QUICKDISK

MODELS -01 AND -02

OWNER'S MANUAL

FOR THE

DISK DRIVE

OF

TI-74 BASICALC

AND

COMPACT COMPUTER 40

This manual was developed with contributions and support by:

MECHATRONIC GmbH

Translation, layout and typewriting were coordinated and executed by:

G R S - Labors
Burggrafenstraße 1
D-8000 München 80
Western Germany

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CONTENTS OF THIS PACKAGE

One QUICKDISK
Microdisk-drive

One separate AC adaptor.

One battery pack for five AA size batteries.
(Batteries not included. Only available for model -02)

One HEX-BUS cable
(Permanently attached to model -02)

One owners manual.

Required System Configuration

TI-74 BASICALC CALCUALTOR
(for direct connection to model -02)

or

TI COMPACT COMPUTER 40 console.
(for direct connection to model -01)

all sold separately.

Optional accessory :

As an optional accessory to this device a diskette containing the directory software is available.
(See description at the end of this manual)

PRECAUTIONS FOR USE

Since this equipment consists of precision parts, select an installation place which is free from abrupt temperature fluctuation, high humidity and much dust.

Install this equipment horizontally on a firm and stable desk and do not shock it or turn its backside up.

To avoid malfunction due to noises, do not install it close to other equipment which generates much noises.

Before inserting the disk, be sure to remove a protective sheet which was provided for transportation. (Refer to page 14)

Do not open or push the disk holder while this equipment is operating (while the BUSY lamp is lit up). This can cause a trouble.

Insert a disk into the drive correctly, along the disk guide (Installing the diskette on Page 13)

Clean the head periodically at QUICKDISK-01. (Refer to page 15)

Avoid making this equipment operate continuously for a longer while.

Do not place any object on this QUICKDISK drive.

When wiping this equipment, use a dry cloth. Use of a volatile liquid(alcohol, benzine, thinner, etc.) or wet cloth may damage the QUICKDISK drive.

When operational errors frequently occur with the QUICKDISK-01 clean the head. If normal operation cannot be restored by this replace a disk with a new one. If errors still frequently occur, felt may be worn out. Replace it spare one (accessory). (Refer to page 15)

Be sure to use the attached AC adapter which is specially designed for this system. If any other type of adapter is used, QUCKDISK may be damaged.

INTRODUCTION

The Mechatronic QUICKDISK drives are versatile, efficient, and compact information storage devices for computers that use the TI HEX-BUS Intelligent Peripheral Interface. The Mechatronic QUICKDISK enables you to store, retrieve, and update programs and data quickly and accurately with simple commands from the computer console. Information is stored on a round magnetic sheet covered with a hard case called a diskette (described in appendix B)

As part of the growing family of TEXAS INSTRUMENTS products that use the HEX-BUS interface (a standardized interconnection system with a uniform set of cabling patterns, control signals, and message structures), the Mechatronic QUICKDISK drives plug directly into any computer compatible with this interface system. Compatible machines currently include the TI Compact Computer Model CC-40 and the TI-74 BASICALC Computer.

This manual first shows you how to connect and test the QUICKDISK drives and presents the BASIC instructions that are used to operate the device. Some common applications of the QUICKDISK are given next, with the exercise and the DIR program. Helpful appendices and a section of service information complete the manual.

Explanations and examples of programming employ the version of BASIC developed for the TI Compact Computer Model CC-40 and the TI-74. Users of other TI computers may note differences in format between the BASIC statements shown here and equivalent statements as used with their own machines. Apart from that distinction, however, the material in this manual applies to operation of the QUICKDISK with any computer compatible with the HEX-BUS interface.

Throughout this manual "QUICKDISK drive" refers without distinction to both models QUICKDISK-01 (which is a top-loader system designed to work with the CC-40) and QUICKDISK-02 (which is a front-loader system designed to work with the TI-74).
If there is a special reference to only one model this is noted as QUICKDISK-01 or QUICKDISK-02.

An adapterbox will be available to enable you to connect also QUICKDISK-01 to the TI-74 or to connect QUICKDISK-02 to the CC-40.

To avoid errors throughout this manual the letter "O" is represented by O but zero as 0 .

SET-UP INSTRUCTIONS

Setting up the QUICKDISK drive is a simple process. First the QUICKDISK drive is attached to the HEX-BUS interface. Then its operation is tested. This section describes the steps involved in each of these procedures. Information about connecting other devices to the QUICKDISK drive is also included. Please read the material in this section completely before you begin to set up the QUICKDISK drive.

CAUTION

The electronic components of the QUICKDISK drive can be damaged by discharges of static electricity. To avoid damage, do not touch the connector contacts or expose them to static electricity.

After you have unpacked the QUICKDISK drive you are ready to attach it to the HEX-BUS interface. Save the packing material for storing or transporting the device.

The devices in the TI HEX-BUS Intelligent Peripheral Interface system have identical eight-pin recessed connectors for the CC-40 or ten-pin inline connectors for the TI-74 for the cable through which they communicate. The computer and the QUICKDISK drives have one such connector, while each peripheral has two of them so that a series of devices may be attached to the computer forming a daisy chain connection.
The first peripheral is plugged directly into the computer, the second peripheral is cabled to the first, and so on. The last peripheral has one connector free.

You may link devices to the computer in any order. Just plug a new section of HEX-BUS interface cable into the available connector and plug the other end of the cable into one of the connectors on the new peripheral, as described on the next page. The plugs are keyed so that you can insert them only one way.

Peripherals are normally arranged in a stack next to the computer, using the short sections of cable supplied with the devices. Longer cables are available separately if you prefer to arrange the peripherals differently.

CONNECTING THE QUICKDISK DRIVES

1. Turn off the computer.

2. If other peripherals are already attached to the HEX-BUS interface, wait for their activity to cease. Then turn them off.

3. Locate the device having the one available HEX-BUS connector (either the last peripheral on the bus, or the computer if no peripherals are attached yet).
   Place the QUICKDISK drive in a position near this peripheral according to the length of cable used to connect it. This can be a short or long cable for the QUICKDISK-Ø1 or the permanently attached cable for the QUICKDISK-Ø2.

4. QUICKDISK-Ø1
   Holding the device with the free connector firmly, plug one end of the cable into the connector and attach the other end of the cable to the connector of the QIUICKDISK-Ø1.
   QUICKDISK-Ø2
   Only the free end of the cable needs to be attached to the free connector.

5. Attach the power cord to the small jack on the back of the QUICKDISK and plug the AC adapter that comes with this device into a standard 115-volt outlet.
   DO NOT CONNECT ANY OTHER ADAPTER TO THIS QUICKDISK DRIVE !

CAUTION

To prevent damage, disconnect all devices before moving any part of the HEX-BUS system. The cables and connectors which link the computer and peripherals are subject to accidental strain if not detached. For shipment over long distances repack the system securely, preferably in its original packing materials.

To disconnect the QUICKDISK drives from the other devices just perform the inverse sequence as described before.

OPERATING THE QUICKDISK DRIVES

The QUICKDISK drive is ready for operation after it was connected to the HEX-BUS and the AC adaptor was pluged into an outlet.

The following sequence is mandatory for powering up the system:
- First supply the QUICKDISK with power.
- Now switch on all peripherals.
- Finally switch on the computer.

Most instructions require a devicenumber.
In these instructions the devicenumbers are:

QUICKDISK-Ø1 = 8
QUICKDISK-Ø2 = 9

Except inserting or removing a diskette no additional steps ar: neccessary to operate the QUICKDISK.
All I/O actions are controlled from the computer.

