR>
AUTOEXEC.BAK	02/13/86	12:37 PM	384
AUTOEXEC.BAT	04/01/86	9:22 AM	384
COMMAND.COM	10/20/83	12:00 PM	17,792
CONFIG.SYS	01/22/86	10:22 AM	41
IBMBIO.COM	10/20/83	12:00 PM	4,736

SEARCH FOR FILE OR DIRECTORY [F OR D]?

F1: ^ F2: v F3: SUBDIR F4: PARENT DIR F5: BACKUP F10: MENU

Push the F4 key to return to the volume list.

Since you want to restore the entire volume you do not have to select any from your directory.

Press the F5 key in order to restore the entire volume.

After you have pressed the F5 key, the screen will ask you which logical drive to restore this volume to.

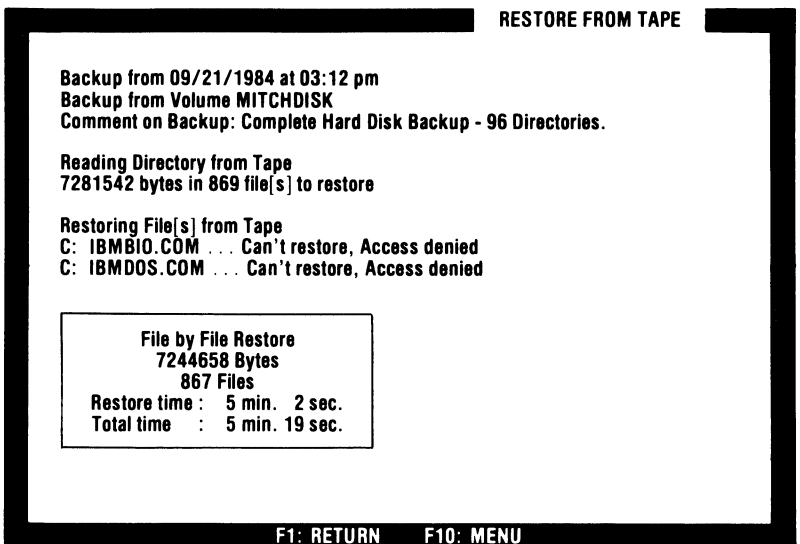
Type in the letter of the drive to which you want your volume restored, then press return.

This drive letter need not be the same as the one from which the backup was made.

A screen appears and displays a warning that the existing data on the drive will be destroyed. This allows you to verify whether you want to execute this command.

If you want to restore, type Y. If you type N, you will be returned to the previously displayed volume listing.

The volume that you chose will be restored to your disk. During the restore, the screen will display messages and information. Your final screen should look like the one below.



File-By-File Selective Restore

Restoring selected files from a file-by-file backup is a lot like restoring the whole volume from a file-by-file backup just mentioned. The difference is that now you will have to select the individual files to be restored.

Insert a tape into your drive that contains a file-by-file backup volume. Press the F2 key from the Main Menu. The restore screen will appear and will give the volume label, date, time, size and type (file-by-file) in the selection window.

RESTORE FROM TAPE				
<u>VOLUME LABEL</u>	<u>DATE</u>	<u>TIME</u>	<u>SIZE</u>	<u>TYPE</u>
MITCHDISK 09/21/84 03:12 pm File By File BACKUP ID: Complete Hard Disk Backup - 96 Directories.				

F1: ^ F2: v F3: VOLUME DIRECTORY F4: RESTORE F10: MENU

Press the F3 key to get a directory of the volume of the tape.

The screen that appears will have a directory of all the directories and files in the volume. It will look like the diagram below.

PATH:\ MAINWORD		RESTORE FROM TAPE	
FILENAME	DATE	TIME	SIZE
NOTICES	10/01/84	08:42 AM	[DIR]
PERSONAL	10/04/84	11:38 AM	[DIR]
REPORTS	10/04/84	11:40 AM	[DIR]
ROMER.LTR	10/04/84	01:54 PM	[DIR]
STOFER.LTR	10/04/84	01:55 PM	[DIR]
FEARNOT.COM	10/04/84	10:15 AM	11,008
FEARNOT.OVR	10/04/84	01:54 PM	38,400
LETTER	08/14/84	11:50 AM	12
PRINT.TST	08/14/84	11:46 AM	3,968
TUTOR.INS	10/04/84	01:49 PM	512
WINSTALL.COM	10/04/84	01:53 PM	1,152
WINSTALL.OVR	08/14/84	11:49 AM	38,528
WS.INS	10/04/84	01:56 PM	43,776
WSCOLOR.BAS	08/14/84	11:54 AM	6,656
WSMSG.S.OVR	08/14/84	11:54 AM	29,056
WSOVLY1.OVR	08/14/84	11:54 AM	41,216
WST1.OVR	10/04/84	01:53 PM	48,896

SEARCH FOR FILE OR DIRECTORY [F OR D]?

F1: ^ F2: v F3: SUBDIR F4: PARENT DIR F5: RESTORE F10: MENU

Scroll through the volume directory to find the files or directories you want restored using the F1 and F2 keys (up and down).

If you have located a file you want restored, press the F5 key and restore will begin.

If the file you want is in another directory, position that directory in the selection window by scrolling.

You can tell the difference between files and directories by the size column on the screen.

When you find the directory where you think the file may be located, press the F3 key to get a listing of the files in this directory.

Again you can scroll through the listing with the F1 and F2 keys, and can further go into subdirectories through the F3 key.

Locate the file you want to restore and position it in the selection window.

Press the F5 key to restore this file to your disk.

You will be asked to confirm that you wish to restore this file, and if you wish to include all subdirectories in the restore.

The system will ask you for the logical drive into which you want to make the restore.

Type in the letter of the drive into which you want the file restored.

Several messages will be shown on the screen during the restore. The final screen below will appear when restore is complete.

RESTORE FROM TAPE

Backup from 09/21/1984 at 03:12 pm
Backup from Volume MITCHDISK
Comment on Backup: Complete Hard Disk Backup - 96 Directories.

Reading Directory from Tape
7281542 bytes in 869 file[s] to restore

Restoring File[s] from Tape
C: IBMBIO.COM ... Can't restore, Access denied
C: IBMDOS.COM ... Can't restore, Access denied

File by File Restore
7244658 Bytes
867 Files
Restore time : 5 min. 2 sec.
Total time : 5 min. 19 sec.

F1: RETURN F10: MENU

Press the F10 key to return to the Main Menu.

If you want to return to the volume listing of the tape to restore more files or directories, press the F1 key.

Mirror-Image Total Restore

If you have backed up your disk using the mirror-image backup, you can only restore the contents of the entire disk during backup. You have no way of selecting certain files for backup. All must be placed on your disk. When you restore with the mirror-image format, you overwrite all files on your disk so you must be sure that there is nothing there that you cannot lose.

For the mirror-image restore, the disk to which you restore your information must be the same size and with the same format configuration. The disk does not have to be the one from which the original backup was made, however. It does not have to have the same number of bad sectors as the original disk and in the same places. Since you are restoring to a disk of the same size and same format, it is nearly impossible to run out of space on your disk. The only way that this could happen would be if the disk to which you are restoring your information had more bad sectors than the original. Guard against this by making sure there are not more bad sectors on the restore disk.

Insert a tape cartridge that contains a mirror image backup into your tape drive.

From the Main Menu select Restore by pressing the F2 key.

This will cause the restore screen to appear with mirror image as the type of backup.

RESTORE FROM TAPE				
<u>VOLUME LABEL</u>	<u>DATE</u>	<u>TIME</u>	<u>SIZE</u>	<u>TYPE</u>
MITCHDISK 09/21/84 03:27 pm 10,563,584 Mirror Image BACKUP ID: Backup of Computer HAL: Disk X.				

F1: ^ F2: v F3: VOLUME DIRECTORY F4: RESTORE F10: MENU

Position the volume you want to have restored in the selection window.

You cannot use the F3 key to get a volume directory on a mirror-image restore. If you do press it, the computer will tell you that there are no volume directories with mirror-image backup.

Press the F4 key to restore the volume from tape to the disk.

If you want to go back to the restore screen to restore more information, press the F1 key.

If you want to return to the Main Menu, press the F10 key.

Tape Directory

This option gives you a chance to look at a directory (a sort of table of contents) of your tape, without the possibility of accidentally restoring tape data on top of disk data. It will show you a list of all the backups you have made to that tape. To get this option press the F3 function key from the Main Menu. The screen will display a tape directory of volumes that exist on the tape. Note the line at the bottom of the screen. This line is referring to the function keys to the left of your keyboard, labeled F1 through F10.

By pressing either the F1 or F2 function keys, the list on your screen will scroll up (F1) or down (F2), and a different volume label will be displayed in the selection window (the reverse-video window in the middle of your screen). The volume label shows which disk volume you backed up. The date and time you backed up are shown. The size of the volume is listed. The *TYPE* column shows how your backup was made: file-by-file or mirror-image. The second line in the selection window shows the backup identification label (if any) that you typed when you backed up.

When you have a volume label positioned in the selection window, you may press the F3 function key to get a volume directory (the table of contents of that volume). The only type of backup that does not show a volume directory is a mirror-image backup, so we cannot get a volume directory (a breakdown, or more detailed listing) of this particular volume.

If we put a tape with a file-by-file backup into the tape drive, and choose the tape directory option (Remember? use the F3 function key from the Main Menu.), we could get a more detailed directory. When F3 is pressed, the directory information from the tape is read and stored in memory (RAM), and the screen will display a directory of the volumes that exist on that tape. Pressing F3 again will bring up a display which lists the files and directories that are in the volume. Remember that the difference between a directory and a file is shown by a directory having the words *<DIR>* under the *SIZE* column, and a file will have a number (its size) in this column.

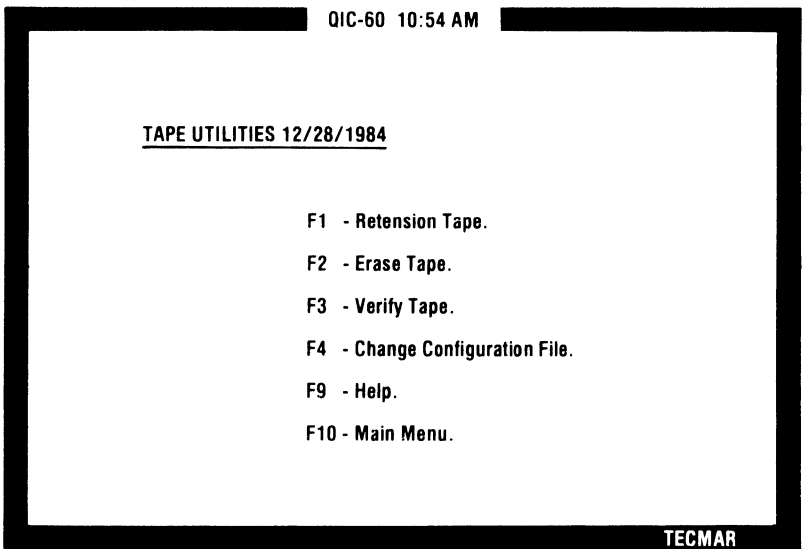
Notice that with the function keys F3 and F4, we may go down (a level at a time) into subdirectories, or regress upwards to the parent directories within our volume, investigating the contents of our tape volume.

When you are finished looking at your tape directory, press the F10 function key to return to the Main Menu.

Tape Utilities Menu

Choose this option by pressing the F4 function key from the Main Menu. These utilities are used to perform various operations to the tape that generally are not done with great frequency. However, these operations are very important for the QIC-60 backup system housecleaning to maintain everything in a neat and organized state. Also, they help you make sure that your backup system is performing as you desire.

To get the Utilities Menu, press the F4 function key from the Main Menu. The screen then displays:



These are the various options that you may now choose. Take a look at each one in more detail to discover their uses, and learn how to make the computer execute them.

Re-tension Tape

You choose this option to even out the tension in a tape. You should execute this operation with any new tape before using it, and also with any tape that has been transported or has been stored away for a long period of time. In addition, any tape that has undergone extreme temperature changes (although those should be avoided if possible) ought to be re-tensioned.

To select this option, press the F1 function key from the Tape Utilities Menu. The display will then ask whether or not you wish to retension the tape. Then you could type in **N** for no (if you had chosen this option mistakenly), and you would be returned to the Tape Utilities Menu. Otherwise, you press the return key (to default to the **Y** for yes). The screen would then blank out except for the flashing word *WORKING* near the bottom of the screen. Once the tape had been re-tensioned, the display would inform you *RETENSION COMPLETE*. You could then press F10 to return to the Tape Utilities Menu, or you could press F1 if you had additional tapes to re-tension.

Erase Tape

Before you erase a tape, BE SURE this is the tape that you want to erase. You can easily make sure of this by pressing the F3 function key when the Main Menu is on the screen (this gives you the *Tape Directory* option so that you may look at the contents of the tape).

To select this option (from the Tape Utilities Menu), press the F2 function key. You will then see a display warning that the erase function will destroy all data on the tape. At this point, you would press return (to default to **N** for no) if you had chosen this option by mistake. (This action would return you to the Tape Utilities Menu.) If you do wish to erase the tape, type a **Y** for yes and press return. As with the re-tension tape option, the screen will clear except for the flashing word *WORKING* near the bottom while the tape drive erases the tape. When the tape has been completely erased, the display will inform you *ERASE COMPLETE*. You can then press F10 to return to the Tape Utilities Menu, or you can press F1 if you have additional tapes to erase.

Note: When operating in Multiple Volume mode, the only way that a full tape can be re-used is by first erasing the tape.

Verify Tape:

This option verifies that the tape is readable and that the material recorded on the tape is still the same as it was when the tape was created. You should note that the QIC-60 performs a read after write on-the-fly during all backup operations in order to verify that the information was recorded correctly. The Verify Tape option gives you a method of re-verifying that material, should you wish to do so. To perform this verification, the QIC-60 reads all data written on the tape, and calculates the checksum (an error-checking number) which should match the checksum written after each data-block on the tape. If these checksums match for all blocks of data, the tape is still valid.

To select this option from the Tape Utilities Menu, press the F3 function key. The display will then ask whether or not you wish to verify the tape. Press return to default to the **Y** (for yes) if you want to verify this tape. Otherwise, you would type an **N** (for no) in order to return to the Tape Utilities Menu (because you chose this option by mistake, or you changed your mind).

If you default to the **Y**, the tape will then begin the verify operation which will probably take several minutes. (Time should be between 10 seconds and 12 minutes.) This time depends on whether the tape is almost empty or almost full. While the verify operation is in progress, the flashing word *WORKING* will appear at the bottom of the screen. If the tape is still valid, the screen will show *VERIFY SUCCESSFUL, TAPE IS READABLE*. You can then press F10 to return to the Tape Utilities Menu, or you can press F1 if you have additional tapes to verify. If you do not see this screen, the tape must be corrupted in some way (physically, or through contact with a magnetic field or other disruptive energy). The QIC-60 system will give you an error message in place of the above screen in that case. You will then have to press the space bar to return to the Tape Utilities Menu.

Change Configuration File

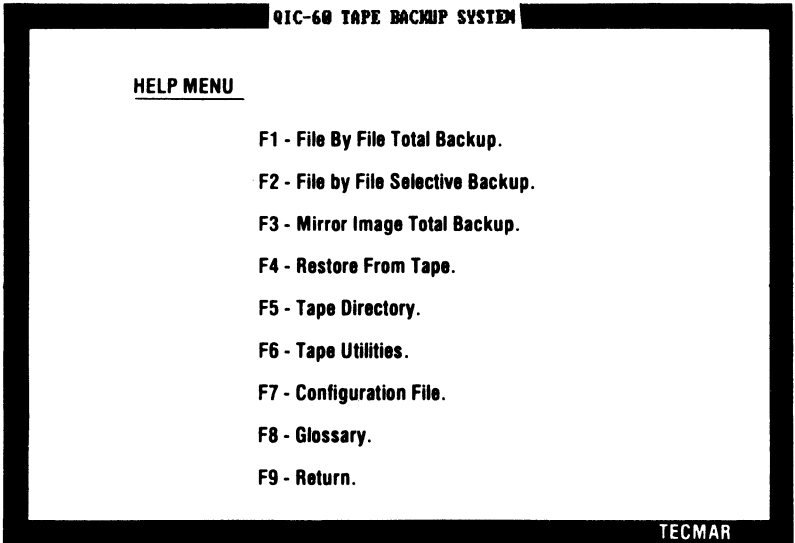
This option allows you to change the default parameters to suit your individual system requirements. You can specify which options are to be followed during normal backup and restore operations on your system. All of these options, except "Search All Subdirectories," are available under menu operation; the "Search All Subdirectories" option can only be used in command-driven operation. Refer to "*Chapter 6, Changing the Default Parameters*" for a detailed explanation on using the configuration file.

Return To DOS

Press the F5 function key (from the Main Menu) when you have finished backing up or restoring (i.e., finished using the QIC-60 backup system). This will return you to the operating system.

Help Menu

When you would like to get more information on a specific topic, you can press the F9 function key. If you do so from the Main Menu, you will be shown the Help Menu, from which you select the topic you wish to read about. That menu looks like this:



Help Menu

From this menu, if you were to press, for example, the F1 function key, you would get a screen of text with information on the *File by File Total Backup* option of the Backup Menu. The screen would display something like the following:

FILE-BY-FILE TOTAL BACKUP HELP

File-By-File Total Backup:

Choose this option if you want to make a copy of all the files on your disk, just as though you wanted to make a copy of all the files in a filing cabinet, from every drawer, no matter what section [directory] or subsection [subdirectory] your files are in. If you need to restore from your "File-By-File Total Backup" you will be able to restore just a single file from a directory or subdirectory, or all of the files in one directory, including all the files in the subdirectories.

When you press the 'F1' function key, you will be asked for the drive letter that contains the information you wish to backup. The computer has named each of your disk drives [floppy disk drives or hard disk(s)] with a letter, such as "A," "B," "C," etc. Type the letter of the device that contains the information you want to backup and press the return key.

Now you have a chance to enter a comment about this backup that will be a reminder to you. You can type about 40 letters at the "Enter Backup Identification Label:" line. When you have made

F1: ^ F2: v F3: RETURN F9: HELP MENU

Help Text for File-by-File Total Backup

As you can see, the F1 and F2 function keys may be used to scroll through the text when there is more information than fits on one screen.

An important feature that you should note is that you can get this type of help from almost anywhere in the program, except while the computer is actually processing some information. Thus, if you press the F9 function key from anywhere under the *Tape Directory* function (i.e., while using that function), you will be shown the help text pertaining to tape directories automatically. And if you actually wish information on some other topic (although you are using, for example, the *Tape Directory* operation), you can press the F9 function key from the text, and it will give you the Help Menu from which to choose.

When you are done looking at all the help text that you wish to see, you press the F3 function key from the text screen (as you can see in the bottom line of the above screen). This will return you to your point of origin, whether it was from the Main Menu, or within some specific operation. You will be able to continue processing, as before, from the same point where you requested the help.

Chapter 3

Command Driven Operations



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Command Driven Operations

The QIC-60 gives you another mode of operation for your backup/restore routines that has more options and versatility than the menu-driven mode.

