TeleVideo®
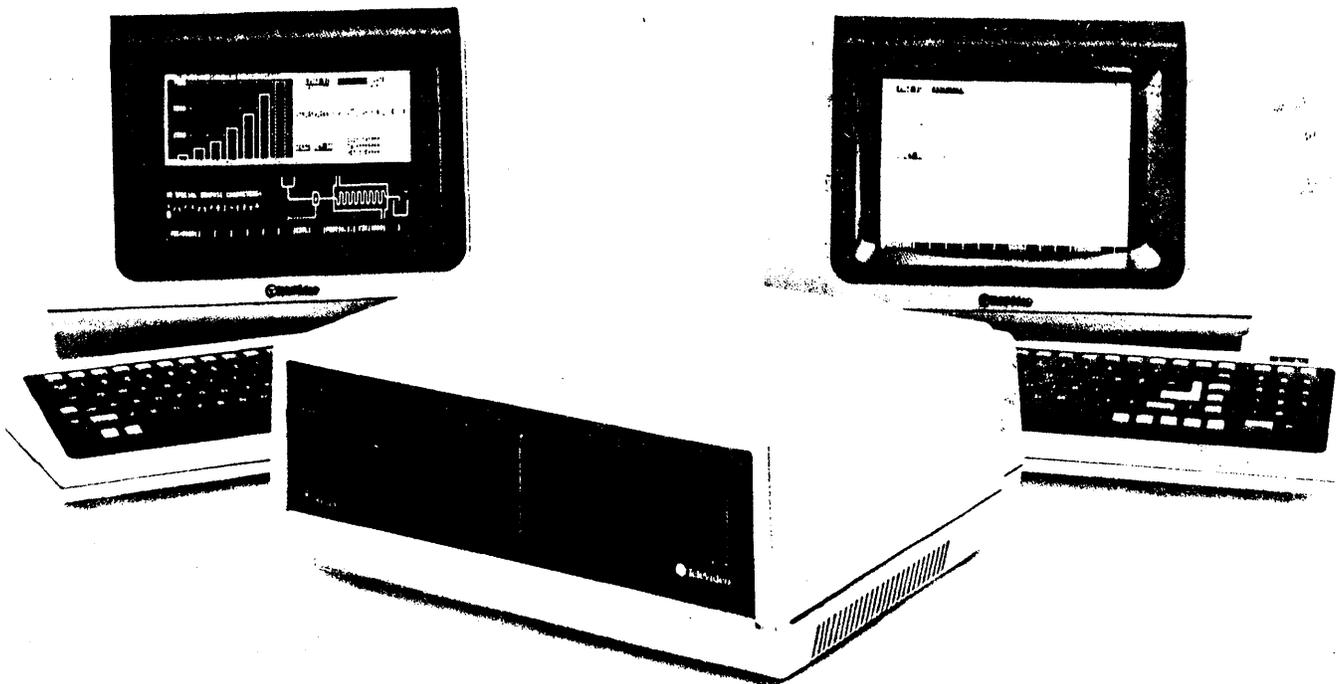# TS 806/20 Computer System
Installation and User's Guide

TeleVideo®
TS 806/20 Computer System
Installation and User's Guide

Disclaimer

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1. INTRODUCTION

1.1 SYSTEM DESCRIPTION

The TeleVideo TS 806/20 is a compact tabletop multiuser microcomputer which can support up to six user stations. A Winchester hard disk and floppy diskettes provide central storage of data for all users. Figure 1-1 shows the TS 806/20 unit.

Many combinations of peripheral devices can be attached to the TS 806/20—serial and parallel printers, a service processor terminal, or modem. Figure 1-2 illustrates several of the possible configurations.
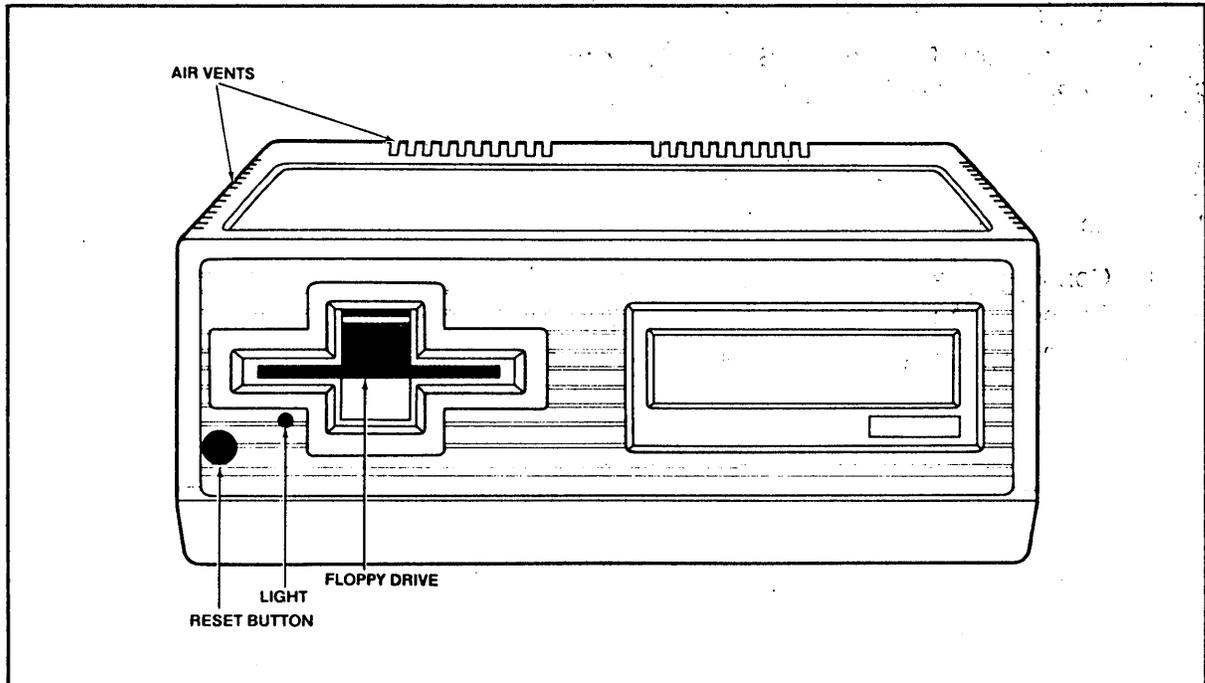
Figure 1-1   TS 806/20 Computer System

1.2 LIMITED WARRANTY

The TS 806/20 is covered by a limited warranty. The terms and conditions of the complete limited warranty are provided in Appendix B.

Read the installation instructions completely before turning on your system. Incorrect installation may void the warranty.

TERMINAL

PRINTER

PRINTER

TS 806/20 SERVICE PROCESSOR

TS 802

TS 800A

TS 802H
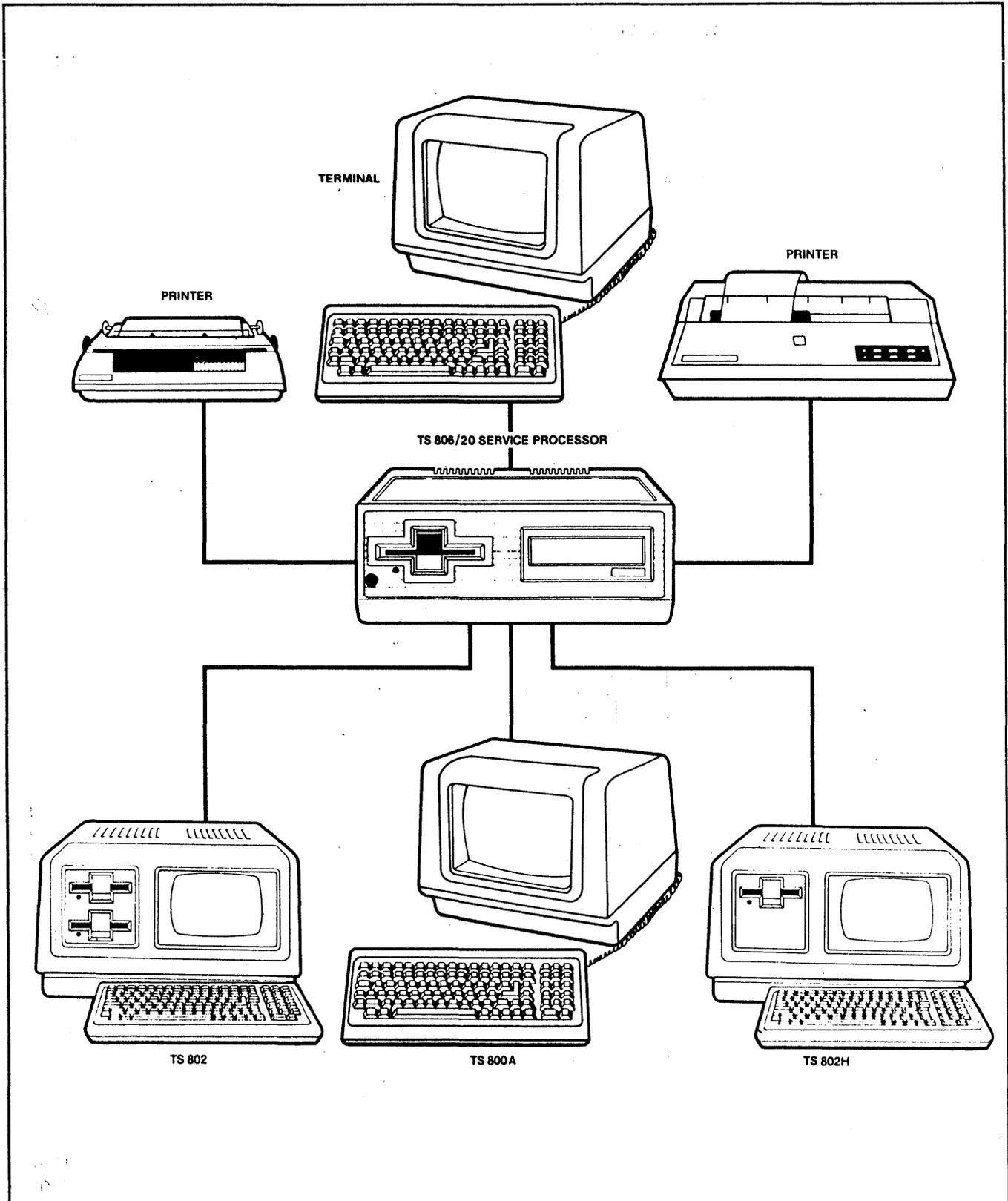
Figure 1-2   Possible TS 806/20 Configurations

1.3   HARDWARE CONFIGURATION

1.3.1   Hardware Overview

The TS 806/20 is a tabletop computer which contains the following components:

    One 5 1/4-inch Winchester hard disk drive

    One 5 1/4-inch floppy disk drive

Specification details are given in Appendix A.

The TS 806/20 will be referred to as the **service processor.**

1.3.2   Disk Drives

The TS 806/20 has one 5 1/4-inch Winchester hard disk drive and one 5 1/4-inch floppy disk drive.

The floppy disk drive is located on the left side of the computer. (See Figure 1-1.)

The Winchester disk drive is located immediately to the right of the floppy disk drive.

1.3.3   Hard Disk and Floppy Diskettes

The hard disk is permanently sealed in an air-tight enclosure and is not accessible to you. It has a capacity of 19.14 megabytes of unformatted disk storage (formatted 15.04 megabytes). Data can be stored on this hard disk and accessed by all user stations connected to the TS 806/20.

The floppy diskettes are 5 1/4-inch, double-sided, double density with a capacity of 500 kilobytes of unformatted storage (formatted 368.6 kilobytes). Figure 1-3 shows the floppy diskette.
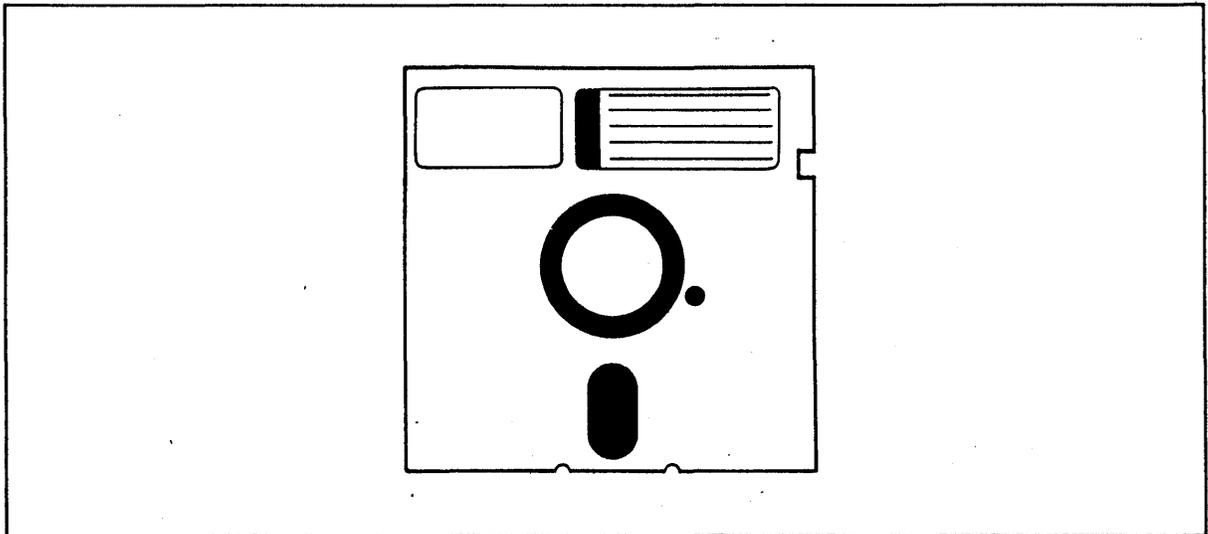
Figure 1-3   Floppy Diskette

Each diskette has a magnetic coating on both sides, much like a phonograph record. Unlike a phonograph record, it arrives in a protective black plastic cover which is NOT removable. Lubricants inside this cover increase the life of the diskette. The actual diskette can be seen through some of the slots in the plastic cover.

1. INTRODUCTION

Figure 1-4 shows the actual floppy diskette and protective lining inside the plastic cover. When cared for properly (as described in Chapter 5), diskettes can be used many times.

The TS 806/20 can use any floppy diskette which meets the specifications given in Appendix F. New diskettes must be formatted before data can be stored on them (as explained in 5.2.2).
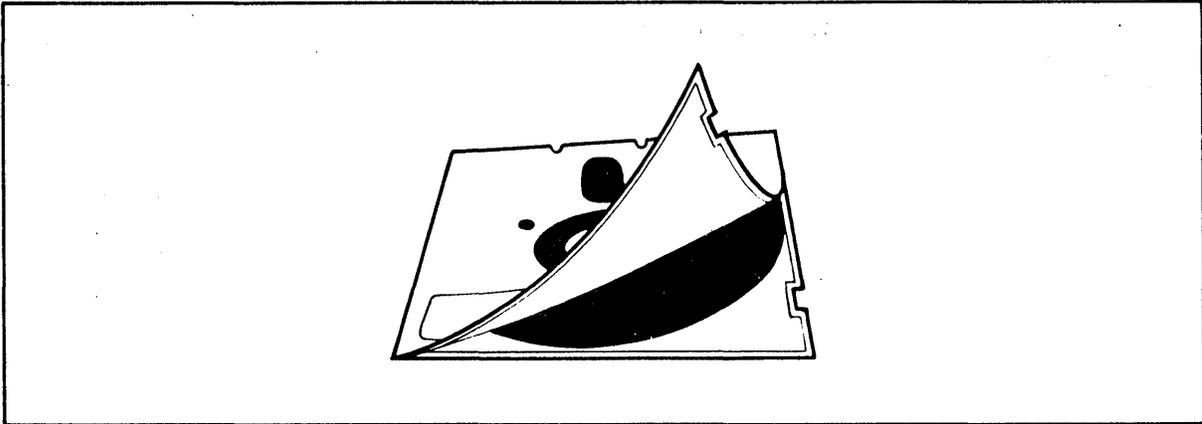
Figure 1-4   Diskette Inside Permanent Plastic Enclosure

Applications programs, text, data, and programs which operate the TS 806/20 can be stored on either the hard disk or floppy diskettes.

1.3.4   Peripheral Devices

The ports on the rear of the TS 806/20 allow you to connect a wide variety of peripheral devices.

Up to six user stations can be attached to the TS 806/20. These user stations may (but do not need to) have their own data storage. In addition to the user stations, a service processor terminal is used to run utility programs, run service diagnostics, modify the operating parameters of MmmOST, and monitor the operation of the TS 806/20. A user station can also operate as a service processor terminal by changing the switch setting on the rear panel. Refer to the operator's manual for location and settings of the switch.

Optional peripheral devices can be shared by all user stations. For hardcopy output, you can connect a serial printer to the port labeled RS232 [OPT]. (This could be a dot matrix, line, or letter-quality printer.) This interface is compatible with most RS232-compatible serial printers currently available on the market, including both character-by-character and buffered printers.

A serial device, such as a modem, can be attached to the RS232 [OPT] port instead of a printer.

You can attach a parallel Centronics-type printer to the port labeled PRINTER.

Refer to Figure 1-2 where several possible configurations are illustrated.

△

The peripherals described here are all in addition to those which may be connected directly to each user station.

1. INTRODUCTION

Table 1-1 TS 806/20 Ports

Port	Description
TERMINAL	This 25-pin RS232 port is used to connect a service processor terminal. This port is used for running system utility programs, monitoring the TS 806/20 operation, running service diagnostics, and modifying the MmmOST parameters.
PRINTER	This 36-pin port can be used to connect a parallel Centronics-type printer.
RS232 [OPT]	This 25-pin port is used to connect a serial printer or modem.
USER 1 through USER 6	Six high-speed serial RS422 ports are available to connect the TS 806/20 to user stations (any TeleVideo 8- or 16-bit system).

1.4 SOFTWARE OVERVIEW

1.4.1 Operating System

Every computer needs instructions in order to operate; these instructions are supplied by a group of programs collectively called the **operating system.**

When the TS 806/20 is turned on, its operating system is loaded into memory from the hard disk and then into the memory of each user station which is turned on. All TeleVideo computers use CP/M (Control Program for Microcomputers) Operating System software, developed by Digital Research.