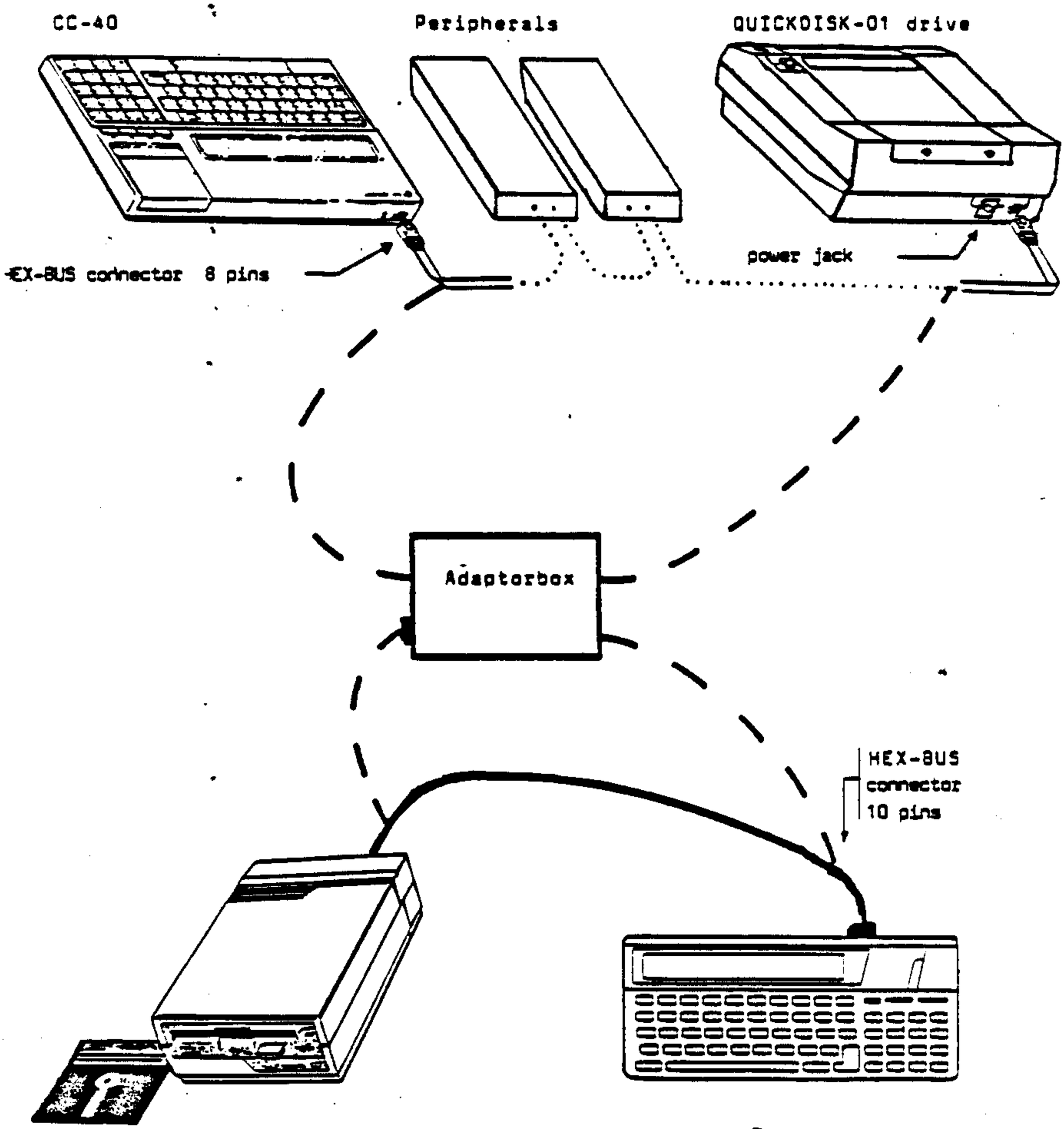
Operating Elements

EJECT button QUICKDISK-Ø1
If this button is pressed, the ornamental panel opens. A diskette can only be installed or removed, if the ornamental panel is open.
QUICKDISK-Ø2
Pressing this button releases the center shaft and the holding mechanism. A diskette can only be installed or removed with these parts being released.

BUSY LED This LED lights up while the QUICKDISK drive is operated.

Ornamental panel QUICKDISK-Ø1 only
The ornamental panel must be closed while operating the QUICKDISK-Ø1.
To close the panel push slightly on its front edge.
Labels of correctly installed diskettes are visible through an inspection window at the front of the panel.

POSSIBLE CONNECTIONS OF QUICKDISK DRIVES (DAISY CHAIN)



TESTING THE QUICKDISK DRIVES

Note: The following test procedure is used with the CC-40 and the TI-74 BASICALC.
Computers other than the CC-40 or the TI-74 may require different test procedures from that listed below.

1. Turn on the QUICKDISK and any other attached peripherals first. Then turn on the computer.
   Note: All peripherals must be turned on for proper operation.

2. Install a **new** diskette (or one without contents) and type:

   FORMAT 8

   The QUICKDISK drive formats this diskette now.
   After this type in

   OLD "8,X" and press [ENTER] (For QUICKDISK-01 only) or
   OLD "9,X" and press [ENTER] (For QUICKDISK-02 only)

   This command causes the QUICKDISK drive operating few seconds with its BUSY LED on and the I/O (input/output) indicator being displayed.
   Then displaying the ERROR indicator the error message

   I/O error: 3 "8" (for the QUICKDISK-01 only) or
   I/O error: 3 "9" (for the QUICKDISK-02 only)

   should appear.
   This message is the expected result and tells you that the QUICKDISK drive is functioning.
   Note: OLD "8,X" or OLD "9,X" is the command to load a program named X from the device numbered 8 or 9 .
   Since no program can be available on a diskette just formatted before, the attempt to load a program causes this error.

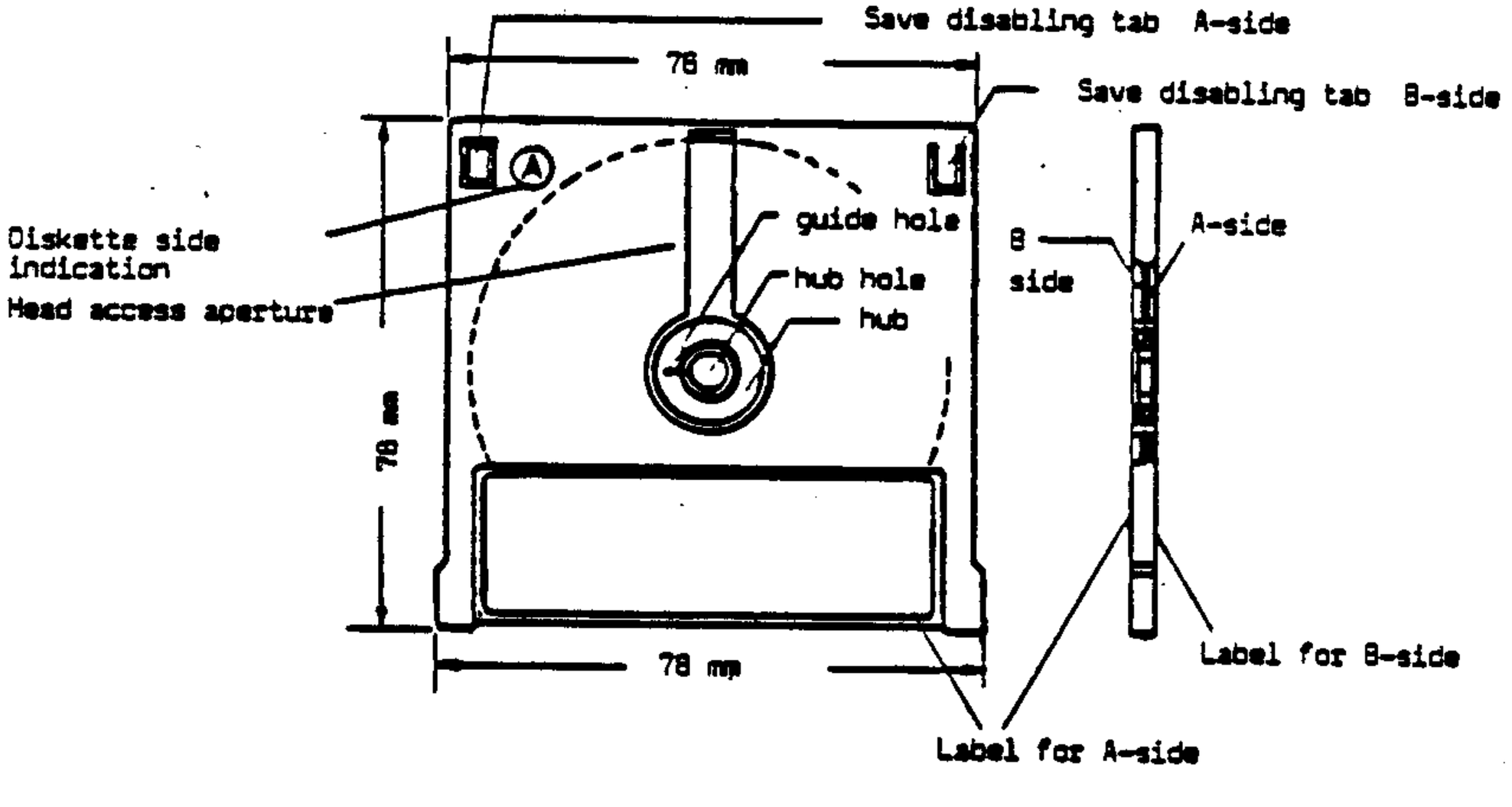
3. Press [CLR] to clear the error message and restore the cursor. The peripheral is now ready for use.

   If the light does not come on, the device may not be connected properly. Check the cable connections between the computer and the QUICKDISK drive. If a code other than "3" is displayed, refer to appendix A.
   If the I/O indicator stays on, check that all peripherals are powered up. The computer cannot respond to input from the keyboard while in this state. Turn the computer off momentarily to clear the condition. Then check the cable connections and try the operational check once more. If the malfunction persists, see the "In Case of Difficulty" section of the manual for further assistance.

QUICKDISK Diskette - The Storage Medium

1. The diskette

For this device as a storage medium doublesided 2.8 inch diskettes are used.
Such a diskette contains a round magnetic sheet covered with a rigid plastic jacket. The following sketch explains a diskette. The magnetic sheet can be seen through the head access aperture.



If a diskette is installed in the QUICKDISK drive the center shaft grips through the hub hole of the diskette. A guide pin is fixed in the guide hole to rotate the disk properly.

To perform reading and saving of information the head comes into contact with the diskette through the head access aperture.