The added options of the command-driven mode could prove to be a useful tool to programmers and system designers. These operations can be used in batch processing and they can be used from within other programs. Although the commands may seem more complex, with experience using the command syntax of this mode, you will find them very convenient and helpful. The commands of the command-driven mode parallel those for IBM DOS.

This command mode has the powerful ability to restore files to directories other than those from which they came. Also, if you want to restore files to directories that don't exist on your disk, QIC-60 software will create these directories and restore your files there. You can even change the names or extensions of files when doing a restore.

Command Syntax Rules

So that you can construct commands that will work according to your needs, it is very important that you understand the format in the syntax section of each backup system command. The following rules exist for the syntax of the backup commands:

- UPPERCASE words or letters are called keywords and they must be entered as shown. They can be entered as either upper or lower case letters, but they are shown in uppercase in this manual.
- Items shown in brackets [] are optional. You should not type in the brackets as part of your command.
- Any items that are completely outside the brackets must be used with the command.
- An ellipsis (...) means that you can repeat an item as many times as you have to.
- All punctuation must be included where it is indicated in the command. Punctuation marks are treated like keywords. Periods, colons, equal signs, double quotes, backslashes, forward slashes, and dashes are included.
- Below the command syntax of some commands, you might see the words *source*, *destination*, and *options*. The source is where the data is coming from. The destination is where the data is going. Options refers the options that exist for that command.

Command Parameter Syntax Requirements

The following notes show you the parameters in the command syntax section that you must fill in. These parameters are variables your system needs to execute commands. Usually, you will substitute some information for the parameter to tell your system specifically what to do.

■ **d: (logical drive)**

This parameter requires that you specify a logical drive. Each drive has a letter (A, B, C, etc.) that you can type in as upper or lower case, followed by a colon. The type of drive designated by these letters can differ from system to system.

■ **.ext (file extension)**

A file extension is a period at the end of the file name followed by three of the following characters:

A-Z, 0-9

(See your DOS manual for other characters that can be used.)

The file extension helps to group similar files.

■ **files (file name or global that defines a group of files)**

A file name is a name made up of from 1 to 8 of the following characters:

A-Z, 0-9

(See your DOS manual for other characters that can be used.)

■ **path (a group of directories that you have to go through to find a subdirectory, file, or a group of files)**

The format for a path is:

[\\][directory name\] [directory name\[...]]

If you use an initial backslash (\), it means that your path should begin with the root directory. If you do not see an initial backslash, the search will begin with the currently logged on directory. With QIC-60 software, the path must always end with a backslash to distinguish directories from files. This is important when you reference files or subdirectories that don't exist but must be created by QIC-60. If you give no file name, the last character in the path must be a backslash.

Global File Characters

There are two characters that may be used in file names. They allow you to specify a *mask* (a generalized description) which will select a group of files that fit the generalized form. This allows you to sift through files which have similar names without the necessity of typing each individual name. These characters are ? and *, and are explained below.

■ **The ? Character**

A ? in a file name or an extension indicates that any character may occupy that position. It is often called a "wild card character" since any character will match it in a search to find a file of a given name. For example, the file name and extension
work??*.txt*

will match any file with the name *WORK* followed by zero, one, or two valid file name characters, with the accompanying extension *.TXT* (which might stand for "text"). So, this example would match any of the following:

WORK01.TXT (Both upper and lowercase are valid)

WORK02.TXT

worka.txt

worker.txt

It would also match a great number of other file names.

■ The * Character

An * in a file name or extension is similar to the ?, except that it counts for more than one position. It means that any character may occupy that position **and all remaining positions** in a given file name or extension. For example, if you type

```
tex*.a*
```

this indicates that the first three letters of the file name must be *TEX* and the first letter of the extension must be an *A*, but all the other characters may be any group of valid characters for file names/extensions as long as you stay within the length limits (i.e., file names = 8 characters maximum, extensions = 3 characters maximum). This example matches all of the following files:

```
tex.a
texas.ant
TEXTURE.AX
Textedit.Asm
texaco.add
```

And, of course, it would match numerous other names.

■ Uses of Global Characters

All of the files listed in the examples above seem to be unrelated, so what is the usefulness of such “wild cards?” Imagine the following. You have kept your disk organized so that certain types of files have certain names, or perhaps they are categorized by extension. This is a very common situation, especially when you are dealing with the great numbers of files that you encounter on hard disks. If, for instance, all your text files from word processing have the extension *.TXT* (abbreviation for “text”), you can refer to all of them at the same time (as a group) by typing **.TXT*. And if all your test files were called *TEST* followed by some number, and with various extensions, you could sift them out from the rest of your files by typing *TEST????.** (or, alternatively, *TEST*.**). The utility of this becomes obvious when you want to back up a number of files that fit within one or two specific categories, and you wish to pull out only these files from a disk which contains hundreds of files.

Command-Driven Operations Commands

File-by-File — — — Backup

■ **Command:**

F_BACK

■ **Purpose:**

To do a file-by-file backup of disk onto tape. This allows selective backup of files (i.e., user chooses which files to back up) and later permits selective restoration of files from the tape.

■ **Syntax:**

```
F_BACK [d:][path][files][.ext][/S][/M][/D:mm-dd-yyyy]
        [C["comment"]][/A][/P][/E][/R]
```

■ **Explanation of Options:**

These are the options available to the user, as specified in the above command syntax.

[IMPORTANT NOTE: Certain options listed below have corresponding *negate options* of the form */-x*, where the x stands for the letter used to specify that option. The options which have a negate option are /S, /P, and /E for the F_BACK command. These negate options are used in conjunction with the default options configuration file (described fully in Chapter 6 under *Changing the Default Parameters*). They cause the specified default option to be negated (i.e., the default will **not** be used) for this particular backup command line. Thus, if you had put /P in your default options file, you could nullify it for this particular instance by putting a /-P on the command line.]

- /S Use of this option causes the QIC-60 backup system to back up any subdirectories (and their contents) pertaining to the entry made for *files* (see above syntax). This means that no matter what name has been entered for *files* in the command line, the backup system will search for files to match that name in all subdirectories at **all levels below the given directory**. These matching files will subsequently be backed up along with the matching files in the parent directory. Note that whenever the /s option is chosen, the entire directory and subdirectory structure of the disk will be put onto the tape, because all of these subdirectories must be searched for matching file names.
- /M This option indicates that only the files that have been modified since the last backup should be backed up onto the tape. This will avoid the unnecessary backing up of files that never change.
- /D The full format of this option is [/d:mm-dd-yyy], where the parameters following the colon indicate a month, day, and year respectively. Note that, as with DOS, the date must be **on or after January 1, 1980**. This option indicates that only those files written on or after the specified date should be backed up. Information about when the file was last written may be found by looking at a directory of disk files (using DOS).
- /C The format of this option is [/c[="comment']], where the comment is some information that you would like to include as part of the header on the tape. The comment must be enclosed between double quotes. This comment information can serve as a later reminder about the contents of that backup, why it was made, or whatever else you may wish to record. The comment length is limited to a maximum of 44 characters, and will be truncated if it overflows this limit. If the parameter [=“comment”] is omitted, you will be prompted for a comment after having entered the complete F_BACK command.

- /A This option will cause the current backup to be added to the tape after the previous volume. The tape directory will also be updated, adding this volume to the list of volumes found on this tape. Using this option ensures that you will not overwrite other volume on the tape cartridge. This allows you to have several backups on one tape.
- /P This option causes the file names to be displayed on the screen as the various files are backed up onto the tape. It allows you to see what the backup system is doing, and the information may also be directed to a printer if you need a hard copy of a particular backup. (This may be done by pressing *ctrl p* at the DOS prompt, before using the F_BACK command; output to the printer is turned off by pressing *ctrl p* again when you no longer need hard copies.) Note that the use of this option will slow down your backup, because the computer needs to interrupt processing to write your file names on the screen while it backs them up. (This amount of time is small, but may become significant when you do a backup of several hundred files or more.)
- /E If you specify this option after your command line, it will cause the computer to produce an error report during the tape operations. This report will tell how many underruns and re-tries occurred on the tape during the current process. (An “underrun” occurs when the disk cannot supply data to the tape fast enough to allow continuous streaming, and the tape has to stop and wait; a “retry” occurs when the tape drive has difficulty reading the tape, and has to try to read it again.) If you use this option on a regular basis, it will give you a good idea of how many errors you can normally expect from a tape that is in good condition. Then, if that figure ever takes a large jump for a particular tape, it can serve as a sign that the tape is deteriorating and may need to be replaced soon.

/R This option lets you perform file-by-file backups in a “Read Only” mode, that is, **without** writing to the disk to re-set the archive bit that indicates whether or not a file has been modified since the last backup. In the default mode, this bit is re-set the first time a backup is made after a file modification. Use of the **/R** option allows any number of backups to be made while leaving the bit set to indicate that the file **has been** modified. This can be a very useful feature on a networking system where backups are likely to be made from different work stations, and the network restricts these work stations from writing to the disk.

Another use of this option is the elimination of error messages that normally occur when backing up “Read Only” files or write-protected diskettes.

■ **Examples of Complete F_BACK Commands:**

The following examples should give the user a better understanding of how the command *F_BACK* and its options may be utilized.

`f_back OR f_back *.*`

Either of these will backup all of the files in the default directory (i.e., your currently logged directory). In this example, the subdirectories will not be backed up (only the files within this particular directory will be backed up to the tape). To include the subdirectories, the user would have had to specify the `/s` option in this command.

f_back \spread\s OR f_back \spread*.*s

Either of these commands will backup all files in the directory *SPREAD*, including all of its subdirectories. Note that in both versions of the example, it is **absolutely necessary** to put a backslash after the name *SPREAD* (even when no file name follows it) to tell the QIC-60 that you are referring to a directory and not to a file by the name of *SPREAD*.

f_back *.bas/s/c="All of my basic programs."/p

This example backs up all files in all directories and subdirectories that have the extension *.BAS* (denoting BASIC programs). It also outputs the comment *All of my basic programs.* to the header on the tape (due to the /c option), and prints out the file names on the screen as they are backed up to the tape (due to the /p option).

f_back \curwork\test??.*/m

This backs up all files of the form *TEST??* that are found in the *CURWORK* directory and have been modified since the last backup. The files may have any extensions (because of the *.** following the file name). For example, files with names such as *TEST01.BAS*, *TESTA.TXT*, and *TESTB.OBJ* would be backed up if they existed in the *CURWORK* directory and had not been backed up since their last modifications. Any files of this form in **subdirectories** of *CURWORK* would **not** be backed up (because the /s option was not specified).

f_back \wordproc\a*.*d:10-28-1982/m/s/p

This command would back up all the files in the directory *WORDPROC* and its subdirectories that meet the following conditions:

1. The file name begins with the letter A, but may have any extension (specified by the parameter *a*.**).
2. The file was last written/modified on or after the date given (October 28, 1982, due to the *d:10-28-1982* option).
3. The file has been modified since the last backup occurred (because the /m option is included).

The subdirectories would be included because the /s option has been specified. Also, the names of the files backed up would be printed on the screen as the backup took place, since the /p option is included in this example.

■ Further Discussion

The command (*F_BACK*) must be separated from the source by a space, but the source and options may appear together or separated by spaces. If the optional [*d:*] parameter (for source disk drive) is not specified, the system will assume that you want to back up the current default disk drive (i.e., the currently logged drive). If the [*path*] is not specified, the current directory is used. When the [*files*] are not specified, the default assumed by the computer is *.* (i.e., all files found beneath specified path).

You might note that to backup a write-protected floppy disk, you must remove the write-protect sticker. This is so that the QIC-60 system can change a marker in the directory for each file indicating that it has been backed up since the last modifications were made. This is what makes it possible for you to use the /m option detailed above.

File-by-File — — — Restore

■ Command:

F_REST

■ Purpose:

To restore files from the tape that were previously saved in a file-by-file mode (e.g., by using *F_BACK*). Files may be restored selectively, choosing particular files from a large group according to the needs of the user. Also, file directories and names may be modified during the restore. Note that the files with duplicate names on the tape and the disk will not be restored unless the */O* option (enable overwrite) is specified in the command or as a default in the *T_PARM.CFG* file. (See Chapter 6 under *Changing the Default Parameters*.)

A unique feature of the QIC-60 system is that it will create any subdirectories that you decide to restore from the tape which do not yet exist on the hard disk. Thus, you do not need to know the tree structure of a tape directory nor construct it on the disk. The QIC-60 software handles all of this, organizing the restored directories just as they appeared on the backed up disk unless you give it instructions to do otherwise (e.g, by specifying a new patch or subdirectory in the destination portion of the command). The patch designated below after the *F_REST* command refers to files on the tape, and the drive path refers to the destination drive.

■ Syntax:

```
F_REST [path][files[.ext]] [d:][path][files[.ext]]  
      [S]/[D:mm-dd-yyyy]  
      [V=]  
      [P]/[Q]/[O]/[E]/[R]
```

■ Explanation of Options:

These are the options which may be specified when using the F_REST command (as seen above in the command syntax).

[IMPORTANT NOTE: Certain options listed below have corresponding *negate options* of the form */-x*, where the *x* stands for the letter used to specify that option. The options included are /S, /P, /Q, /O, and /E for the F_REST command. These negate options are used in conjunction with the default options configuration file (described fully in Chapter 6 under *Changing the Default Parameters*). They cause the specified default option to be negated (i.e., the default will **not** be used) for this particular restore command line. Thus, if you had put /P in your default options file, you could nullify it for this particular instance by putting a /-P on the command line.]

- /S Use of this option causes the QIC-60 system to restore any subdirectories (and their contents) pertaining to the entry made for *files* on the source portion of the command line. This means that no matter what name has been entered for *files* in the command line, all subdirectories on the tape at **all levels below the given directory** will be searched for matching files. These subdirectories and their matching files (from the tape backup done previously) will be restored following the path specified in the destination portion of the command line (see examples below for further clarification if needed).

- /D The full format of this option is [/d:mm-dd-yyy], where the parameters following the colon indicate a month, day, and year respectively. Note that, as with DOS, the date must be **on or after January 1, 1980**. This option tells the QIC-60 backup system to restore only those files written or modified on or after the specified date, and then backed up to the tape. Information about when the file was last written or modified and then backed up may be done using the menu-driven mode).

- /V The format for this option is [/v=n], where "n" refers to the number of the desired volume on the tape; "n" can be from 1 to 256, inclusive. If you do not know the number of the desired volume, refer to the Tape Directory Search Command (T_SRCH) Option /V, on p.3-19, which can provide you with a numerically ordered list of the volumes on the tape.
- /P This option causes the file names to be displayed on the screen as the various files are restored from the tape. It allows you to see what the QIC-60 system is doing, and the information may also be directed to a printer if you need a hard copy record of a particular restore. (This can be done by pressing *ctrl p* at the DOS prompt, before using the *F_REST* command; output to the printer is turned off by pressing *ctrl p* again when you no longer need hard copies.) Note that the use of this option will slow down your restore, because the computer needs to interrupt its processing to write your file names on the screen while it restores them.
- /Q Use of this option causes the QIC-60 system to prompt you with **each** file name as it restores, so that you have an opportunity to confirm each file that you wish included in the restore. Remember: this option (as the /p option above) will add to the time needed for the restore, because the computer must interrupt processing to allow for the confirmation of each file during the restore operation.
- /O This option enables the overwrite of any already-existing file during the restore. Thus, if the file exists on the disk AND on the tape and a restore is performed without this option specified, the file from the disk will remain the same as it was before the restore, because the file will not be transferred across from the tape volume (i.e., it will not be allowed to overwrite the file of the same name that already exists on the disk).

- /R When used with the /O option (or with the Overwrite default enabled in your Configuration File), the /R option lets you perform file-by-file restores of “Read Only” files. Ordinarily, “Read Only” files can be backed up to tape but cannot be restored to disk. When you use the /R option, however, you can restore “Read Only” files.

- /E If you specify this option after your command line, it will cause the computer to produce an error report after the tape operations. This report will tell how many underruns and retries occurred on the tape during the current process. If you use this option on a regular basis, it will give you a good idea of how many errors you can normally expect from a tape that is in good condition. Then, if that figure ever takes a large jump for a particular tape, it can serve as a sign that the tape is deteriorating and may need to be replaced soon.

■ **Examples of Complete F_REST Commands:**

The following examples should serve as a guideline for the uses of the *F_REST* command, and show how to make use of its various options. Note that any command that is not followed with the /O option (enable overwrite) will not restore any files from the tape to files of duplicate names on the disk. (This overwriting of existing files would occur if we specified the /O option in the command OR in the T_PARM.CFG file. Look in Chapter 6 under *Changing the Default Parameters* for further explanation).

`f_rest *.*\s OR f_rest *.**.*\s`

These commands do the same thing. They will restore all directories and their contents from the backup volume on the tape to the disk (the default disk since no disk is specified). The backslashes in front of both the source and destination indicate that the QIC-60 system should look in the root directory on the tape for the files to restore, and should restore them to the root directory on the disk.

```
f_rest c:\finance\p OR f_rest c:\finance\*.*p
```

Either of these would restore all files from the *FINANCE* directory on the tape (but not its subdirectories) to the *FINANCE* directory on disk drive c:. If that directory did not exist on disk c:, the QIC-60 would create it first, and then restore the files to it.

```
f_rest \curwork\ \oldwork\p OR f_rest  
\curwork\*.*\oldwork\*.*p
```

This will restore all files from the *CURWORK* directory on the tape (but not its subdirectories nor their contents) to the *OLDWORK* directory on the disk. File names will be unchanged, and they will be printed on the screen as they are restored to the disk. Note that it is imperative to follow directory names with a backslash, which tells the system that they are directories rather than just file names. Otherwise, if *OLDWORK* did not exist on the disk, the system would not be able to tell whether you wished to restore each individual file to a subdirectory or if you wished to stuff them all into a single file together (i.e., a file that did not yet exist).

```
f_rest \wordproc\*.txt \*.wp/d:10-03-1984
```

This command would restore files from the *WORDPROC* directory on tape with the extension *.TXT* to the root directory on the disk. There they are renamed with the new extension *.WP* (which might stand for "word processing"). This does not include any subdirectories or files contained in them. Only those files that were modified on or after October 3, 1984 (and were then backed up to the tape) will be included in this restore.

```
f_rest \doctor\patients\s*.* c:\s_files\*.patp
```

This example will restore all files that begin with the letter *S* from the *PATIENT* subdirectory in the *DOCTOR* directory to drive c:. The files will be put in a directory named *S_FILES* and will be given the new extension *.PAT* (which might stand for "patients"). A listing of the files restored will be displayed on the screen as the files are transferred from the tape to the hard disk.

f_rest \ *.* \s/o/q

All files that exist on the tape volume will be transferred to the disk. Any files of the same name that existed on the disk would be overwritten by the copy from the tape. You would have an opportunity to reject the restoration of any specific files that you did not wish to restore (due to the /q option). The computer gives you this ability by asking you to confirm the inclusion of **each** file in the restore.