$\triangle$

If you are not already familiar with CP/M, TeleVideo highly recommends that you refer to the reference books listed in Appendix C and become familiar with the basic operation of the CP/M operating system.

When the TS 806/20 is used in a multiuser environment, it also uses a special program called **MmmOST.** MmmOST is an acronym for Multiuser, multiprocessor, multitasking Operating System Technology. MmmOST controls access by the user stations to the files and programs stored in the TS 806/20.

1.4.2 Programming Languages

User stations can use any programming language which will run under CP/M. Among these are BASIC, ALGOL, APL, "C," COBOL, CBASIC, FORTH, FORTRAN, MBASIC, PL/I, and RM/COBOL. When these languages are used with MmmOST, modifications which are described in the MmmOST Programmer's Manual allow them to take advantage of the features of MmmOST. In addition, TeleVideo COBOL allows applications programs to be used with MmmOST with little or no modification.

1.   INTRODUCTION

1.4.3   Applications Programs

Applications programs are commercially available for a wide range of tasks, from accounting to security. In addition, you may write your own applications programs in one of the programming languages compatible with CP/M.

Applications programs are normally run in the user stations, not in the service processor.

1.5   USING THE MANUAL

This manual will show you how to successfully install and use your new TS 806/20 regardless of your past experience with computers. Every attempt has been made to present all of the information you will need in a complete and easy-to-understand format. Refer to the operator's manual supplied with your user station also.

Your comments about the manual are welcome. To facilitate this, we have provided a Reader Comment Card. Please take a moment to complete and return the card after you have installed your system.

1.5.1   Organization

The manual is organized in the sequence you will need the information. The chapters are as follows:

2   Installation: How to unpack and install the TS 806/20

3   Operating the Service Processor: How to install CP/M and MmmOST and operate the system

4   Operating the User Stations: How to operate user stations in a multiuser environment

5   Operational Guidelines: How to effectively use the system and floppy diskettes

6   Utility Programs: How to use the system utility programs

7   Maintenance and Troubleshooting: How to care for the TS 806/20 and what to do if you have a problem

In the Appendices are the specifications, limited warranty, suggested references, and technical information.

1.5.2   Special Information

Notes will call your attention to information which is of special importance. These categories of notes are used:

$\triangle$ General useful information

🛑   Important information concerning your safety or possible loss of data. *When you see this, STOP and read the note before proceeding!*

1.5.3   Format of Control Commands

Control commands will be shown as $\wedge$ plus the control character (e.g., $\wedge$C).

1.5.4   Carriage Returns

When you should press the RETURN key on the operator's keyboard, the symbol <CR> for CARRIAGE RETURN will be used. (On Televideo terminals, you can press the ENTER key instead of the RETURN key.)

2. SYSTEM INSTALLATION

2.1 UNPACKING

2.1.1 How to Unpack

The TS 806/20 was double-boxed when shipped. Follow the instructions shown here to unpack your system.

△

The unpacking process will be easier if two people unpack the TS 806/20.

DO NOT USE LONG, SHARP OR POINTED OBJECTS TO OPEN THE INNER BOX AS THEY MIGHT DAMAGE THE ENCLOSED SYSTEM.
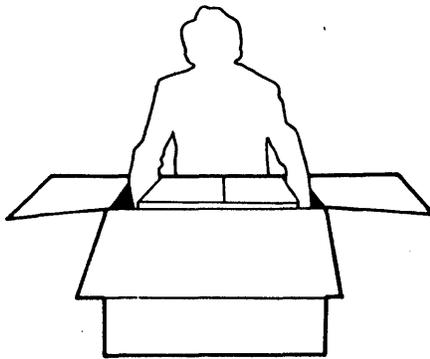
1. After opening the outer box, lift the inner box containing the TS 806/20. Gently place on floor.
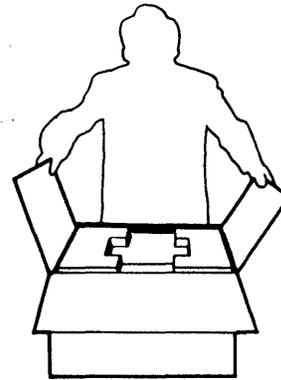
2. Open the box containing the TS 806/20. There are two plastic foam pieces protecting the system.
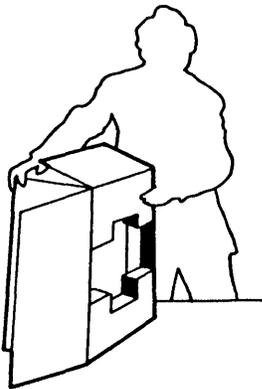
3. Gently turn this box on its side.
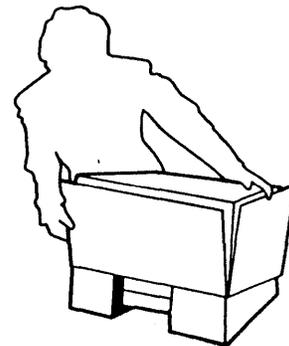
4. Holding the box firmly, gently turn it upside down. Lift the box off the TS 806/20.
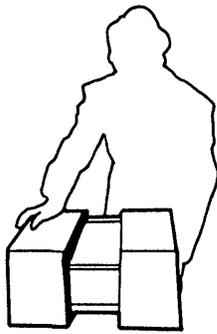
5. TS 806/20 enclosed in two foam pieces.
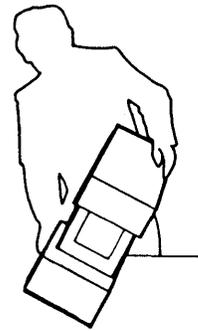
6. Turn the TS 806/20 (with foam still in place) on its side.
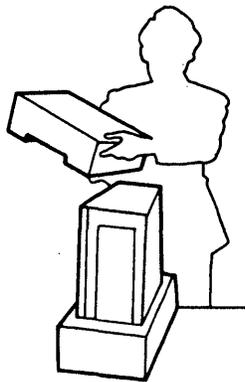
7. Remove the top foam piece.
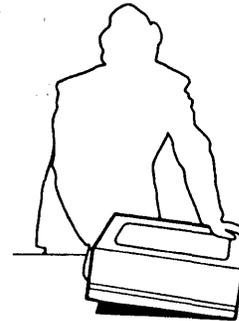
8. Lift the TS 806/20 away from the bottom foam piece and gently place the TS 806/20 on a sturdy, level table.

△

Save all packing materials and the cartons in case you need to ship the TS 806/20 in the future.

2.1.2   Checklist of Components

As you unpack, check to make sure you received the following items:

1. TS 806/20
2. Envelope containing the following items:
    a. TS 806/20 Computer System Installation and User's Guide
    b. MmmOST Programmer's Manual and software license agreement and card
    c. Digital Research CP/M User Manual containing software license agreement and card
    d. One floppy diskette containing CP/M (installation only) and one floppy diskette containing MmmOST.

△

*IF ANY ITEM IS MISSING, CONTACT YOUR DEALER OR DISTRIBUTOR BEFORE PRO-
CEEDING WITH THE INSTALLATION.*

!.1.3 Shipping Damage

Check for shipping damage before proceeding with the installation. If the system case appears
to be damaged, contact your freight carrier immediately. *DO NOT PROCEED WITH THE IN-
STALLATION IF YOU BELIEVE THERE IS ANY SHIPPING DAMAGE.* If in doubt, contact your
dealer or distributor as well as the freight carrier.

!.2 SOFTWARE REGISTRATION

Inside the front cover of the CP/M Manual that accompanies the system are the CP/M Software
License and License Agreement and inside the MmmOST manual is the MmmOST Software
License Agreement. Read the agreements and sign them *before* opening the package contain-
ing the floppy diskettes. Signing the agreements and returning the cards will:

1. Entitle you to use the CP/M operating system and the MmmOST operating technology on
    your TS 806/20 and make back-up copies for your own use
2. Register you as a CP/M and MmmOST Owner, allowing you to receive:
    a. CP/M User's Newsletter
    b. Notices of updates and enhancements to TeleVideo and Digital Research software
    c. TeleVideo and Digital Research software bug reports and patches
    d. Discounts on updated versions of Digital Research software

△

*TeleVideo will provide you with information regarding MmmOST and CP/M updates. Do not at-
tempt to install any CP/M updates without first contacting TeleVideo.*

!.3 SELECTING THE RIGHT LOCATION
!.3.1 Power Requirements

The TS 806/20 requires a steady supply of power:

>   115 VAC 60 Hertz (domestic) at 1.0 amps

or

>   230 VAC 50 Hertz (international) at 0.5 amps

△

*Incorrect or fluctuating line voltages can cause disk error or damage to the system. If you have
any doubt about the line voltages at your location, ask your dealer to check out your facility be-
fore proceeding with installation.*

2.   SYSTEM INSTALLATION

2.3.2   Physical Requirements

The TS 806/20 and user stations should be within 300 feet of each other. The service processor terminal should be within 50 feet of the TS 806/20. A serial printer should be within 50 feet of the TS 806/20. The parallel printer (Centronics-type) should be within 10 feet of the TS 806/20. Refer to the printer instructions for recommended distance.

Leave at least four inches of free space around the enclosure for proper air flow. Place the TS 806/20 on a sturdy, flat, level surface. The dimensions are given in the specifications in Appendix A.

2.3.3   General Environment

The TS 806/20 will operate best at temperatures and humidity levels in which you are also comfortable. Sudden and drastic temperature changes may adversely affect your stored data.

The system requires a clean environment—free of contaminants such as dust, carpet fuzz, and smoke. Excessive moisture or oil particles in the air will hinder the performance of the system. Keep the system away from the floor where dust or carpet fuzz would be more likely to get into the floppy disk drive.

2.3.4   Magnetic Isolation

For optimum performance, locate the system at least five feet from other computing equipment, any electrical appliances, or equipment (such as elevators, radio transmitters, and television sets) which generates magnetic fields.

2.4   INSTALLATION

General directions for all installations are given in this section. The next four subsections give directions for connecting the following peripheral devices:

1.   Up to six user stations
2.   A service processor terminal
3.   A serial printer or modem
4.   A parallel Centronics-type printer

2.4.1   Cables

To connect the TS 806/20 to a terminal, user station, printer and any other peripheral device (such as a modem), you will need cables. The quantity and types of cables needed are determined by the number and types of devices to be attached. Your dealer or distributor can supply you with the appropriate cables. The technical specifications for each type of cable are shown in Table 2-1. Refer to Appendix G for more detailed cable specifications.

Table 2-1   Cable Specifications

Distance in Feet Between TS 806/20 and Peripherals	Type of Cable
1 to 20	Ribbon cable*
20 to 100	24 gauge twisted pair with at least an overall shield
100 to 300 (maximum)	24 gauge twisted pair (individually and overall shielded)

*This is acceptable as long as the ribbon cable is not placed next to electrical devices or cables that could induce electrical interference into the ribbon cable.

Cable connectors commonly have D-shaped end connectors (Figure 2-1). These fit onto a D-shaped pin connector on the rear panel of the system. To install a cable, turn the connector end to fit the pin connector on the device, then gently but firmly push on the connector.
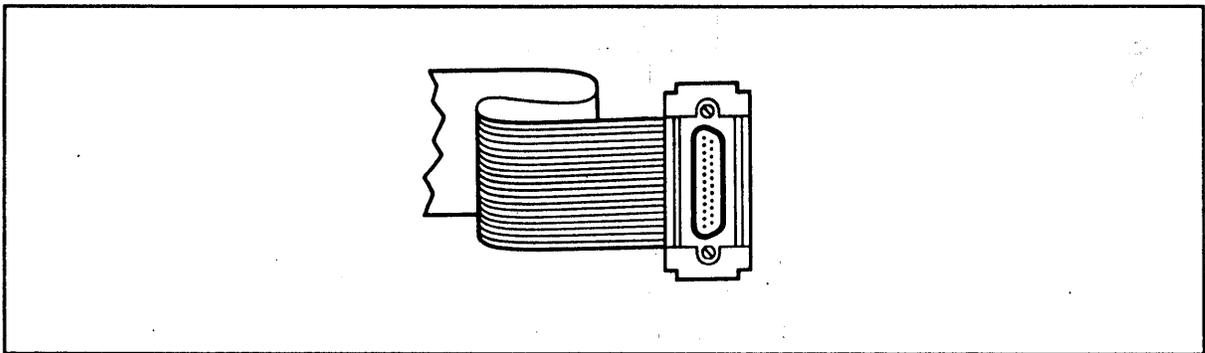
Figure 2-1   Cable Connector

As you connect the cables, leave some slack. If you have excess cable left, coil it loosely and secure it with a rubber band. Place the cable out of the way.

△

If you are using a ribbon cable, do not roll up the excess cable. Rolled ribbon cable looks nice but it creates an inductor or choke which can adversely affect system performance. Excess ribbon cable should be folded accordion-style as shown in Figure 2-2.
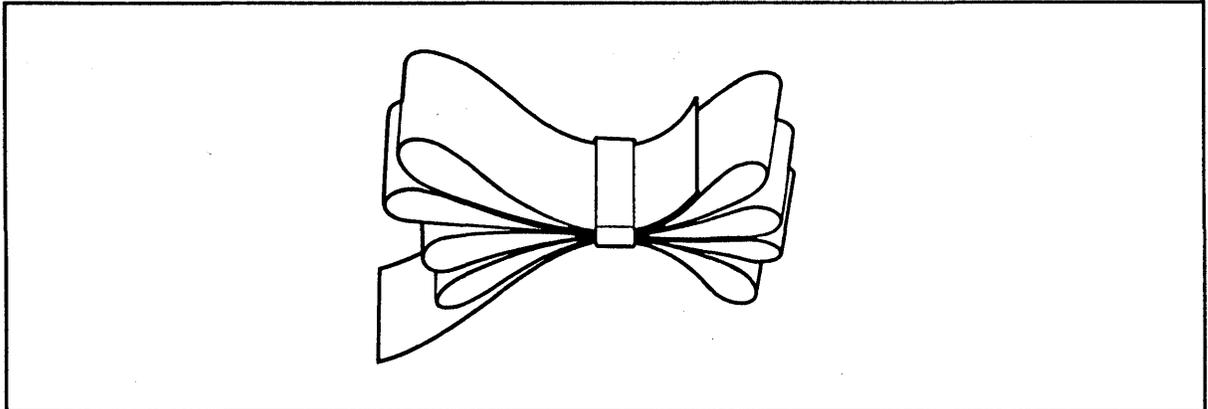
Figure 2-2   Correctly-Folded Excess Ribbon Cable

2.4.2   Power Configuration

The system will be configured for your power requirements at the factory (either 115 or 230 VAC). A three-prong plug is provided. If you use it with an adapter, ground it with a "pigtail." The power cord wires are color-coded as follows:

Green   Earth ground

Black   Primary power (hot)

White   Primary power return (neutral)

2.4.3   Connecting a Service Processor Terminal

To connect a service processor terminal to the TS 806/20, follow these steps:

1.   Attach one end of an RS232 interface cable to the pin connector labeled **TERMINAL** on the rear of the TS 806/20. (See Figure 2-3.)

2.   Attach the other end of the cable to the RS232 pin connector on the rear of the terminal. (Refer to the terminal operator's manual if necessary to locate the appropriate connector.)
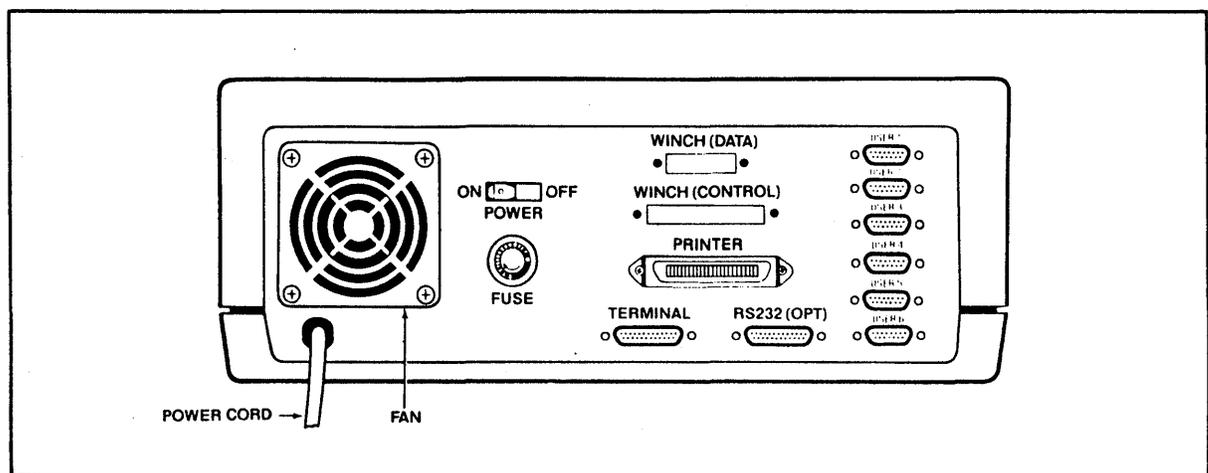
Figure 2-3   Rear Panel of the TS 806/20

The TS 806/20 is shipped with the terminal baud rate preset at 9600 baud. Should you need to change this baud rate, follow these steps:

1.   Open the TS 806/20 case. There are four large screws on the bottom of the case (one in each corner) as shown in Figure 2-4. Without tilting the TS 806/20, remove the screws with a Phillips head screwdriver. Once all screws are removed, gently lift off the cover.
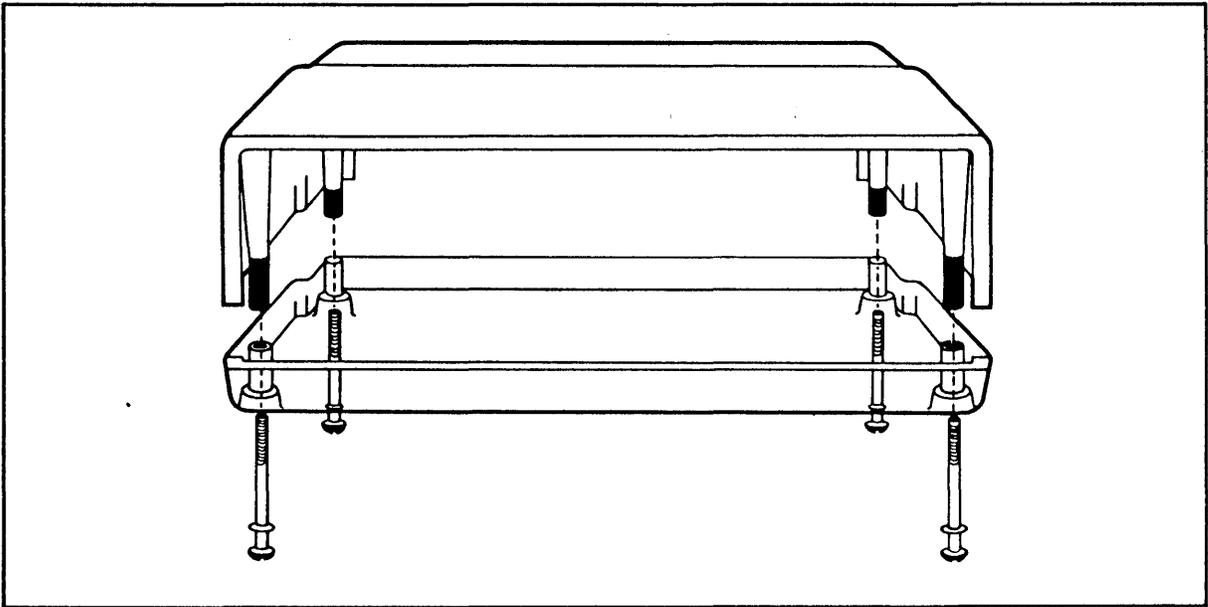
Figure 2-4   Location of Screws in the TS 806/20 Case

2.   Locate Switch 1 on the TS 806/20 logic board as shown in Figure 2-5.
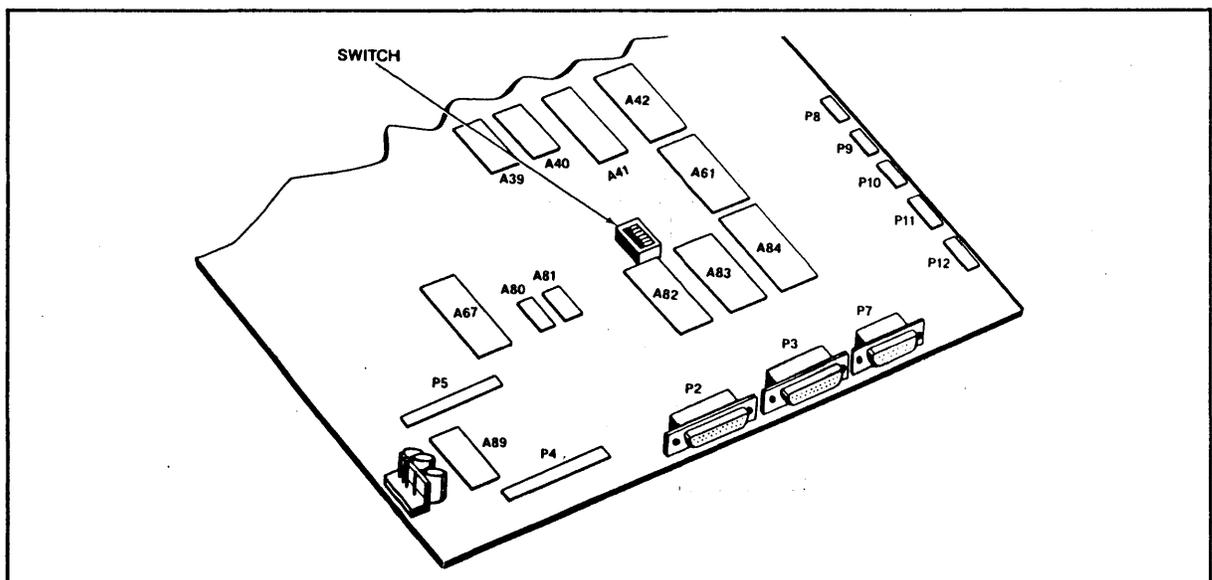
Figure 2-5   Location of Internal Switch 1

2. SYSTEM INSTALLATION

3. Set dipswitches 1 through 4 using the settings described in Tables 2-2 and 2-3. (Figure 2-6 illustrates closed and open dipswitches.)

4. Replace the cover and the screws.
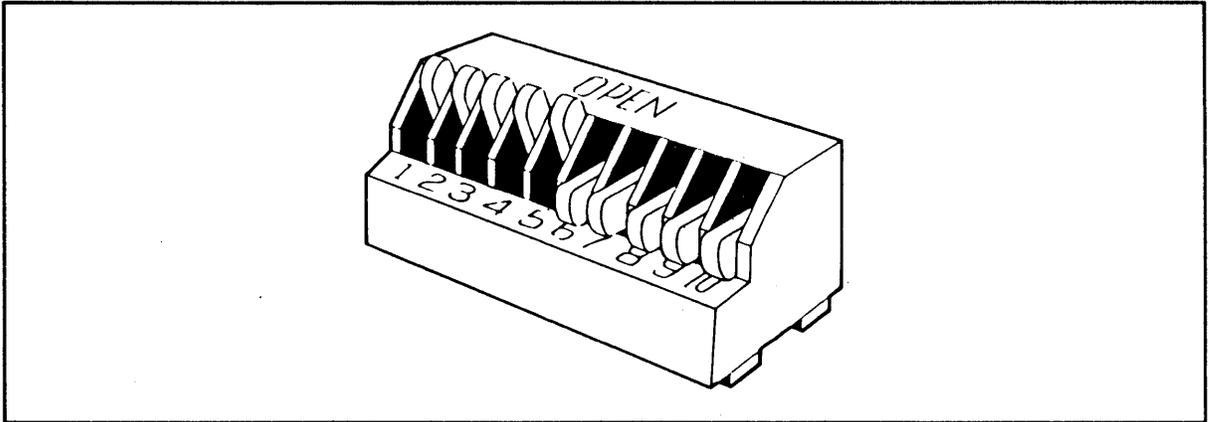
Figure 2-6   Dipswitches 1 through 5 Open; 6 through 10 Closed

Table 2-2   Switch Settings for RS232 Terminal Port Switch 1

Dipswitch No.	Function
1	Baud rate for TERMINAL (service processor terminal) port; see Table 2-3
2	Baud rate for TERMINAL (service processor terminal) port; see Table 2-3
3	Baud rate for TERMINAL (service processor terminal) port; see Table 2-3
4	Baud rate for TERMINAL (service processor terminal) port; see Table 2-3
5, 6, 7	Unused
8	Reserved for diagnostics

Table 2-3   Terminal Baud Rate (Switch 1)

Dipswitch No.				Baud Rate
1	2	3	4	(Bits per second)
0	0	0	0	19,200
1	0	0	0	9,600
0	1	0	0	4,800
1	1	0	0	2,400
0	0	1	0	1,200
1	0	1	0	600
0	1	1	0	300
1	1	1	0	150
0	0	0	1	75

Legend

0 = Switch closed)ᴰⱱ Ⱳᴺ
1 = Switch open ⱱᑭ

2.4.4   Connecting User Stations

To attach a user station to the TS 806/20, follow these steps:

1.   Attach one end of an RS422 interface cable to one of the pin connectors which are labeled **User 1** through **User 6** on the rear panel of the TS 806/20. (See Figure 2-3.)

2.   Attach the other end of the cable to the appropriate RS422 port on the back of the user station. Refer to the user station operating manual for the location of this pin connector.

△

If you are connecting several user stations, they may be connected to any of the TS 806/20 user station pin connectors. It is not necessary to connect them in sequence. You could, for instance, use User 2, User 5, and User 6.

2.4.5   Connecting a Serial Printer or Modem

The TS 806/20 can be connected to auxiliary serial devices, such as a printer or a modem.

The RS232 pin connector which is labeled **RS232 [OPT]** is configured for a serial printer or modem when the TS 806/20 is shipped from the factory. The default baud rate value of the printer port is 9600; this value can be changed through the software.

2.4.6   Connecting a Parallel Centronics-Type Printer

To attach a parallel Centronics-type printer, follow these steps:

1.   Attach one end of a Centronics-type interface cable to the pin connector labeled **PRINTER** on the back of the TS 806/20.

2.   Attach the other end of the cable to the appropriate pin connector on the back of the printer.

2.4.7   Plugging in the TS 806/20

After you have connected the TS 806/20 to all the peripheral devices, make sure the power switch is off. Then plug it into a grounded wall outlet. *Do not turn it on yet.*

2.5   CHECKLIST OF INSTALLATION INSTRUCTIONS

After the installation is complete, review this checklist before installing the operating system and using the system.

1.   Did you check the TS 806/20 for possible shipping damage?
2.   Is the location which you selected
   a.   Magnetically isolated?
   b.   Supplied with steady line voltage?
   c.   Within comfortable temperature and humidity levels?
   d.   Clean?
   e.   Spacious enough for good ventilation around the case and on a sufficiently large and stable table?
3.   Is the power plug correct for your wall outlet?
4.   Is the outlet grounded?
5.   Are peripheral devices within the distance limits specified?
6.   Did you use the correct cables according to the specifications in Table 2-1?
7.   Did you check the printer baud rate compatibility?
8.   Did you plug the TS 806/20 and peripherals into the wall outlet?

If your installation satisfies this checklist, you are ready to install the operating system and MmmOST.

3. OPERATING THE SERVICE PROCESSOR

3.1 INTRODUCTION

This chapter is designed for the person who prepares the service processor for initial operation and uses it on a daily basis.

△

All of the operations described in this chapter require a service processor terminal.

3.2 INITIAL START UP

Now that all peripheral devices are installed and the TS 806/20 is plugged in, you are ready to turn it on and install CP/M and MmmOST.

3.2.1 Power On

1. Make sure the floppy disk drive is empty before proceeding.

🛑

ALWAYS MAKE SURE THAT THE FLOPPY DISK DRIVE IS EMPTY WHEN YOU TURN THE TS 806/20 ON OR OFF. IF A DISKETTE IS IN THE DRIVE, RESULTING POWER SURGES MAY DESTROY THE INFORMATION STORED ON THE DISKETTE.

2. Locate the ON/OFF switch on the left-center side of the rear panel of the TS 806/20. (Figure 3-1). This is a rocker-type switch.
3. Push the end which has a white dot on it to turn on the TS 806/20.
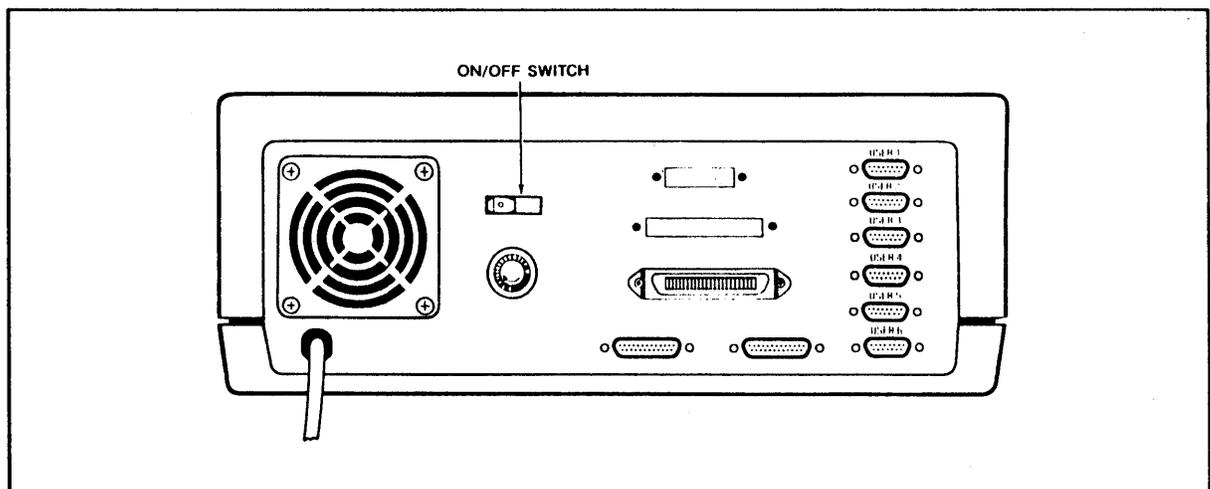
Figure 3-1   On/Off Switch on Rear Panel

3.2.2 Installing CP/M and MmmOST

Your system is shipped with a copy of CP/M and MmmOST on separate diskettes. This section explains how to install (transfer) a copy of these programs to the hard disk.

3. OPERATING THE SERVICE PROCESSOR

3.2.2.1   **Booting Up**—The process of transferring the operating system programs to the service processor's or user stations's memory is called **booting** or **booting the system** from the expression to *pull oneself up by one's bootstraps.*

Booting the service processor the first time after you turn on the power is called a **cold boot, cold start,** or **reset.** A cold boot clears the memory and loads the operating system programs into it again. While a cold boot does not affect data already stored on the hard disk or on a floppy diskette, *any data in memory will be lost.* A cold boot is normally used if you have a problem with your program and wish to start over or if your system is not responding correctly.

To cold boot (reset) the TS 806/20, press the red reset button located at the left front of the computer (Figure 3-2).
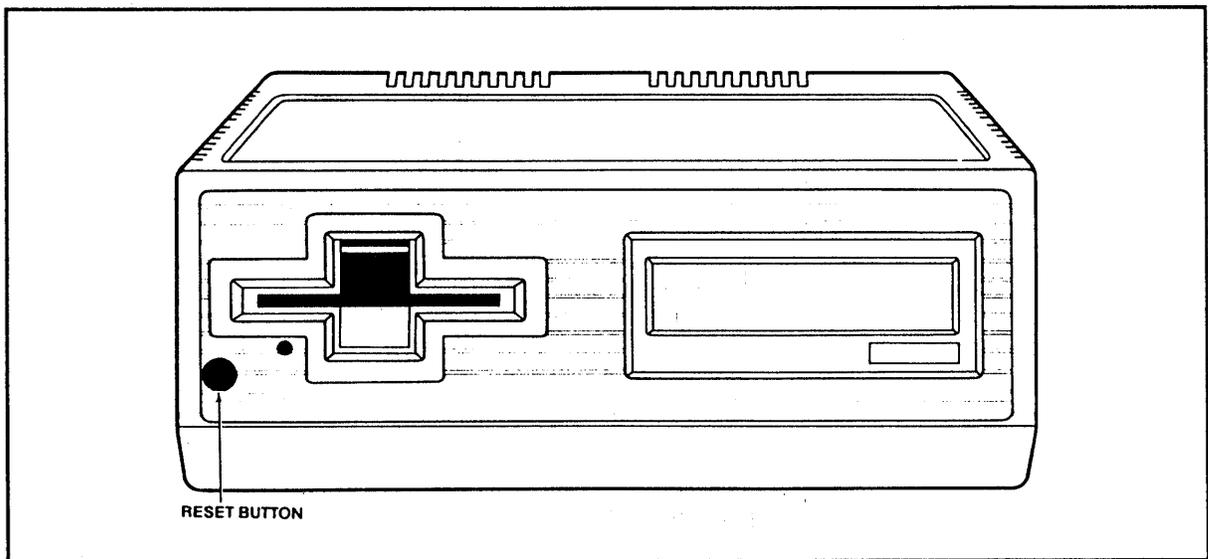
RESET BUTTON

Figure 3-2   Location of Reset Button

To load the CP/M operating system programs into the system without affecting the TS 806/20 memory areas, perform a **warm boot.** To warm boot the TS 806/20, press the CTRL and C keys simultaneously (∧C) on the service processor terminal keyboard.

Whenever the service processor is warm booted, MmmOST is cancelled and user stations are not operable. To reinstate MmmOST, either press the TS 806/20 reset button, or enter

        MMMOST <CR>

after the system prompt (ex. A>).

(STOP)

BEFORE YOU WARM OR COLD BOOT THE SERVICE PROCESSOR, MAKE SURE ALL USER STATIONS ARE OFF OR NOT IN USE. IF USER STATIONS ARE OPERATING WHEN THE SERVICE PROCESSOR IS BOOTED, DATA WILL BE LOST FROM THE USER STATION MEMORY.

Addendum For: TS 806/20 Computer System Installation
                         and User's Guide

Addendum
Document Number: 2226501

Date Issued: February 24, 1983

This addendum includes information of the TS 806/20 new slimline
floppy drive and the new software installation procedure for the
system. This software procedure replaces pages 3-3, 3-4, 3-5,
and 3-6 of the manual.

The floppy drive illustrated in the TS 806/20 Computer System
Installation and User's Guide is not the drive that is now shipped
with the system. The new slimline floppy drive is shown below.
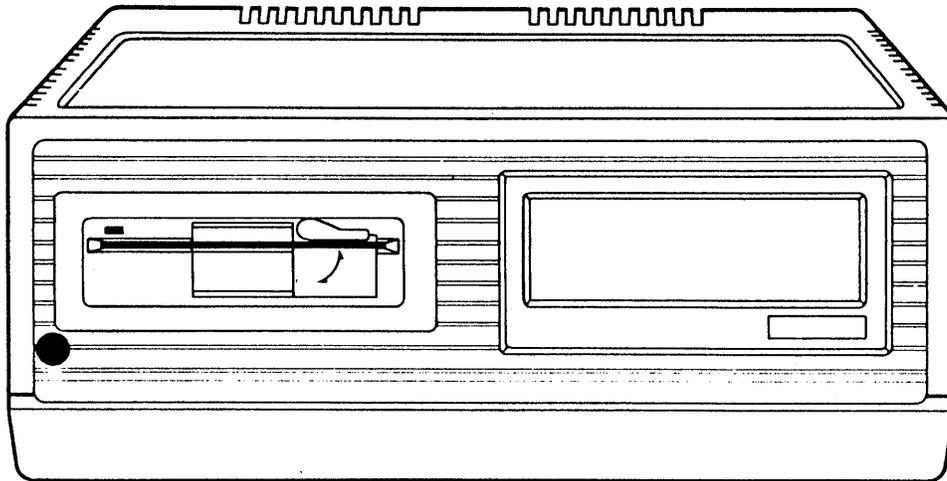
TS 806/20 Computer System

To open the slimline floppy drive, turn the latch up to a
horizontal position. To close the drive, turn the latch down to
a vertical position.

