Business Systems 600/800

TEXAS INSTRUMENTS

Dear Customer,

Your new business system is a powerful and versatile tool. This operator's guide contains the operation, care, and cleaning procedures required to help you realize the full potential of your new system. We recommend that you read this guide and become familiar with its contents before using your new computer. The guide's handy size makes it practical to keep near your system workstation for quick reference purposes.

If you have problems or questions, contact your customer representative who will gladly assist you.

Sincerely,

TEXAS INSTRUMENTS

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGED PAGES AND DISCARD SUPERSEDED PAGES

Note: The changes in the text are indicated by a change number at the bottom of the page and a vertical bar in the outer margin of the changed page. A change number at the bottom of the page but no change bar indicates either a deletion or a page layout change.

Business Systems 600/800 Operator's Guide (2311343-9701)

Original Issue . . . . August 1982
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  Change 1 . . . . February 1985
  Change 2 . . . . May 1985

Total number of pages in this publication is 230 consisting of the following:

The computers, as well as the programs that TI has created to use with them, are tools that can help people better manage the information used in their business; but tools—including TI computers—cannot replace sound judgment nor make the manager's business decisions.

Consequently, TI cannot warrant that its systems are suitable for any specific customer application. The manager must rely on judgment of what is best for his or her business.

System Description (SD)

Each model in the Business Systems 600/800 series consists of:

- A central processing unit (990/10A for S600 models or 990/12 for S800 models) in a 990A13 13-slot chassis

- A principal mass data storage device such as:

    - A WD500 fixed Winchester disk drive (S600 models only)

    - A WD800/WD800A Winchester disk drive

    - A WD900 fixed Winchester disk drive

- A CD1400 disk drive

- A DS80 medium-capacity multiplatter disk drive

- A DS300 high-capacity multiplatter disk drive (S800 models only)

- A backup mass data storage device that is either separate from or integral to the principal storage device

- One or more data terminals through which the operator interacts with the computer system

- Optional devices such as printers and additional storage devices and data terminals

For operating instructions on the computer chassis and the peripheral devices, turn to the appropriate tab (such as MS for mass storage devices) and locate the description of the device.

The photographs on the following pages illustrate the Business Systems. In some cases, more than one model number appears below one photograph. In these cases, the S600 models use the 990/10A computer, the S800 models use the 990/12 computer and the storage capacity of the system disk drives vary.
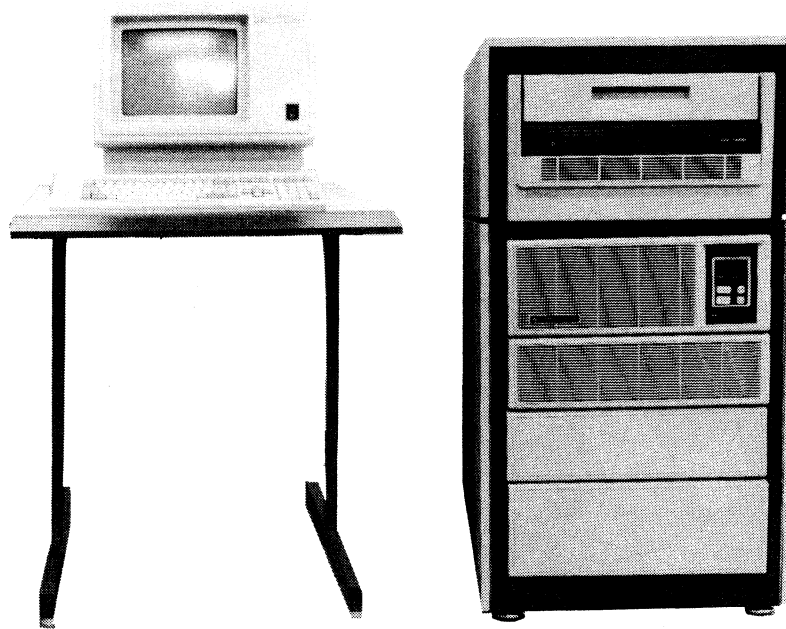
All S800 models include two video display terminals (VDTs), although only one is shown in the photographs.

All models use one or more Model 931 VDTs as the interactive device.