■ **Further Discussion of the F_REST Command:**

Note that each use of this command consists of three separate parts: the command itself (*F_REST*), the source, and the destination plus options. Each of these three portions should be separated by a space. The destination and options may or may not be separated by spaces. In the *destination* portion of the command, the defaults are as follows:

- 1) *[d:]* (the drive) defaults to the current default disk drive if it is not specified, and tells the QIC-60 where to restore the files (unless this is overridden by the *destination* portion).
- 2) *[path]* (the path to find the files on the tape) defaults to the current directory on the disk when left unspecified unless it is overridden by the *destination* part of the command.
- 3) *[files]* (the files to be restored) default to all files found in the path (i.e., as if you had put *.* in the command line) unless overridden by the *destination* portion of the command line.

Note that when left unspecified, the option parts from the *source* portion will first default to those items specified in the *destination* portion of the command. The above listed defaults will be used only when the item has been left unspecified in both portions of the command.

In the *destination* portion of the command, the defaults are the same as in the *source* portion (outlined above). Note that the *destination*, when unspecified, will default to the entry made for the *source* portion of the command. If both are left unspecified, the above listed defaults are used; this organization does have a purpose. You may wish to specify one source (for tape) and a completely different destination (for disk), to change file paths, names, or the disk on which a group of files resides. The defaults are basically "intuitive." You should understand them after a little use of the QIC-60 command-mode operation.

Note that the F_REST command will not restore "read only" files (e.g., the *IBM DOS.COM* and *IBMBIO.COM* system files) from the tape to the disk. The QIC-60 system does not attempt to write over "read only" files by restoring them from the tape.

During a file-by-file restore, the QIC-60 system will only restore as many files as will fit in the available space on the disk. If you are restoring a large tape volume, you will need a lot of space on the disk, unless (of course) most of the files on the tape already exist on the disk. If they already exist, they will not be restored (unless the /O option is specified, or this default is set in the T_PARM.CFG file, in which case they will be overwritten), and thus will not consume much new space, and may even free up some space. A file-by-file restore will create any files and directory structures that exist on the tape but do not yet exist on the disk (and this is what begins to consume free disk space). If your file-by-file restore runs out of room on the disk, it will tell you. Then you will have to get rid of some old files before you can restore the remainder of the files from the tape.

■ **Command:**

F_COMP

■ **Purpose:**

Using the F_COMP command, you can verify which files have been modified or deleted on your disk since a particular backup was made. You do this by comparing the backup data on the tape with the data on the disk. Files that you've added to the disk will not be reported because the comparison priority is tape-to-disk, and the check is to see if the data that was previously backed up on tape exists intact on the disk. **There is no check to see if new files have been added.** Only files that have been modified or deleted are reported.

You can compare files selectively on an individual file basis, on a subdirectory basis, or on a total backup basis.

If the file on disk is not identical to the one on tape, the message:

[drive]:[path] ... Is Different

is displayed.

If the file does not exist on disk, the message:

[drive]:[path] ... File Not Found

is displayed.

If the subdirectory where the file was located has been deleted from the disk, the message:

[drive]:[path] ... Path Not Found

is displayed.

The F_COMP command can also verify that all files were written to the tape identically to the way they existed on disk. Since this command compares files in a file-by-file manner, you cannot use it with mirror image backups.

■ **Syntax:**

F_COMP [d:][path][files[.ext]] [d:][path][files[.ext]]
[/D:mm-dd-yyyy][/E][/S][/P][/V=n]

■ Explanation of Options

These are the options which may be specified when using the F_COMP command (as seen in the above command syntax).

[IMPORTANT NOTE: Some of the options listed below have corresponding *negate options* of the form */-x*, where x stands for the letter used to specify that option. These options include /E, /S, and /P for F_COMP. These negate options are used with the default options file (described fully in Chapter 6 under *Changing the Default Parameters*). They cause the specified default option to be negated (i.e., the default will **not** be used) for this particular compare command line. Thus, if you had put /P in your default options file, you could nullify it in this particular instance by putting a */-P* in the command line.]

- /E Use of this option causes your computer to produce an error report after the tape operations. This report tells you how many underruns and re-tries occurred on the tape during the current process. If you use this option on a regular basis, it gives you a good idea of how many errors you can normally expect from a tape that is in good condition. Then, if that figure ever takes a large jump for a particular tape, it can serve as a sign that the tape is deteriorating and may have to be replaced soon.

- /S Use of this option causes the QIC-60 backup system to compare any subdirectories (and their contents) pertaining to the entry made for *files* on the source portion of the command line. This means that no matter what name has been entered for *files* in the command line, all subdirectories on the tape at **all levels below the given directory** will have their files compared to those in matching subdirectories on disk.

- /P* This option causes the file names on the tape to be displayed on the screen as the various files are compared with those on the disk. This information can also be directed to a printer if you want a hard copy of a particular compare operation. (This can be done by pressing *ctrl p* at the DOS prompt before using the *F_COMP* command; output to the printer is turned off by pressing *ctrl p* again when you no longer want hard copies.) Note that the use of this option will slow down your compare operation because the computer needs to interrupt its processing to write your file names on the screen while it compares them.
- /V* The format for this option is [*v=n*], where “n” refers to the number of the desired volume on the tape; “n” can be from 1 to 256 inclusive. If you do not know the number of the desired volume, refer to the Tape Directory Search Command (*T_SRCH*) Option */V*, which provides a numerically ordered list of the volumes on the tape. If no volume is specified, the program defaults to Volume 1 of that particular tape.
- /D* The full format of this option is [*d:mm-dd-yyyy*], where the parameters following the colon indicate a month, day and year respectively. Note that as with DOS, the date must be **on or after January 1, 1980**. This option tells the QIC-60 backup system to compare only those files written or modified on or after the specified date, and then backed up to the tape.

■ Examples of Complete F_COMP Commands:

The following examples demonstrate the use of the F_COMP command and show how to use its various options.

```
f_comp \*.*/s/p
```

This command compares all files in all subdirectories to those in the current drive (since none was specified, it will default to current). Use of the /p option causes each file name to be displayed on the screen as it is compared. Since no Volume Number is specified, the program defaults to Volume 1.

```
f_comp \d:01-01-1986/s/p/v=4
```

This command compares all files that were written or modified on or after January 1, 1986, in all subdirectories on Volume 4 of the tape with those on the current default drive. Since no file names were specified, the program defaults to *.* , and compares all files in the subdirectories. The /p causes each filename to be displayed as it is compared.

```
f_comp \wp\words\*. * c:\wp\letters\*.*/v=7
```

This command illustrates the use of a comparison in a situation where the source path (tape) is different than the destination path (disk). In this example, the subdirectory “words” was changed to “letters”, but the contents of its files were not altered. This command compares the files in the “words” subdirectory of Volume 7 on the tape with the files in the “letters” subdirectory on the drive c: disk.

Mirror-Image — — — Backup

■ **Command:**

M_BACK

IMPORTANT NOTE: The mirror-image backups and restores can be used only to transfer volumes between logical disks of the same formatted size that have the same format configuration. This applies to both menu-driven and the command-driven operations. You may find out a disk's size by using the DOS function *chkdsk*, which will tell you how many formatted bytes are available on any disk. Also, the QIC-60 system will tell you (by giving you an error message) if you try to violate this restriction.

■ **Purpose:**

To do a mirror-image backup of the files on the disk drive onto the tape. This is the fastest complete backup possible from disk to tape, and its speed is further enhanced when the tape unit is used in conjunction with the QIC-60 Winchester (because of its faster-than-average access time and smaller interleave ratio).

The files will be written out in a form such that they will not be individually accessible for a restore at a later time. Only the entire contents of the backup may be restored if the user wishes to get at some of these old files. Only an entire drive may be backed up at one time. There is no selection or sifting of files either on the mirror-image backup or on a mirror-image restore.

■ **Syntax:**

M_BACK [d:][/C[="comment"]][/A][/E]

■ **Explanation of Options:**

These options may be specified with the M_BACK command, as can be seen above in the syntax.

[IMPORTANT NOTE: The `/E` option listed below has a corresponding *negate option* of the form `/-E`. This negate option is used in conjunction with the default options configuration file (described fully in Chapter 6 under *Changing the Default Parameters*). It causes the `/E` default option to be negated (i.e., an error report will **not** be produced) for this particular restore command line. Thus, if you had confirmed the `/E` in your default options file, you could nullify it for this particular instance by putting a `/-E` on the command line.]

- `/C` The format of this option is `[/c[="comment"]]`, where the comment is some information that you would like to include as part of the header on the tape. This information can serve as a later reminder about the contents of that backup, why it was made, or whatever else you may wish to record along with that particular backup. The comment length is limited to a maximum of 44 characters, and will be truncated if it overflows this limit. If the parameter `[="comment"]` is omitted, you will be prompted for a comment after having entered the complete `M_BACK` command.
- `/A` This option will cause the current backup to be added after the previous volume. The tape directory will also be updated, adding this volume to the list of volumes found on this tape. Using this option ensures that you will not overwrite other volumes on the tape cartridge. It allows you to have several backups on one tape.
- `/E` If you specify this option after your command line, it will cause the computer to produce an error report after the tape operations. This report will tell how many underruns and retries occurred on the tape during the current process. If you use this option on a regular basis, it will give you a good idea of how many errors you can normally expect from a tape that is in good condition. Then, if that figure ever takes a large jump for a particular tape, it can serve as a sign that the tape is deteriorating and may need to be replaced soon.

■ Examples of Complete M_BACK Commands:

These examples show how this command may be utilized.

`m_back c:`

This creates a mirror-image backup on the tape of drive `c:`.

`m_back d:/c="Mirror-Image Backup - Drive D"/e`

A mirror-image backup of drive `d:` will be output to the tape, with a header that contains the comment enclosed within the double quotes above. An error report of the tape and/or drive condition will also be produced because of the `/e` option seen at the end of the command.

■ Further Discussion of the M_BACK Command:

As noted above, the mirror-image backup commands do not allow selective backup or restore of files. Their main usefulness lies in the speed with which they can back up an entire drive full of files at one time and the simplicity of the command format. Thus, they might be used to do high volume backups on a computer system that has a large number of disk drives. Also, they prove useful for copying a complete drive full of material onto a different disk drive (of the same format size and type).

You do not supply a destination with the M_BACK command: The destination is assumed to be the tape. You may specify the source drive (as reflected in the command syntax); if you don't specify the source drive, the default drive will be used. The command is separated from the source by a space, and there may or may not be separating spaces between the source and the options.

Mirror-Image — — — Restore

■ Command:

M_REST

■ Purpose:

IMPORTANT NOTE: The mirror-image backups and restores can be used only to transfer volumes between logical disks of the same formatted size that have the same format configuration. This applies to both menu-driven and the command-driven operations. You may find out a disk's size by using the DOS function *chkdsk*, which will tell you how many formatted bytes are available on any disk. Also, the QIC-60 system will tell you (by giving you an error message) if you try to violate this restriction.

■ Purpose:

To restore an entire drive from a previously made mirror-image backup on tape. Any contents currently on the drive to be restored will be lost. The drive does not have to be the same one from which the mirror-image backup was made. This is because this form of mirror-image will reallocate bad sectors on the disk, thus allowing the user to copy one disk to another physically separate disk.

■ Syntax:

```
M_REST d:[/V=n][/E]
      <destination>
      +options
```

■ Explanation of Options:

This command has only two valid options, explained on the next page.

[IMPORTANT NOTE: The `/E` option listed below has a corresponding *negate option* of the form `/-E`. This negate option may be used in conjunction with the default options file (described fully in Chapter 6 under *Changing the Default Parameters*). It causes the `/E` default option to be negated (i.e., an error report will not be produced) for this particular backup command line. Thus, if you had confirmed the `/E` option in your default options file, you could nullify it for this particular instance by putting a `/-E` on the command line.]

- `/V` The format for this option is `[/v=n]`, where “n” refers to the number of the desired volume on the tape; “n” can be from 1 to 256, inclusive. If you do not know the number of the desired volume, refer to the Tape Directory Search Command (`T_SRCH`) Option `/V`, on **HELP**, which can provide you with a numerically ordered list of the volumes on the tape.

- `/E` If you specify this option after your command line, it will cause the computer to produce an error report during the tape operations. This report will tell how many underruns and re-tries occurred on the tape during the current process. (An “underrun” occurs when the disk cannot supply data to the tape fast enough to allow continuous streaming, and the tape has to stop and wait; a “retry” occurs when the tape drive has difficulty reading the tape, and has to try to read it again.) If you use this option on a regular basis, it will give you a good idea of how many errors you can normally expect from a tape that is in good condition. Then, if that figure ever takes a large jump for a particular tape, it can serve as a sign that the tape is deteriorating and may need to be replaced soon.

■ Examples of Complete M_REST Command:

The following example demonstrates how to use the M_REST command.

```
m_rest c:/e
```

This example restores the previously made mirror-image backup to disk drive c:. (Note that the backup could have been made from any drive of the same formatted size and disk configuration.) An error report would be produced at the end of the operation (due to the /e option).

■ Further Discussion of the M_REST Command:

This command may be used only to restore a mirror-image backup on the tape to an entire logical drive. It cannot be used in conjunction with the file-by-file backups, which have their own set of commands. During an M_REST operation, the entire drive specified will be restored, and any contents previously on that drive will be lost.

The destination and options may be separated by spaces (though those spaces are not required), but should be separated from the command M_REST by one space. The destination drive must be specified, or else you will receive an error message from the system.

Tape Directory Search

■ Command:

T_SRCH

■ Purpose:

To search out files on the tape that were previously saved in a “file-by-file” mode (i.e., using F_BACK). Files and groups of files may be searched for selectively, choosing particular files from a large group according to what you wish to look for in the file directory. Also, T_SRCH will display the identification label for a tape volume if used on a mirror-image backup tape. Basically, this command will provide you with a directory of your tape, any portion of that tape or any group of files on that tape. (It closely parallels the way a DOS *dir command* works on the disk, except that T_SRCH is tape oriented.) If you need a hard copy record of a particular tape directory search, the output can be directed to a printer by pressing *ctrl p* at the DOS prompt, before using the T_SRCH command; output to the printer is turned off by pressing *ctrl p* again when you no longer need hard copies.

■ Syntax:

T_SRCH [path][files][.ext][/S][/D:mm-dd-yyyy][/P][/E][V=n]

■ Explanation of Options:

These are the options which may be specified when using the T_SRCH command (as seen above in the command syntax). **[IMPORTANT NOTE:** Certain options listed below have corresponding *negate options* of the form */-x*, where the x stands for the letter used to specify that option. The options which have a negate option are /S, /P, and /E for the T_SRCH command. These negate options are used in conjunction with the default options configuration file (described fully in Chapter 6 under *Changing the Default Parameters*). They cause the specified default option to be negated (i.e., the default will **not** be used) for this particular backup command line. Thus, if you had put /P in your default options file, you could nullify it for this particular instance by putting a /-P on the command line.]

- /S Use of this option causes the QIC-60 system to search under any subdirectories (and their contents) pertaining to the entry made for *files* on the source portion of the command line. This means that no matter what name has been entered for *files* in the command line, all subdirectories at all levels below the given directory. will be searched to find the file names that match the requested files.

- /D The full format of this option is [/d:mm-dd-yyyy], where the parameters following the colon indicate a month, day, and year respectively. Note that, as with DOS, the date must be **on or after January 1, 1980**. This option tells the QIC-60 backup system to search for only those files written or modified on or after the specified date, and then backed up to the tape.

- /P This option causes the file name display to be suppressed. Note that this is opposite of the way that the /P option functions for the other commands. This is because when you are doing a tape directory, it is assumed that you would like to see the details of that directory (i.e, the files and their specifications). If you do suppress the printout of these details, you will still be shown the *totals information* that is usually printed at the bottom of a directory.

- /E If you specify this option after your command line, it will cause the computer to produce an error report during the tape operations. This report will tell how many underruns and re-tries occurred on the tape during the current process. If you use this option on a regular basis, it will give you a good idea of how many errors you can normally expect from a tape that is in good condition. Then, if that figure ever takes a large jump for a particular tape, it can serve as a sign that the tape is deteriorating and may need to be replaced soon.

V The format for this option is [*v*=*n*], where “*n*” refers to the number of the desired volume on the tape; “*n*” can be from 1 to 256, inclusive. The specified volume will be searched, and a directory of what is contained in that volume will be displayed. If you do not specify a volume number, the default mode will provide a numerically ordered list of the volumes on the tape.

■ **Examples of Complete T_SRCH Commands:**

The following examples should serve as a guideline for the uses of the T_SRCH command, and show how to make use of its various options.

`t_srch`

This will cause the QIC-60 system to print out the contents of the tape directory that matches your currently logged directory on the disk (e.g., if you are currently in `c:\WORDS` on your disk, that is the directory that will be searched for on the tape volume, and, if found, its contents will be printed).

`t_srch */s/e` OR `t_srch \s/e`

This will search for all files on the tape volume starting at the root directory, including all subdirectories, and will print a listing of all of this information. At the end of the operation, an error report will be printed on the screen (due to the `/e` option). In other words, it gives you a complete directory of the tape volume.

`t_srch \main\` OR `t_srch \main*.*`

This example will print out a complete directory of all the files found within the MAIN directory on the tape. Files within subdirectories will not be included (as the `/s` option was not specified). Note that the path ends with a backslash to tell the QIC-60 that we are looking for the contents of a directory named MAIN rather than a file by that same name.

`t_srch \words*.wp/s/e`

This will produce a complete directory of all files with the extension .WP that are found on the tape directory WORDS or in any of its subdirectories. An error report will be given at the end of the operation.

`t_srch *.dat/d:06-12-1984/s`

This will produce a listing of all files on the tape volume in all directories and subdirectories that have the extension .DAT and were modified on or after the date shown before being backed up onto the tape.

`t_srch \ *.* /p/s OR t_srch \ /p/s`

This example will not produce a detailed listing of the files in the tape volume, but rather will give you only the *totals information* about all the files on the tape volume. Thus, you will see a line that tells you how many bytes all of the files occupy, how many files are there, and how many directories are there.

■ Further Discussion of the T_SRCH Command:

Remember that this command will provide detailed listings of “file-by-file” backups only (although it will tell you if a tape contains a mirror-image backup). Note that each use of this command consists of two separate parts: the command itself (T_SRCH), and the source plus options. These two portions should be separated by a space. The options and the source may be separated by spaces, although they are not required. When you print a detailed file listing using the T_SRCH command, the following information will be printed for each file: the file name, the extension, the size, the date it was last modified, the time it was last modified, and the path for that file.

The path defaults to the current path on the disk (i.e., your current “location” within the disk catalog structure). The files, when left unspecified, default to *.* (i.e., all files within the path).

Chapter 4

General Information

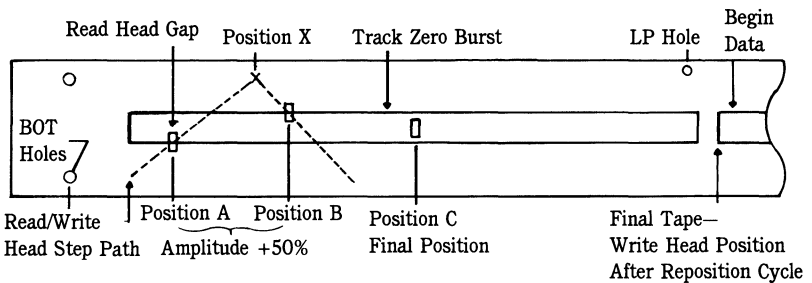
Tapes

The tape cartridge is constructed of high-impact plastic fastened with screws onto an aluminum base-plate. It is designed within strict tolerances so that the tape drive unit can locate the various tracks on the tape (by a physical offset of the reading head).