All floppy drive storage capacity and diskette format specifica-
tions listed in the TS 806/20 manual are applicable to this
drive.

3.2.3 Procedure for Installing CP/M and MmmOST

When setting up your system, you must install CP/M and MmmOST from
diskette onto the hard disk.

STOP!

**WHEN YOU BOOT THE TS 806/20, YOU WILL FIND SOFTWARE INSTALLED ON THE
HARD DISK. DISREGARD THIS SOFTWARE AND INSTALL THE NEW SOFTWARE
CONTAINED ON YOUR SYSTEM DISKETTE.**

After the initial installation, you should not have to repeat
this procedure unless you have problems with the hard disk.

To install CP/M and MmmOST onto the TS 806/20's hard disk from the
TS 806/20 system diskette, follow the steps listed here. All user
responses are shown in bold print.

NOTE!

The system boots alternately from the hard disk and the
floppy diskette. The source of the boot will be specified in the
system message. The drive which is the source of the boot will
be considered by the system to be logical drive A until the next
boot.

1. Connect a service processor terminal to the pin connector
    labeled **TERMINAL** on the back of the TS 806/20.

2. Turn on the TS 806/20 and the service processor terminal and
    wait 15 seconds.

3. Insert the diskette into the floppy drive, and close the
    drive door.

4. Push reset and wait 10 seconds.

5. If the system does not boot from the floppy drive, push reset
    again until it does.

6. The system will respond with a page of instructions,
    followed by a system prompt (A>).

7. Enter

    SUBMIT BUILDDSK<CR>

8.   Look for the following system response:

A> HDFORMAT
Hard Disk FORMAT
TeleVideo Systems, Inc. Vers. 1.3

***CAUTION; ALL DATA ON THE INTEGRAL HARD DISK WILL BE
DESTROYED***
TYPE RETURN WHEN READY (ESC OR CTRL-C TO ABORT)

9.   To continue with the installation, press

<CR>

10.   Look for the following response:

FORMAT on drive 0 at Cylinder = XXX, Head = Y, Sector = 00,
Count = 1

where

XXX is any value between 000 and 305

 Y is any value between 0 and 5

11.   Look for a possible message saying

FORMAT ERROR on Cylinder xxx, head x, sector x

If this message appears, you will see the total number of
errors given at the completion of HDFORMAT:

TOTAL FORMAT ERRORS XX

If the total is less than 50 and none of the errors occurs on
cylinder (head) 0 or 1, proceed to Step 12.

If the total is 50 or more, call your distributor or dealer.

12.   Look for the following message to appear. This message
should appear in approximately ten minutes if FORMAT encoun-
ters no errors.

FORMAT Complete
A>FIXDISK B:
FIX DISK PROGRAM VER X.0
CURRENT SCANNING BLOCK: XXXX

where

XXXX is a changing value from 0000 to 1835

NOTE!

> If there are any bad sectors, the sector numbers will be
> displayed on the screen and stored in FILE.BAD, stored on
> the system A directory under CP/M User 15.

13. Look for the following message to appear:

    ```
    FIXDISK COMPLETED WITH YYYY DATA BLOCK ERROR
    A>FIXDISK C:
    FIX DISK PROGRAM VER X.0
    CURRENT SCANNING BLOCK:  XXXX
    ```

    where

    XXXX is a value from 0000 through 1835
    YYYY is the total number of sectors with bad areas

    The message will appear in approximately seven minutes if
    FIXDISK encounters no errors.

14. Add up the total data block errors (YYYY) from FIXDISK
    B: and FIXDISK C: (Steps 12 and 13). If there are more than
    50 total data block errors, re-run the program SUBMIT BUILDDSK.
    If you are unable to run the program with less than 50 errors
    after five tries, call your distributor.

15. After you successfully run HDFORMAT and FIXDISK B: and C:
    with less than 50 errors, you are ready to install CP/M on
    the hard disk.

    Look for the following message:

    ```
    A>;Type RETURN when ready to continue
    A>PIP
    *
    ```

16. Press

    <CR>

    to continue the installation. At this point, you must press
    a <CR> so the submit program will install the CP/M files on
    the hard disk.

SER → RUN SCANDUP Now "THIS IS CRITICAL"
    REFER TO Page 6-14

17. Look for the following message:

```
; MAKESYS INSTALLS CPM ON THE FIRST LOGICAL HARD DISK
; TYPE 'C' FOR DESTINATION DRIVE
; TYPE 'TS6BOOT.COM' FOR BOOTSTRAP FILE NAME
; TYPE 'CPM60.COM' FOR BDOS FILE NAME
; TYPE '806BIOS.COM' FOR BIOS FILE NAME
  MAKESYS VER x.y
  Destination Drive?
```

18. Enter

    C<CR>

19. System will display:

    Bootstrap Filename (Or RETURN To Skip)

20. Enter

    TS6BOOT.COM<CR>

21. System displays

    BDOS Filename (Or RETURN to Skip)

22. Enter

    CPM60.COM<CR>

23. System displays

    BIOS Filename (Or RETURN to Skip)

24. Enter

    806BIOS.COM<CR>

25. System displays

    ```
    MAKESYS Completed
    A>PIP B:=A:*.*[VO]
    COPYING
    ```

    (Several file names will follow.)

    ```
    A>PIP C:=A:*.*[VO]
    COPYING
    ```

    (Several files names will follow.)

26. System displays

    TO INSTALL THE MmmOST OPERATING SYSTEM SOFTWARE:

    1. RESET THE SYSTEM, WHICH WILL THEN BOOT FROM THE HARD DISK
    2. REMOVE THE DISKETTE FROM THE FLOPPY DRIVE
    3. INSERT THE MmmOST SOFTWARE DISKETTE LABELED 'DISK 1 OF 2'
    4. TYPE: SUBMIT COPYMST

27. Press the reset button.

28. Remove the system diskette from the floppy drive.

29. Insert the first MmmOST floppy diskette labeled "DISK 1 OF 2"
    in the floppy drive and close the drive door.

30. Enter

    SUBMIT COPYMST<CR>

31. Look for the following series of messages to appear:

    ; MmmOST SOFTWARE INSTALLATION SUBMIT FILE (FOR TS-806/20)
    ; COPIES ALL FILES FROM THE MmmOST DISKETTE LABELED
    ; 'DISK 1 OF 2' TO THE HARD DISK DRIVES A: AND B:
    PIP A:=C:*.*[VO]
    PIP B:=C:*.*[VO]

32. Several file names will follow. The screen will then display:

    ; REMOVE THE DISKETTE FROM THE FLOPPY DRIVE
    ; IF YOU ▓▓▓▓▓ HAVE 16-BIT USER STATIONS, PRESS RESET TO
    ; ACTIVATE THE MmmOST OPERATING SYSTEM
    ;
    ; IF YOU DO HAVE 16-BIT USER STATIONS,
    ; INSERT THE MmmOST DISKETTE LABELED 'DISK 2 OF 2' INTO THE DRIVE
    ; AND PRESS 'RETURN' WHEN READY TO CONTINUE
    ; PIP

33. If you have only 8-bit user stations, you do not need to copy
    the files on the second MmmOST diskette. Press the reset
    button to activate MmmOST. User stations are now operable.

34. If you have 16-bit user stations and 8-bit user stations,
    insert the MmmOST diskette labeled "DISK 2 OF 2" into the
    floppy drive. **Press**

    <CR>

    to copy the files on this diskette to the hard disk.

35. The following messages will be displayed:

```
PIP A:=C:*.*[VO]
PIP B:=C:*.*[VO]
A>PRESS RESET TO ACTIVATE THE MmmOST OPERATING SYSTEM
```

36. Press the TS 806/20 red reset button twice or type MMMOST<CR>. This will activate the MmmOST program.

3.2.4 System Message

Once you have installed CP/M and MmmOST, the service processor terminal will display a system message whenever the TS 806/20 is cold booted (turned on or reset). Figure 3-3 illustrates the system message.

```
TeleVideo Systems TS 806/20 V X.X
xxK CP/M Vers. x.x
Tandon TM-603s Winchester

MMMOST
authorized dealer:   TVInc  license:   XXXXXXXX
MmmOST Vx.y
(C) 1982 TeleVideo Systems TS-806/20   XX/XX/XX ver. x.y
```

Figure 3-3 Service Processor Terminal System Message

Table 3-1   Hardware Error Abbreviations

Abbreviation	Description
DMA	Direct memory access controller
CTC	Counter timer circuit
SIO #1	Serial I/O controller
SIO #2	Serial I/O controller
WDC	Winchester disk controller
FDC	Floppy disk controller

If you see this message, push the reset button once or twice. If the message still appears, call your dealer or distributor. If you are unable to see the system message or the hardware error message, or if you see obviously incorrect or garbled information, refer to Chapter 7, Maintenance and Troubleshooting.

OPERATING THE USER STATIONS

.1   **INTRODUCTION**

Your user station may be one of many user stations connected to the service processor. In most ways your user station operates as it would in a single-user system. This chapter explains how to use your user station in the multiuser environment and take advantage of the many features offered by the system.

.2   **TURNING ON THE USER STATION**

Before operating your user station, you must be sure the TS 806/20 is turned on. To verify that the TS 806/20 is on, turn on your user station and look for this message:

TeleVideo CP/M VX.X
DISTRIBUTED PROCESSOR VX.Y
Proc. ID XX < = > Y
A>

Whenever you see this message after cold booting your user station, you will know the TS 806/20 is also turned on.

The A> is called the **prompt.** Prompts vary from one computer system to another but almost always indicate that the operating system is ready for your response. While you are using an application program, you may see a different prompt symbol; this will be explained in the application program instructions.

.3   **TYPES OF DRIVES IN THE MULTIUSER ENVIRONMENT**

.3.1   **Physical and Logical Drives**

The hard disk drive and the floppy disk drive of the TS 806/20 are physical objects and are called **physical drives.**

The physical hard disk is divided into imaginary drives. These drives are called **logical drives.** A logical drive does not have any physical qualities (as opposed to the hard disk and floppy disk drives). A logical drive serves as a recognizable area of the hard disk on which the computer can store and organize information.

The number of logical drives may vary from computer to computer. The TS 806/20 hard disk has two logical drives; they are designated A and B. The logical drive designation for the floppy disk drive is C.

You can tell which logical drive is being used (is active) by looking at the letter before the prompt (i.e., A>). For example, B> would mean that drive B is active.

Table 4-1 illustrates the logical drive designations and their corresponding physical drives in a multiuser environment. These designations can be changed later; refer to MmmOST Programmer's Manual.

4. OPERATING THE USER STATIONS

Table 4-1 TS 806/20 Logical and Physical Drives

Logical Drive	Configuration When Shipped*	Corresponding Physical Drive
A	Private	Hard disk
B	Public (Shared)	Hard disk
C	Public Only	Floppy disk
M,N O,P	Local	User stations' physical drives (hard disk and/or floppy disk drives)

Note
*See 4.3.2 for explanation of private and public.

Whenever you cold boot your user station, you automatically access drive A. This is called the **default drive** since it is accessed in the absence of other instructions.

It is important to correctly identify logical drives when using CP/M commands and utility programs.

The capacities of the TS 806/20 logical drives are shown in Table 4-2.

Table 4-2 Logical Drive Capacities

Logical Drive	Approximate Formatted Capacity*	Maximum Directory Entries
A	7.328	2048
B	7.344	512
C	0.342	64

*In megabytes (millions of bytes)

Each user station can access logical drives A, B, and C. If the user station has a storage device of its own, the logical drive designations for those physical drives will be M, N, O, or P.

4.3.2 Private and Public Drives

A private drive is a logical drive on which each user station has its own private area to store and access information. A public drive is a logical drive to which all user stations have access.

When the MmmOST system diskette is shipped, logical drive A is designated as a private drive and drives B and C are public drives. CP/M and MmmOST are stored on drive A. CP/M and MmmOST programs and commands are located on public drive B.

Public drive B has the capacity of containing files that are shared. Shared files are those to which several users may write simultaneously. This does *not* mean that a user may write to the same *record* (a single listing of information in a file; i.e. one employee's information in a company's payroll file) at the same time as another user. However, by using shared files, the second user does not have to wait until the first user completes all updates to the whole file. Rather, as soon as the first user completes updating a record, the second user may read the updated record and use it.

For more information on public and shared files, refer to the MmmOST Programmer's Manual.

3.3 Private and Password Directories

Logical drive A contains six **private default directories** (one for each user station) and ten **private password directories.** These directories can be reconfigured; refer to the MmmOST Programmer's Manual.

A private default directory is the area which is accessed by a particular user station when it is first turned on (unless the operator had previously logged onto another directory). A private password directory is a directory accessible only when a password is entered. You can access a password directory from any user station attached to the TS 806/20. A password can, if desired, be assigned to a private default directory. This would allow you to access your default directory from either your user station or from any user station (using the assigned password).

Each password directory has a preassigned password when MmmOST is shipped; these can be changed. Refer to the MmmOST Programmer's Manual.

4 BOOTING THE USER STATION

You can warm boot the user station by pressing ∧C when it is the first character entered in response to a system prompt and in applications programs when allowed.

If you are not familiar with the term "boot," refer to 3.2.2.1.

5 OPERATING UNDER MmmOST

When you are operating in a multiuser environment using MmmOST, you will notice a few differences in the methods used to access directories and to print files. The next sections describe how to perform those functions using MmmOST.

5.1 Accessing Directories

When you turn on your user station (providing the TS 806/20 has already been turned on), you will see the following display:

TELEVIDEO CP/M VX.X
DISTRIBUTED PROCESSOR VX.Y
Proc. ID XX < = > Y
A>

As explained in 4.2, the A> is a prompt which tells you that the user station is accessing logical drive A. To change to a different logical drive, enter the letter designation for the drive you want, followed by a colon and <CR>.

For example, if you are on logical drive A and want to access drive B:, enter

B:<CR>

You will see the following display:

B>

4.5.2   Calling Up a Directory

To call up a directory, enter

       dir<CR>

in response to the system prompt.

If you want a directory on a different logical drive, enter

       dir [drive:] <CR>

where:

       drive: is the drive on which the directory you want to access is located.

If the user station is turned off and then on, while the TS 806/20 continually operates, the user station will access the directory it was in prior to being turned off. For example, if the user station was in a password directory when turned off (and the TS 806/20 remained on), it will access the same password directory when turned on again. Likewise, if the user station was in its default directory when turned off (and the TS 806/20 was still on), it will access that default directory when turned on again.

To find out which directory the user station is in when turned on, call up a directory. By looking at the directory file names you created, you can tell which directory you are accessing. If you discover your user station is in a private password directory, enter

       LOGON <CR>

to change to the private default directory.

For more information on using the CP/M command DIR (calling up a directory) and on accessing different drives, refer to the Digital Research CP/M User Manual.

4.5.3   Using LOGON

To access your private password directory, you will use a program called **LOGON.**

When the system is shipped, LOGON is stored on public drive B. (The program can be moved to your private default or password directory through the CP/M program PIP). To locate LOGON, you can use the normal CP/M dir command.

To use LOGON, enter one of the following commands

       [drive 1:] LOGON [drive 2:] [password] <CR>

               or

       [drive 1:] LOGON [drive 2: or *:] <CR>

where:

       [drive 1:] is the logical drive on which LOGON is stored (if it is not on the drive which you are currently accessing)

       [drive 2:] is the drive on which the directory or file you want to use is stored. If you enter both drive 2 and a password, you will have access to drive 2 only if your password is valid for a directory on that drive.

If you do not specify drive 2, you will have access to directories or files on all private directories on all drives that contain directories for which that password is valid.

If the second form of the LOGON command is entered (drive or asterisk), do not enter a password. You will be prompted

*

by the system.

After you see this prompt (*), enter your password. Your password will not be displayed on the user station screen as you type it. (Deletions are not allowed.) This method allows you to keep your password a secret from bystanders.

The system will respond:

End of Execution
A>

To determine if you have accessed your password directory, enter

DIR <CR>

The system will respond by displaying the file directory of your private password directory.

For example,

you are currently on drive B

LOGON is on your default directory on drive A

you wish to access your password directory which is named PERSONAL and is on drive A:

Your entry would be as follows:

A:LOGON PERSONAL <CR>

or

A:LOGON [A: or *:] <CR>

You will see the following display if you successfully executed LOGON:

End of Execution
A>

You enter

DIR <CR>

You will now see your password directory named PERSONAL which is on drive A.

Until you create your private default and password directories by creating and storing files, you will not see a list of files on those directories. The space for that directory is there, but since no files have been stored yet, the display will respond with NO FILE when you try to call up a directory.

△

If you enter incorrect information when executing LOGON (such as incorrect password/drive association or an invalid password) or if you try to access a password directory when it is already in use, you will see this message in response to the LOGON command:

Unsuccessful
End of Execution

Check your input, make necessary corrections, and re-enter the LOGON command.

4.5.4   Directory Configurations

When shipped, the TS 806/20 logical drive A provides for six private default directories and ten private password directories. These configurations can be changed through the MmmOST program GENPARMS; refer to the MmmOST Programmer's Manual.

Possible directory configurations include the following:

1.   User has only a private default directory.

2.   User has a private default directory and a separate password directory.

3.   User has only a private default directory which has been assigned a password.

4.   User has a private default directory (which has been assigned a password) and a separate password directory.

Assigning a password to your default directory allows you to access that directory from any user station attached to the TS 806/20.

4.6   WORKING WITH MmmOST

MmmOST is a special program which works with CP/M and enables multiple users to share applications programs, peripheral devices (such as printers), and the hard disk. (Refer to the MmmOST Programmer's Manual for more detailed information.)