Never touch the magnetic sheet of the diskette with the fingers. Deposited traces of fat, sweat and other debris on the skin can cause read/write errors.

Handling Diskettes

1. Observe the instructions given on the envelope of the diskette.

2. If the diskette is not used put it in its envelope and store it vertically in a storage box. Do not put it in obliqueley or in a way that it may warp.
   Also avoid to expose diskettes to direct sunlight. This causes deformation and in consequence read/write errors.

3. Do not bend or press on diskettes.

4. Fill in the label before sticking it to the diskette.
   When filling in labels after having it stuck to the diskette use a pen which tip is soft, avoiding a pencil or ball point pen.

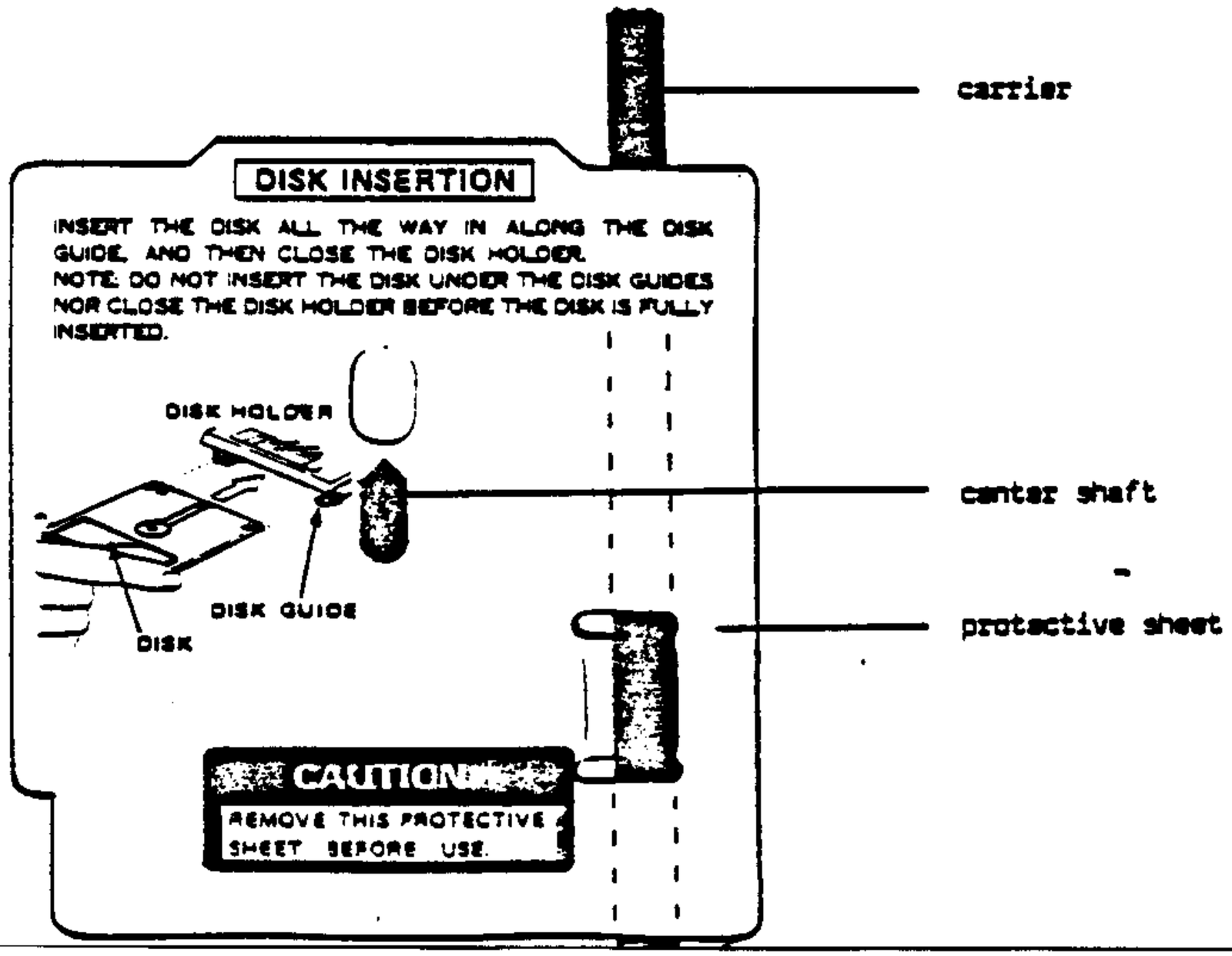
5. Never put a magnet close to the diskette. Each magnetic object that comes too close to a diskette can destroy information on it.

6. Make "Backup"-(copy) diskettes from your original diskettes and use the copy for work.

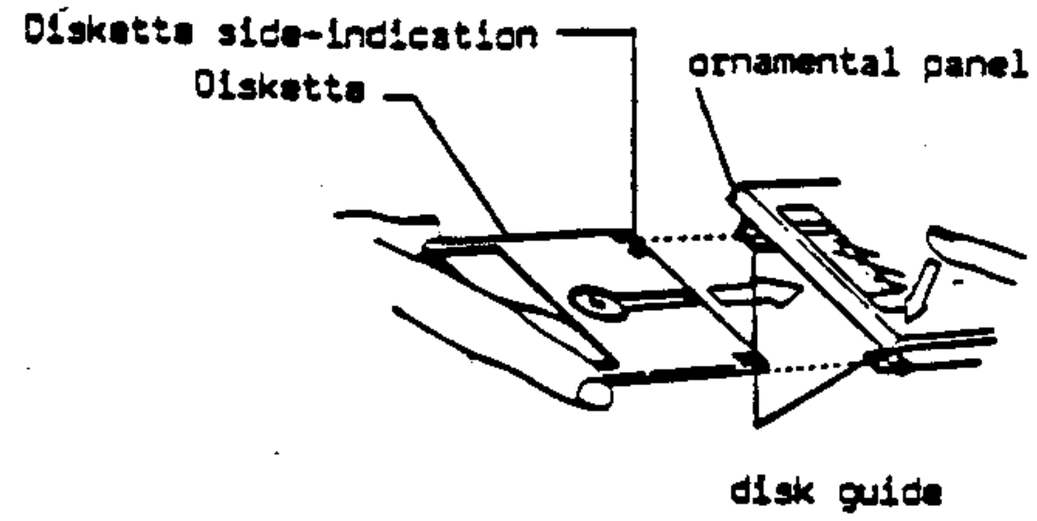
REMOVING PROTECTIVE SHEET

Be sure to have removed the protective sheet provided for transport before installing a diskette.
It can be removed by gently pulling the right side of the carriage to the front side.

For QUICKDISK-01 only.
Attention: Do not touch the disk table with the hand.



2. Installing the diskette



1) Press the EJECT button to open the ornamental panel of the QUICKDISK-Ø1 or to release the mechanism inside the QUICKDISK-Ø2.

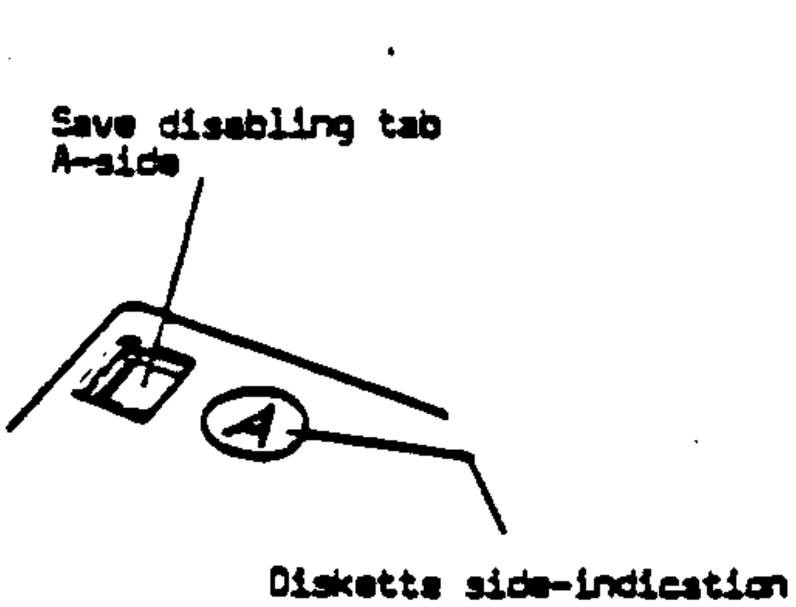
2) Insert the diskette with its head access aperture directing into the drive along the disk guide (Hold both ends of the diskette between thumb and forefinger).
Both A and B side of a diskette can be used. To use its opposite side turn the diskette round.