The QIC-60 tape drive unit looks for a zero-track reference burst (a magnetic demarcation on the tape), and uses that to align the head **exactly** with the tracks of the tape. Positioning the head in this manner causes less reduction of tape signal amplitude to be introduced by normal tape wander.

Description of Tapes

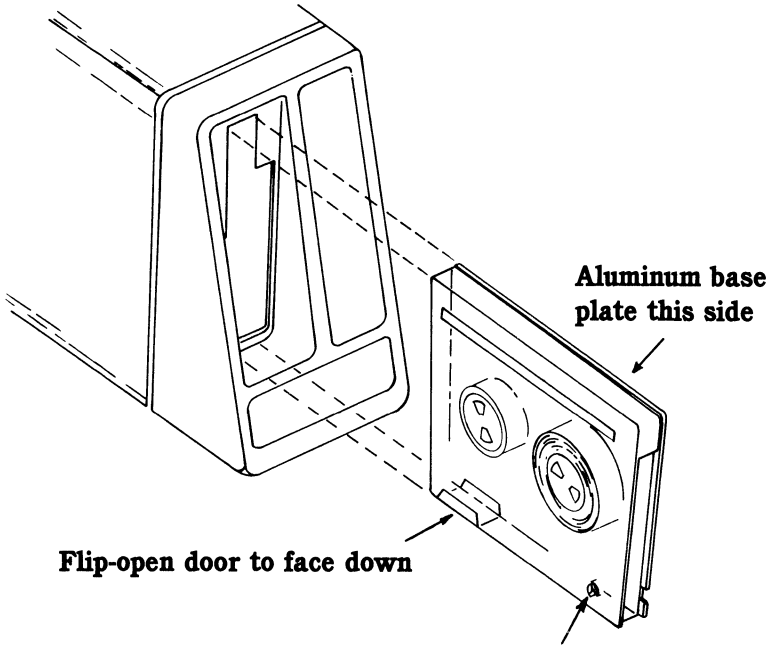
As shown in the illustration below the QIC-60 begins reading the tape at the beginning of tape holes (BOT).



The head then steps across the tape and stores the zero track burst signal amplitude. The unit notes the head position at which the amplitude is 50% (position A), and continues to move the head until the amplitude is zero (position X). The head is then moved back toward center, while the tape continues to be read, until the signal amplitude reaches 50% again (position B). The read/write head is then positioned at a point halfway between positions A and B. For this reason, QIC-60 tapes are completely interchangeable among distinct QIC-60 tape drives, even if there were variations in the mechanical alignment of these drives.

Insertion of Tapes

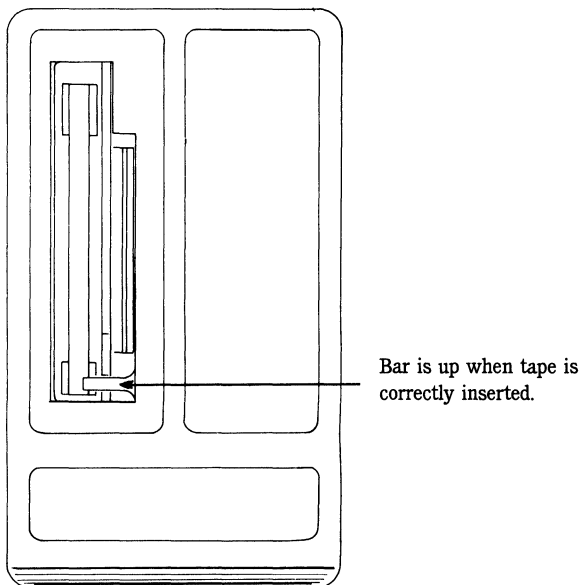
To insert the tape in the drive unit, you hold it as shown in the figure below.



The aluminum base-plate is on the right, and the flip-open door on the tape cartridge (where the tape gets exposed) is facing downwards and is on the end of the cartridge that enters the tape drive first.

Note: Power to the tape drive should be on before inserting a tape or taking one out.

Push the cartridge **all the way** into the drive. It will click, and a little holding arm will then come up from the bottom as you let the tape slide out to its loaded position (shown below).



Removal of Tape

To remove the tape, you simply push it back into the drive until it clicks again. The little holding arm will retract, and the tape will slide out loosely a little way so that you may remove it completely from the drive unit.

The Write-Protect Cylinder

You will notice a little plastic cylinder (that looks like an adjustment screw), with the word “*SAFE*” written beside it located on one corner of the plastic tape housing. This little cylinder is used to protect the tape from being written on by the tape drive unit. If you have an important set of data that you do not wish erased or changed on a particular tape, you would turn this cylinder to point the little arrow at the word *SAFE*. You do this by inserting a small-bladed screwdriver (Non-magnetic! Remember that magnetic fields can erase or scramble your tape!), a pocketknife, or similar thin object into the slot in the plastic cylinder, and turn while pushing down slightly. When the arrow points at *SAFE*, the tape is write-protected (i.e., cannot be written on), but may only be read by the tape drive unit.

Care Tips

- The following tips should be observed if you wish your tapes to give you maximum performance throughout their life span.
- **Always** handle the tape cartridge; **never** touch the actual tape surface. This could contaminate the recording media.
- Keep your tape away from any magnetic field, such as your magnetic paperclip holder or electric motors (which can generate strong magnetic fields). These fields scramble and erase the information on the tape.
- Do **not** leave your tape in the sun.
- Do **not** put your tape in the glove compartment of your car and forget about it. Extreme temperature changes (either hot or cold) can damage it.

Crossing DOS Versions

It is important that you be careful about “crossing” different versions of DOS on the same system disk. This can happen if you back up one version of *COMMAND.COM* onto a tape, change DOS versions on your computer, and then restore from that tape back to the disk.

You will end up with the old version of DOS (i.e., from the tape) on your disk, EXCEPT for the *IBMDOS.COM* and *IBMBIO.COM* system files. These will remain as they were before the restore (i.e., the newer updated versions will remain intact on the disk).

Note: This crossing of DOS versions can occur **only** with certain file-by-file restores. It cannot occur with mirror-image restores.

A system disk with two different versions of DOS will be the root of frequent errors such as **Incorrect version of DOS** and others during regular system operation. This problem will be **permanent** until you change your DOS to make it all one version. Turning the computer on and off will **not** rectify this situation.

If you have crossed DOS versions accidentally, it is a relatively easy operation to correct your DOS so that it is all one version. To put the **latest** version back on your disk (i.e., the one that was there immediately before the restore operation), you just need to copy all files from your new version DOS Master Diskettes back onto your system disk. To do this, you just put each of them in the floppy disk drive (in succession), and copy all files (i.e., *.*) to your system disk. This will bring the *COMMAND.COM* and other external DOS command files back to the state they were in before the tape restore operation.

When performing this procedure to rectify a disk with crossed DOS, it is recommended that you turn your computer off, insert the DOS Master Diskette (i.e., the one containing the DOS version that you wish to use) into the floppy drive, and then turn your computer back on. This will allow your computer to boot up from the floppy so that you can perform the procedure using a coherent version of DOS (rather than the mixed version that now exists on your normal system disk).

The Directory and File Allocation Table (FAT)

To create valid backup volumes, the information that you are backing up (and your method of accessing it), must be valid in the first place. Thus, before creating a backup volume, it is a good idea to check if you have any bad directory or FAT entries that might cause you to lose data at a later time.

DOS has provided a method of eliminating these bad entries and recovering the data at the same time. These *lost clusters* may be found by typing the DOS command **chkdsk/f** followed by pressing return. This will cause your disk to be checked for lost clusters. You may recover any that are found by confirming that you wish to do so. They would then be stored in files (in the root directory) with names of the format *FILEXXXX.CHK*, where *XXXX* is a number from 0001 to 9999. This would fix the directory and the FAT and allow you to look at the contents of these files when you wish.

File Performance

Normally, when DOS stores a file on a disk, it finds an empty sector and writes all or part of the file in that sector. If that sector can't hold the entire file, it looks for the next available sector to continue writing out the file. This process is followed until the entire file is stored on the disk.

During the course of adding, deleting, and modifying various files, some of these files will become "fragmented", that is, they will be spread out all over the disk. This can affect performance when you access large files (e.g., data base or spreadsheet files).

You can improve disk performance in the following manner.

- Do a file-by-file backup of your disk (which has fragmented files) to the tape.

The QIC-60 will de-fragment the files as it writes them on the tape.

- Do a directory of the backup you've just made to make sure all your files are there.
- Re-format the disk (in accordance with your DOS manual), which removes the file names and old locations from the disk.
- Restore the de-fragmented files to your disk.

Memory-Resident Utilities

You can use the QIC-60 with a number of memory-resident utilities, including a **print spooler**, a **RAMdisk**, and a special **key-defining utility**. However, the amount of free memory must not fall below the QIC-60's minimum memory requirements (listed in Chapter 5).

It is possible that such utilities will use some interrupts that conflict with those used by the QIC-60, or perhaps a conflicting I/O address could cause a problem. Information on the QIC-60's software specifications (i.e., interrupts, I/O and DMA channels, etc.) is found in Chapter 5. These specifications **can** be changed in the QIC-60 system with a minimum of effort.

Other Applications Programs

If other applications are run concurrently with the QIC-60 (e.g., through the QIC-60 command mode), conflict such as those listed above are a slight possibility. Check the specifications for your particular application to detect conflicts.

Also, there are applications programs which can leave behind a "residue" (e.g., lost clusters or other corrupt data) which can be a problem. If you back up bad data, you will get bad data back on a restore. This usually happens only if something irregular happens during an application (e.g., power loss). If you detect this kind of problem, the only remedy is to avoid backing up during the same computing sessions when you use that application. Also, it is a good idea (as discussed in **The Directory and File Allocation Table (FAT)**) to check your hard disk for corrupt data before doing a backup.

Making a Clean Exit

It is important when using the QIC-60 menu-driven software, that you make a "clean exit" from the program. This is because the program enables certain interrupts that the DOS will try to use, causing your system to hang (i.e., "crash, stop working", etc.) if these interrupts are not disabled before returning to DOS. If you ever do exit from the QIC-60 software in an unusual fashion (e.g., error, breaking out, etc.), it is a good idea to re-boot your system before continuing with further processing.

**REMEMBER TO TAKE YOUR TAPE OUT OF THE DRIVE
BEFORE TURNING YOUR COMPUTER OFF!**

Chapter 5

Technical Information

Operating Environment and Specifications

■ Tape Drive Specifications

Recording Form	9 track serpentine
Speed of Tape Travel	90 ips (inches per second)
Start/Stop Time	300 mSec maximum
MTBF (Mean Time Between Failure)	Greater than 3500 hours
Soft Error Rate*	Less than 1 in 10^8 bits
Hard Error Rate**	Less than 1 in 10^{10} bits

■ Tape Drive Environment

Temperature - Operational	+5 to +35 degrees Celsius
Temperature - Non-operational	-20 to +60 degrees Celsius
Humidity - Operational	20% to 80% non-condensing
Humidity - Non-operational	0% to 99% non-condensing
Thermal Gradient - Operational	1 degree Celsius per minute
Altitude - Operational	-200 to 15,000 feet
Altitude - Non-operational	-200 to 50,000 feet

■ Winchester Drive Specifications

Soft Read Errors*	Less than 1 in 10^{10} bits
Hard Read Errors**	Less than 1 in 10^{12} bits
Seek Errors	Less than 1 in 10^8 seeks
MTBF (Mean Time Between Failure)	Greater than 11,000 POH

■ Winchester Drive Environment

Temperature - Operational	+5 to +40 degrees Celsius
Temperature - Non-operational	-20 to +60 degrees Celsius
Humidity - Operational	20% to 80% non-condensing
Humidity - Non-operational	0% to 90% non-condensing
Thermal Gradient - Operational	1 degree Celsius per minute
Altitude - Operational	-200 to 10,000 feet
Altitude - Non-operational	-200 to 30,000 feet

*Recoverable within 16 retries

**Not recoverable within 16 retries

System Requirements

■ Computer

IBM PC, XT, AT, or equivalent compatible

Note: If you have an IBM PC1 (16K-64K model that has no identification letter stamped on the back panel above the Keyboard connector), you will need to replace the BIOS ROM with an updated ROM to allow your computer to use a hard disk. Update ROM kits for the PC1 are available from your IBM dealer as **IBM Part Number 6137800**.

■ Peripherals

1 Floppy disk drive

1 Hard disk drive (a hard disk is required to run the QIC-60 menu software)

■ Minimum RAM Requirements (Random Access Memory)

Menu Operation (Total System RAM) 256K or greater

Command Operation (Total System RAM) 192K or greater

■ Tape

45 MB 1/4" Tape Cartridge: 3M DC-300XL or equivalent DEI Cartridge

Default Configuration Settings

The following settings are the “normal” ones for the QIC-60 tape controller. They are configured this way when the system is shipped, though you may easily change them through a slight hardware change and by changing the T_PARM.CFG default configuration file. (See Chapter 6 under *Changing the Default Parameters* for more details.)

DMA Channel = 1
I/O Start Address = 338 Hex
Interrupt Used = None

Channels, Interrupts, and I/O Addresses

■ DMA Channel

There are normally 4 DMA channels on an IBM PC, XT, AT, and compatibles. They are numbered 0 through 3. DMA channel 0 is not usually available for use, as it is used for system RAM refresh. DMA channel 1 is unused in most systems, but networking systems may utilize it. DMA channel 2 is normally used for floppy disk operation, and DMA channel 3 for hard disk operation.

The QIC-60 system is set up to use DMA channel 1 to avoid conflict with most devices. However, to maintain compatibility with powerful networking systems, you may need to change the DMA channel used by the QIC-60. If you do so, it is recommended that you change it to channel 2 (when channel 2 is used, interrupt 0 must also be used). This is a logical choice, because the QIC-60 will not often be used in conjunction with floppy disks. Also, concurrent usage of the QIC-60 and the floppy disk has been preserved (should the user wish to back up or restore using the QIC-60 with a floppy disk), through use of block moves (instead of DMA) for that option when DMA channel 2 has been selected. This is totally user-transparent.

WARNING: Conflicts may occur with other applications when a user changes this default DMA channel. Be sure that no other utility uses the DMA channel at the same time that it is accessed by the QIC-60 unit. If this occurs, unpredictable data handling and doubtful data integrity will be the result.

The DMA channel is easily changeable through the use of a simple menu-driven utility which allows you to fill in the number of the channel you wish to use. Then you must change a pair of jumper blocks on the controller card to correspond to the DMA channel chosen in the software. This is explained in Chapter 6: *Installation*, under *Changing the Default Parameters*.

■ Interrupts

The QIC-60 system is shipped with the controller and software configured to use no system interrupts. If you have other utilities on your system that make use of user interrupts, you should make sure that none of them use the same interrupt (in the case that you decide to assign some interrupt for the QIC-60's use). If there is a conflict, you must change the interrupt vector utilized by one of the two conflicting programs or utilities. This is possible on the QIC-60 system through the use of a simple menu-driven utility provided with the system. You will also have to change a jumper block on the QIC-60 controller card. This procedure is explained in Chapter 6: *Installation*, under *Changing the Default Parameters*. If you do assign an interrupt for use by the QIC-60 system, you may choose any interrupt from IRQ2 through IRQ7.

■ I/O Addresses

The QIC-60 system also makes use of the user-reserved I/O addresses from 338 hex to 33B hex. If you have another utility or application on your system that conflicts with this usage, you must change one of the two conflicting objects. The QIC-60 is easily changeable to use another set of I/O addresses through use of a menu-driven utility that is provided with the QIC-60 system. You will also have to change a set of four jumper blocks (if you have the PC Host board) or a block of ten DIP switches (if you use the PC-36 board). This procedure is explained in Chapter 6: *Installation* under *Changing the Default Parameters*.

There are four valid groups of I/O addresses usable by the PC Host Adapter or PC 36 Controller Cards. They are as follows (all numbers are in hex): 338 to 33B, 368 to 36B, 398 to 39B, and 3C8 to 3CB. When selecting a group of I/O addresses, the starting address for that block must be put in, and the entire block will be used.

Alternate source controller cards allow you to use any unused I/O address that begins with a value between 0 and 400 (hex) and is divisible by eight. This means that any number between 0 and 400 (in hexadecimal) that ends with either a zero or an eight (this implies that the number is divisible by eight) may be used as the starting address if you have an alternate source Controller Card.

Chapter 6

Installation of Hardware and Software

Installing Hardware

You can install QIC-60 in your IBM PC, XT, AT or other compatibles. All you will need is a medium-size flat blade screwdriver. Basic installation of the QIC-60 is discussed first. Software installation is discussed next. This is followed by a section on complex installation. Complex installation covers installing the QIC-60 + Winchester into a system that already has an internal hard disk drive and changing the system defaults (DMA channel, interrupts, I/O address).

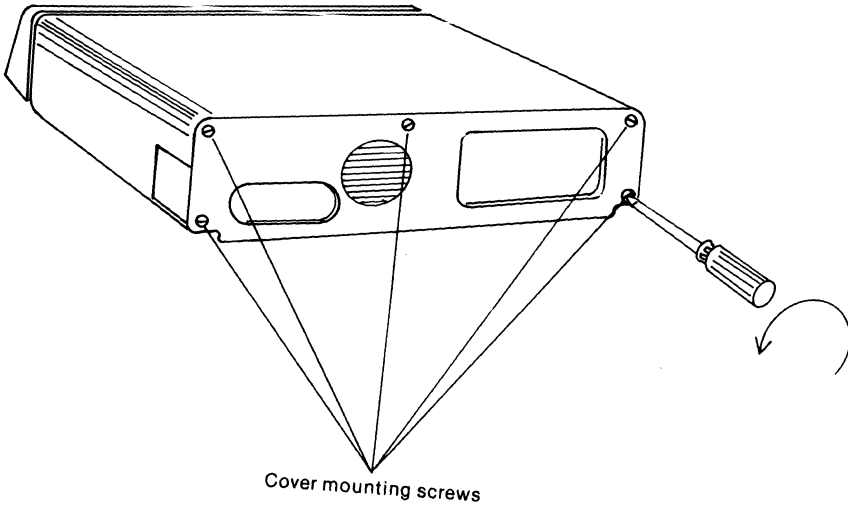
Basic Installation

The instructions for basic installation are arranged in a step-by-step format. Read and perform each step as directed.