When the TS 806/20 is turned on or reset, MmmOST is loaded into its memory. When a user station is also turned on, CP/M is loaded into the user station's memory from the TS 806/20. At this point, you will see the user station message

    TeleVideo CP/M VX.X
    DISTRIBUTED PROCESSOR VX.Y
    Proc. ID XX < = > Y
    A>

4.6.1   Printing With MmmOST

MmmOST allows users to share a printer connected to the TS 806/20. When you want to print a file, you can use any of the following commands:

1.   CP/M PIP

2.   CP/M ∧P

3.   A word processing applications program print command (e.g., **p** in WordStar)

When a user enters one of these print commands while using MmmOST, a delay will occur before the desired file is actually printed out. This delay is due to the print spooling process which occurs within MmmOST. **Print spooling** is the process in which a temporary file is created to store the data before it is printed. This temporary file is called the **print spool file**.

The printer prints the contents of the print spool file in the sequence in which the files are received. If another user has sent text to the print spool file before you did, his text will print out first. Print spooling under MmmOST works on a first-come, first-served basis.

I.6.1.1 **Using PIP to Print**—To print using the CP/M PIP command, enter the following in response to the prompt:

PIP LST: = <**source drive:**>**file name** <**CR**>

where:

LST: is the designation of the logical printer device

<source drive:> is the logical drive on which the file is presently located

file name is the name of the file to be printed

Refer to the Digital Research CP/M User Manual for more information on PIP.

I.6.1.2 **Using ∧P to Print**—To print a file using the CP/M command ∧P, enter ∧P followed by another command (such as TYPE or DIR). These commands tell the system what to print. For example, if you want to print a file while "typing" it, enter

∧PTYPE <file name> <CR>

△

∧P will not be displayed on user station terminal screen.

Once a ∧P is given along with another command, the print spooling process starts creating the temporary print spool file. You will see the file on the user station screen. When you come to the end of the file or text to be printed, enter another ∧P. This second ∧P will send the print spool file to the printer, and the printing process will begin.

Refer to the Digital Research CP/M User Manual for more information on ∧P.

I.6.1.3 **Using Print Command in a Word Processing Program**—To print a file using a word processing applications program such as WordStar, use the print command in that program. Once you have entered the command and answered program-prompted questions, the temporary spool file is created. At this point, you will probably see the main word processing menu on the screen.

To begin the actual printing process, you must warm boot the system using the appropriate "exit to system" command (i.e. ∧X in WordStar).

△

Remember, there will be a delay between the moment the first print command is entered and when the actual printing begins (due to print spooling). This applies to each example (PIP, \P, and word processing print command) in this section.

For additional printing features, refer to the MmmOST Programmer's Manual.

5.   OPERATIONAL GUIDELINES

5.1   INTRODUCTION

This chapter will describe procedures which can prevent damage to your diskettes and possible loss of data.

5.2   FLOPPY DISKETTES

Floppy diskettes provide additional storage space for the TS 806/20 user. Applications programs, text, data, and programs which operate the system can be stored on diskettes. User stations attached to the TS 806/20 can access the floppy diskette contained in the floppy disk drive by referring to drive C. Once the user has accessed drive C, all read and write functions can be performed on files contained on the floppy diskette.

5.2.1   Inserting a Floppy Diskette

To insert a floppy diskette into the floppy drive, put your finger under the doorhandle of the drive and open it gently.
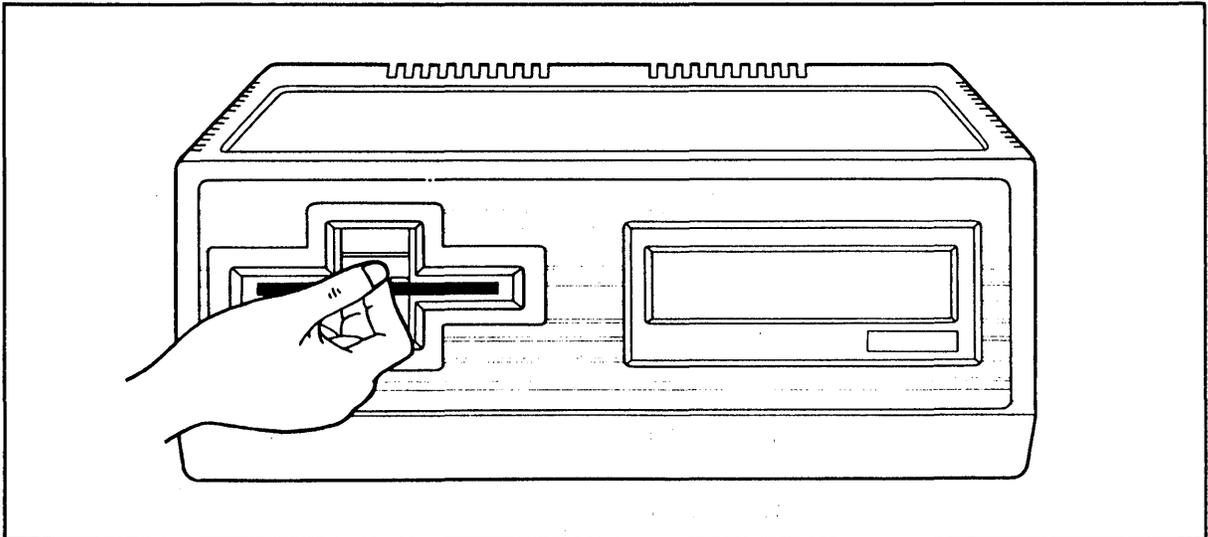
Figure 5-1   Opening Floppy Drive Door

△

BEFORE TURNING POWER ON OR OFF, ALWAYS MAKE SURE THE DRIVE DOOR IS OPEN. When power is turned on or off, the power may surge, damaging information stored on the diskette or the diskette itself. If the drive door is open, the disk head is away from the diskette surface.

Take the diskette out of its white paper jacket. Hold the diskette by the edge of the black plastic cover.
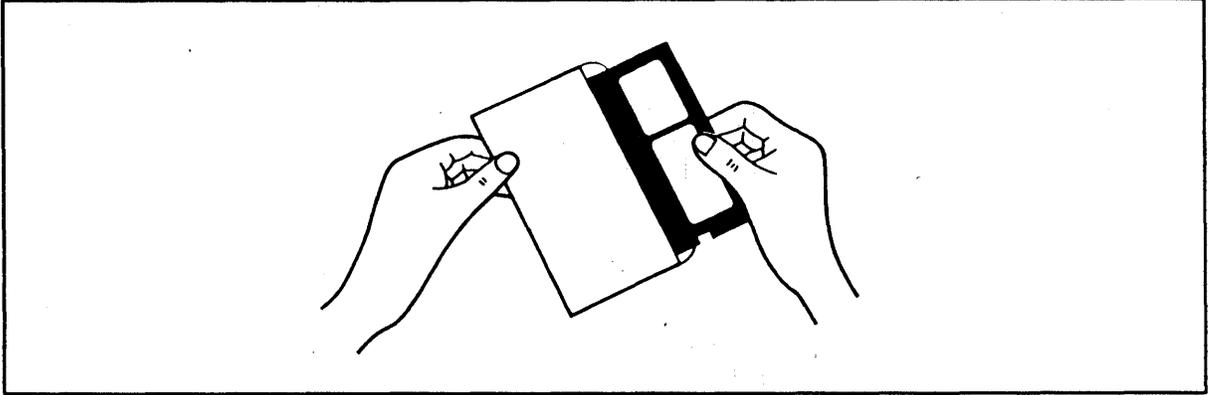
Figure 5-2   Removing Diskette from Jacket

△

Avoid touching the surface of the diskette (which shows through the openings on the cover) with your hands or the diskette may be damaged.

The small notch which is cut out of one side of the diskette near the label allows the disk head to write on the disk.
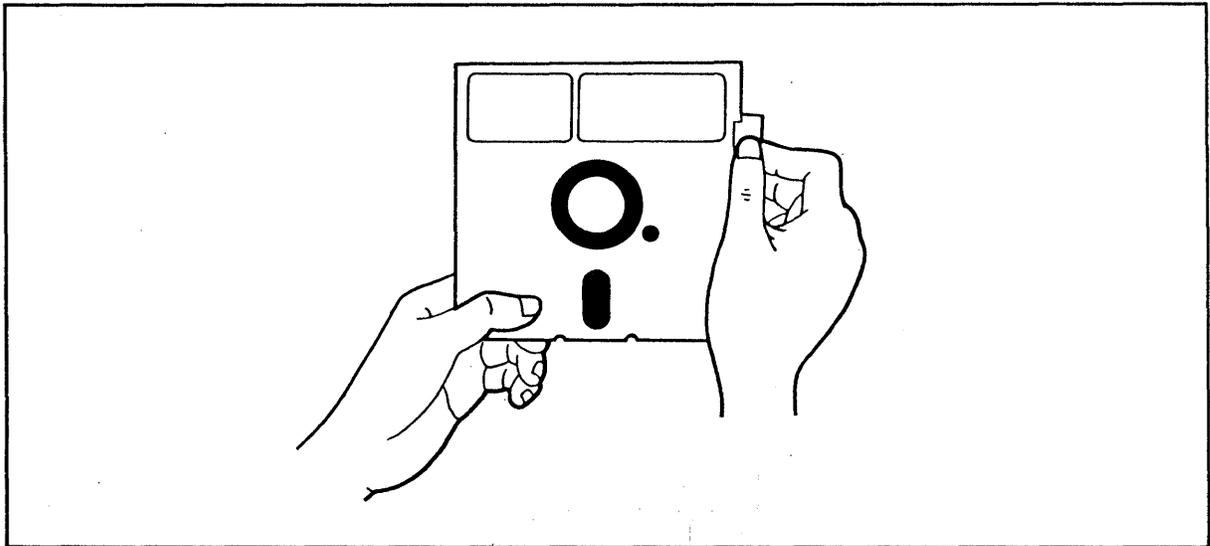
Figure 5-3   Write-Protecting Diskette

When the notch is covered, the write mechanism is not allowed to function and information on the diskette cannot be overwritten accidentally. Put a Write-Protect tab (furnished with each package of blank diskettes) over the notch on the system diskette. (Refer to 5.3 where Write Protection is discussed.)

Turn the diskette so the label is near you and facing up and the notch is on the left side.
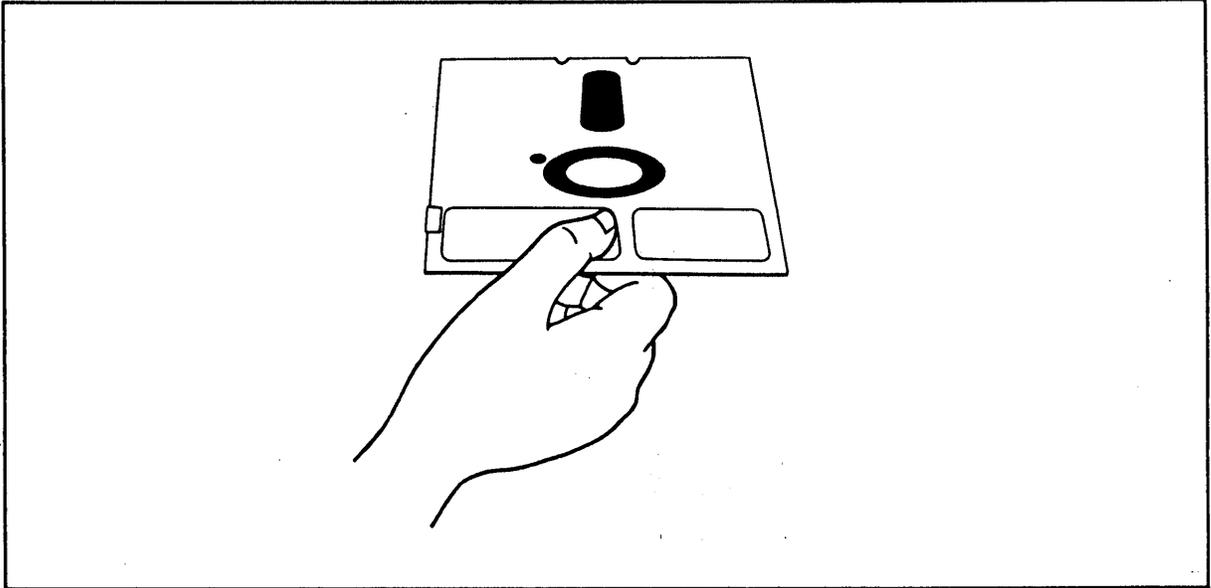
Figure 5-4   Holding Diskette Before Insertion

Hold the diskette level, with the notch on the left side and the oblong hole in the diskette cover towards the back of the diskette. Insert it in the opening of the floppy drive. Using the tip of your finger, push it gently in the rest of the way.
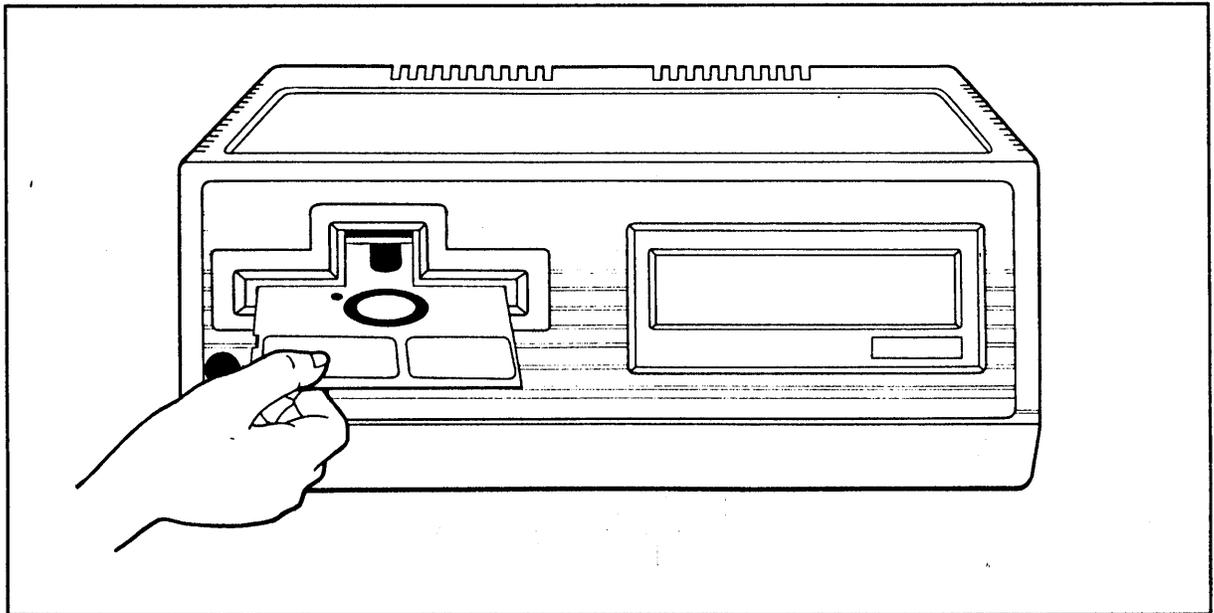
Figure 5-5   Inserting Diskette in Floppy Drive

△

If the diskette seems to catch slightly, pull it out slightly and push it in gently again. DON'T FORCE IT IF IT RESISTS.

Close the drive door slowly.

5.2.2   Formatting

Your hard disk and the system diskette contain a utility program called **FORMAT**, described in Chapter 6. This program superimposes messages on your blank diskette which serve as reference points for the system later. During formatting, any data already on the diskette is erased and the diskette is prepared for new data. The diskette is divided up into **tracks** (very much like grooves on a phonograph record) and then again into wedges called **sectors.**

Since each computer system has its own format requirements, blank diskettes are not formatted by diskette manufacturers. Before you can use a new diskette, you must first format it for your system. Diskettes formatted on a TeleVideo system can be used on any TeleVideo floppy-disk system.

ROTATION

SECTOR

MOVING HEAD
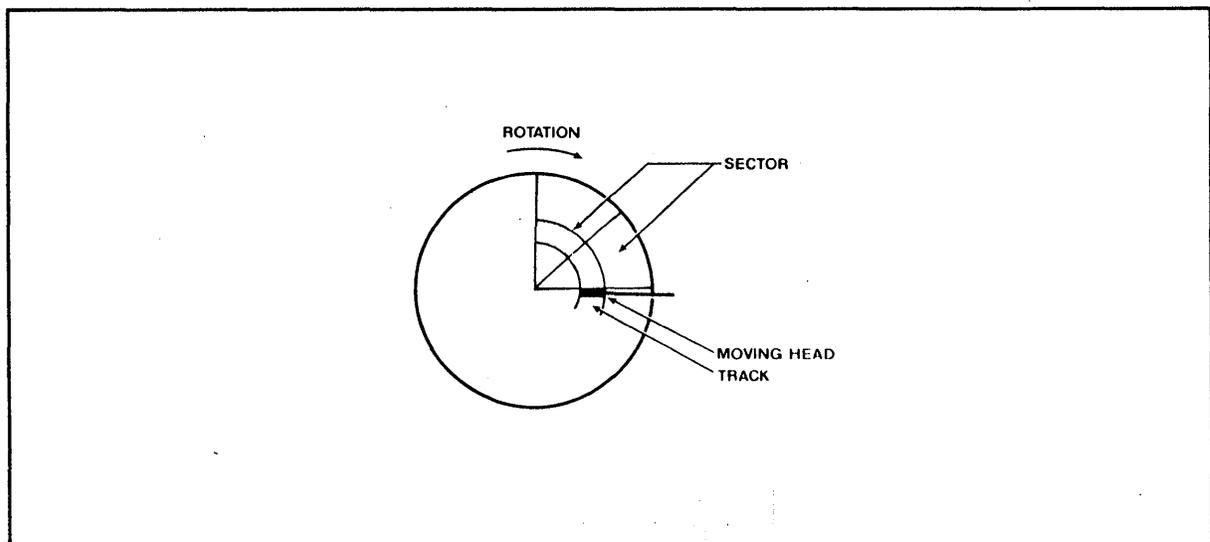
TRACK

Figure 5-6   Diskette Tracks and Sectors

Detailed instructions on using the utility program FORMAT can be found in Chapter 6.

5.2.3   Caring for Diskettes

Although diskettes look sturdy, they can be easily damaged by scratches, fingerprints, magnetic fields, or liquids. If the diskette is damaged, the system can no longer *read* the diskette. This section explains how to handle and store diskettes so their useful life is prolonged and the data stored on them protected.