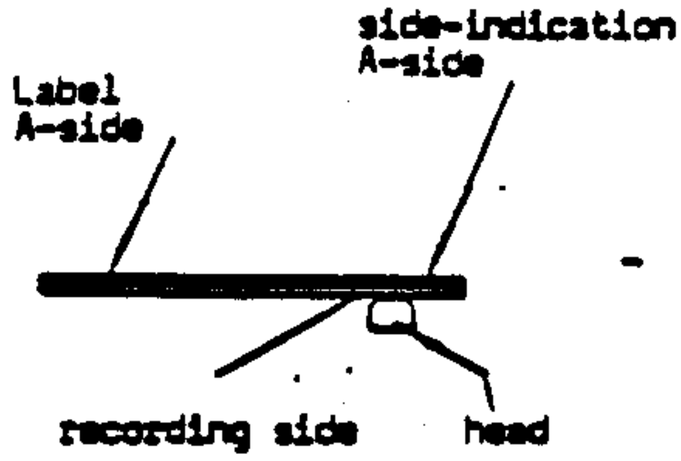
3) As soon as the diskette is correctly inserted you feel a counterforce and for the QUICKDISK-Ø2 you hear a gentle click after having pushed it forward with the thumb.
For QUICKDISK-Ø1
Be cautious not to insert the diskette outside the disk guide since this can damage the diskette or can cause read/write errors.

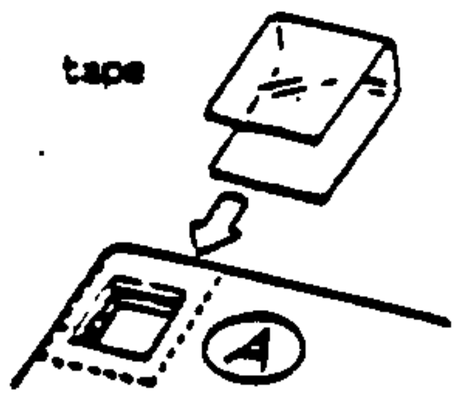
3. Save disabling tab

This tab is provided to prevent information saved on the diskette being erased by mistake. If this tab was broken no writing to the diskette is posible. However, information can be read from the diskette. For both sides there is a separate tab for disabling.

Note that relation between an actual recording surface and the diskette side indication are reverse (if the tab located on the left of the disk side indication is broken, saving is disabled for the recording surface on the other diskette side).
If information is desired to be saved again on a diskette which save disabling tab has been broken, stick a piece of tape over both sides of the hole.







PROCEDURES ON THIS PAGE ARE ONLY POSSIBLE WITH QUICKDISK-01

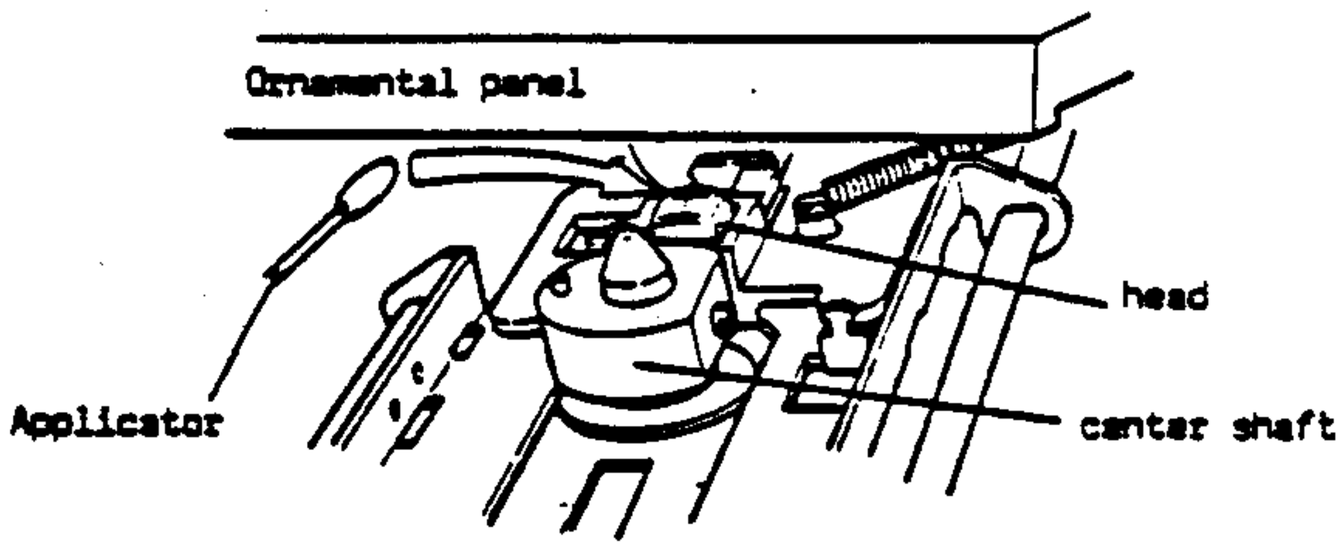
CLEANING THE HEAD

Clean the head periodically depending on the debris that has deposited on the head surface. If the head is used with much debris on its surface this can cause malfunction.

1. Press the EJECT button to open the ornamental panel.

2. The head is visible behind the center shaft. Soak an accessory applicator in a head cleaning liquid slightly and wipe cautiously the head surface with it (in the same manner as cleaning head of a tape recorder).

Attention
Touch the head only with the applicator.
Purchase the head cleaning liquid and the applicator at an electric appliance store.



REPLACING THE FELT

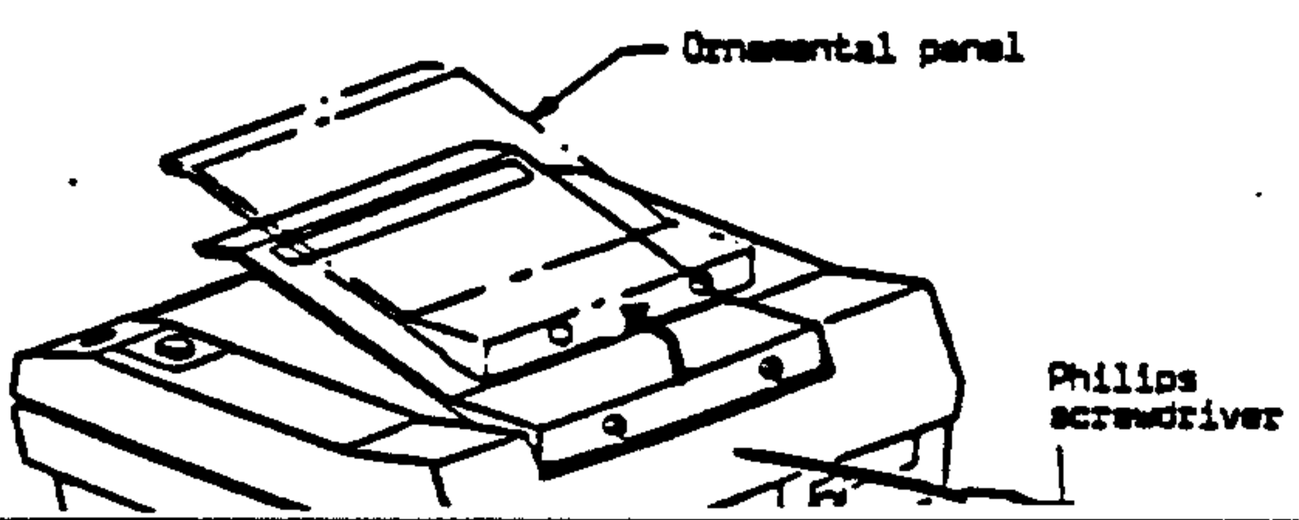
1. Remove ornamental panel setscrews (2 pcs) with an appropriate philips screwdriver.

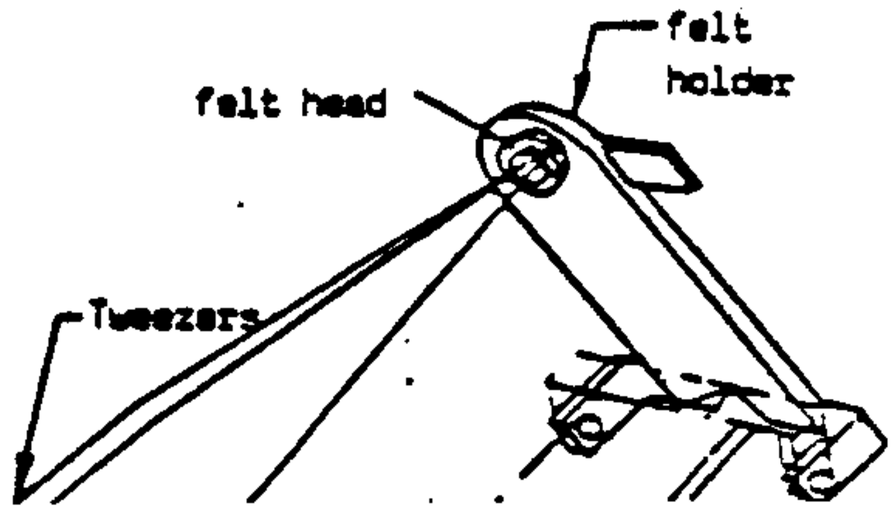
2. Lift gently the rear side (where the setscrews were removed) of the ornamental panel.

3. Pull up cautiously the felt holder as shown in the figure with your hand.
   Hold the grooves of the felt head (black) with tweezers.
   Then, if the felt head is turned by 90° to the right and pulled to the near side it can be removed.