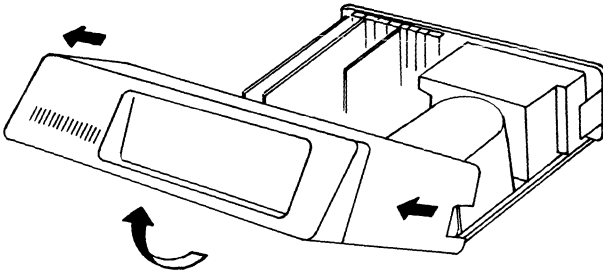
The following instructions include cover removal and replacement for an IBM PC or an IBM XT. If you are installing QIC-60 into any other computer, consult your **Guide to Cover Removal and Replacement** for instructions on cover removal and replacement for your particular system.

- Turn off your computer, expansion chassis, and all options (monitor, printer, etc.).
- Unplug your computer, expansion chassis, and all other options from their source of power (wall outlets, power strips, etc.). Disconnect all cables.

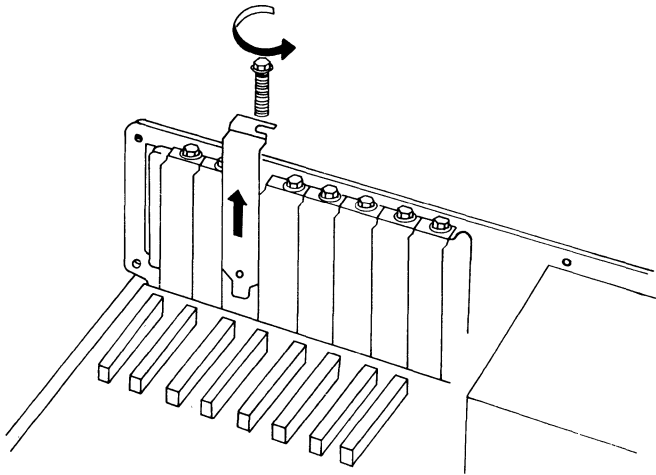
■ Remove the five screws at the back of your computer.



■ Slide the cover forward until it will go no further. Then, lift up.

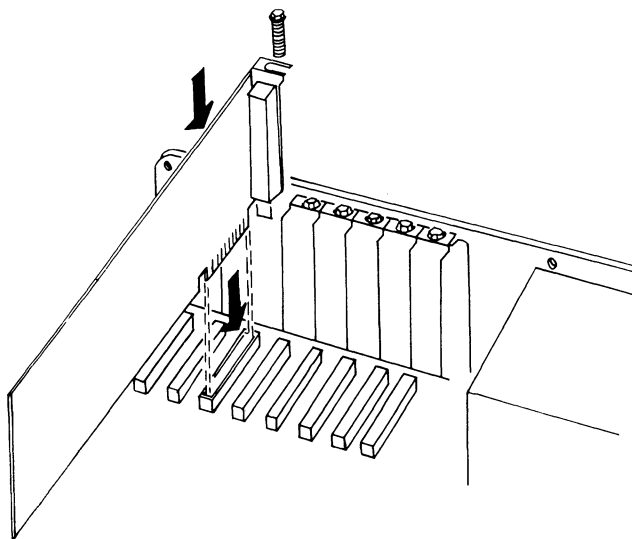


- Choose an empty expansion slot for your tape drive controller board. In an IBM XT you can use a short slot if one is available and you have the short controller board. **Do not use the slot next to the power supply. That slot will not work with the QIC-60 tape drive controller board.**
- Remove the screw from the slot cover. Pull the slot cover upward and remove it.

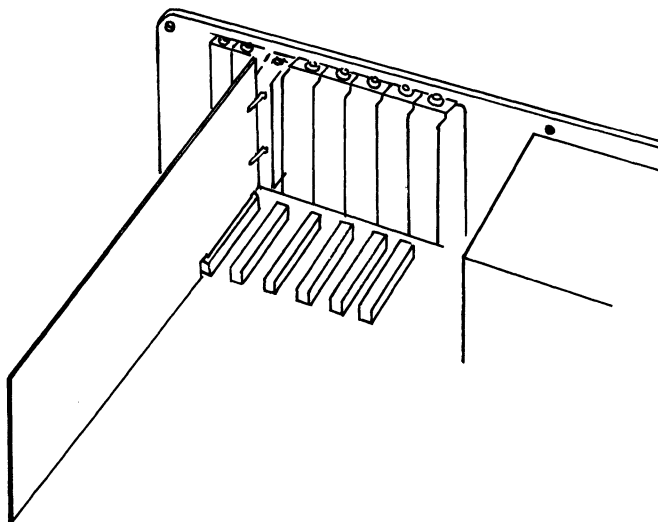


Set this screw aside in a safe place.

- Slide the tape drive controller board down into the slot. Make sure that the gold “fingers” of the edge connector are pushed completely into the socket on the bottom of the system chassis.

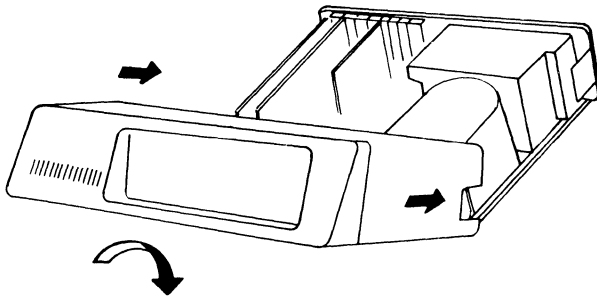


- Line up the hole in the top of the mounting bracket with the hole that was used to secure the slot cover you removed.
- Fasten the board securely into the slot using the screw you set aside earlier.

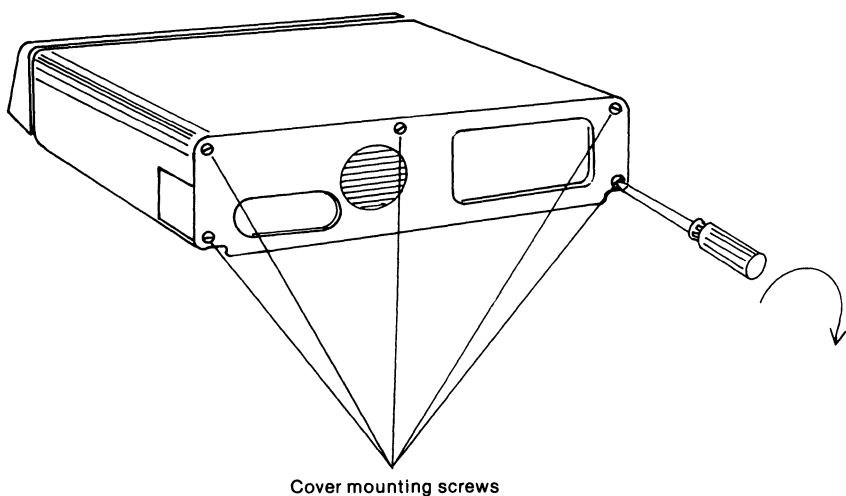


Perform the next five steps only if you have a QIC-60 + Winchester and have no internal hard disk.

- If you have a QIC-60 + Winchester and no internal hard disk in your computer, locate another empty expansion slot in your computer.
- Remove the screw from the slot cover.
- Slide the hard disk controller board into the slot, making sure that the gold “fingers” of the edge connector are pushed completely into the socket on the bottom of your system chassis.
- Line up the hole in the mounting bracket with the hole that was used to secure the slot cover you removed.
- Fasten the board securely in the slot using the screw you removed earlier.
- Slide the cover of your computer down then back.



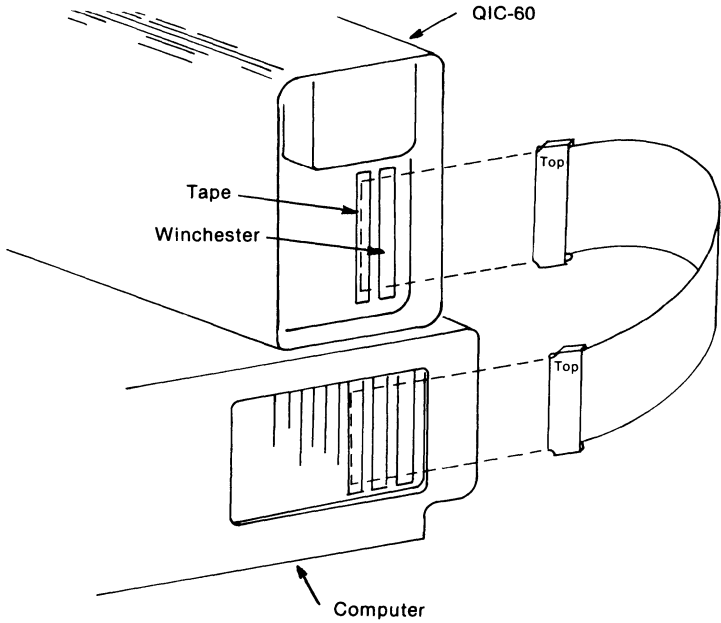
- Replace the five screws.



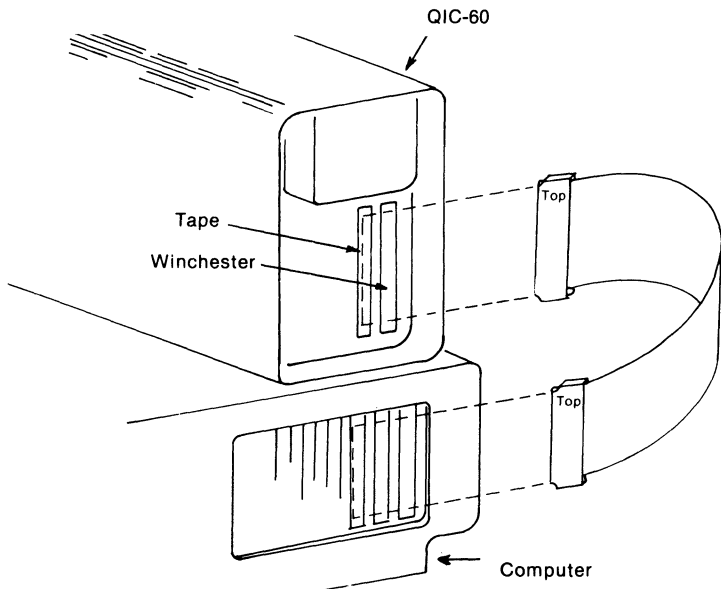
- Plug the shielded cable into the port of the QIC-60 controller board.

The tops of the plugs are labeled so that you can fit them into the connectors correctly. If you have difficulty plugging them in, don't force them. You might have them positioned incorrectly. Reposition them and try again.

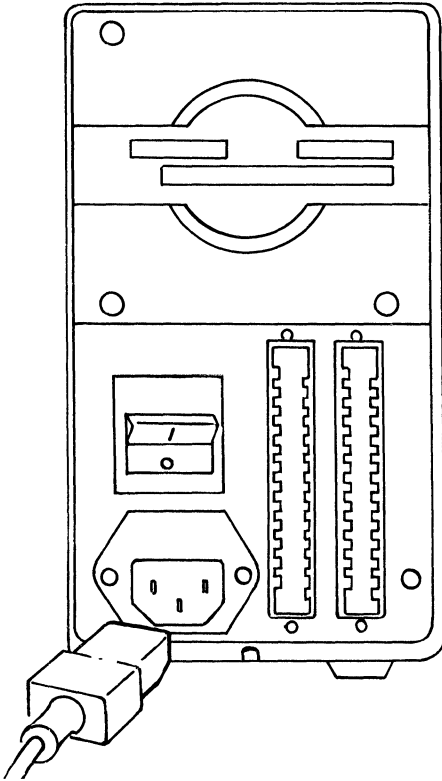
- Plug the other end of the cable into the back of the QIC-60 unit. Use the connector on the back of the QIC-60 labeled "tape".



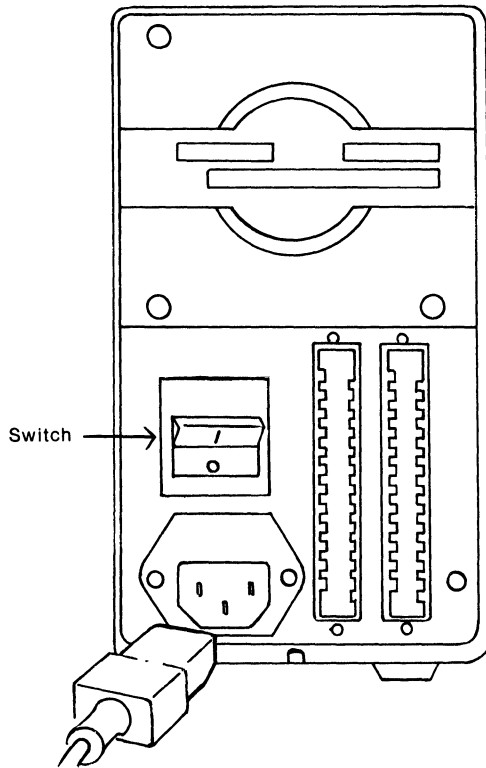
- If you have a QIC-60 + Winchester unit, plug one end of another shielded cable into the hard disk controller board at the back of your computer.



- Plug the other end of the cable into the back of the QIC-60 unit. Use the connector on the back of the drive unit labeled “Winchester”.
- If you have the QIC-60 + Winchester, locate the PC Drive Select Switch on the bottom panel of your unit. Set the slide switch to “1”. This makes your QIC-60 Winchester drive C.
- Connect the QIC-60 power cord to the back of the unit.



- Reconnect all cables to your computer and other options.
- Make sure there is no tape in your tape drive unit. Plug your computer, options, and QIC-60 into their source of power.
- Turn on the power to your personal computer and options. Turn on your tape drive unit with the on/off switch at the back of the unit.



- Go to the next section on installing software.

Installing Software

You must transfer the QIC-60 software from the floppy Master Diskettes onto your already prepared (formatted for DOS) hard disk. To install this software, you will need the two QIC-60 Master Diskettes that came with your QIC-60 unit.

■ Turn on the power to your computer and let it boot up.

■ Insert the QIC-60 Master Diskette #1 into floppy disk drive A, Type A:INSTALL, then press the RETURN key.

The Install Software screen will be displayed. This indicates that the software installation program is ready to execute.

■ If the correct date is displayed, press RETURN. If the date is incorrect, type N and press RETURN. Enter the correct date and press RETURN.

■ If the correct time is displayed, press RETURN. If the time is incorrect, type N and press RETURN. Enter the correct time and press RETURN.

■ When the Install Software menu is displayed, choose the next step from it by pressing the appropriate key:

F1 to begin installation of QIC-60 software.

F2 to change the tape backup configuration file.

F3 to return to DOS control.

F9 to get more information about QIC-60 software installation.

■ Press F1 to begin installation of software.

The screen will prompt you to give the letter of the disk drive where you want the QIC-60 software installed.

■ If the letter displayed (default drive) is the drive you have chosen, press RETURN.

- If you want the software installed on a different drive, type in the letter of that drive, then press RETURN.
- The screen will prompt you to enter the name of the directory into which you want to install the software. If you want to use the name QIC, press RETURN.
- If you want to create your own directory for installing the software, follow the standard PC or MS DOS format, and enter the selected name. Press RETURN.
- Select the next step from the four functions listed at the bottom of the screen. Press F1 to continue the installation process.
The computer will copy the diskette onto your directory.
- The screen will prompt you for the type of monitor you are using. If your monitor displays red, green, and blue colors (an RGB or color monitor), type **Y** at the prompt and press RETURN. If you have a monochrome monitor, simply press RETURN (N is supplied as the default).
- Remove Diskette #1 when the screen prompts you to do so.
- Insert Diskette #2 into Drive A.
Press RETURN.
This diskette is copied into the directory.
- When the screen prompts, enter the letter of the drive that your system boots from. Press RETURN.
If a config.sys file does not exist in the root directory of the boot disk, one will be created there at this time.
- One of three messages will be displayed:
QIC-60 INSTALLATION SUCCESSFUL. This indicates that you have successfully installed the software. Press F1 to return to the main menu. Press F3 if you want to return to DOS control.

QIC-60 INSTALLATION COMPLETE, EXCEPT CONFIG.SYS FILE NOT UPDATED. If you see this display, either the software had a hard time updating the Config.Sys file, or the operator did not want it updated. In either case, the program will still operate, but speed may be downgraded.

QIC-60 INSTALLATION UNSUCCESSFUL. If you see this, it means that the software could not be installed. An error message giving you the reason will be displayed.

- To run QIC-60 software, go to the directory you created by typing `cd/qic`, if `qic` is the name of the directory you selected. If not, after the backslash type in your directory's name. Press RETURN.
- Type in "QIC" to load the QIC-60 program. The QIC-60 menu system will come up.
- To run QIC-60 in the command mode, get to your directory and type in a legal command. Press RETURN.

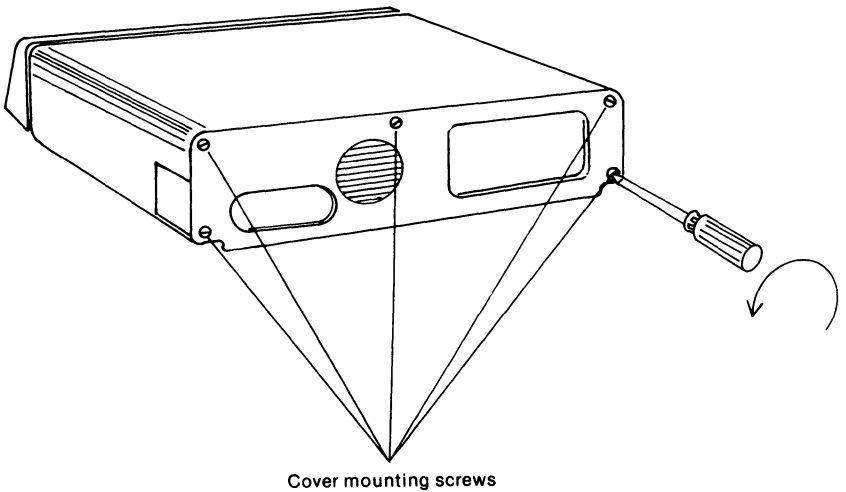
Complex Installation

The instructions in this section are not intended for the inexperienced computer user. If you feel comfortable with the following instructions, you may perform the operations on your own. If you have any doubts, call your Tecmar dealer.

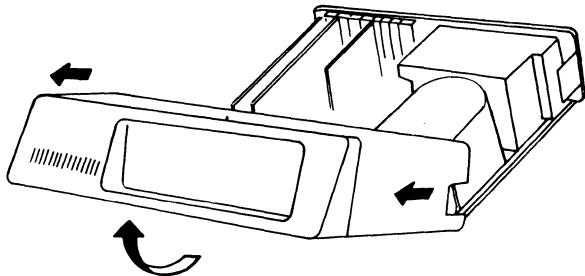
Parts of the following instructions repeat the option card installation procedure found in the **IBM Guide to Operations** manual for the IBM PC and XT computers. Please have this IBM manual handy so that you can refer to it when you need to during this installation procedure.

The following instructions are only for the installation of the QIC-60 + Winchester onto a system that already has an internal hard disk drive (installation onto an IBM AT is covered in the **Q60 AT Installation Manual**).