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Business System Models 661A and 861A/861B With CD1400 Disk System, 990A13 Chassis in a 1.07-Meter Pedestal, and 931 VDT

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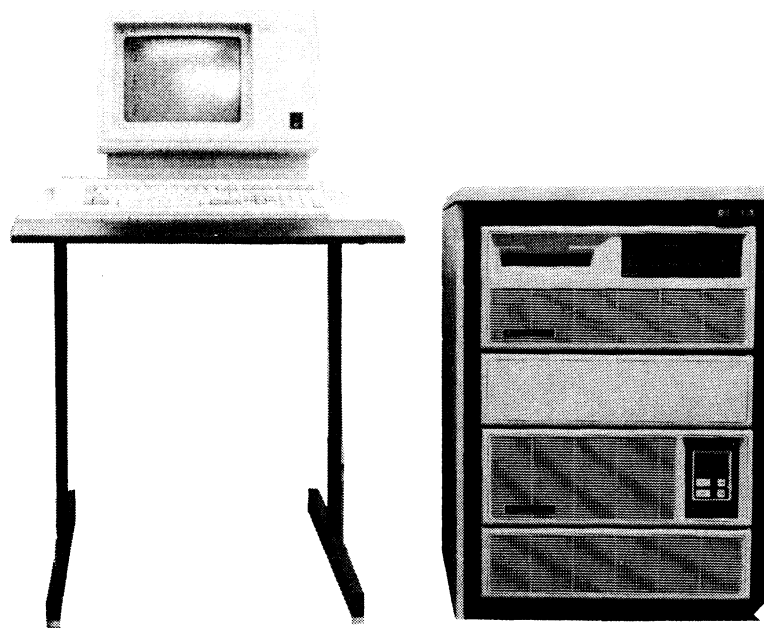
Business System Models 671A, 672A, 673A, 674A, 675A, 872A/872B, 874A/874B, and 875A/875B With WD800/WD800A Disk System, 990A13 Chassis in a 0.81-Meter Pedestal, and 931 VDT
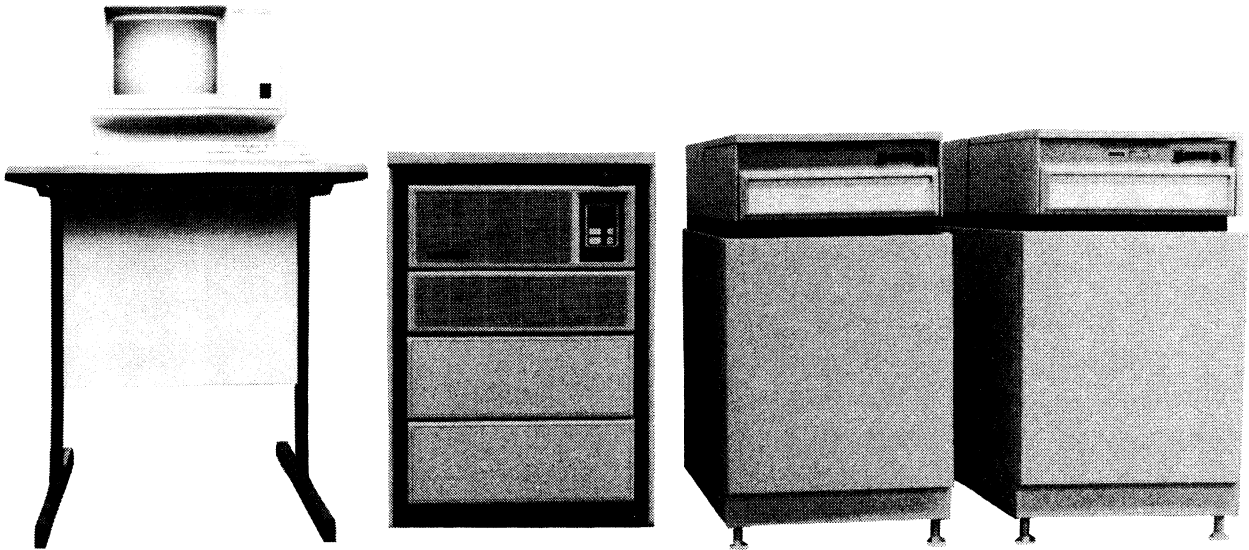
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**Business System Models 680A and 880A/880B With Two DS80 Disk Systems,
990A13 Chassis in a 0.81-Meter Pedestal, and 931 VDT**
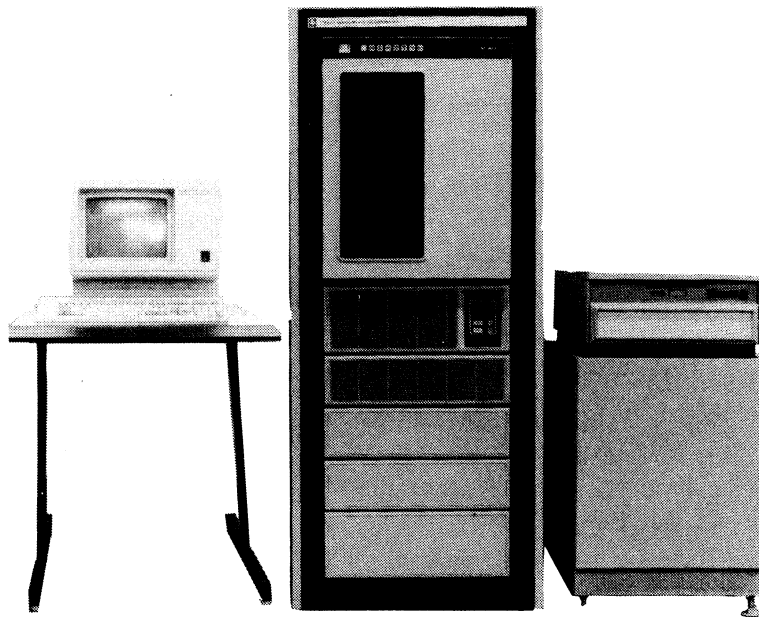
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**Business System Models 682A and 882A/882B With MT1600 Magnetic Tape System,
990A13 Chassis in a 1.52-Meter Cabinet, 931 VDT, and DS80 Disk Drive**