4. Insert a new felt into the felt holder and turn it by 90° to the left.

5. Remount the ornamental panel performing the steps described above in inverse order.





QUICKDISK BASIC

The BASIC of CC-40 and TI-74 consists of special instructions to operate the QUICKDISK drives, with the following features:

If an error is detected during the execution of an instruction, an error message is displayed and the system normally returns to the system command level of the BASIC-interpreter.
See appendix A for details concerning error codes and error messages.

The QUICKDISK-01 drive has the devicenumber 8
The QUICKDISK-02 drive has the devicenumber 9

In difference to the manuals of CC-40 and TI-74 the format for the instructions OLD, SAVE, VERIFY and OPEN is:

INSTRUCTION "devicenumber,filename"

this means after the specification of devicenumber a comma instead of a period!
For example when testing QUICKDISK-02 drive: OLD "9,X"

Filename may consist of maximum 15 characters. For longer filenames a storage procedure is initiated, but an error occurs with the attempt to load such a program.
Since the DIR programm displays only the first 12 characters of a filename it is recommended not to use longer names.

Explanations for spelling

This chapter is an alphabetical list of the CC-40 and TI-74 BASIC command, statement and function keywords refering to the QUICKDISK drives.

The Format section explains that part of the syntax concerning the QUICKDISK drives using the following conventions:

- Instructions are printed in CAPITALS.
- Optional elements are enclosed in [brackets].

The description section explains the use of the keyword and its function and includes options that the keyword can use.

The cross reference section refers to similar and complementary keywords, where appropriate.

The examples illustrate the practical use of a keyword.

Except programs also data files can be stored and retrieved.
In each case the I/O indicator appears while QUICKDISK operates.
While in this state no input via keyboard is possible.
To enable the QUICKDISK to save a data file this file has to be opened in the QUICKDISK before. The OPEN statement informs the computer how to save data and which number is assigned to access the file. Though the OPEN statement must be performed before the statements for file-processing as INPUT, LINPUT, PRINT, EOF, RESTORE, and CLOSE can access a file.
OPEN is not used with the commands RUN, SAVE, OLD, and VERIFY!

The QUICKDISK drives support SEQUENTIAL- or RELATIVE-type files. For each opened file the computer keeps an internal counter that points to the next record to be accessed. The counter is incremented by 1 each time a record is read or written. For a random accesss file which is specified with the RELATIVE attribute in the OPEN statement the REC clause may be used to access records in any order.

To all statements for file processing (PRINT, INPUT, LINPUT, EOF, RESTORE, and CLOSE) applys:
All input/output statements that refer to a file must use the same filenumber that was used to open the file.

The following recommendations should be observed for the work with the QUICKDISK drives:

- With the attempt to read data files using an OLD command the program being in memory at this moment is totally erased! The error message "Bad program number" appears in the display.

- The last file on a diskette can be overwritten with the same filename as many times as wanted. As soon as there is any other file following, another file with the name of the files before the last one can be saved without changing those prior files.
  By this way it is possible to actualize the last file on a diskette until it accomodates a wanted state (e.g. improve a program) without having to change the filename each time.
  In consequence there may be available several files with the same name on a diskette, but only the last of the equally named files can be accessed.

These features of the QUICKDISK drive enable especially effective work by the following procedure:
It has proved when optimizing programs to use a diskette that is formatted on both sides. So all steps of development of a program can be saved on one side. Due to the natural sequence the latest version of a program is also the last content on the diskette. As soon as there has occured a significant change in the programm in memory one can decide if the last program on the QUICKDISK shall be deleted by DEL "8" (if it was no improvement) or if it will be overwritten by SAVE "8,filename" (because it was an improvement).
On the other side of the diskette the consequences caused by the changes in program can be tested (e.g. if data files are saved) without loading the "clean" side with useless contents.
Here it is also possible to apply more rigorous methods as FORMAT 8 without care.

QUICKDISK and Software Cartridges

The QUICKDISK software in its EPROM supports also programming with software cartridges for example the memo-processor.
No restrictions are known.

CALL IO

Format

```
          (device,command [,status-variable] )
CALL IO
          (string-variable [,status-variable] )
```

Description

The IO subprogram performs special control operations which are not available in CC-40 or TI-74 BASIC, but may be supported by some peripherals. Additional information about the CALL IO subprogram is contained in the user's guide for the CC-40 respectively in the TI-74 manual.

Also a function test for the QUICKDISK drive can be performed with CALL IO .

Cross Reference

ON ERROR

Example

```
790 CALL IO(8,1)
```

Closes device 8.(A command code of 1 is a CLOSE operation.)

Software reset
If invalid filenames were entered it can happen that the QUICKDISK drive may lock up and does not stop running. CALL IO will be helpful in this case, to restore defined conditions. If the display of the CC-40 contains an error message in this situation, press the [CLR] key as many times as necessary to make the flashing cursor appear at the left side of the display.
Now, while the QUICKDISK drive is still running, enter:

```
CALL IO(8,FF)
```

and press [ENTER]
Now the QUICKDISK drive will terminate its current run.
Displayed error messages if any can be cleared now.
(A command code of FF is a BUS-RESET operation.)

CLOSE

Format

CLOSE #file-number

Description

The CLOSE statement terminates the association between a file and its current file-number. The file or device cannot be accessed by the program unless it is reopened. After a file is closed, file-number can be assigned to another file or device. If any attempt is made to CLOSE a file that is not open, an error occurs.

Any of the following actions closes all open files.

- Editing the program or subprogram.
- Entering a NEW, RENUMBER, RUN, OLD, SAVE, or VERIFY command.
- Listing the program to a peripheral device.
- Calling the ADDMEM or CLEANUP subprogram.
- Turning the system off or pressing the reset key.

Normal program termination also closes all open files.

In difference to other peripheral devices the QUICKDISK drive does not allow a file to be deleted at the time it is closed by adding DELETE to the statement.

Cross Reference

OPEN, DELETE

Example

790 CLOSE #6

Closes file #6.

DELETE

Format

DELETE "devicenumber"

Description

The DELETE (or DEL) statement is used to delete the last file or the program from the QUICKDISK drive. Device is the number associated with the physical device and can be from 1 through 255.

It is possible to use DELETE as a statement in program, to delete a file after having it closed. In this way it replaces the DELETE option which some devices allow to add to the CLOSE stetement.

By repeated use of DELETE, to delete always the last content, finally all contents on a diskette can be deleted!

DELETE will not remove unused variables since this is done with CALL CLEANUP for the CC-40. The TI-74 allows to remove such variables performing a LET statement also out of program.

Cross Reference

CLOSE,CLEANUP

Examples

```
DELETE "8"
```

Deletes the program file saved as the last on the diskette.

```
CLOSE #2:DELETE "8"
```

Deletes from the QUICKDISK drive the file closed just before.

```
CLOSE #3:DELETE "8":LET variable1 = variable2 = ... = 0
```

Deletes from the QUICKDISK drive the file closed just before and removes from the memory of the computer the unused variables.

EOF

Format

```
EOF(file-number)
```

Description

The EOF function is used to test whether the logical end of a file is reached. The value of file-number indicates the file to be tested and must correspond to the number of an open file. EOF returns a value which indicates the current position in the file as follows.

Value	Position
0	Not end-of-file
-1	Logical end-of-file

The logical end-of-file occurs when all records on the file have been input, in difference to the physical end, where no more storage capacity is available.

When using pending INPUT (see chapter 4 of CC-40 user's guide or TI-74 manual), EOF does not indicate whether pending input data remains in memory.

Cross Reference

INPUT (with files)

Examples

```
140 PRINT EOF(3):PAUSE
```

Prints -1 if file #3 has reached the end-of-file and 0 if it has not reached the end-of-file.

```
710 IF EOF(27) THEN 1150
```

Transfers control to line 1150 if the end-of-file has been reached for file #27, or if not, continues with the following statement.

FORMAT

Format

FORMAT devicenumber

Description

The FORMAT statement initializes the current medium in an external storage device.
Normally storage media that are used for the first time have to be initialized, before information can be stored on it. Use of an unformated diskette produces an I/O error.

Formatting a diskette, destroys all previously stored information.
To prevent a diskette against eroneous formatting the save disabling tabs may be broken out for each side at the edge of a diskette.

Example

FORMAT 8

Formats one side of the diskette in the QUICKDISK drive.

INPUT

Format

```
INPUT #file-number [,REC numeric-expression],variable-list
```

Description

The INPUT statement is used to read data from files that have been opened in INPUT or UPDATE mode. Each variable in variable-list is assigned a value from the file.

File-number can be a number from 1 through 255 and must refer to an open file.

Variable-list is a list of variables separated by commas. The variables may be numeric or string, subscripted or unsubscripted. The data values beginning with the current record are assigned to the variables in the list. If the current record does not contain enough data, another record is read. Successive records are read until each of the variables is assigned a value or the end-of-file is encountered.

The computer interprets data differently when reading DISPLAY and INTERNAL type data. See the passages about INPUT in the user's guide of the CC-40 or in the TI-74 manual for informations about DISPLAY- and INPUT-format and the passages about file processing.