5.2.4   Handling Diskettes

Each diskette arrives in a white paper jacket. *Do not discard this paper jacket, as it protects the diskette, prolongs its life and ensures the accuracy of the information on the diskette.*

Although you can see parts of the diskette through openings in the black cover, NEVER touch the magnetic surface of the diskette itself. Objects touching the surface can cause scratches, and oil from your skin can damage the surface. Whenever the diskette is not in the drive, keep it in the white paper jacket; otherwise the normal dust and chemicals in the air will shorten its life expectancy.

The diskette is encased in a black plastic cover. NEVER try to remove the black plastic jacket. This jacket contains cleaning agents and lubricants which prolong the life of the diskette.

Even with the black jacket around the diskette, the diskette can be damaged. Anything which creases, mutilates, or distorts the surface of the diskette (e.g., paperclips, staples, and ballpoint pens) will keep it from operating correctly later. *You will prolong the life of your diskettes if you follow these rules:*

NEVER attach anything to the diskette with paperclips or staples.

NEVER fold or mutilate the diskette.

Write on the diskette label only with a soft felt-tip pen. Press lightly. (Better yet, write on the label BEFORE putting it on the diskette.) NEVER write on the diskette label with a pencil or ballpoint pen or while the diskette is under your writing surface.
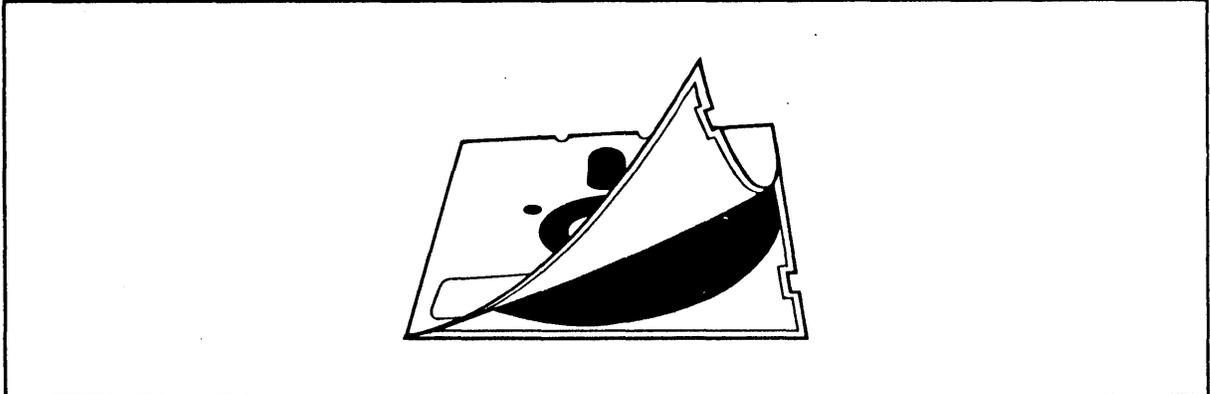
Figure 5-7   Diskette and Protective Lining Inside the Protective Black Plastic Enclosure

The diskette can also be damaged by careless handling. Hold the diskette GENTLY by the corners or on the edge. DO NOT BEND IT! (Think of the diskette as a photographic negative where you must hold it by the edges to avoid putting fingerprints on it.)

After the diskette is inserted in the drive, close the door slowly.

5.2.5   Storing Diskettes

Store diskettes in an UPRIGHT position in one of the excellent dustfree containers available on the market. Keep this container in a cool place. Diskettes left in direct sunlight or in a hot area (such as a hot car) even for a short time can warp. If this happens you may not be able to retrieve the data.

Diskettes are made of magnetically-treated mylar. Even temporary exposure to magnetic fields can erase the data. Magnetic fields are around many items commonly found in an office environment, such as:

> Telephones
>
> Magnetic paperclip holders
>
> Typewriters
>
> Adding machines
>
> Television sets

Even the bell in a telephone can damage the diskette if the telephone is resting on the diskette when the telephone rings.

As soon as you remove a diskette from the drive, put it back in the white jacket and in the storage container. If you need to ship diskettes, you can purchase special mailing protectors.

5.3   WRITE PROTECTING DISKETTES

When information is copied onto a diskette, it may erase or superimpose new data on the information originally there. If the information on a diskette is particularly important, you may want to protect it against accidental erasure by *write-protecting* the diskette.

To write-protect a diskette, place one of the silver self-adhesive tabs which are supplied with blank diskettes over the notch on the side of the diskette. When you want to remove the protection, just remove the tab from the diskette.
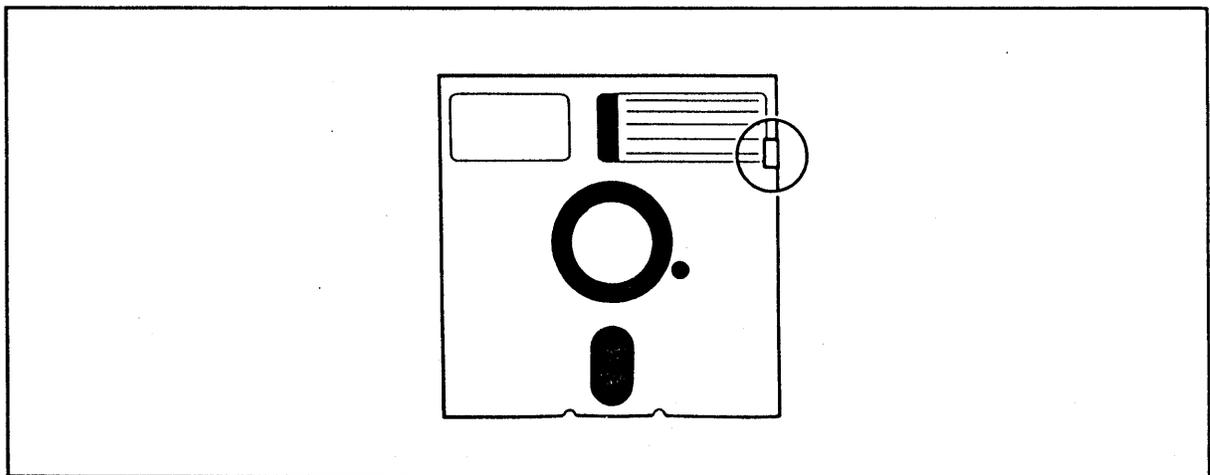
Figure 5-8   Write-Protected Diskette

5.4   BACKING UP THE HARD DISK

When diskettes work perfectly and you don't accidentally erase or change data, it is perhaps difficult to understand why back-up diskettes are necessary. However, accidents do happen and diskettes do eventually wear out. To protect your investment of time and effort, learn to make a back-up copy of each file on a regular basis using the CP/M utility program PIP or COPY-FILE (Chapter 6).

You will have to decide for yourself how often this should be done. If, for example, you are doing extensive text editing, you may want to make a back-up just before lunch and again before going home. Or perhaps only one back-up per day is sufficient.

Follow a regular system for backing up your files. One of the more common methods uses one or two back-up copies (on floppy diskettes) of files on the hard disk.

Of all the habits which you can develop as a computer user, probably the careful handling of diskettes and the faithful backing up of data are the most desirable.
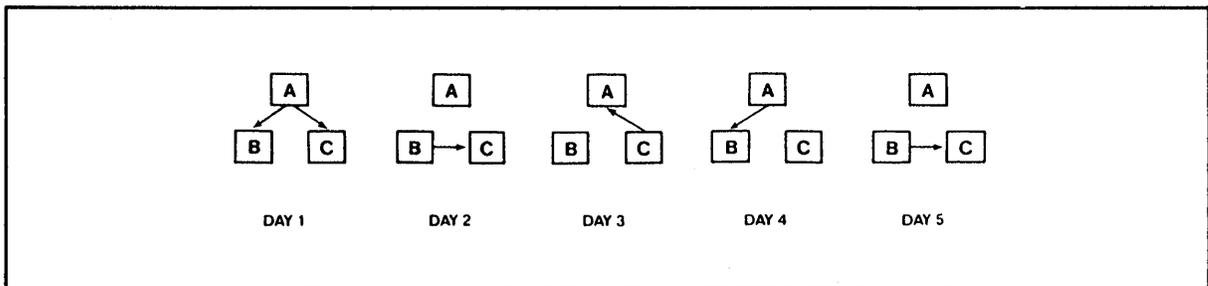
Figure 5-9   Typical Back-up System

5.5   WORK HABITS

When working near the system, do not remove staples or leave paperclips, food, or beverages on or near the system. Foreign objects (such as staples, paperclips, and liquids) which get inside the system are the most common causes of computer failure.

Contamination of the system by foreign objects will be considered neglect under the terms of the limited warranty.

5.6 SUMMARY OF GOOD PRACTICES

1. Handle diskettes gently and store them in a cool, protected environment. Always keep them in the paper jackets and in the storage container when not in use.

2. Do NOT open the drive door while the system is executing a program unless the program or instructions tell you to do so.

3. Open the drive door BEFORE turning the system off or on.

4. Make a back-up copy of all updated files at least once a day (e.g., before you go to lunch or home).

5. Do not eat, smoke, drink, or remove staples near the system.

6. Use the original system disk only as a source for copies.

6. UTILITY PROGRAMS

6.1 INTRODUCTION

This chapter describes the system maintenance utility programs for the TS 806/20. Certain utility programs are executed from a service processor terminal only while others can be executed from a service processor terminal or a user station.

6.2 USING THE UTILITY PROGRAMS

Included on your system diskettes are several utility programs. These programs are used to maintain your system.

6.2.1 General Instructions for Utility Programs

To run any of the utility programs listed in Table 6-1, you must connect a service processor terminal, bypass the MmmOST software, and operate only under the CP/M operating system. Once MmmOST is bypassed, connected user stations and their peripheral devices are inoperable.

The utility programs that can be run from a user station or a service processor terminal are COPYFILE and GENPARMS. (GENPARMS is described in the MmmOST Programmer's Manual.)

Table 6-1   Utility Programs Run from a Service Processor Terminal*

FORMAT	HDFORMAT
SCANDUP	CNFG86
FIXDISK	CNFUSER
PARK32	SYSGEN

Note
*These utilities can be run only from the service processor terminal. During the time utility programs are being run (executed) on the service processor terminal, the user stations cannot be used.

Follow these steps before you execute a utility program from a service processor terminal:

1. Enter a ∧C on the service processor terminal. (This warm boots the TS 806/20 and bypasses MmmOST.)

2. Look for the following message on the service processor terminal screen:

    End of Execution
    A>

3. Run the utility program as directed in the program description.

4. After all utility programs are run, press the reset button or enter

    MMMOST<CR>

    after the system prompt to restore MmmOST. User stations are now operable after a warm boot.

Table 6-2 shows the format used in the utility program descriptions.

6. UTILITY PROGRAMS

Table 6-2   Utility Program Format

UTILITY	Name of the program, model(s) with which it is compatible, configuration required, version number, release date, and copyright information.
PURPOSE	Description of what the utility is used for and tells when and how it should be used.
EXECUTION	Detailed explanation of how to call up the program and how to respond to each screen prompt.
COMMENTS	Additional useful information provided.

The utilities in Table 6-3 are among those included on your system diskettes.

Table 6-3   Utility Programs

Name	Function
COPYFILE	Copies files from the hard disk to a floppy diskette and from a floppy diskette to hard disk. This utility can be run from the user stations.
FIXDISK	Scans the hard disk for bad sectors. When a bad sector is found, it is assigned to a **dummy file.** Dummy files stop the system from writing onto bad sectors. It is used in conjunction with SCANDUP.
FORMAT	Formats floppy diskettes.
HDFORMAT	Formats the hard disk.
PARK32	Used when the system is to be moved or shipped. Positions the head of the hard disk over cylinder 32; decreases the possibility of damage to the area on the hard disk where the system programs are stored.
SCANDUP	Scans the hard disk for duplicate directory entries created by FIXDISK and lists them so they can be deleted.
TOD	Allows you to set and examine the time and date for user stations. Time and date will appear on user station screens.

6.2.2   Utility Program Descriptions

The following pages contain descriptions of the individual utility programs. The programs are listed in alphabetical order.

UTILITY

COPYFILE
For TS 806/20
Configuration required: User station/service processor terminal
Version 2.0
Release date: February 1, 1982
Copyright 1982 TeleVideo Systems, Inc.

PURPOSE

COPYFILE copies files from the hard disk to floppy diskettes (file back-up) and copies files from floppy diskettes to the hard disk (file restore).

This utility allows you to back-up and restore files that are larger than the capacity of a single diskette. COPYFILE will divide the file into as many diskettes as necessary to complete the back-up operation. Likewise, COPYFILE will restore a file to the hard disk from several floppy diskettes.

During the back-up procedure, COPYFILE creates two files on the floppy diskette(s). The first file is called the **destination file**. It contains the data that is being copied (backed-up) to the floppy diskette. The second file is called the **status file.** COPYFILE uses the status file during the restoring process. The status file contains the original (source) file size, information which allows you to restore the data on several diskettes in the right order, and the password given to the file during the back-up procedure. The password identifies diskettes and the file to which they belong.

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COPYFILE can be executed from user stations or from a service processor terminal.

EXECUTION 1. Choose from two possible COPYFILE operations:

Function	Refer to
Back-Up Files (Hard Disk to Floppy Diskettes)	Step 2
Restore Files (Floppy Diskettes to Hard Disk)	Step 12

2. To back-up a file, enter

COPYFILE [source drive:filename] [destination drive:filename]<CR>

where

[source drive:filename] is a combination of the drive on which the file to be copied is presently located and the name of the file to be copied

[destination drive:filename] is a combination of the drive to which the file will be copied and the name of the file to be copied

For example:

COPYFILE a:prnt.com c:prnt.com

tells the system to copy the file prnt.com located on drive A (source drive or hard disk drive) to drive C (destination drive or floppy disk drive).

3. Look for the message

   TELEVIDEO SYSTEMS, INC.
   COPYFILE VX.X - YY/YY/YY

   PRESS RETURN WHEN FLOPPY DISK IS READY.

4. Insert a floppy diskette into the floppy drive.

5. Press

   <CR>

   and watch for the message

   PLEASE, ENTER PASSWORD: xxxxx

6. Make up a password pertaining to the file being copied. The password can contain up to sixteen alphanumeric characters. Enter

   the password<CR>

   and look for the message

   BACK-UP PROCEDURE? (yes or no)

7. Enter

   YES<CR>

   to start the file back-up program. Watch for the message

   COPYING FILE TO FLOPPY DISK

8. If the file is not larger than the capacity of a single diskette, you will see the message

   COPY COMPLETED

   followed by a system prompt. COPYFILE is now completed and your system is ready for your next command.

9. If the file is larger than the capacity of a single diskette, you will see the message

   FLOPPY DISK IS FULL, INSERT NEXT FLOPPY.

10. Insert the next floppy diskette and press

    <CR>

    to continue with the back-up program. Label each diskette by file name, password, and sequence (i.e. 1 of 3, 2 of 3, 3 of 3) for future use.

11. Watch for one of two messages: the message in Step 8 or the message in Step 9. Follow the designated procedures in either step.

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IF YOU RECEIVE AN ERROR MESSAGE, REFER TO TABLE 6-4.

12. To restore a file from floppy diskettes to the hard disk, enter

COPYFILE [source drive:filename] [destination drive:filename]<CR>

where

[source drive:filename] is a combination of the drive on which the file to be copied is presently located and the name of the file to be copied

[destination drive:filename] is a combination of the drive to which the file will be copied and the name of the file to be copied

For example,

COPYFILE c:prnt.com a:prnt.com

tells the system to copy file "prnt.com" from drive C (origin drive or floppy drive) to drive A (destination drive or hard disk drive).

13. Watch for the message

TELEVIDEO SYSTEMS, INC.
COPYFILE VX.X - YY/YY/YY

PRESS RETURN WHEN FLOPPY DISK IS READY

14. Insert the floppy diskette containing the file to be restored to the hard disk. If you have several diskettes containing the file (from the back-up process), insert the diskette containing the beginning of the file, press

<CR>

15. Watch for the message

PLEASE, ENTER PASSWORD: xxxx

16. Enter

the password<CR>

(given to the diskette during the back-up procedure)

17. Watch for the message

BACK-UP PROCEDURE? (yes or no)

18. Enter

NO<CR>

to begin the restoring process.

19. Watch for the mesage

COPYING FILE FROM FLOPPY DISK

20. If the file to be restored is contained on one floppy diskette, look for the message

COPY COMPLETED

followed by a system prompt. The system is now ready for the next command.

21. If the file to be restored is contained on several diskettes, look for the message

END OF FLOPPY DISK, INSERT NEXT FLOPPY

22. Insert the next diskette.

23. The next system message will be either the one in Step 20 or the one in Step 21. Follow the designated procedures.

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IF YOU RECEIVE AN ERROR MESSAGE, REFER TO TABLE 6-4.

Table 6-4   COPYFILE Error Messages

PASSWORD DOES NOT MATCH
SOURCE FILE PASSWORD IS "XXXXX"
PLEASE, ENTER PASSWORD:

This message may appear during the restore operation. It indicates that the password entered and the password in the status file are not the same. Check the inserted diskette and the password you entered; make sure they are correct. The correct password (the password the program was expecting) is listed in the string "XXXXXX."

FATAL VERIFY ERROR

This message indicates that COPYFILE detected a verify error during the restore operation. Probable cause of this error is a bad sector on the hard disk.

VERIFY ERROR
INSERT NEW FLOPPY DISK AND PRESS RETURN TO CONTINUE

This message indicates COPYFILE detected a verify error during the back-up operation. Insert a new floppy diskette to continue the program.

SOURCE FILE READ ERROR - (Return Code #)

The COPYFILE program was not able to read the source (origin) file because of the following possible reasons:

Return Code	Description
1	Reading unwritten data
2	Not possible on read
3	Cannot close current extent
4	Seek to unwritten extent
5	Not possible on read
6	Seek past physical end of disk

See the CP/M Manual for more detailed information.

Table 6-4   Continued

DESTINATION FILE WRITE ERROR - (Return Code #)

The COPYFILE program was not able to write to the destination drive file because of the following possible reasons:

Return Code	Description
1	(Not possible on write)
2	Unsuccessful write operation due to a full disk
3	Cannot close current extent
4	Seek to unwritten extent
5	New extent cannot be created due to directory overflow
6	Seek past physical end of disk

See the CP/M Manual for more detailed information.