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Business System Models 884A/884B With Two DS300 Disk Systems, 990A13 Chassis in a 0.81-Meter Pedestal, and 931 VDT

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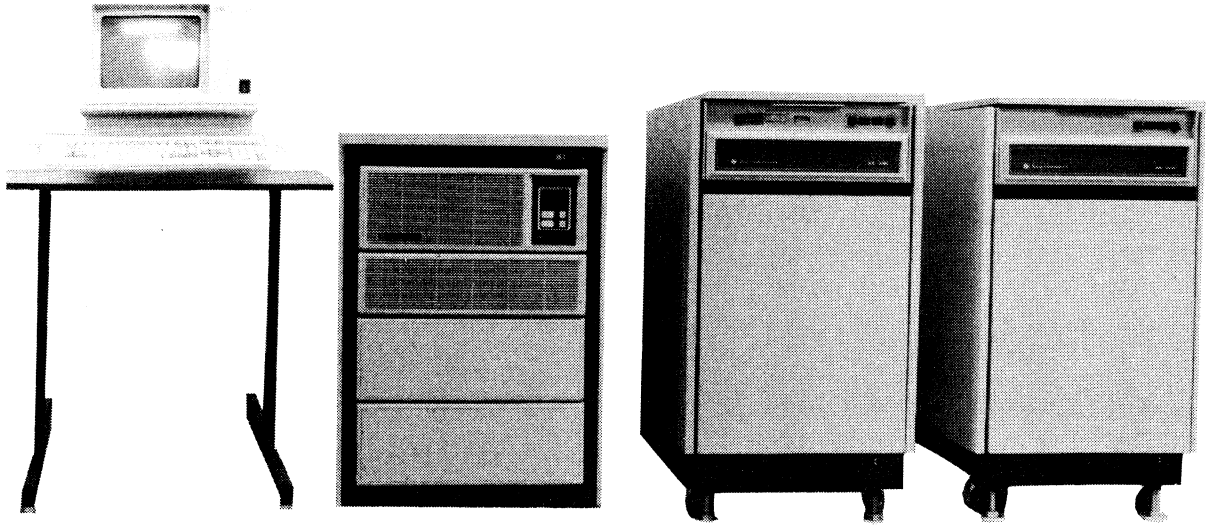**Business System Models 886A/886B With MT1600 Magnetic Tape System, 990A13 Chassis in a 1.52-Meter Cabinet, 931 VDT, and DS300 Disk System**
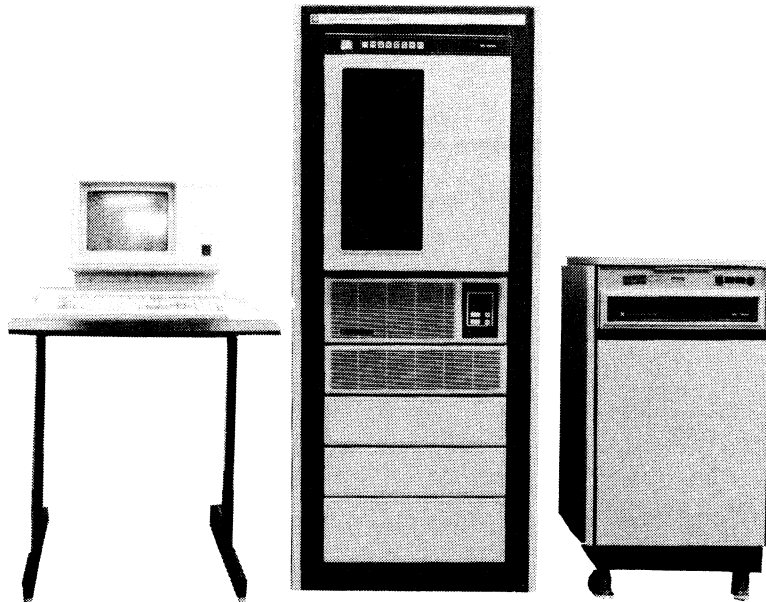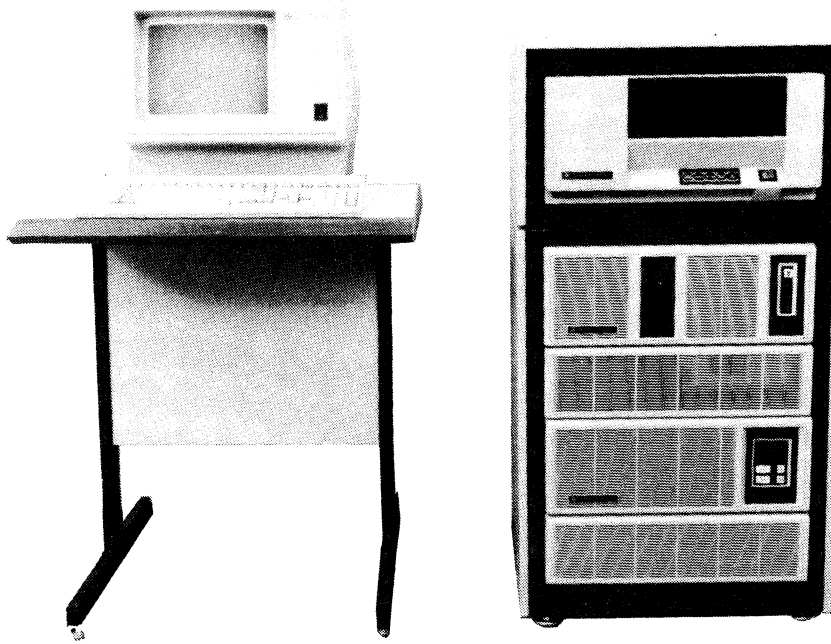
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Business System Models 690A, 691A, 890A/890B, and 891A/891B With MT3200 Magnetic Tape System, WD900 Disk System, 990A13 Chassis in a 1.07-Meter Cabinet, and 931 VDT

Chassis (CH)

This section describes the 990A13 chassis that houses the Business Systems 600 and 800 computers. The information is presented in the following major paragraphs:

- Switches and Indicators

- Power-Up

- Operator Maintenance

- Related Information

SWITCHES AND INDICATORS

Normal operation of the 990A13 chassis requires familiarity with the control switches and indicator lights described in the following paragraphs.

The switches on the control and display panel are enabled and disabled by the 1-S-2 switch, a three-position slide control that is concealed during normal operation by the upper trim panel. In the 1 (local) position, all control and display panel switches are enabled; they are disabled when the switch is in the S (secure) position. The 2 (remote) position is only used when an external control panel is connected to the test connector and is not normally used by the operator.