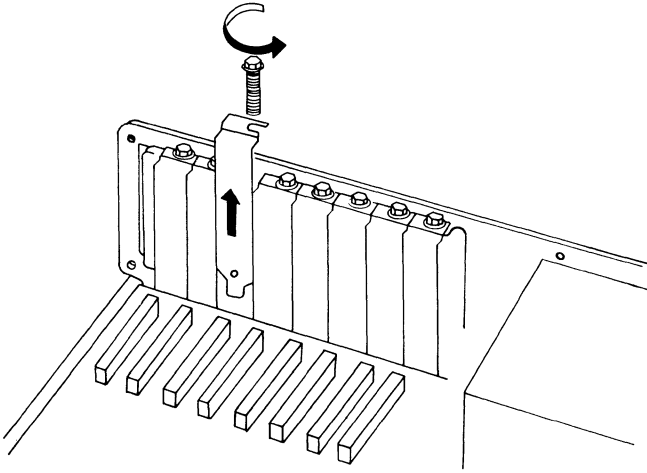
- Turn off the power to your personal computer, expansion chassis, and all other options.
- Unplug your computer and all other options from their source of power (wall outlets, power strips, etc.). Disconnect all cables.
- Remove the five screws from the back of your computer (an IBM PC is used as an example. If you have another computer, refer to your system manual for information on cover removal and replacement.).



- Slide the cover forward until it will go no further. Then, lift up.



- Choose an empty expansion slot for your tape drive controller board. **Do not use the slot next to the power supply. That slot will not work with the QIC-60 controller in an IBM XT.**
- Remove the screw from the top of the slot cover. Pull the slot cover upward and remove it.

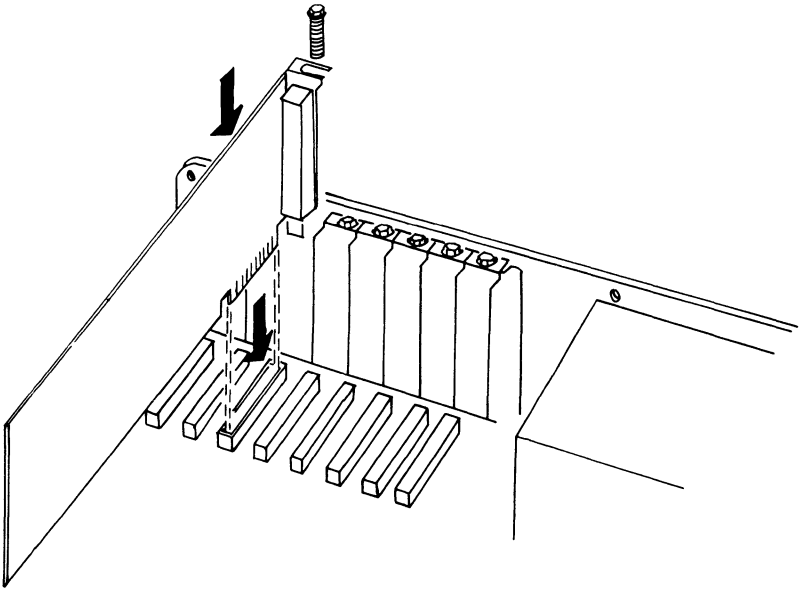


Set this screw aside in a safe place.

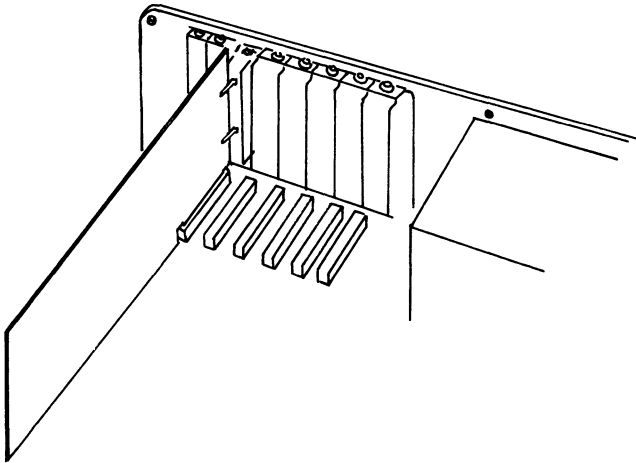
- Slide the tape drive controller board into the slot.

Make sure that the gold “fingers” of the edge connector are pushed completely into the socket on the bottom of the system chassis.

- Line up the hole in the top of the mounting bracket with the hole that was used to secure the slot cover you removed.



- Fasten the board securely into the slot using the screw you set aside earlier.

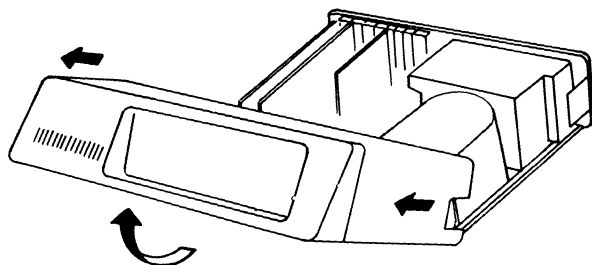


The next step in installation is to install your new Winchester.

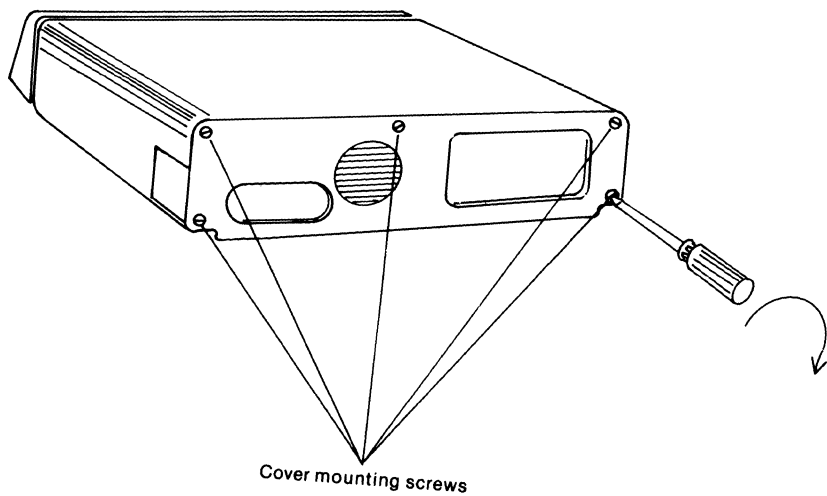
Before installing your new Winchester, you should make a complete backup of your internal hard disk onto tape or floppies. You should make this backup as a precaution against making a mistake during installation. Also, if your old controller board is not an IBM XT controller, it will be necessary to do a low-level format of your old hard disk with your new controller board, and you will lose all existing data on the disk.

Before you make the backup, check your system hardware that may be using DMA channel 1 and/or I.O. addresses 338 through 33B. If you have any, refer to the section in this manual on changing DMA channels and I.O. addresses.

- Slide the cover of your computer down then back.



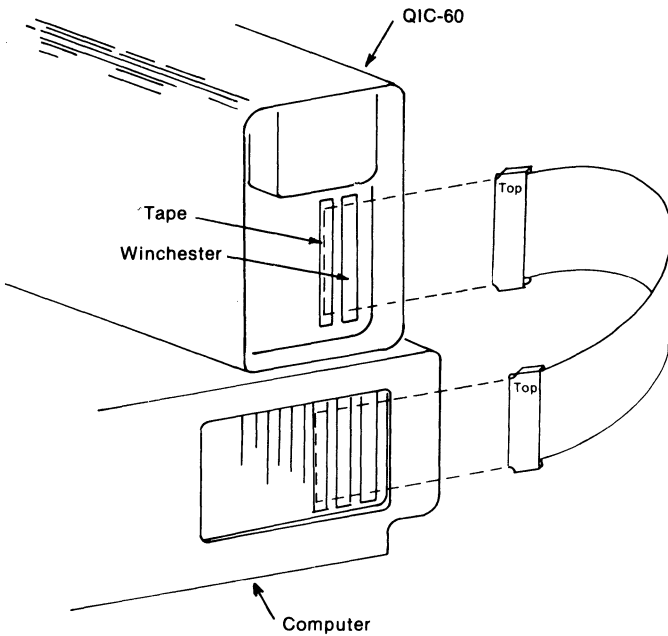
- Replace the five screws.



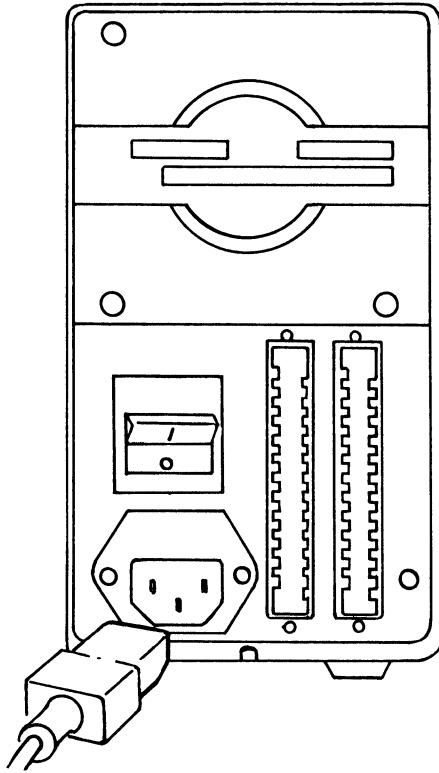
- Plug one end of the shielded cable that came with your QIC-60 into the connector of the tape controller board that you just installed. This connector is at the back of your computer.

The tops of the cable plugs are labeled so that you can fit them into the connectors correctly. If you have difficulty getting them in, don't force them. Re-position them and try again.

- Plug the other end of the shielded cable into the back of the QIC-60 tape drive unit. Use the connector labeled "tape".



- Connect the QIC-60 power cord to the back of the unit.



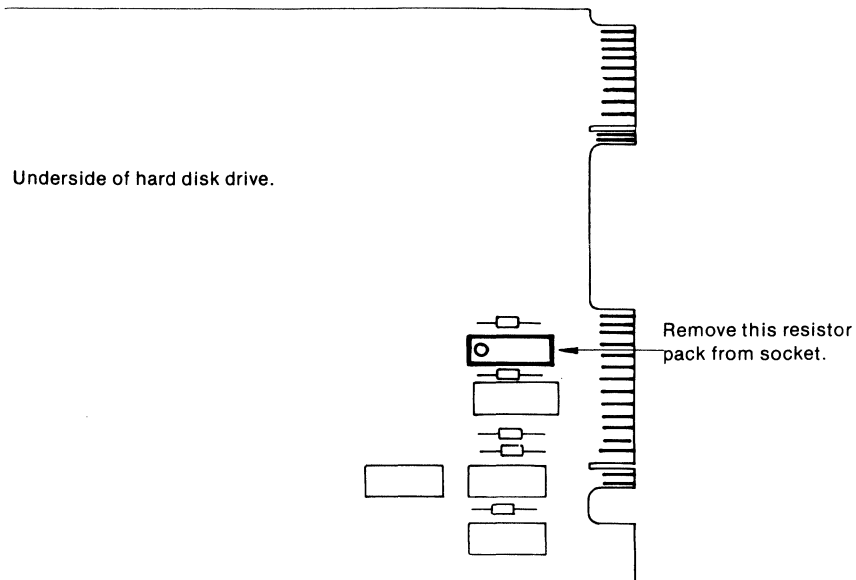
- Turn on your computer and let it boot up under DOS (version 2.0 or higher).
- Turn on the QIC-60.
- Put the QIC Master Diskette #1 into the floppy drive and make that drive your current drive.
- Insert a tape. Refer to Chapter 4 for information on inserting tapes.

The unit should now be ready to make a backup.

- Enter the backup command:
F_BACK <hard disk drive letter to backup>:\S/P
- Press RETURN.

The tape drive will backup the entire hard disk.

- Do a directory of your tape to make sure all files were copied.
- **TURN THE POWER OFF TO YOUR COMPUTER AND QIC-60 UNIT.** Make sure you disconnect both of these from any power source before proceeding to the next step.
- Remove your computer cover again.
- Look at the back of your QIC-60 unit, and find the serial number. If the serial number ends with a dash (-) followed by KA17, disregard the next two steps.
- Locate the resistor pack on the underside of your internal hard disk drive unit. The location of the resistor for standard IBM XT hard disk drives is shown in the figure below.



The resistor pack usually will have either 14 or 16 pins; it is the only socketed device of this size on this PC board. (All socketed integrated circuits will be much larger and have more pins.) If you cannot locate this resistor pack, you may not have a standard hard disk drive unit; ask your dealer to help you locate the resistor pack or its counterpart on the circuit board.

- Remove the resistor pack. Use a small screwdriver to pry it up, being careful not to bend the pins. Set this resistor pack aside in a safe place, in case you should ever need to replace it.
- Connect your internal hard disk to the new QIC-60 hard disk controller board. The QIC-60 controller board will serve as the controller for both hard disks.

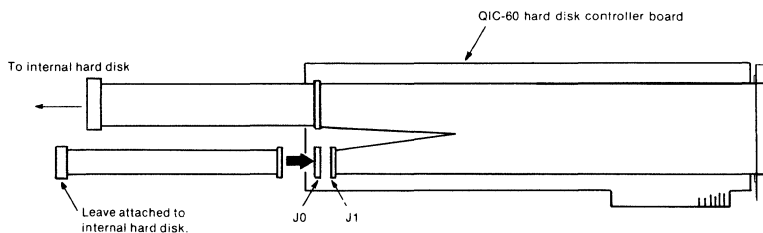
To do this, remove the internal hard disk's present controller board from its slot in the computer. You will note that there are already two cables connecting your hard disk to its present controller board. Disconnect the widest of these two ribbon cables from both the internal hard disk and its present controller board. Next disconnect the smaller of the two cables from only the controller board; leave it attached to the internal hard disk.

- If your QIC-60 hard disk controller board is a full length board, locate the narrow ribbon cable that is attached to connector J0 in the lower right-hand corner of the board. Disconnect this cable from J0 and connect it to J1, which is located about one-half inch to the right. This connection is necessary so that the internal hard disk can be the default drive. (The QIC-60 hard disk controller is shipped with this ribbon cable connected to J0 for users who do not have an internal hard disk.)

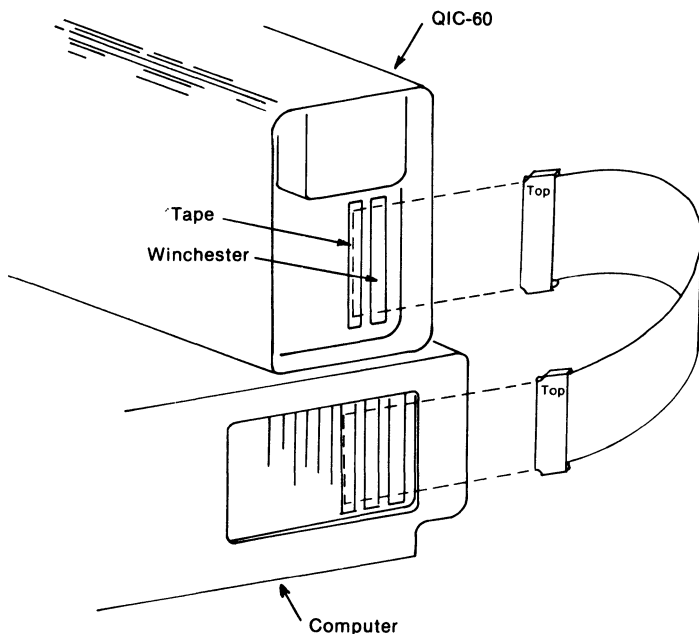
If your QIC-60 hard disk controller board is a Western Digital 8" (3/4 length) board, go to Appendix C and follow the instructions there.

- Take the small ribbon cable that is connected to your internal hard disk, and connect the unattached end of it to the connector J0; the cable connector is keyed to help you position it properly.
- Connect the "pigtail" wide ribbon cable (hanging off the end of your QIC-60 hard disk controller board) to the internal hard disk, plugging it into the same socket from which you removed the widest ribbon cable that connected the drive to its old controller. This wide ribbon cable is also keyed, so that it can't be plugged in upside down.

- Remount your internal hard disk drive back in the computer, just the opposite of the way in which you removed it earlier.



- Install the hard disk controller card.
- If everything is in order, put the cover back on your computer.
- Plug the shielded cable into the connector of the QIC-60 controller board. The cable ends are labeled at the top so that you can correctly position them. Do not force the plugs. If you have difficulty plugging them in, re-position them and try again.
- Plug the other end of the cable into the QIC-60 tape drive unit.



- Connect the hard disk controller board (now in your computer) to the socket for Winchester control on the QIC-60 + Winchester unit.
- Find the Drive Select Switch on the bottom panel of your QIC-60 + Winchester unit. Ensure that this slide switch is set to "2", which causes the QIC-60 system to recognize the internal disk as the default drive.
- Make sure there is no tape in the QIC-60 unit. Reconnect power to your IBM computer and also connect the QIC-60 power cord.

The QIC-60 unit is designed to fit comfortably on top of your IBM system unit alongside your monitor. Place it there now, or in another place that would be convenient for you.

- Now you are ready to put the QIC-60 software on the hard disk of your choice. If your hard disk is new or not prepared for DOS, or if the software is to be installed on your new QIC-60 + Winchester, the selected disk must be formatted and prepared for DOS; to do this, you must perform both the Fixed Disk Setup (FDISK) and the Format programs, which are found in your DOS manual.

Note: If you are not using DOS Version 3.0, but instead are using either 2.0 or 2.1, then you must follow the steps below to create a new format routine for your disk. (This is necessary because DOS 2.0 and 2.1 will not allow you to format a hard disk with greater than 15 MB capacity.) The **bolded** portion is data that you must enter exactly as shown; the other is information that will appear in a prompt before you enter each portion of data. Put your system under DOS control, your DOS diskette which contains the "Debug" program in Drive A (you can find "Debug" by using the DIR command), and enter the following data for your respective version of DOS:

DOS 2.0

```
A>debug format.com (press return)
-e 292 (press return)
0F7D:0292 7D.73 (press return)
-e 2d9 (press return)
0F7D:02D9 7F.73 (press return)
-n frmt20mb.com (press return)
-w (press return)
-q (press return)
```

DOS 2.1

```
A>debug format.com (press return)
-e 2da (press return)
0F7D:02DA 7D.73 (press return)
-e 323 (press return)
0F7D:0323 7F.73 (press return)
-n frmt20mb.com (press return)
-w (press return)
-q (press return)
```

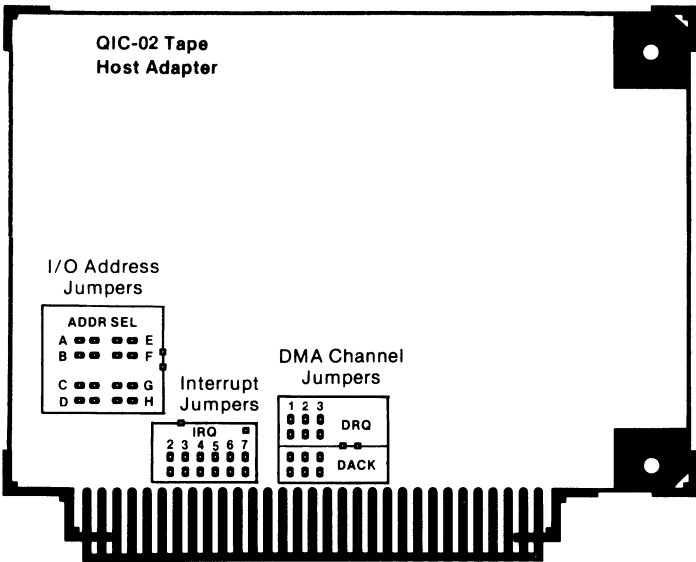
Now perform the FDISK program as found in your DOS manual; but when performing the Format program in the DOS manual, instead of calling the DOS format routine (which is named "format.com"), call your special format program — which you named "frmt20mb.com" above. Then perform the steps of the Format routine exactly as detailed in the DOS manual.