The QUICKDISK drive allows files to be organized sequentially or relative. The default attribute is SEQUENTIAL and needs not to be specified. SEQUENTIAL type files can only be processed in the sequence from the beginning successive to a particular record. The attribute for random access files is RELATIVE. With the REC clause, access to any particular record is allowed. A numeric expression specifies the number of the record to be read. The first record in a file is always assigned a number of zero (0). The computer reads data from a file as entire records and stores these for further processing in a temporary storage area called an input/output (I/O) buffer.
When an INPUT statement terminates with a comma as the last character, a pending input is created. That is, the remaining values in the current record are maintained. The next INPUT statement which accesses the file assigns the next available data value.
If pending input data exists when a REC clause, a PRINT, RESTORE, or CLOSE statement accesses the file, the pending data is discarded, since these statements are higher in hierarchy.

Cross Reference

OPEN, CLOSE, LINPUT, PRINT, RESTORE, EOF

Examples

```
100 INPUT #1,X$
```

Stores in X$ the next value available in the file that was opened as #1.

```
260 INPUT #23,REC 4,C,A,LL$,
```

Stores in C, A, and LL$ the next three values from the fifth record (counting begins with 0) from the file that was opened as #23. The comma after LL$ creates a pending input condition.

LINPUT

Format

```
LINPUT #file-number,[REC numeric-expression,]
          string-variable
```

Description

The LINPUT statement assigns an entire input record or the remainder of a pending input record to string-variable. The message "Bad INPUT data" is displayed if the record or partial record is longer than 255 characters. Unlike INPUT, LINPUT performs no editing on the input data. Thus, all characters including commas, leading and trailing spaces, semicolons, and quotation marks are placed into string-variable.

However, LINPUT can only be used to read display-type data from a file. File-number must refer to the number of an open file.

Important is, that as the spelling of syntax in the format section shows, one LINPUT statement can assign only one string-variable. Otherwise the error message "Illegal Syntax" will be generated.

Since the QUICKDISK drive supports also random acces files, the REC clause can be used also as for INPUT, PRINT, and RESTORE if a file was opened with the RELATIVE attribute.

Cross Reference

INPUT

Examples

```
430 LINPUT #3,REC N,D$
```

Assigns from the record with the number N+1 (counting begins with zero) of the file opened as #3 a string to the variable D$.

OLD

Format

OLD "devicenumber,filename"

Description

The OLD command loads a program from the QUICKDISK drive into the memory of the CC-40 or the TI-74. Performing an OLD command erases any program automatically, being in the memory of the computer before!
OLD closes all open files.
A file will be loaded if filename begins with a valid character.
No difference is made in the filename between upper and lower cases.

Cross Reference

SAVE, VERIFY

Example

OLD "8,sample1"

Loads the program named sample1 from the QUICKDISK drive.

OPEN

Format

```
OPEN #file-number,"devicenumber,filename"[,file-organization]
     [,file-type] [,open-mode] [,record-length]
```

Description

The OPEN statement enables a BASIC program to use data files and a peripheral device as the QUICKDISK drive by providing a link between file-number and the file on the QUICKDISK drive.
In setting up this link, the OPEN statement specifies exactly how the file or device can be used (for input or output) and how the file is organized.
The OPEN statement must be executed before any BASIC statement in a program attempts to use a file requiring the file-number.

If an OPEN statement references a file that already exists, the attributes in the OPEN statement, except for the open-mode, must be the same as the attributes of the file.
An indepth explanation of the optional attributes mentioned in the **Format** section above is given under OPEN in the user's guide of the CC-40 or in the TI-74 manual.

For short reference the following is outlined:
(Defaults are underlined)

File-organization:
     SEQUENTIAL records have to be accessed in sequence.
     RELATIVE records may be accessed in random order.

File-type
     DISPLAY data are processed as ASCII characters.
     INTERNAL data are processed in binary format.

QUICKDISK provides following open-modes:
     INPUT The computer can only read data from the file.
     OUTPUT The computer can only write data to the file.
     UPDATE The computer can both read data from and write
            data to the file.
     APPEND The computer can only write data to the end of
            the file.

Only VARIABLE records with maximum length of 80 characters are possible.

Cross Reference

CLOSE, INPUT, LINPUT, PRINT, RESTORE

Example

```
100 OPEN #1,"8,SAMPLE",DISPLAY,OUTPUT
110 T$="THIS IS A TEST"
120 PRINT #1,T$:T$=" ":PRINT T$:PAUSE
130 CLOSE #1
140 OPEN #1,"8,SAMPLE",DISPLAY,INPUT
150 LINPUT #1,T$
160 PRINT T$:PAUSE
170 CLOSE 1
180 END
```

The program "SAMPLE" stores the phrase "THIS IS A TEST" in the QUICKDISK drive. It opens the file #1 and closes it again. Then the file is reopened and the phrase assigned to the string T$ is read and displayed to show that writing and reading were correct. Finally the file is closed.

PRINT

Format

```
PRINT #file-number [,REC numeric-expression]
                    line-number
          [,USING                        ] [print-list]
                    string-expression
```

Description

The PRINT statement is used to write data into files that have been created on the QUICKDISK. File-number can be a number from 1 through 255 and must refer to an open file. The file must be opened in OUTPUT, UPDATE or APPEND mode. File-number Ø refers to the display, which is always open. File-number is rounded to the nearest integer.

REC numeric-expression may appear only when file-number refers to a relative record file. Numeric expression is evaluated to designate the specific record number of the file to which to write.

USING may be used to specify an exact format for a DISPLAY-type file. Refer to the IMAGE and USING sections in the user's guide of the CC-4Ø or in the TI-74 manual for a description of format definition and its effect upon the PRINT statement. Including USING in a reference to an INTERNAL-type data file results in an error.

Print-list consists of print items and print separators. Print items are numeric and string expressions that are displayed and TAB functions that control print positioning. Print separators are commas or semicolons that indicate the position of print items in the display.

Print-list is interpreted in order from left to right. The form of the output depends upon the type (DISPLAY or INTERNAL) of the file.

If a PRINT # statement ends with a comma or a semicolon, a pending print-condition is created. The PRINT section in the user' s guide of the CC-4Ø or in the TI-74 manual gives a detailed description of terms as file-types, pending conditions and the definition of formats with IMAGE and USING.

The values of the variables in the PRINT statement are written in a temporary storage area called an I/O buffer. A separate buffer is provided for each open file number.

Cross Reference

OPEN, INPUT (with files), TAB, IMAGE, USING

Examples

```
150 PRINT #32,A,B,C,
```

Causes the values of A, B, and C to be printed to the next record of the file that was opened as number 32. The final comma creates a pending print condition. The next PRINT statement accessing file #32 prints to the same record as this PRINT statement.

RESTORE

Format

```
RESTORE #file-number [,REC numeric-expression]
```

Description

The RESTORE statement is used to control the order in which data is read from a file.

RESTORE #file-number positions that file to the first record. The next input/output statement that refers to file-number accesses the first record in the file. Any pending output data is written to the file before the RESTORE statement is executed. Any pending input data is ignored. File-number Ø refers to a data statement.

REC numeric-expression may be used with the QUICKDISK drive, since it provides relative files. The numeric expression specifies the record to which the random access file is positioned. The next input/output statement that refers to that file accesses that record.
Note: The first record of a file is record zero (Ø).
Calling a record with REC that does not exist will not cause an error! The reaction of the system will depend on the statements which are following.

Cross Reference

INPUT, LINPUT, PRINT

Examples

```
23Ø RESTORE #1
```

Sets file #1 to the first record in the file, which is record Ø .

```
35Ø RESTORE #3,REC 4
```

Sets the internal pointer for access to the random access file #3 to the fifth record. (counting begins with zero!)

RUN

Format

```
RUN "devicenumber,filename"
```

Description

The RUN statement loads a program from the QUICKDISK drive into the memory of the CC-40 or TI-74 and executes it immediatly. Performing a RUN statement erases any program automatically, being in the memory of the computer before!

Before a program is executed, the following process takes place.

- Variables are initialized. Numeric variables are set to zero and string variables are set to null strings.
- Certain errors, such as a FOR statement without a NEXT statement or a line reference out of range, are detected.
- All open files are closed.
- ON BREAK STOP, ON WARNING PRINT and ON ERROR STOP are selected.
- The angle mode is left unchanged.

The RUN statement supports the interesting fact to use the full 64 kbytes storage capacity of one disk side for programming, since a program can be divided in separate parts of 16 kbytes or 24 kbytes. With RUN these parts of the program can call and execute each other in an operation-loop.