HALT
The HALT switch halts computer operation and enables the RUN, LOAD, and ALT LOAD switches.
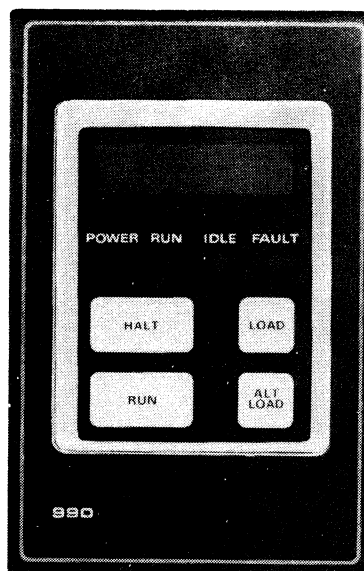
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Chassis Control and Display Panel

RUN

The RUN switch restarts the computer after it has been halted (when the operator has pressed HALT). The RUN indicator lights when the computer is executing instructions.

LOAD

The LOAD switch initiates a load of the computer operating system software from the standard system disk (that is, the primary mass storage device). The HALT switch must be pressed before the LOAD switch will respond.

ALT LOAD

The ALT LOAD switch is used to load the computer operating system software from some device other than the standard system disk. The HALT switch must be pressed to enable the ALT LOAD switch.

POWER

The POWER indicator lights when operating power is on.

IDLE

The IDLE indicator lights when the computer is executing an idle instruction. Depending on how much activity is in progress, the IDLE indicator may stay off, flicker, or appear to remain on.

FAULT

It is normal for the FAULT indicator to light and remain on for a few seconds when the computer operating system software is loaded. However, if this indicator remains on or lights while the computer is running, a failure has occurred.

POWER-UP

CAUTION

Do not operate the chassis unless all fans are working. Operation with one or more failed fans can lead to overheating and damage to the chassis electronics.

The ac power switch (ON-1/OFF-0) located on the rear panel of the 99013A chassis is normally left on, with computer system power controlled by the enclosure power switch. This switch is the 0/1 switch on the front of the 0.81-meter pedestal, and

the circuit breaker on the rear of the 1.07-meter pedestal and 1.52-meter cabinet.

To turn on the chassis, set the enclosure power switch to the 1 position if your enclosure is a 0.81-meter pedestal or to the ON position if your enclosure is a 1.07-meter pedestal or a 1.52-meter cabinet.

To turn off the chassis, set the enclosure power switch to 0 (for 0.81-meter pedestal models) or OFF (for 1.07-meter pedestal or 1.52-meter cabinet models). If an optional standby power supply is installed in the computer, turning off enclosure

power (and the ac power switch ON-1/OFF-0) does not remove all voltages from the chassis interior. The standby batteries begin to supply power and to discharge when main power is turned off, so you should not turn off main power for periods exceeding 45 minutes without also turning off the standby power. To turn off standby power:

1. Remove the lower trim panel by grasping the outer edges and pulling straight away from the chassis.

2. The standby power switch is visible behind a cutout in the lower left corner of the air filter. Use a pencil or short screwdriver to switch the standby power off (switch up). Standby power is turned on by placing the switch in the down position.

3. Replace the lower trim panel.

OPERATOR MAINTENANCE

The exterior of the chassis and the intake air filter should be cleaned at regular intervals as described in the following paragraphs.

Cleaning the Chassis
Keep the chassis clean and dust-free by wiping the exterior as needed with a damp (not wet) cloth and mild detergent. A gentle liquid dishwashing detergent diluted in water is recommended for exterior cleaning.

CAUTION

Do not use strong solvents, cleaners, or detergents to clean the chassis trim panels.

Cleaning the Air Filter
The intake air filter behind the trim panels should be vacuumed every three months. To vacuum the filter:

1. Turn off the enclosure power switch.

2. Remove the upper and lower trim panels by grasping the outer edges and pulling straight away from the chassis front.

3. Use a vacuum cleaner with a brush tool to remove the accumulated dust from the air filter front. Do not tear the filter. If you accidentally damage the filter or cannot get it clean, replace it with a new one. (See Replacing the Air Filter.)