After the hard disk has been formatted and prepared for DOS, refer to p. 106 of this chapter for instructions on installing the QIC-60 software on the disk.

■ Changing the DMA Channel

The default DMA (the one selected when QIC-60 is shipped) is DMA channel 1. It can be changed to channel 2 or 3 in two easy steps.

Step 1 is changing the hardware. You must change a pair of jumper blocks on the QIC-60 controller board to correspond with the DMA channel you want to use. Refer to the figure below if you have a QIC-02 Host Adapter (the short board); refer to the figure on the following page if you have the PC-36 Controller (the long board)



Gently pull the blocks from the default pins, and replace them on another of the sets of pins.

If you have the QIC-02 Host Adapter, reset both jumpers to the same DMA channel, both falling vertically below the DMA number of the channel you've chosen.

If you have the PC-36 Controller, use the last six pairs of pins on the jumper block above the bottom edge connector to change the

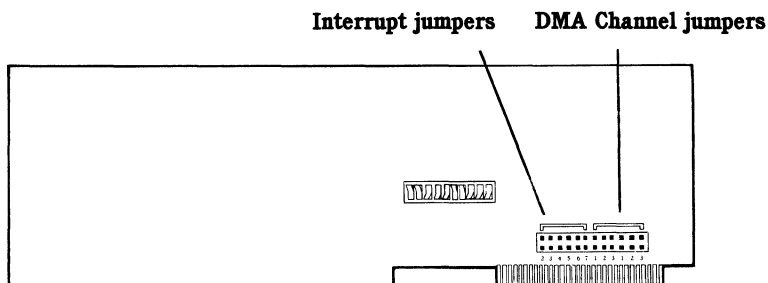
DMA channel (in the diagram these pins are labeled “DMA Channel Jumpers”). Each pair of pins (from the DMA Channel Jumpers) whose number corresponds with the DMA channel you’ve chosen must be jumpered. You must change two jumper positions. For example, if you chose DMA channel 2, jumper both pairs of pins labeled “2” in the DMA Channel Jumpers.

Step 2 requires a change in the software. You can use the menu-driven program from QIC-60 software to make this change (detailed later in this chapter).

■ Changing the I/O Addresses

The default I/O addresses used by the QIC-60 are hex 338 through 33B. These may also be changed in two easy steps.




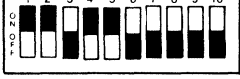
Step 1 requires that you change a group of four jumpers (if you have the QIC-60 Host Adapter board, shown on the previous page) or set a group of ten DIP switches if you have the PC-36 controller board, (shown in the diagram below).



You will notice that there are letters on the card next to the blocks or switches. These letters will help you set the I/O addresses correctly. Table 1 below is included to show you the four valid settings for the QIC-60 I/O addresses. (It shows these settings for the PC Host short board and the PC-36 long board.) You must reset the switches or jumper blocks correctly so that they correspond to one of the settings in the table.

Next, you must change the software to correspond to the change that you have made on the controller board. To do this, you will use the menu-driven program that has been included with your QIC-60 software (detailed later in this chapter).

Table 1

I/O Address	(For PC Host Controller) Select Jumpers	(For PC-36 Controller) Set DIP Switches
338-33B	B D E G	
368-36B	B C E H	
398-39B	A D F G	
3C8-3CB	A C F H	

■ Changing the Interrupt Used

The QIC-60 is shipped with no hardware interrupt set. It will not use any interrupts unless you change the default by altering the hardware and software. If you want to change the interrupt of your QIC-60, use the following instructions.

First, change a jumper block on your controller board. This jumper block location is shown on page 121 for the QIC-02 Host Adapter and on page 122 of the PC-36 Controller. These jumpers are labeled “Interrupt Jumpers” in both diagrams.

Note: On the PC-36 board, the interrupt is changed by using the first six pairs of pins, labeled “Interrupt Jumpers”, in the jumper block above the bottom edge connector.

A number, representing the number of an interrupt, is next to each set of jumper pins on the controller board. Remove the jumper block from its present position (be careful not to bend the gold pins) and replace it on the pins under the number of the interrupt you are using.

You also have to change the software to tell the program which interrupt you are using. A menu-driven program (detailed later in this chapter) will help you make this change easily.

■ Changing the Default Parameters

The QIC-60 system can be used for different purposes and in different manners. Some users will always want a display of the files that they backed up; others will always want their operations to apply to subdirectories as well as the current directory. The DMA Channel, I/O addresses, or interrupt may need to be changed for a particular system because of memory-resident utilities that conflict with the QIC-60's normal usage.

The program to alter default parameters allows you to specify which defaults are to be followed during backup and restore operations on your system. You may specify a number of different default options, which are listed in the screen below, and then save them to be used as the normal defaults. (The QIC-60 system will save them in a file called `T_PARM.CFG`.) The first four parameters in the configuration file can be altered by entering your numerical specification; the last six options can be selectively activated by entering a **Y** in place of the **N** for each desired option, otherwise each will default to **N**, and the option will not be activated. All of these options are available under both menu- and command-driven operation except the "Search All Subdirectories" option, which can only be used in command-driven operation.

The last six of these defaults may be overridden during command-driven operation without remodifying this file. This is done by using the `/-x` option, where the `x` represents the option letter that you wish to override. This will become clear as you get more familiar with command-driven operation. See the beginning of each Explanation of Options section in Chapter 3 for clarification on these "negate options" that are used for overriding these defaults in the `T_PARM.CFG` file.

The screen for setting up the configuration file appears as follows:

CONFIGURATION FILE SETUP	
CARD TYPE [1, or 2]:	1
DMA CHANNEL [1, 2, or 3]:	1
INTERRUPT [0, 2 - 7]:	0
I/O START ADDRESS [in Hexadecimal]:	338
MULTIPLE VOLUMES [Y OR N]:	N
DISPLAY FILE NAMES [Y OR N]:	N
SEARCH ALL SUBDIRECTORIES [Y OR N]:	N
REQUEST CONFIRMATION OF EACH FILE [Y OR N]:	N
ENABLE 512 BYTE BLOCK MODE [Y OR N]:	N
ENABLE OVERWRITE OF FILES [Y OR N]:	N
ENABLE BLOCK SHIFT TAPE OPERATION [Y OR N]:	N

\F1:\UPDATE\FILE\ \F9:\HELP\ \F10:\MENU\

All of the items listed on the screen are variables that you may fill in to specify how you want your system setup. You need fill in only those items that you specifically want to change from their default values. These values will then be permanently saved in a file called T_PARM.CFG in your current directory when you hit the F1 function key. Each of the entries is detailed below.

Card Type

Legal Values: 1 = PC Host Adapter or PC 36 Controller Board
2 = Alternate Source Board

This refers to the controller board that you received with your QIC-60 unit. You may look for a label on your card to tell what kind it is. (This information should also be listed on the shipping list included with the unit.)

DMA Channel

Legal Values: 1 = DMA Channel 1 (sometimes network)
2 = DMA Channel 2 (floppy disk control)
3 = DMA Channel 3 (hard disk control)

This is the Direct Memory Access channel to be used by your QIC-60 unit. As you can see, each channel has a reserved purpose, so you must select one that will not conflict with your system. Channel 1 is the default because it will be unused in most computer systems. Channel 2 could be used for the QIC-60 DMA if the user is not going to access the floppy disk while the QIC-60 tape is being used, and if Interrupt 0 is used. This will usually be the case, because the QIC-60 tape will be used in conjunction with the hard disk in the majority of systems.

CAUTION: If you use DMA channel 2 *and* the floppy disk at the same time, your system will do unpredictable things; data could be destroyed on floppy disks installed at the time and/or the backup could be invalid.

Channel 3 should normally not be used as the QIC-60 tape drive DMA channel. It is reserved as the channel for the hard disk. Again, unpredictable results and doubtful data integrity will result if this channel is used while the hard disk and QIC-60 tape are accessed simultaneously by the computer. There is further important information on DMA channel usage in Chapter 5: *Technical Information*.

If you change the DMA channel, you will have to make a corresponding change to the jumper blocks on the QIC-60 controller board. The procedure for this is detailed in this chapter (under *Changing the Default Parameters*). Be sure to make *both* hardware and software changes in order for your QIC-60 to work correctly.

Interrupt

Legal Values: 0 = Use no system interrupts
 2 to 7 = Use interrupt number entered

Normally, the QIC-60 system does not need to utilize any of the system interrupts to operate. This is because it uses the system timer to generate pseudo-interrupts when they are needed.

If your system has some utility or hardware that interferes with this timer you will have to supply the QIC-60 with an interrupt to use. To find out if your system does have a conflict with this timer usage, you have to look in the manuals for any memory-resident applications or peripherals that you have connected to your system. These should tell you whether they use the timer in any unusual way that might affect another device's operation (e.g., the QIC-60's). You may specify any of the numbers shown above to be used as an interrupt as long as it is not utilized by another part of your system.

If you allow the QIC-60 to use an interrupt, you must make sure that you choose an interrupt that will not conflict with any that is already in use by your system. The allowed interrupts (i.e., 2 through 7) are generally reserved for use by applications programs. Therefore, it is important to check and be sure that no memory-resident utilities make use of the interrupt that you choose.

Note that you must also make a corresponding change in the hardware on the QIC-60 tape controller board. You will have to put a jumper block on a set of pins to enable this interrupt in hardware. The details of this operation are found in this chapter (under *Changing the Default Parameters*). It is necessary to make both hardware and software changes (i.e., in the software and the hardware) in order for the QIC-60 to operate.

I/O Start Address

Legal Values:

For PC Host Adapter and PC 36 Controller Board

(Card number 1) = 338, 368, 398, or 3C8 (in hex)

For Alternate Source Card

(Card number 2) = Any number between 0 and 400 (in hex)
that is divisible by eight

The default starting address for the I/O channel is 338 hex. The QIC-60 will use that number and the next three I/O address numbers for its input and output. So, for the default of 338 hex, addresses 338, 339, 33A, and 33B (all in hexadecimal) would be used by the QIC-60 tape controller.

Again, (as with the interrupt) you must make sure that no other card or peripheral installed in your system is using the I/O addresses that you use for the QIC-60. This is the reason for supplying you with various possible sets of I/O addresses. The I/O channel used by each addition to your system should be documented in your manuals so that you can make sure that no duplicate I/O addresses are used.

To change the I/O address, you must change the number on the above screen (to change the address in software). The necessary hardware change is explained in detail in this chapter (under *Changing the Default Parameters*).

Multiple Volumes

Legal Values: Y (for Yes) or N (for No)

When you specify Y for this option, the current backup will be added at the end of the previous volume. The tape directory will also be updated, adding the current volume to the list of volumes found on this tape.

If N is specified, the Single Volume Mode will be set, which means that only one volume can be stored per tape.

Display File Names

Legal Values: Y (for Yes) or N (for No)

If you specify Y for this option, any files backed up or restored in file-by-file operations will have their names displayed on the screen as the operation is performed. See the /P option under the F_BACK and F_REST commands.) This can be useful because you will see exactly which files are being transferred. This display process can take some time if there a great number of files to be processed. If you would like a hard-copy, press *ctrl p* from the DOS prompt, before starting the backup or restore program.

Search All Subdirectories

(Note: This option cannot be used in menu-driven operation.

Legal Values: Y (for Yes) or N (for No)

If you specify Y for this option, all subdirectories will be included. If you are using the command-driven mode and specify a mask for the file name, files matching that mask will be searched for in the subdirectories below the specified path. See the /S option, under the F_BACK and F_REST commands.)

Request Confirmation of Each File

(Note: This option applies only to File-By-File Restore operations)

Legal Values: Y (for Yes) or N (for No)

If you specify Y for this option, the QIC-60 system will ask you to confirm each file to be included during any file-by-file restore operation. This allows you to specifically select which files should be included. This process can be very time consuming if you are dealing with a large number of files. See the /Q option under the F_REST command.

Enable 512 Byte Block Mode

Legal Values: Y (for Yes) N (for No).

When you enter a Y for this option, the buffer's size is set to 512 bytes (0.5K). It might be necessary to do this because the DMA hardware in some compatible (non-IBM) systems does not work exactly the same as the IBM. If you enable this mode, an interrupt between 2 and 7 must be used (see Chapter 5). Using this option might slow down your system's operation because of reduced buffer size.

Note: This option is NOT to be used with IBM systems. Only use it with compatibles if system lockup occurs during a backup or restore.

Enable Overwrite of Files

Legal Values: Y(for Yes) or N (for No)

If you specify Y for this option, it allows a restore from a file-by-file tape volume to overwrite any files of the same name on the destination. If you specified an N, the files on your disk or other storage device will be protected against accidental overwrite during a restore from a file-by-file tape volume with duplicate names.

Note that putting an N here does **NOT** protect you against the overwriting of files during mirror-image operations. During a mirror-image restore the **entire logical disk** is overwritten, and all data that was on it previously is lost. See the /O option in the F_REST command.

Enable Block Shift Tape Operation

Legal Values: Y (for Yes) or N (for No)

If you specify Y for this option, it will allow the tape to operate without using the DMA controller. This may be necessary in cases where certain hardware in the system restricts the use of the DMA channel by QIC-60 software. This mode of operation, which shifts data to the tape in blocks of information and does not use the DMA chip, is slightly slower than the normal mode of operation.

Appendix A

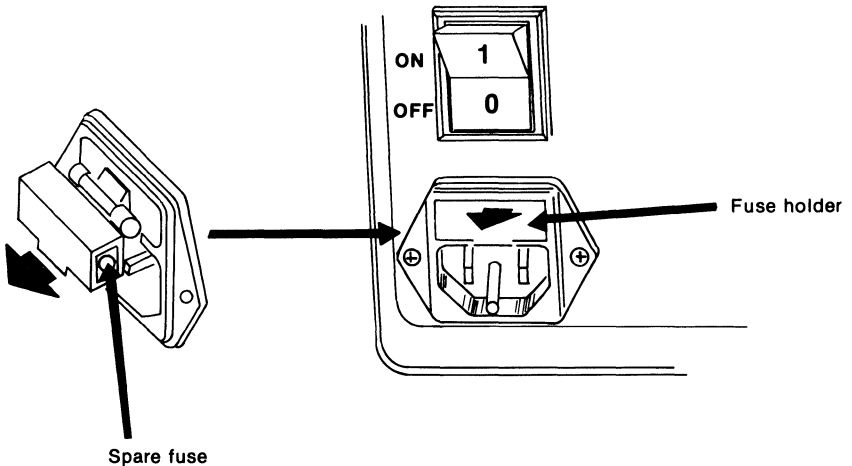
Maintenance of Tapes and Hardware

The Drive Unit

■ Replacing the Fuse

If the QIC-60 drive unit does not operate and all power cables and plugs are properly connected (and your computer is receiving power), it is likely that you need to replace the fuse in the back of the QIC-60 tape drive unit.

First, disconnect the tape drive unit from all power connections AND from your comouter. Then, disconnect the power cord from the back of the unit. The fuse is located in a little compartment just above the power cord connection on the tape drive unit.



Use a small flat-blade screwdriver to lift up and out on the compartment from below. The fuse compartment, which contains both the old fuse and a spare fuse, will fall out easily.

Discard the old fuse and remove the spare one from its hiding place by pushing on one end gently with a thin instrument. Put the spare fuse in the plastic clip where the old fuse was located and reinsert the black plastic fuse compartment back into its place above the power connection on the tape drive unit. The fuse will automatically connect with the circuit inside the unit.

■ Cleaning the Tape Heads

The only regular maintenance that the tape drive unit itself requires is a periodic cleaning of the tape heads. This should be done about once per month.

You should purchase a QIC tape drive cleaning kit from your dealer. This is the only cleaning method recommended by Tecmar for tape drive read/write heads. Other cleaning procedures might damage the heads or capstan drive mechanism and could result in an invalidated warranty.

The Tapes

After a long period of use, the magnetic tapes probably will become worn because of the contact with the tape head and the constant winding they endure. To maximize the period of time that each tape remains in usable condition, be sure to observe the tape care tips offered in *General Information* (Chapter 4).

If you suspect that a tape may be wearing out and nearing the end of its useful life, you may check it by doing a backup to that tape, and requesting an error report (Chapter 6). If there are a large numbers of errors, and/or the backup does not execute properly, you may be fairly certain that the tape is bad (provided no other problems caused the backup failure). If the backup does work, you should set the tape aside for a few hours (or days if possible). Then, verify the tape using the *Tape Utilities Menu Verify* option. If the tape will not verify, then the magnetic coating on the tape is too worn to be reliable, and you should replace that tape.

Appendix B

Guide to Error Messages





Tape and Tape Drive Messages

- **DATA NOT READ CORRECTLY — BAD TAPE**

This could be because the tape has been exposed to magnetic or electric fields and the data on the tape has been scrambled. It might be because the tape is physically worn.

- **END OF MEDIA WHILE WRITING**

You have come to the end of the tape while performing write operations.

- **END OF TAPE ENCOUNTERED**

You have reached the end of a tape or the end of a specific volume on the tape.

- **NO TAPE IN DRIVE OR TAPE REMOVED or
NO TAPE IN TAPE DRIVE PLEASE PRESS SPACE BAR
TO CONTINUE**

This message indicates that you probably don't have a tape in the tape drive, or that the tape is not seated correctly.

- **NOT ENOUGH ROOM ON TAPE FOR THIS BACKUP
PRESS SPACE BAR TO CONTINUE**

The tape is too full to store all the information that you are trying to backup. You can either get another tape with more room on it and reinitiate the backup, or erase this tape and then reinitiate the backup.

■ **READ OR WRITE ABORT — TAPE UNUSABLE or
READ ERROR, BAD BLOCK DETECTED — CONTINUING or
READ ERROR, BAD BLOCK DETECTED — FATAL or
READ ERROR ON TAPE PLEASE PRESS SPACE BAR
TO CONTINUE**

If you get the second of these messages (i.e., "...CONTINUING"), the operation in progress will continue; but this is a sign that the tape is worn. Otherwise, the operation will be terminated because of the detected error. The tape is either physically corrupted or worn, or the read head on the drive unit needs cleaning. Try cleaning the tape heads first and re-reading the tape. If this does not work, attempt to read the tape a few more times if it is necessary that you get the information off the tape (i.e., if you are doing a restore). If neither of these solves the problem, then the tape is probably physically corrupted (e.g., creased, contaminated with a foreign substance).