Cross Reference

OLD

Example

```
100 REM MENUE with RUN
110 INPUT "WHICH PROGRAM ? 1, 2 OR 3";A
120 IF A<>1 AND A<>2 AND A<>3 THEN PRINT "INVALID CHOICE!":PAUSE
130 IF A=1 THEN RUN "8,PRG1"
140 IF A=2 THEN RUN "8,PRG2"
150 IF A=3 THEN RUN "8,PRG3"
160 CALL KEY(KEY,STATUS):IF KEY<>250 THEN 110
170 END
```

```
170 PRINT "PROGRAM 1":PAUSE
180 RUN "8,MENUE"
190 END
```

```
200 PRINT "PROGRAM 2":PAUSE
210 RUN "8,MENUE"
220 END
```

```
230 PRINT "PROGRAM 3":PAUSE
240 RUN "8,MENUE"
250 END
```

Lines 100 bis 160 represent the program named MENUE.
Lines 170 bis 190 represent the program named PRG1.
Lines 200 bis 220 represent the program named PRG2.
Lines 230 bis 250 represent the program named PRG3.
Depending from the input in the program MENUE one of the programs PRG1, PRG2 or PRG3 is loaded and executed immediately.
The programs PRG1, PRG2 and PRG3 call the program MENUE after beeing executed. This principle generates an operation-loop which allows to divide longer programs into parts of 16 kbytes or 24 kbytes.

SAVE

Format

```
SAVE "devicenumber,filename"[,PROTECTED]
```

Description

The SAVE command allows to copy the BASIC program in the memory of the CC-40 or the TI-74 to an external device (the QUICKDISK drive).
SAVE removes any variables from the system which are not used.
A copy of a program can be achieved when loading it by OLD and storing it on another diskette by SAVE on the QUICKDISK drive.

Note:
Only the last file on a diskette can be overwritten by a file with the same name. When there are more files with the same name on a diskette, only the last can be accessed.

When PROTECTED is specified, the program in the memory of the CC-40 or the TI-74 is left unprotected but the copy on the QUICKDISK is saved in protected format. A protected program cannot be listed, edited or saved.

Cross Reference

OLD, VERIFY

Examples

```
SAVE "8,PRG1"
```

Saves the program in memory to the QUICKDISK drive under the name PRG1.

```
SAVE "8,PRG2",PROTECTED
```

Saves the program in memory to the QUICKDISK drive under the name PRG2. The program may be loaded into memory and run, but it cannot be edited, listed, or saved.

VERIFY

Format

VERIFY "devicenumber,filename"[,PROTECTED]

Description

The VERIFY command checks that data was saved on an external storage device as the QUICKDISK drive or was loaded into memory correctly. VERIFY is used after a SAVE or OLD command to compare the program in memory to the program on the external storage device. If a difference is found, an error message is displayed. Both input/output errors 12 and 24 indicate a verfication error.

Devicenumber,filename identifies the device and the file in which the program is stored. Devicenumber for the QUICKDISK-Ø1 is 8 and for the QUICKDISK-Ø2 it is 9 . Filename identifies the file.

Like SAVE, VERIFY removes any variables from the system which are not used.
If the program is protected, then PROTECTED must be specified in the VERIFY command.

Cross Reference

OLD, SAVE

Examples

SAVE "8,MYPROG"

Saves the file named MYPROG on the QUICKDISK drive.

VERIFY "8,MYPROG"

Verifies wether the file was stored correctly.

OLD "8,STAT",PROTECTED

Reads the file named STAT into the memory from the QUICKDISK.

VERIFY "8,STAT",PROTECTED

Verifies wether the file was read correctly.

EXERCISE

The following exercise illustrates the use of the statements for file-processing descripted in the BASIC section.
It is recomended to read the exercise carefully. Here the statements are not separated but are combined to cooperate with each other.
This example is written for execution on the QUICKDISK-Ø1. To run it with a QUICKDISK-Ø2 just change the devicenumber to 9 instead of 8.

Description

The programm creates a file on the QUICKDISK to which data are written.
Later the data are read again and printed.
At the beginning the program asks for the name of the data file and assumes a default if the name is omitted.
Also the program waits for a decision if data will be written or will only be read.
Finally it asks if single records have to be read. To read no single records Ø has to be entered.

```
1ØØ ON ERROR 41Ø
```
Transfers control to line 41Ø if any error ocurs.
(Some printers cause errors with longer inputs)
```
11Ø INPUT "FILENAME ";D$
```
Asks for a filename.
```
12Ø IF D$=""THEN D$="DATA"
```
Assumes the default "DATA" if filename was omitted.
```
13Ø INPUT "READ ONLY? L ";L$
```
Waits for the input "L" if data have to be read only.
```
14Ø IF L$="L"THEN GOTO 26Ø
```
Transfers control to the reading routine if condition is true.
```
15Ø OPEN #1,"8,"&D$,DISPLAY,OUTPUT
```
Opens file #1 in the QUICKDISK drive with the name specified by D$ and the attributes DISPLAY and OUTPUT.
```
16Ø T$="THIS IS A TEST "
```
Assigns the phrase "THIS IS A TEST" to the string T$.
```
17Ø PRINT #1,T$:T$="":PRINT T$:PAUSE
```
Multi-statement line. The statements are separated by a colon.
Writes the string T$ as the first record (number Ø) into file #1.
Assigns T$ a nullstring to avoid later input-error and to prove that in the following the string T$ will really be read from the QUICKDISK drive.
T$ is displayed to test that it was erased correctly.
Proceed with [ENTER].

```
18Ø CLOSE #1
```
File #1 is closed in the QUICKDISK.

```
190 INPUT "DATE, TIME ";US
A string is entered by INPUT with the intention to transfer it
to the QUICKDISK drive.
200 OPEN #1,"8,"&DS,RELATIVE,DISPLAY,APPEND
File #1 is opened again, to add data to its end (APPEND).
This time random access is chosen (RELATIVE).
210 PRINT #1,REC 1,US:US="":PRINT US:PAUSE
Multi-statement line.
The first statement after the linenumber shows the flexibility
of the QUICKDISK. Using REC 1 specifically the second record
is accessed.
Again: Assigning a nullstring and displaying it to prove that
the data will later come from the QUICKDISK.
Proceed with [ENTER].

220 INPUT "ADD MORE DATA ?";WS
Entering data to transfer it to the QUICKDISK afterwards.
230 IF WS=""THEN 250
Testing for additional data to be entered.
240 PRINT #1,WS:WS="":GOTO 220
Multi-statement line.
Transfer of input-data to the QUICKDISK drive.
Initializing the operational variable.
Return to the start of the loop.
250 CLOSE #1
File #1 was opened in APPEND mode. To read data as intended from
now the file has to be closed and reopened in INPUT mode.
260 OPEN #1,"8,"&DS,RELATIVE,DISPLAY,INPUT
270 OPEN #2,"2@",DISPLAY,OUTPUT
Two files are opened in the computer at the same time (but only
one is allowed in the QUICKDISK)!
Line 260 opens the QUICKDISK for the reading-routine.
Line 270 accesses a printer which is connected to the RS232-
interface.
280 LINPUT #1,T$
290 LINPUT #1,U$
Two of the records which were stored before in file #1 are now
read successively.
300 PRINT T$,U$:PAUSE:Z=0
Multi-statement line.
Two values were read separately, but both are displayed at the
same time.
Also a counting variable for read records is initialized.
Proceed with [ENTER].
```

```
310 ON ERROR 410
320 INPUT "SINGLE RECORDS? No ";N
330 IF N<>0 THEN K=1:RESTORE #1,REC N
Asks if single records have to be read and if this is true, the
internal pointer for file #1 is set to the specified value.
340 IF EOF(1)THEN 390
To avoid an error, file #1 is checked if there are another data.
If there were no more data available the open files are closed
in line 390.
350 LINPUT #1,W$:Z=Z+1
Multi-Statement Zeile
Reads data from file #1 and assignes these to operational
variable W$ .
The counting variable for read records is incremented each time
when this line is executed.
360 PRINT #2,W$
The read data are transferred to the printer.
370 IF K=1 THEN K=0:GOTO 320
Decision to proceed reading single records.
380 GOTO 340
Return to start of loop for reading.
390 CLOSE #1:PRINT #2,Z:CLOSE #2
Multi-statement line.
Printing of counting variable for read records.
Closing of all open files.
400 END
410 CALL ERR(CODE,TYPE,FILE,LINE)
420 PRINT #2,"CODE";CODE;"TYPE";TYPE;"FILE";FILE;"LINE";LINE
430 PRINT #2,Z
440 RETURN 310
Subroutine for error-handling.
```

Note:
Of course this example is intentionally simple and experienced programmers will know various optimizations. The purpose of this program was not to compete for the most elegant technique, but to provide practical exercises for beginners.

DIRECTORY-PROGRAM DIR

The directory-programm is used to determine the contents of a diskette. The list available with this program displays protected and unprotected programs as well as data files.

Working with the DIR program

For the use of the QUICKDISK it is necessary to know the names of program- and data-files. Without knowledge of these names no programs can be loaded with OLD. Also OPEN without a valid filename causes an error.
The DIR program is used to determine these names.
For example it gives also rise to use this programm if one wants to

know if a file is realy available on the QUICKDISK.

see the contents of a diskette that was not in use for longer time or which contents are not known exactly.

determine contents of diskettes other than an own.

check if the length of a program from a diskette is suitable to the available memory space in the computer.

Attention:
The DIR program has to be loaded into the memory of the CC-40 or TI-74 before it can be executed. Of course, other programs that are in the memory of the computer are totaly erased!
In consequence be sure to know the memory content (↑↓,LIST, FRE) before loading DIR. If there is any program in memory which is to be kept for later use, this can be stored on a diskette performing a SAVE command.