4. Reinstall the upper and lower trim panels:

   a. Orient the upper trim panel with the cutout to your right and the panel rear pointing toward the chassis front. Slip the two smooth alignment posts into mating holes in the outer rim of the chassis sheet metal. The cutout portion of the panel must frame the control and display panel.

   b. Press the panel home so that the barbed locking posts lock into the white nylon latches on the chassis outer rim. Do not use excessive force. Note that the trim panel covers the switch and test connector at the left edge of the control and display panel.

c. Orient the lower trim panel with the rear of the panel pointing toward the chassis front. The smooth plastic alignment posts must be below the barbed nylon locking posts; otherwise the panel is upside down.

d. Slip the two alignment posts into mating holes in the chassis.

e. Press the panel home so the nylon locking posts lock into the latches. Do not use excessive force.

5. Turn on enclosure power.

Replacing the Air Filter
The air filter should be replaced every 12 months or

before it has been cleaned four times. To replace the air filter:

1. Turn off the enclosure power.

2. Remove the upper and lower trim panels by grasping the outer edges and pulling straight away from the chassis front.

3. Use a vacuum cleaner to remove the accumulated dust from the air filter front. This prevents dust from falling into the chassis when you remove the filter.

4. Grasp the air filter along the outer plastic rim and pull straight away from the metal grillwork.

5. To install the new filter:

a. Locate the two filter mounting holes on either side of the chassis front grillwork.

b. Turn the filter so the four protruding posts point toward the chassis front grillwork and are oriented to the filter mounting holes. The cutout for the standby power ON/OFF switch should be located at the lower left corner.

c. Press the filter into place, flush against the grillwork.

6. Replace the upper and lower trim panels as described in step 4 of Cleaning the Air Filter.

7. Turn on the enclosure power.
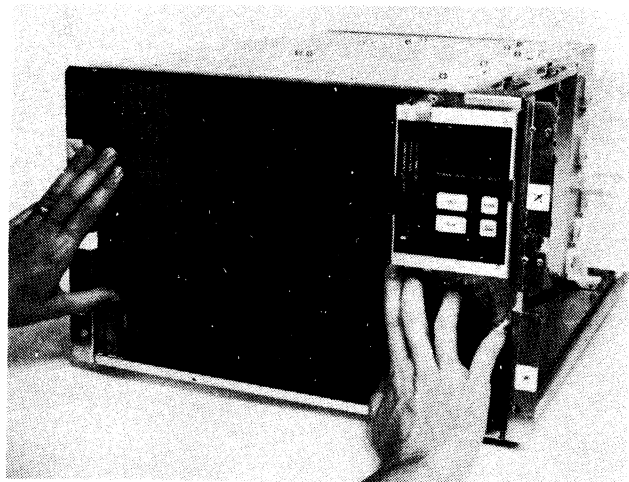
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Replacing the Air Filter

RELATED INFORMATION

Additional air filters are available from Texas Instruments. For a quantity of six, specify part number 2310376-0001.

The *Model 990A13 Chassis Maintenance Manual — General Description*, part number 2308774-9701, provides more information about the 990A13 chassis.

Mass Storage (MS)

This section describes the mass storage devices for the Business Systems 600/800 series:

- The CD1400 disk system, which stores data on one or three fixed platters and a removable disk cartridge

- The DS80 disk system, which stores data on a medium-capacity disk pack

- The DS300 disk system, which stores data on a high-capacity disk pack

- The MT1600 magnetic tape system, which stores data on a reel of magnetic tape

- The WD500 mass storage system, which stores data on two 5¼-inch Winchester disks (not removable) and removable diskettes

- The WD800/WD800A mass storage system, which stores data on a fixed, 8-inch Winchester disk and a removable disk cartridge

Each subsection describes the following:

- Switches and Indicators

- Power-Up

- Installing and Removing Media

- Operator Maintenance

- Write-Protecting Media

- Care and Storage

- Operator-Correctable Problems

- Related Information

SWITCHES AND INDICATORS

Normal operation of the CD1400 disk system requires familiarity with the switches and indicators described in the following paragraphs.