DESTINATION FILE READ ERROR - (Return Code #)

This message indicates that the destination file was unable to be read for verification due to program error. The return code value is the same as Source File Read Error.

CANNOT FIND NEXT FILE, INSERT CORRECT FLOPPY

This message indicates that you inserted the wrong floppy diskette into the drive or the file has been deleted from the floppy. During a restore function, you may have inserted a diskette which was out of sequential order.

NO DIRECTORY SPACE

This message indicates that the COPYFILE program was not able to create a new file due to overflow in the directory space on the drive. If you are backing-up a file, insert a new diskette or erase old files on the one in the drive. If you are restoring a file, erase old files on the hard disk logical drive you are accessing or switch to the other logical drive.

CANNOT FIND PASSWORD FILE

This message indicates that you inserted the incorrect floppy diskette or that the status file is deleted from the floppy.

CANNOT WRITE FILE SIZE AND PASSWORD

This message indicates that the COPYFILE program was not able to write file size and password to the information file. The diskette may be full of information already.

CANNOT READ FILE SIZE AND PASSWORD

This message indicates that the COPYFILE program was not able to read the file size and password file.

CANNOT FIND SOURCE FILE

This message indicates that COPYFILE program was not able to find the original (source) file.

NO SOURCE FILE

When the command to run COPYFILE was given, no source parameter was given. Check your command and re-enter.

NO DESTINATION FILE

When the command to run COPYFILE was given, no destination parameter was given. Check your command and re-enter.

6.   UTILITY PROGRAMS

UTILITY	**FIXDISK** For TS 806/20 Configuration required: Service processor terminal Version 1.0 Release date: 4 September 1981 Copyright TeleVideo Systems, Inc. 1981
PURPOSE	**FIXDISK** inspects the hard disk for defective data areas. It builds a file called FILE.BAD containing the pointers associated with the defective data blocks. This file has a CP/M user designation of User 15 and the attributes of Read Only and System (no directory listing).
	FIXDISK can be used on any CP/M-compatible disk drive. The program should be run immediately after formatting or whenever a disk is suspected of having defective areas. During the execution of the program, no data is destroyed. Directory areas are not scanned.
	Run the program from the service processor terminal.
COMMENTS	While the program does not retrieve data which may already be on bad data blocks, it does prevent the system from using those areas for future data storage. This program is designed to be used in conjunction with the program SCANDUP. SCANDUP lists the files containing any resulting duplicate block pointers, allowing you to save and delete those files.

EXECUTION

USER: 1.   Enter

[drive]FIXDISK <drive name:> <CR>

([drive] is the drive on which FIXDISK is located if other than the currently active drive)

(<drive name:> is the specified disk drive to be checked. Use A: for drive A and B: for drive B, etc. If no drive is specified, FIXDISK will check the currently-selected disk drive.)

SYSTEM: 2.   Displays

FIX DISK PROGRAM VER X.Y
CURRENT SCANNING BLOCK:#____

3.   Displays the block numbers as they are scanned by the program.

4.   Displays

FIXDISK COMPLETED WITH xxx DATA BLOCKS ERROR

USER: 5.   Run the program SCANDUP if the number of defec tive data blocks is other than 0000 and if there were files on the disk before you ran FIXDISK.

6.   Press

∧S∧C

to abort the program any time during execution.

UTILITY

FORMAT
For TS 806/20
Configuration: Service Processor Terminal
Version 3.0
Release Date: September 1982
Copyright TeleVideo Systems, Inc. 1982

PURPOSE

FORMAT formats floppy diskettes. All new diskettes must be formatted before they can be used. Used diskettes containing data can also be formatted. If a used diskette is formatted, all data on the diskette will be erased; once formatted, the used diskette is ready for new data.

EXECUTION

🛑

FORMAT WILL OVERWRITE ALL DATA PRESENTLY ON THE DISKETTE; ANY FILES AND PROGRAMS ON THE DISKETTE WILL BE ERASED.

USER: 1.   Enter

[drive:]FORMAT<CR>

where

[drive:] is the drive FORMAT is located on if not on the active drive

SYSTEM: 2.   Displays

TELEVIDEO SYSTEM FLOPPY DISK FORMAT Vx.x

1. TS-801/802 AS STAND ALONE
2. TS-801/802 AS SATELLITE USERSTATION
3. TS-802H AS STAND ALONE/SATELLITE USERSTATION
4. TS-806/20
5. EXIT

Select system configuration option number

USER: 3.   Enter

4

SYSTEM: 4.   Displays

Insert a diskette into floppy disk drive
Press RETURN when ready. (ESC to abort.)

USER: 5.   Insert the diskette to be formatted into the floppy drive.

            6.   Press

<CR>

SYSTEM: 7.   Displays

formatting . . . .

Formatting Completed.

Insert a diskette into floppy disk drive
Press RETURN when ready. (ESC to abort.)

USER: 8.   Press

\<CR\>

to format another diskette

or

press

ESC

to end the program.

SYSTEM: 9.   Displays once ESC is pressed

End of Execution
A\>

UTILITY	**HDFORMAT**
	For TS 806/20
	Configuration required: Service processor terminal
	Version 1.0
	Release date: September 1981
	Copyright TeleVideo Systems, Inc. 1981

PURPOSE   **HDFORMAT** formats the hard disk. This program should be executed when you

a.   Install CP/M and MmmOST onto the hard disk

b.   Suspect the hard disk is malfunctioning

Bad sectors on the hard disk may be corrected by FIXDISK and SCANDUP. Run these programs before running HDFORMAT. If the hard disk still malfunctions after you have executed these programs, run HDFORMAT.

EXECUTION

🛑

HDFORMAT WILL OVERWRITE ALL DATA PRESENTLY ON THE HARD DISK. ALL FILES, PROGRAMS, AND OPERATING SYSTEM PROGRAMS WILL BE ERASED. BACK-UP ALL VALUABLE FILES ONTO FLOPPY DISKETTES BEFORE EXECUTING HDFORMAT.

USER: 1.   Enter

HDFORMAT <CR>

SYSTEM: 2.   Displays

Hard Disk Format
TeleVideo Systems, Inc. Version 1.0
CAUTION: ALL DATA ON THE INTEGRAL HARD DISK WILL BE DESTROYED
TYPE RETURN when ready. (ESC or CTRL-C to abort)

USER: 3.   Press

<CR>

SYSTEM: 4.   Your screen will display cylinder, head, sector, and count information as the hard disk is being formatted. The program takes approximately 15 minutes to complete.

5.   Displays

FORMAT Complete
A>

△

To end the format program before it is completed, press

∧**C**

If you press Y in response to the message "Abort HDFORMAT? (Y/N)," be aware that a portion of the hard disk has been formatted while the rest remains unchanged.

6.   UTILITY PROGRAMS

UTILITY	**PARK32** For TS 806/20 Configuration required: Service processor terminal Version 2.0 Release date: February 1982 Copyright 1982 TeleVideo Systems, Inc.
PURPOSE	PARK32 should be executed whenever the TS 806/20 is to be shipped or moved. Movement due to shipping may cause the head to touch the disk. This program positions the head of the hard disk above cylinder 32. By placing the head over cylinder 32, PARK32 decreases the possibility of the head touching the system tracks (0 and 1).

EXECUTION

USER: 1.   Enter

                PARK32 <CR>

SYSTEM: 2.   Displays

                PARK32 for TS 806/20 only Version 1.0
                POSITION HEADS AT TRACK 32

                REMOVE floppy from drive and turn power OFF

USER: 3.   Remove any floppy diskette (possibly the system diskette) in the floppy disk drive.

          4.   Turn off the TS 806/20.

          5.   Follow the reshipping instructions in 7.4.4.

UTILITY   **SCANDUP**
For TS 806/20
Configuration required: Service processor terminal
Version 2.0
Release date: 24 February 1982
Copyright TeleVideo Systems, Inc. 1982

PURPOSE   SCANDUP searches for duplicate data block pointers which may exist on the directories of the specified logical disk drive. Duplicate pointers indicate that two files are attempting to "own" the same data, an improper and potentially harmful condition. (The pointers may be those placed by the program FIXDISK. FIXDISK places all pointers to bad disk blocks in a file named FILE.BAD.)

SCANDUP lists the names of files which contain duplicate pointers so they can be erased. No data on the disk will be affected by running SCANDUP.

SCANDUP should be run immediately after FIXDISK.

EXECUTION

USER: 1.   Enter

[drive:]SCANDUP <CR>

([drive:] is the logical drive on which SCANDUP is located, if other than the currently active drive)

SYSTEM: 2.   Displays

SCAN DRIVE?

USER: 3.   Enter the logical drive that you wish to scan — A, B, C, etc. SCANDUP scans one drive at a time, so only enter one drive name.

4.   Press

<CR>

△

This program cannot be aborted.

SYSTEM: 5.   Displays (if no duplicate pointers are found)

no allocation blocks are duplicated in directory
End of Execution
A>

or

Displays (if duplicate pointers are found in the directory) a list of files that contain the duplicate pointers.

USER: 6.   Enter

                     TYPE <filename> <CR>

                     to determine which file(s) listed contains incorrect information.

               7.   Erase the file(s) that contains incorrect data.

               8.   Press

                     ∧**C**

                     (this enables the service processor to read the latest directory)

The example below shows SCANDUP run for a drive that had two files with identical data block pointers.

USER: 1.   Enter

                     SCANDUP <CR>

SYSTEM: 2.   Displays

                     SCAN DRIVE?

USER: 3.   Enter

                     A <CR>

SYSTEM: 4.   Displays

block	count	sector	entry	filename		user
035A	2	14	2	TEXT	DOC	00
035B	2	14	2	TEXT	DOC	00
035C	2	14	2	TEXT	DOC	00
035D	2	14	2	TEXT	DOC	00
035A	2	14	3	FILE	BAD	15
035B	2	14	3	FILE	BAD	15
035C	2	14	3	FILE	BAD	15
035D	2	14	3	FILE	BAD	15

4 allocation blocks are duplicated in directory
End of execution
A>

△

Block refers to the disk allocation block number that is owned by multiple files in filename.

The term **count** indicates the number of times the block is owned (if more than once).

The **sector** tells the user the directory sector number where filename is located.

Entry is an index into the directory sector for filename.

Filename is the file which owns the block, and is the CP/M-assigned user number that owns this file.

The error message tells the user that blocks 035A, 035B, 035C, and 035D are "pointed to" by the files TEXT.DOC and FILE.BAD. This indicates that TEXT.DOC has a bad sector.

USER: 5.   Transfer the file TEXT.DOC to drive B or C.

             6.   Erase TEXT.DOC from drive A. **DO NOT ERASE FILE.BAD.**

             7.   Enter

                 TYPE<drive:>TEXT.DOC <CR>

                 to read the file and to determine how much incorrect data it contains.

             8.   Press

                 ∧**C**

SYSTEM: 9.   Displays

                 A>

USER: 10.   Enter

                 DIR <CR>

SYSTEM: 11.   Displays the latest directory.

UTILITY	**TOD** For TS 806/20 Configuration: Service Processor Terminal/User Station Version 3.0 Release Date: September 1982 Copyright TeleVideo Systems, Inc. 1982
PURPOSE	The TOD utility program allows you to examine and set the correct time and date on your screen. When you power on or reset your system, the local time and date are reset to 0. Use TOD to change this initial value, at your option, to the current date and actual time. The date is represented as a month value in the range from 1 to 12, a day value in the range of 1 to 31, and a four-digit year value. Time is represented as a twenty-four hour clock, with the hour value from 00 to 11 for morning, and 12 to 23 for the afternoon.
COMMENTS	You must specify a four-digit value for the year (yy). If a two-digit value is entered, the program will assume that the specified year is to be relative to the year 1900.
EXECUTION	There are three ways to use this program:

1. To set the time and date from service processor terminal or user station

2. To display the time and date continuously on a user station

3. To call up the time and date on a user station or service processor terminal

To set the time and date on the system:

USER: 1. Enter

          TOD S>mm⸱dd⸱yy hh:mm:ss<CR>

EXAMPIE
S> 8:6:1983ぃP) 19:46:21

          where

          mm/dd/yy = month/day/year

          hh:mm:ss: = hour:minute:second

△

This can be done at a service processor terminal or at a user station.

SYSTEM: 2. Displays

          Press any key to set time and date

USER: 3. When the time you specified in your command occurs, press any key. TOD begins timing at that instant. The system time has been set at this point.

6. UTILITY PROGRAMS

To display local time (previously set in user stations at power on/reset) continuously on the user station screens, enter the following command:

USER: 1. Enter

                      TOD P<CR>

SYSTEM: 2. Displays

                      Current date and time is:

                      mm/dd/yy/   hh:mm:ss

                      (This message will remain on the screen until you press another key.)

After setting the time and day at power on, user stations can call up the local and system current date and time using the following command:

USER: 1. Enter

                      TOD<CR>

SYSTEM: 2. Displays

                      Current system date and time is: mm/dd/yy hh:mm:ss
                      Current local date and time is: mm/dd/yy hh:mm:ss

7. SYSTEM TROUBLESHOOTING AND GENERAL MAINTENANCE

7.1 CARE

Periodic preventive maintenance will prolong the useful life of your TS 806/20.

7.1.1 Cleaning

Clean the TS 806/20 periodically. Use a soft, lint-free cloth and a commercial detergent to clean the case. *Do not use solvent-based or abrasive cleaners.*

7.1.2 Inspection

Inspect the TS 806/20 case for cracks or breaks. On customized units, check the bezel for paint damage (peeling, cracking, or severe scratches).

Inspect the cables and pin connectors twice a year for damage. Inspect the interface cable connectors for kinks or other signs of excessive stress (such as stretching).

Refer any damage to a qualified service technician.

7.2 TROUBLESHOOTING

The information provided in Table 7-1 may help you to resolve many operating problems without placing a service call.

Table 7-1 Troubleshooting Procedures

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1. **IF TS 806/20 IS NOT ON AFTER POWER SWITCH IS TURNED ON AND**

   a. **TS 806/20 DOES NOT MAKE ANY NOISE (FAN IS OFF)**

   Unplug power cord and plug it in again.

   Plug something else into the same wall outlet and test for power.

   Check the line fuse (as described in Section 7.3) and replace it if necessary.

   b. **FAN IS ON BUT SYSTEM PROMPT DOES NOT APPEAR ON SERVICE PROCESSOR TERMINAL SCREEN**

   Push the reset button on the TS 806/20. Reset the terminal or power it down and then up.

   c. **SERVICE PROCESSOR TERMINAL SCREEN DISPLAYS SYSTEM PROMPT BUT DOES NOT RESPOND TO OPERATOR COMMAND**

   Push the reset button on the TS 806/20.

---

2. **TS 806/20 IS ON, BUT THERE IS NO RESPONSE FROM ANY USER STATION**

   Check the power specifications in Appendix A. Make sure they have been met.

   Check the fuses in the TS 806/20 and in the user stations. The TS 806/20 has one exterior fuse. See 7.3.

   Make sure cables used are appropriate (refer to Table 2-1).

   Check the cable connections. Make sure they are secure.

   Make sure the peripherals are connected to the correct ports on the rear panel of the TS 806/20. Refer to Table 1-1 and Chapter 2.

   To see if the TS 806/20 is operational, follow these steps:

   (1) Connect a terminal to the TS 806/20 TERMINAL port. A TS 800 may not be used for this purpose.

Table 7-1   Continued

(2)   Press the TS 806/20 reset button. The system should then boot from the hard disk. Either the system message will be displayed on the service processor terminal screen (verifying the TS 806/20 is operational) or a hardware error message will be displayed (TS 806/20 is not operational).

$$\triangle$$

IF THERE IS STILL NO RESPONSE, TURN OFF ALL POWER AND CALL YOUR DEALER. THE HARD DISK MAY BE DEFECTIVE.

3.   **TS 806/20 IS ON, BUT THERE IS NO RESPONSE FROM AN INDIVIDUAL USER STATION**

Check the cable connecting the nonfunctioning user station to the TS 806/20; make sure it is secure.

Replace the cable with a new cable.

Check the fuse at the nonfunctioning user station; is it good or burned out?

To check the communications controller contained in the USER port to which the unresponsive station is connected, follow these steps:

(1)   Turn off the power to two user stations—the unresponsive user station and a working user station.

(2)   Disconnect the unresponsive user station's RS422 cable from its USER port on the TS 806/20 and from the appropriate port on the rear of the user station.

(3)   Disconnect the working user station's RS422 cable from its USER port on the TS 806/20 unit and from the appropriate port on the rear panel of the user station.

(4)   Connect the unresponsive user station to the responsive user station's TS 806/20 port.

(5)   Connect the responsive user station to the unresponsive user station's TS 806/20 port.

(6)   Turn on the power to the two user stations.

If the original unresponsive user station now works and the original working user station does not work, the problem is with the communications controller associated with the malfunctioning USER port on the TS 806/20. *CALL YOUR DEALER.*

7. SYSTEM TROUBLESHOOTING AND GENERAL MAINTENANCE

7.3 CHANGING THE EXTERIOR FUSE

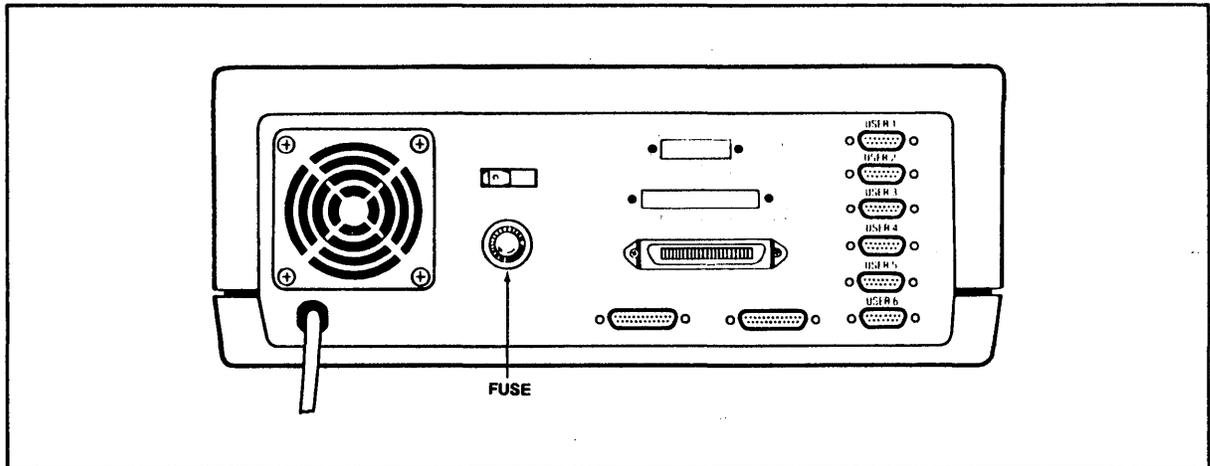The exterior fuse of the TS 806/20 is located on the rear panel.