1. Load the DIR program into the memory of the computer. Enter

   OLD "8,DIR"
   [ENTER]

2. Set up a copy of this program on another Diskette.
   (See SAVE).
   This proceeding is called "BACKUP".
   The purpose of "BACKUP" is safety (of information), to protect from improper use or natural wear of storage medium by existence of a backup-copy.
   Since the DIR program may be stored on a diskette beside other contents without difficulty, it is useful to store DIR on each new diskette. So it is sure that there is a sufficient number of backup-copies and to have this frequently used program available without changing the diskette.

3. Remove the original diskette with the DIR programm from the QUICKDISK drive and put in the diskette which content is to be determined.

4. To start the DIR program press the [RUN] key and then press [ENTER].

5. Now the QUICKDISK drive becomes busy and the display of the computer will contain for:

   at least one program on the diskette

   formatted diskettes without any file stored on it

   F N FILENAME LENGTH X T CATALOG COMPLETE

   Press [CLR] or [ENTER] to proceeed with displaying the next file information.

   Diskettes which were never formatted before cause the message IO ERROR

The particular items in the display mean:

N	Sequence number of a file on diskette.
FILENAME	Name of the program- or data file.
LENGTH	Occupied storage capacity in bytes.
T	Type of data: 0 = Programs ; 1 = DISPLAY data 9 = INTERNAL data

Example

If there is only the DIR program stored on a diskette without any other file, after pressing [RUN] und [ENTER] in the display of the computer appears:

F 0 DIR 666 1 0

This displayed information means that the first file on the QUICKDISK is named DIR occupies 666 bytes of storage capacity and is a program file.

The DIR programm uses the following variables:
A; ADR; BUF; FLAGS; FNUM; H; HI; I; L; LEFT; LOW; LSB; MSB; PAB$; NAME$; PAB$; R; R$; RIGHT; RLEN; RNUM; STATUS;

If the DIR program was erased by uncovered inputs, a copy of this program is available from the other side of the diskette!

APPENDIX A

I/O ERROR CODES

The following list details the standard input/output (I/O) error codes.

Further informations are given in the corresponding section of the manuals of CC-40 and TI-74.

I/O errors are displayed in one of the following forms:
- I/O error: ccc # fff
- I/O error: ccc "ddd"

where ccc is the I/O error code listed below, fff is the file-number assigned in an OPEN statement, and ddd is the device code associated with the peripheral device.

Code	Definition
2	ERROR IN ATTRIBUTES Attempt to read an INTERNAL-type file in DISPLAY format (which is default).
3	FILE NOT FOUND A statement or command which requires a programm-name or file-name cannot find the specified file. Probably a false diskette was inserted.
4	DEVICE/FILE NOT OPEN Attempt to access a closed file with a INPUT, LINPUT, PRINT, or CLOSE operation. File specified in EOF function is closed.
6	DEVICE ERROR A failure has occured in the QUICKDISK drive. This error can occur when directory information on the diskette was lost, the drive detected a transmission error or a medium failure, etc.
8	DATA/FILE TOO LONG Attempt to output a record which was longer then the capacity of I/O buffer. A file exceeded the maximal file length for a device.
9	WRITE PROTECT ERROR The save disabling tab of the diskette in the drive was broken. It is only possible to read from this diskette. To store information on this diskette again cover the tab with a piece of tape. (see also page 9)
13	UNSUPPORTED COMMAND Attempted an operation not supported by the QUICKDISK drive.

Code	Definition
16	CHECKSUMME ERROR This message is displayed if an error was detected when loading information. Try once again. This message can also appear with an attempt to access a diskette which was not formated.
17	RELATIVE FILES NOT SUPPORTED This message appears with the attempt to get random access to a SEQUENTIAL-type file.
24	VERIFY ERROR Program or data in memory does not match specified program or storage medium.
32	MEDIUM FULL The physical capacity on the diskette is totally occupied.
255	TIME-OUT ERROR. The computer generates this error code if it cannot communicate with a peripheral. Check the HEX-BUS cable connections and make sure that you are using the correct devicenumber.

APPENDIX B

TECHNICAL DATA

Storage capacity

The total storage capacity of a QUICKDISK diskette on its both sides amounts 128 kbytes. Due to this on one side (A or B) 64 kbytes are available.
The limiting quantity for the amount of transmitted information of programs or data, however, is the buffer-length.
When saving or loading programs with the QUICKDISK drive these may have a maximum length of 16 kbytes or with extended capacity of memory a length of 24 kbytes.
Before saving longer programs these can be checked with the FRE function for proper length. (See corresponding sections of computer manuals)

Example

```
FRE(1)
```

Displays the total length occupied by programs in memory.

APPENDIX B

TECHNICAL DATA

Specifications

Common features

Storage capacity	128 kbytes (A + B side)
Number of tracks	1 track (spiral)
Storage media	2,8 inch hardcase diskette
Longevity of media	2000 passes
Working temperature	10°C to 35°C
Working humidity	20% to 80% (condensation not permitted)

Individual features

Model QUICKDISK	-01	-02
System	Top-loader	Front-loader
Power supply	DC 6 V 5% 600 mA (average)	DC 7.5 V -15% to +10% 400 mA (working)
Power consumption	3 VA (average) 5 VA (maximum)	2 VA (standby) 3 VA (maximum)
Batteries	No batteries	Five AA-size alkaline recommended
Cable	8 pin HEX-BUS both end female	10 pin HEX-BUS inline, permanently attached to QUICKDISK -02
Dimensions [mm]	176 (breadth) 144 (depth) 68 (height)	110 (breadth) 180 (depth incl. bat.case) 55 (heigth)
Weight	1.2 kg	0.8 kg
Accessory	Owner's manual Waranty card Power supply HEX-BUS cable,long	Owner's manual Waranty card Power supply Battery case

APPENDIX C

IN CASE OF DIFFICULTY

If this QUICKDISK drive or attached devices do not appear to be working properly, check the following.

1. Power- Be sure that the power source is in order, the QUICKDISK drive is attached to the HEX-BUS and the power cord is pluged in the small jack at the back of the QUICKDISK drive. All peripherals must be turned on for proper operation.

2. Cables- Be sure the correct cable is in use. Check for loose or broken leads and connectors. Be sure that cables are plugged in securely. Some devices as the different models of the QUICKDISK drives require apropriate cable connections.

3. Software- Even when all devices are operating correctly, this QUICKDISK drive can appear to malfunction if program-names or filenames are not specified correctly. See the BASIC section of this manual to check if options specified in an OPEN statement or after a SAVE, OLD, or VERIFY command are correct.

4. Computer- See if the computer itself is working properly. Turn on the computer. Enter the statement OPEN #1,"8". The error message I/O error 255 #1 should appear in the computer display, indicating that the file named cannot be opened. This result is expected when the QUICKDISK drive is not connected to the HEX-BUS interface.

   Check that the QUICKDISK drive is working properly. Refer to the set-up instructions and reconnect only the QUICKDISK drive to the HEX-BUS interface. Enter the statement OPEN #1,"8" and press [ENTER]. The OPEN statement should disappear from the computer display and be replaced by a flashing cursor on the left side, indicating that the port named has been opened.

5. If none of the above procedures correct the difficulty, consult the appropriate section in the corresponding computer manual or refer to the Service Information portion of this manual.

THREE-MONTH LIMITED WARRANTY

MECHATRONIC EXTENDS THIS WARRANTY TO THE ORIGINAL CONSUMER PURCHASER OF THE QUICKDISK DRIVE.

WARRANTY DURATION

This QUICKDISK drive is warranted for a period of three (3)months from the date of original purchase by the consumer.

WARRANTY COVERAGE

This QUICKDISK drive is warranted against defective materials or workmanship. THIS WARRANTY IS VOID IF THE ACCESSORY HAS BEEN DAMAGED BY ACCIDENT, UNREASONABLE USE, NEGLECT, IMPROPER SERVICE OR OTHER CAUSES NOT ARISING OF DEFECTS IN MATERIALS OR WORKMANSHIP.

WARRANTY DISCLAIMERS

ANY IMPLIED WARRANTIES ARISING OUT OF THIS SALE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE ABOVE THREE-MONTH PERIOD. MECHATRONIC SHALL NOT BE LIABLE FOR LOSS USE OF THE SYSTEM OR OTHER INCIDENTAL OR CONSEQUENTIAL COSTS EXPENSES, OR DAMAGES INCURRED BY THE CONSUMER OR ANY OTHER USER.

Some states do not allow the exclusion or limitation of implied warranties or consequential damages, so the above limitations or exclusions may not apply to you.

LEGAL REMEDIES

This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

WARRANTY PERFORMANCE

During the above three-month warranty period, your QUICKDISK drive will be repaired or replaced with a new or reconditioned unit of the same or equivalent model (at option of MECHATRONIC) when the unit is returned by prepaid shipment to MECHATRONIC. The repaired or replacement unit will be warranted for three months from date of repair or replacement. Other than the postage requirement, no charge will be made for the repair or replacement of in-warranty units.

MECHATRONIC strongly recommends that you insure the unit for value, prior to shipment.