■ **TAPE DRIVE IS NOT ATTACHED PLEASE PRESS SPACE
BAR TO CONTINUE**

The most probable cause of this error is a loose connection somewhere between the QIC-60 unit and your computer system. Check all of the following:

- 1) Make sure that the shielded cable running between your system unit and the QIC-60 tape drive unit is securely fastened at both ends. This is usually the problem.
- 2) Make sure that the card inside your system unit is properly seated in its expansion slot.
- 3) See that the unit is receiving power from its AC outlet. The little red select light should be on. This message can also occur if the AC power supply is unstable (i.e., there are a lot of line transients).

■ **TAPE IS UNUSABLE PLEASE PRESS SPACE BAR
TO CONTINUE.**

This message can result from the same causes as the READ ERROR... messages above. First, clean the tape heads and try again. If this does not solve the problem, it is likely that you have a physically corrupt or very worn tape. Replace it.

- **TAPE IS WRITE PROTECTED or
TAPE IS WRITE PROTECTED PLEASE PRESS SPACE BAR TO
CONTINUE**
Check the write-protect cylinder on the tape cartridge (see Chapter 4: *General Information*). It probably is turned so that the tape is write-protected. The tape is protected when the hole on the side of the little black cylinder is facing outwards. (This hole should be totally blocked in order to write on the tape.)
- **TRYING TO ACCESS A NONEXISTENT TAPE UNIT**
The most probable cause of this error is that your tape unit is unplugged from the wall socket or is not receiving power from that outlet. Also, it is possible that the tape drive unit is not securely connected with your computer.

Disk, Directory, and File Messages

- **<xxxxxxxx> IS NOT A SUBDIRECTORY**
The <xxxxxxxx> above represents a file name in a directory listing upon which you tried to perform a directory function. You must have a subdirectory in the selection window in order to use these functions.
- **<x>: IS NOT A VALID DISK DRIVE**
The <x> here represents a logical drive letter designation such as A, B, C, etc. You have tried to tell the backup system to either backup or restore to a logical drive that does *not* exist on your system (or the computer thinks that the drive does not exist). Make sure you are using a valid drive letter for your system.
- **MIRROR-IMAGE BACKUPS HAVE NO VOLUME DIRECTORY**
You pressed a function key to indicate your wish to see a volume directory, but the volume on the tape is a mirror-image backup.

■ **NO DIRECTORIES ABOVE THIS DIRECTORY**

You have pressed the function key that indicates that you want to go to the parent directory of this directory, but this is the highest level directory that exists in this tape volume or on this disk. If you wish to exit to the menu, choose the main menu or the return function key.

■ **NO FILES SPECIFIED**

This message indicates that you did not specify a file where one was needed under command-driven operation. Check the syntax to make sure you are specifying a valid operation.

■ **NO FILES MATCHING <xxxxxxxxxxxx>**

The <xxxxxxxxxxxx> above represents a global mask that you specified under command-driven operation. There are no files in your source directory that match the mask that you specified. It *is* possible that there are some files there that match the mask (e.g., if you specified the /m option, but none of the matching files had changed since the last backup, you would receive this message).

■ **NO FILES TO BACKUP**

You tried to backup an empty directory. Since there were no files to backup, the backup system did not create a backup volume on the tape.

■ **NO FILES TO RESTORE**

You tried to restore an empty directory. Since there was nothing in this directory to restore, nothing was brought in from the tape and nothing was restored to the disk.

■ **NOT A VALID PATH**

You have specified an invalid path under command-driven operation. Check the syntax of your path specification to be sure that it is correct.

■ **PLEASE ENTER F TO SEARCH FOR FILES OR
D TO SEARCH FOR DIRECTORIES**

You are at a screen where you must either enter an F or a D in response to the prompt at the bottom of the screen, OR press a function key.

■ **THIS DIRECTORY HAS NO SUBDIRECTORIES**

This message appears when you try to get a subdirectory of a directory that has no directories or files.

■ **TOO MANY FILES FOR AVAILABLE MEMORY**

You have tried to bring a directory into memory (either from the tape or from the disk) that is too large to fit in the available memory on your system. You must either add more memory to your system (through memory expansion sets), reduce the number of files in the directory, or use the command mode of the QIC software (which requires less memory).

■ **YOU MUST SPECIFY FILE NAME**

You have omitted a file name under command-driven operation where one was necessary.

Memory and Miscellaneous Messages

■ **<Bell>**

The bell sound can indicate several different things. It usually means one of the following:

- 1) You have entered more characters than are allowed at the current prompt on the screen, or you have entered an illegal response to the prompt.
- 2) You are trying to do something illegal or impossible.
- 3) Sometimes the bell sounds just to draw your attention to a message being displayed on the screen.

■ **DOS MEMORY ALLOCATION ERROR <xxxxx> or
ERROR WHILE ALLOCATING MEMORY.**

There is no memory, or the QIC-60 software or the DOS *thinks* there is no memory to be used by the program. The <xxxxx> in the first message represents an error number returned by DOS. These errors usually occur as a result of a conflict with some other resident application (e.g., a RAMdisk). Check to see if this is possible on your system. Otherwise, the most likely cause is insufficient memory on your system. You might try using the command-line mode of QIC-60 operation, which requires less memory.

■ **ILLEGAL COMMAND**

This is a serious error. It could be a hardware problem with the tape drive unit or controller board or an undetected bug in the software used by the QIC-60. Try the operation that you were performing another time, documenting carefully the steps that you take to reach this point. If the error occurs again under the same conditions, you should contact your dealer with the specific details which you have documented.

■ **INSUFFICIENT MEMORY or
INSUFFICIENT MEMORY PLEASE PRESS SPACE BAR
TO CONTINUE**

This usually indicates that you do not have enough system memory available for use by the QIC-60 software. First, try removing any resident utilities from memory (e.g., RAMdisks, print spoolers, key-define utilities, etc.). If you still get this message, you might try using QIC-60 command-mode operation, which requires less memory than menu-driven operation. Also, try using the smallest buffer size possible with the /b option (setting it at 8K; see Chapter 3 for more information on this).

■ **INVALID DATE <xx/xx/xxxx> USE /D:MM-DD-YYYY**

You have supplied an invalid date, or have supplied a date that does not conform to the format necessary for command-driven operation. (The <xx/xx/xxxx> above represents the invalid object that you typed). Retry your operation, supplying a valid date in the format illustrated in the error message.

- **INVALID OPTION <xxx> –**
VALID OPTIONS ARE <list of options>
 The <xxx> above represents an invalid option that you specified during command-driven operation. The valid options for this operation are listed in the list of options that follows the message.
- **INVALID USE OF /B USE /B=x (x = 8, 16, 32, 64).**
 You have attempted to use the /b option incorrectly under command-driven operation. Please follow the format specified.
- **INVALID USE OF /C USE /C=“This is a valid comment.”**
 You have used the /c option incorrectly under command-driven operation. Follow the format specified.
- **INVALID USE OF /D USE /D:MM-DD-YYYY**
 Your use of /d option under command-driven operation is incorrect. Retype the command, following the correct format.
- **POWER ON/RESET ENCOUNTERED or
 POWER ON OR RESET ENCOUNTERED PLEASE PRESS
 SPACE BAR TO CONTINUE**
 This indicates that power was lost somewhere in the system, or there was a reset interrupt that caused operation to be held up temporarily. Check the power connections to your computer and the QIC-60 tape drive. Also, it is possible that it was caused by a transient in the AC power line.
- **PROGRAM ERROR PRESS SPACE BAR TO CONTINUE**
 Something went wrong with the QIC-60 software, probably in its communications. This could be caused by a conflicting applications program or memory-resident utility. Also, there might be some problem with your disk directory (i.e., it might have some lost clusters). If neither of these seems to be the case, try reinitiating the operation. If the same thing occurs, document the error, and contact your dealer.

- **READ ERROR, BAD BLOCK DETECTED – CONTINUING or
READ ERROR, BAD BLOCK DETECTED – FATAL**

These are the same two errors found in the **READ ERROR...** messages above (under the *Tape and Tape Drive Messages*). They usually indicate a bad tape or tape heads that need cleaning.

- **TOO MANY FILES FOR AVAILABLE MEMORY**

This message and suggested actions are listed above under the *Disk, Directory, and File Messages* section.

- **UNDEFINED ERROR <xxxxx>**

An undefind error number has been passed back from the tape drive unit to the QIC-60 software. This probably means that your tape drive or controller is malfunctioning. Repeat the operation that produced the error. If you get the error again, document the steps used to produce it and contact your dealer.

- **UNKNOWN ERROR. PLEASE PRESS SPACE BAR TO
CONTINUE**

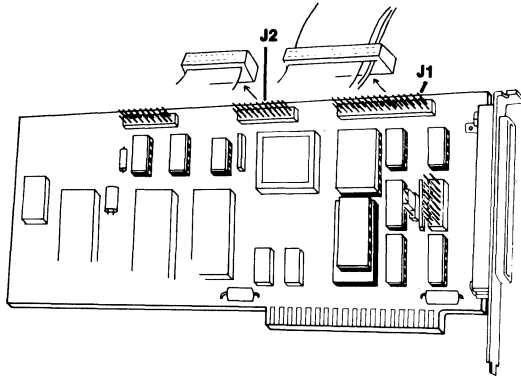
This message is very similar to the **PROGRAM ERROR** above. Try the same actions (i.e., isolating the program from any other applications programs or utilities), and running the program again under the same conditions. If it occurs again, document the details, and contact your dealer.

Appendix C

**Installation
of QIC-60 W20
with Western
Digital 8"
(3/4 length)
Board**

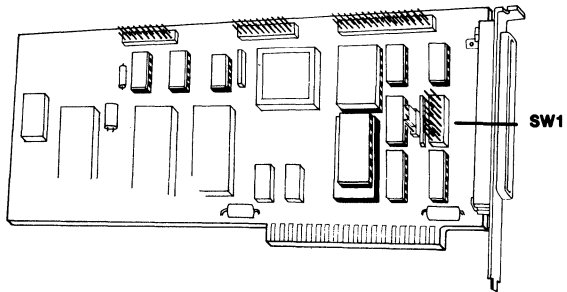


- Position your board component side up so that the “gold fingers” of the bottom edge connector point down. Remove the 34 pin hard disk controller cable from connector J1. Remove the 20 pin data cable from connector J2.



You will find these connectors across the top of the board.

- Locate the jumper block, SW1.



- Depending upon the size drive you already have installed in your computer, you will have to change jumper settings on your board. For your disk drive to work with the QIC-60 W20, it will have to confirm with one of the configurations below.

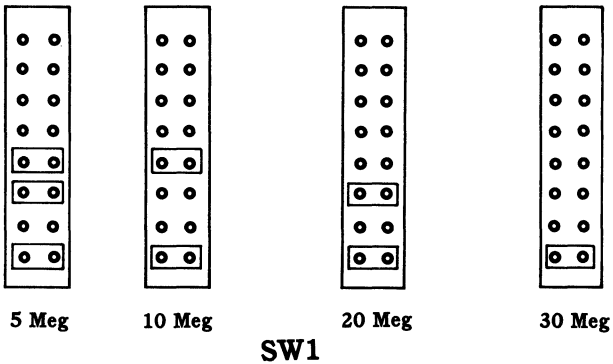
A 5 Meg drive must be a Syquest Removable Hard Disk.

A 10 Meg drive must have 4 heads and 306 cylinders.

A 20 Meg drive must have 4 heads and 612 cylinders.

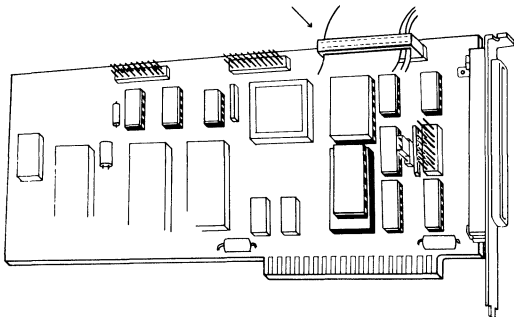
A 30 Meg drive must have 5 heads and 695 cylinders.

The jumper settings for the different size drives are shown below. Change your jumper settings to correspond with the particular drive you already have installed.



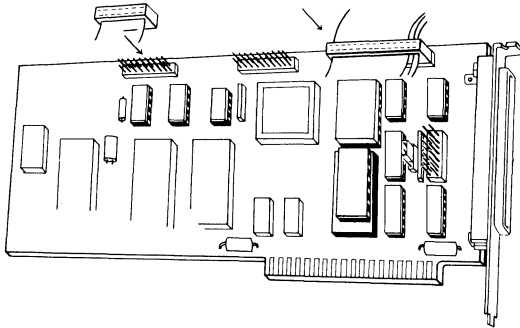
- Re-connect the plug of the 34 pin hard disk controller cable to connector J1.

Align pin 1 of the plug with pin 1 of the connector.



- Re-connect the 20-pin data cable to connector J3.

Align pin 1 of the plug with pin 1 of the connector.



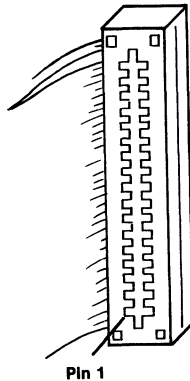
- Connect the unattached end of the small ribbon cable connected to your hard disk drive to connector J2.

Pin one of the plug of this cable is marked with an arrow or a notch. Make sure that pin 1 of the plug is aligned with pin 1 of the connector.

- Connect the “pigtail” wide ribbon cable (the free plug on the hard disk controller board’s cable) to the internal hard disk drive.

Pin 1 of this plug must be on top and on the same side as the slot cut into the edge connector of the drive.

- **Caution:** The colored stripe on this “pigtail” ribbon cable is not on the pin 1 side of the cable’s plug. Look at the face of the plug for pin numbers. This will help you find pin 1. Position the cable so that the side of the plug opposite the colored stripe is on Pin 1.



- Remount your internal hard disk drive back in your computer just the opposite of the way you removed it earlier.
- Go to page 118 in this manual. Beginning with the second bulleted paragraph, follow the rest of the instructions to the bottom of page 119. When you have finished with these instructions, return to this Appendix to prepare your hard disk drives.

Preparing Your Hard Disk Drives

After you have finished the instructions above, you will have to prepare your internal hard disk drive before a different hard disk controller board can be used to control its operations. A BIOS format must be done, the DOS utility FDISK must be run, and the disk must be formatted under DOS 2.0 or higher to accomplish this.

- Using a DOS 2.0 or higher diskette enter:

DEBUG

then press RETURN.

The Debug prompt (a dash) will appear.

- Now enter:

r ax

then press RETURN.

The lines

AX 0000

:

will appear.

- Enter:

0004

then press RETURN.

This will enter the drive you want to format and the interleave.

The DEBUG prompt will appear again.

■ Enter:

g = c800:5

then press RETURN.

This will enter the format program and the following lines will appear:

WX2 FORMAT REVISION 6.0 © copyright Western Digital Corp.
1984

(AH) = Relative drive number (0-7)

(AL) = Interleave factor (3 is standard)

Press "Y" to begin formatting drive C with interleave 4.

■ Enter "Y" if you are ready to format the internal disk.

This will destroy all data on your disk drive! Be sure that you have backed up your disk drive to avoid losing important data. If you hit any other key than "Y", the program will stop without doing anything.

When the formatting is successful, a message will appear telling you so. If not, an error code will appear. The codes and what they mean are displayed below.

Completion Code	Meaning
01	Bad command
02	Address mark not found
04	Sector not found
05	Reset failed
07	Initialize drive failed
09	Attempt to DMA across 64K boundary
0B	Bad track
10	Uncorrectable data error
11	ECC corrected data error
20	Controller failed self-test
40	Seek failed
80	No response from device
BB	Undefined error
FF	Read status failed

If your format was unsuccessful, you should also check all cables, power supplies, wires, and software version levels.

If the format was successful, the DOS prompt will appear when the DEBUG program ends.

- Go to page 120 of this manual. Follow the instructions there to format your hard disk drives.

Limited Warranty

With respect to the product(s) delivered with this Limited Warranty, Tecmar, Inc. ("Tecmar") warrants to the **original purchaser** that:

- (i) boards and cables manufactured by Tecmar and any QIC-60 product will be free from defects in materials and workmanship for one (1) year from the date of delivery to such **original purchaser**;
- (ii) disc controllers and drives, terminals, printers, and any other hardware items other than boards or cables manufactured by Tecmar or any QIC-60 product, whether bearing a Tecmar label or not, will be free from defects in materials and workmanship for a period of ninety (90) days from the date of delivery to such **original purchaser**;
- (iii) any media for software will be free from defects in materials for a period of ninety (90) days from the date of delivery to such **original purchaser**; and
- (iv) any software, or any items such as batteries, tape cartridges, printer ribbons, printer wheels or paper products, are provided "as is" without warranty of any kind.

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SOME STATES DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

If any product delivered with this Limited Warranty is non-conforming or defective during the applicable warranty period, Tecmar will, at its option, either repair or replace such non-conforming or defective product, or return the purchase price to purchaser. Any software delivered with this Limited Warranty has been thoroughly tested and is thought to be functional when released. In the event that a serious functional problem is discovered in any software delivered with this Limited Warranty, Tecmar may endeavor to correct such problem. Tecmar shall have no obligation hereunder if any product delivered with this Limited Warranty has been misused, carelessly handled, defaced (including unauthorized repairs made or attempted by others), modified or altered. The product must be returned with proof of purchase in its original packaging (or other adequate packaging) to the point of purchase or, by prior arrangement with Tecmar, to Tecmar at 6225 Cochran Road, Solon, Ohio 44139. Claims must be made in accordance with the provisions of this paragraph within the applicable warranty period or they will be barred.

If Tecmar determines that any product which has been returned to Tecmar in accordance with the provisions of the preceding paragraph is not under warranty, it will be repaired using Tecmar's standard rates for parts and labor. Tecmar will use its best efforts to repair the product after receipt thereof. Tecmar shall not be responsible, however, for delays caused by shipping or non-availability of replacement components or other similar or dissimilar causes, events or conditions beyond its reasonable control.

THE FOREGOING STATES THE PURCHASER'S EXCLUSIVE REMEDY FOR ANY BREACH OF THIS LIMITED WARRANTY AND FOR ANY CLAIM, WHETHER SOUNDING IN CONTRACT, TORT OR NEGLIGENCE, FOR LOSS OR INJURY CAUSED BY THE SALE OF ANY PRODUCT. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, TECMAR SHALL IN NO EVENT BE RESPONSIBLE FOR ANY LOSS OF BUSINESS OR PROFITS, DOWNTIME OR DELAY, LABOR, REPAIR, OR MATERIAL COSTS, INJURY TO PERSON OR PROPERTY OR ANY SIMILAR OR DISSIMILAR CONSEQUENTIAL LOSS OR DAMAGE INCURRED BY PURCHASER, EVEN IF TECMAR HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH LOSSES OR DAMAGES.

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

Keep your original sales receipt for the product with this warranty statement.

PRODUCT _____

SERIAL NUMBER _____ DATE OF PURCHASE _____

WHERE PURCHASED _____