Figure 7-1   Location of Exterior Fuse

To check and/or change this fuse, unscrew the fuse holder (see Figure 7-1). The fuse is a small glass cylinder. If the thin wire inside the fuse is still intact, the fuse should be functional. If the thin strip is broken and/or if the glass is slightly black, the fuse is burned out and must be replaced. If the glass is totally black, do not replace the fuse. The problem could be with the system or with the wall outlet. Call your dealer.
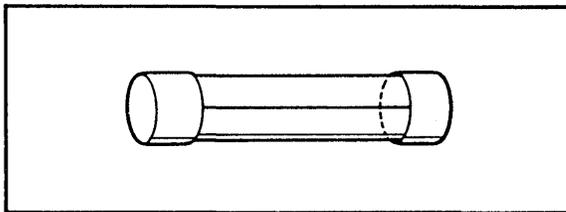
Figure 7-2   Good Fuse
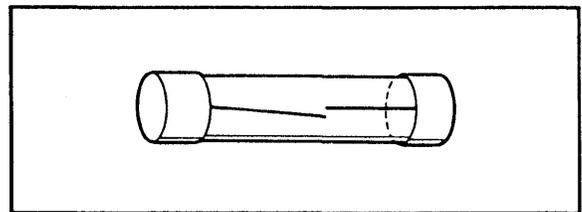
Figure 7-3   Burned Out Fuse

To replace the fuse, slip it out of the fuse holder and insert a new fuse. The fuse rating is shown on a label above the fuse holder. You can purchase new fuses from your dealer.

If the newly replaced fuse burns out immediately, do not replace it with another. Call your dealer.

7.4 HOW TO GET SERVICE

7.4.1 During Warranty

If you need service on your computer while it is under TeleVideo's limited warranty, call your dealer and he will obtain a Return Material Authorization number for you. (Refer to the Limited Warranty in Appendix B for a detailed description of service provided under warranty.) In cases of extreme emergency, you might want to either pay for overnight delivery to and from Tele-Video's factory or have the unit serviced by one of the third-party maintenance centers. If a maintenance center repairs it under warranty, you will be invoiced by the maintenance center for labor charges. Your dealer can help you arrange for emergency warranty repair.

7.4.2 On-Site Service After Warranty

You can obtain on-site service after warranty from any of the maintenance centers. Call your dealer if you need service.

7.4.3 Information Needed for Service

When you call for service, you will be asked for the serial number of your system. The serial number is located on a label at the top center of the rear panel (Figure 7-4). For future reference, note the serial number, the date you took delivery, and the names and phone numbers of your dealer and service center in the space below.

Model TS 806/20 Serial No. _____ Delivery Date _____

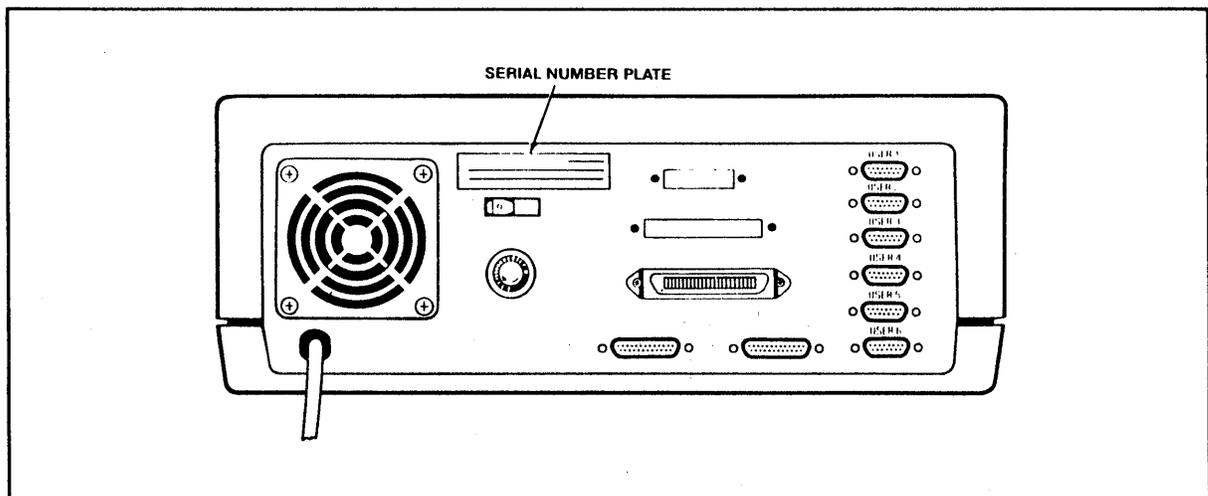Dealer _____ Phone No. _____

Service Center _____ Phone No. _____

Figure 7-4   Location of Serial Number on Rear Panel

Should your company require a purchase order for out-of-warranty repairs, have the purchase order number ready when you call in. One purchase order may cover several repairs but we will give each unit its own individual RMA number. This allows us to return each item quickly and not hold up the entire purchase order because of one item.

7.4.4   **Reshipping the TS 806/20**

Should you need to reship the TS 806/20, follow these procedures:

1.   Immediately prior to shipping the TS 806/20, execute the utility program **PARK32.** See Chapter 6 for a detailed description of PARK32. Once the program is completed, turn off the system.

2.   Remove the cover of the TS 806/20. Refer to 2.4.3.

3.   Check the integrity of the internal cabling and security of the internal mounting hardware.

4.   Replace the cover, being careful not to overtighten the screws.

5.   Leave the drive door open.

6.   Repack the unit in the original TeleVideo shipping container or other suitable materials.

7.4.5   **Technical Assistance**

If you have any technical problems with your system, call your dealer or distributor.

APPENDICES

A. TS 806/20 SPECIFICATIONS
B. STATEMENT OF LIMITED WARRANTY
C. SUGGESTED REFERENCES
D. PIN CONNECTOR ASSIGNMENTS
E. PORT ASSIGNMENTS
F. BUYING ADDITIONAL DISKETTES
G. CABLE SPECIFICATIONS
H. USING THE TIME AND DATE CAPABILITY IN APPLICATIONS PROGRAMS

APPENDIX A   TS 806/20 SPECIFICATIONS

MICROPROCESSOR		Z80A 4 MHz
Memory		64K dynamic RAM
		4K EPROM
		1K static RAM
ON LINE STORAGE		
A.	Type	5¼-inch floppy diskette
	Technology	Double-density, double-sided
	Format	Soft sectored, 40 tracks per side, 18 sectors per track, 256 bytes per sector
	Capacity	500 Kilobytes (unformatted)
		368.6 Kilobytes (formatted)
	Access Time	5 msec (track to track)
	Skew Factor	4
	Data Transfer	250 Kilobits/sec
B.	Type	5¼-inch hard disk
	Technology	Winchester
	Capacity	19.14 Megabytes (unformatted)
		15.04 Megabytes (formatted)
	Access Time	3 msec (track to track)
	Data Transfer	5 Mbits/sec
Operating System		MmmOST with CP/M
Ports		One serial RS232C asynchronous, 150-19.2K baud (optional); word structure eight data bits, one stop bit; parity NONE; baud rate 9600
		One serial RS232C (restricted service)
		Six serial RS422 800 Kbits/sec (SDLC link)
		One parallel (Centronics type)
Power Requirements		115/230 plus/minus 12 VAC, 50/60 Hertz, 130 Watts
Power Consumption		1 amp maximum at 115 VAC
		0.5 amp at 230 VAC
Start Current		1.3 amp at 115 VAC
ENVIRONMENTAL REQUIREMENTS		
Temperature		Computer: 32-120 degrees Fahrenheit (0-50 Centigrade)
		Diskette 50-85 degrees Fahrenheit
Humidity		Computer: maximum 95% relative noncondensing
Altitude		Maximum: 10,000 feet above sea level
Dimensions		Height 7¼ inches (18.2 cm)
		Width 17½ inches (43.8 cm)
		Depth 16⅞ inches (42.0 cm)
WEIGHT		
	Shipping	45 lbs.
	Net	35 lbs.

STATEMENT

TeleVideo Systems, Inc. ("TeleVideo") warrants to Buyer that products, except software, manufactured by Tele-Video will be free from defects in material and workmanship. TeleVideo's obligations under this warranty will be limited to repairing or replacing, at TeleVideo's option, the part or parts of the products which prove defective in material or workmanship within 90 days after shipment by TeleVideo, provided that Buyer gives TeleVideo prompt notice of any defect and satisfactory proof thereof. Products may be returned by Buyer only after a Return Material Authorization number ("RMA") has been obtained from TeleVideo by telephone or in writing. Buyer will prepay all freight charges to return any products to the repair facility designated by TeleVideo and include the RMA number on the shipping container. TeleVideo will deliver replacements for defective products or parts on an exchange basis to Buyer, freight prepaid to the Buyer. Products returned to TeleVideo under this warranty will become the property of TeleVideo. With respect to any product or part thereof not manufactured by TeleVideo, only the warranty, if any, given by the manufacturer thereof, will apply.

EXCLUSIONS

This limited warranty does not cover losses or damage which occurs in shipment to or from Buyer, or is due to, (1) improper installation or maintenance, misuse, neglect or any cause other than ordinary commercial or industrial application, or (2) adjustment, repair or modifications by other than TeleVideo authorized personnel, or (3) improper environment, excessive or inadequate heating or air conditioning and electrical power failures, surges or other irregularities or (4) any statements made about TeleVideo's products by salesmen, dealers, distributors or agents, unless confirmed in writing by a TeleVideo officer.

THE FOREGOING TELEVIDEO LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, WHETHER ORAL, WRITTEN, EXPRESS, IMPLIED OR STATUTORY. IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WILL NOT APPLY. TELEVIDEO'S WARRANTY OBLIGATIONS AND BUYER'S REMEDIES HEREUNDER ARE SOLELY AND EXCLUSIVELY AS STATED HEREIN. TELEVIDEO MAKES NO WARRANTY WHATSOEVER CONCERNING ANY SOFTWARE PRODUCTS, WHICH ARE SOLD "AS IS" AND "WITH ALL FAULTS."

TELEVIDEO'S LIABILITY, WHETHER BASED ON CONTRACT, TORT, WARRANTY, STRICT LIABILITY OR ANY OTHER THEORY, SHALL NOT EXCEED THE PRICE OF THE INDIVIDUAL UNIT WHOSE DEFECT OR DAMAGE IS THE BASIS OF THE CLAIM. IN NO EVENT SHALL TELEVIDEO BE LIABLE FOR ANY LOSS OF PROFITS, LOSS OF USE OF FACILITIES OR EQUIPMENT, OR OTHER INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES.

APPENDIX C   SUGGESTED REFERENCES

The following books will be useful references:

1. Fernandez, Judi N. and Ruth Ashley, *Using CP/M: A Self Teaching Guide*, John Wiley and Sons, 605 Third Avenue, New York, New York, 1980, $8.95.

(This is an excellent self-teaching guide, highly recommended for the user unfamiliar with CP/M but perhaps familiar with computers. Assumes no prior knowledge about operating systems.)

2. Hogan, Thom, *Osborne CP/M User Guide*, Osborne/McGraw-Hill, 630 Bancroft Way, Dept. UB, Berkeley, CA 94710, $12.99.

(A complete book for the beginning computer operator. Covers all aspects of computer operation and CP/M use. Organization and presentation are outstanding.)

3. Zaks, Rodney, *The CP/M Handbook with MP/M*, SyBex, 2344 Sixth Street, Berkeley, CA 94710 (415/848-8233), 1980, $13.95.

(Giving very complete details of CP/M, this book gives more detail than many beginners will want.)

4. *CP/M Summary Guide for Versions 1.4 and 2.X*, edited by Bruce Brigham, The Rosetta Stone, Post Office Box 35, Glastonbury, CT, 06025, 203/633-8490, $6.95 plus $1.00 postage and handling.

5. Murtha, Stephen M. and Mitchell Waite, *CP/M Primer*, Howard W Sams & Co., Inc, 4300 West 62nd St., Indianapolis, Indiana 46268, $14.95.

(An excellent introduction to both CP/M and microcomputers.)

6. Townsend, Carl, *How to Get Started with CP/M*, Dilithium Press, Post Office Box 606, Beaverton, Oregon 97075, $9.95

(A succinct discussion of CP/M. Also includes a listing of CP/M software suppliers.)

TeleVideo welcomes comments from you about these books as well as names of others which you find useful.

PPENDIX D   PIN CONNECTOR ASSIGNMENTS

Table D-1   P2 Connector Assignments
(RS232C Terminal Interface)

Pin No.	Description
1	Frame Ground
2	Transmit Data
3	Receive Data
4	Request to Send
5	Clear to Send
7	Signal Ground
8	Data Carrier Detect
20	Data Terminal Ready

Table D-2   P7 Connector Assignments
(RS422 User Connector)

Pin No.	Description	
1	Ground	
2	Transmitted high	(Txd +)
3	Received high	(Rxd +)
4	Request to send high	(Rts +)
5	Clear to send high	(Cts +)
6	Transmit clock high	(Txck -)
7	Receive clock high	(Rxck -)
8	Ground	
9	Transmitted low	(Txd -)
10	Received low	(Rxd -)
11	Request to send low	(Rts -)
12	Clear to send low	(Cts -)
13	Transmit clock low	(Txck +)
14	Receive clock low	(Rxck +)
15	Test	

Table D-3   P4 Connector Assignments
(Parallel Printer Connector)

Pin No. Rear Panel		Board		Port/ Data Bit	Description		
1	19[1]	1	2[1]	D0/0	-Data strobe	Output	
2	20[1]	3	4[1]	D1/0	Data 0	Output	
3	21[1]	5	6[1]	D1/1	Data 1	Output	
4	22[1]	7	8[1]	D1/2	Data 2	Output	
5	23[1]	9	10[1]	D1/3	Data 3	Output	
6	24[1]	11	12[1]	D1/4	Data 4	Output	
7	25[1]	13	14[1]	D1/5	Data 5	Output	
8	26[1]	15	16[1]	D1/6	Data 6	Output	
9	27[1]	17	18[1]	D1/7	Data 7	Output	
10	28[1]	19	20[1]	BSTB/P10	-Acknlg	Input	
11	29[1]	21	22[1]	D0/5	Busy	Input	
12		23		D0/4	PE[2] (paper empty)	Input	(W5)
13		25		D0/6	Select[3]	Input	(W4)
31	30[1]	26	24[1] (W6)	D0/1	-Input Prime	Output	(W8)
14		27			GND		(W7)
32		28		D0/3	-Fault[3]	Input	(W3)
15		29			Unused		
33		30		D0/2	Light Detect[2]	Input	(W2)
16		31			GND		
34		32		D0/7	LC Pulse	Output	(W9)
17		33			GND		
35		34			Unused		
18		35			Unused		
36		36			Unused		

NOTES
1. Second pin number indicates return ground
2. Ground if no connection
3. Tie high if no connection
Pins 37, 38, 39, and 40 are not connected.
(W_) indicates cut and jumper locations.

Description	Hex Value	Board Location
Board LEDs	00H	
SIO No. 1		
Channel A		
data	10H	
command/status	12H	A61
(User 1)		
Channel B		
data	11H	
command/status	13H	
(User 2)		
SIO No. 2		
Channel A		
data	20H	
command/status	22H	A84
(User 3)		
Channel B		
data	21H	
command/status	23H	
(User 4)		
SIO No. 3		
Channel A		
data	30H	
command/status	32H	A83
(User 5)		
Channel B		
data	31H	
command/status	33H	
(User 6)		
SIO No. 0		
Channel A		
data	50H	
command/status	52H	A82
(TERMINAL P2)		
Channel B		
data	51H	
command/status	53H	
(RS232 OPT P3)		

APPENDIX E   PORT ASSIGNMENTS

Description	Hex Value	Board Location
Dip Switch	60H	
CTC Channel 0	80H Baud Rate	
1	81H Baud Rate	
2	82H Time of Day User Option	
3	83H	
DMA	90H	
PIO		
Channel A		
data	D0H	
command/status	D2H	
Channel B		
data	D1H	
command/status	D3H	

SOURCES

Any TeleVideo Systems dealer or distributor

SPECIFICATIONS

Any new diskettes should meet these specifications to ensure data integrity:

Type   Floppy minidiskettes
Size   5¼-inch
Technology   Double density, double sided
Format   Soft sectored
                Guaranteed for 48 tpi drives
                40 tracks per side

RECOMMENDED BRAND(S)

   Dysan Diskettes 104/2D
   Part No. 800272 (40 tracks)

Manufactured by:

Dysan Corporation
Santa Clara, California
800/538-8150

QUALITY

You should purchase the best quality diskettes available to ensure data integrity.

LIFE EXPECTANCY

Depending on the care and amount of use given your diskettes, they may last for several years. Many users automatically phase out diskettes periodically. Factors such as number of disk accesses, care, etc. can significantly affect diskette life. One of the first signs of diskette wear will be incorrect data. The care with which you handle and store diskettes is probably the most important single factor in life expectancy of diskettes.

To read the system date and time from a user program:

a)   Open "B:MULTI.SYS" file

b)   Read "B:MULTI.SYS" record #6

c)   Current system date and time are now in read buffer (first 22 bytes only)

buffer

$\longrightarrow$ 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1

M M ? D D ? Y Y Y Y ? H H ? M M ? S S ? N N

Note: ? = field delimiters are undefined upon return from read record #6 operation