START/STOP
When the START/STOP switch is pressed, the START/STOP indicator lights, and, provided a disk cartridge is properly installed, the drive comes up to operating speed. When the switch is pressed a second time, power is removed from the disk drive and the indicator goes out.

READY
The READY indicator lights when the disk drive is up to operating speed and no fault exists that requires manual intervention. The READY indicator blinks throughout the start and stop procedure.

FAULT
The FAULT indicator lights during any disk drive fault condition except ac power failure. If a momentary nondamaging fault occurs, pressing the FAULT switch extinguishes the indicator. If the FAULT indicator remains lighted, the problem requires further attention. Refer to Operator-Correctable Problems.

WRITE PROTECT CART
The WRITE PROTECT CART switch protects the information on the removable disk cartridge by inhibiting writing to the cartridge. The WRITE PROTECT CART indicator lights when write protection of the cartridge is in effect. Pressing the switch removes write protection and turns off the indicator.

WRITE PROTECT FIXED
The WRITE PROTECT FIXED switch inhibits writing on the fixed disk. The WRITE PROTECT FIXED indicator lights while write protection of the fixed disk volume is in effect. Pressing the switch removes write protection and extinguishes the indicator.

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CD1400 Disk Drive Switches and Indicators

POWER-UP

There are two methods for turning on a CD1400 disk drive and bringing it up to operating speed. The method you use depends on whether the enclosure power is turned on or off.

Power-Up When Enclosure Power Is Off
When you turn on enclosure power, you can start up the CD1400 drive(s) at the same time by taking the following steps:

1. Ensure that the ac power switch at the rear of each drive is ON (in the up position).

2. Install a disk cartridge in the drive according to the instructions in Installing and Removing Disk Cartridges.

3. Set the START/STOP switch on each drive to START.

4. Turn on the enclosure power.

When enclosure power comes on, the disk drives will be started up one at a time.

Power-Up When Enclosure Power Is On
When the enclosure is already on, perform the following procedure to power up each drive:

1. Ensure that the START/STOP switch is in the STOP position.

NOTE

Since a disk drive draws a large amount of current when it is started, disk drives in multiple-drive computer systems should be turned on one at a time, allowing each drive to reach operating speed before starting another.

2. Set the ac power switch at the rear of the drive to ON.

3. Install a disk pack into the drive according to the instructions in Installing and Removing Disk Cartridges.

4. Set the START/STOP switch to START.

5. Verify that the READY indicator stops blinking and remains on.

6. Verify that the FAULT indicator is off.

Repeat this procedure for each drive in the computer system.

INSTALLING AND REMOVING DISK CARTRIDGES

CAUTION

Do not install disk cartridges that are damaged or of questionable quality into the drive. To do so can damage read/write heads, requiring extensive (and costly) replacement and alignment procedures. Do not use disk drives without a clean and serviceable air filter. (See Care and Storage.)
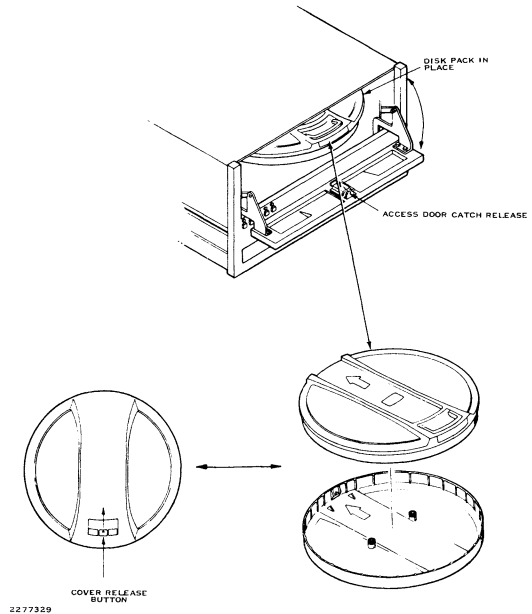
Disk Cartridge Installation

NOTE

Store the disk cartridge in the same environment as the disk drive for at least 24 hours prior to installation.

To install the CD1400 disk cartridge, perform the following steps:

1. Ensure that the drive power is on, the START/STOP switch is in the STOP position (out), and the READY and FAULT indicators are off.

2. Release the latch under the lip of the access door recess and pull down the cartridge access door.

CD1400 Disk Cartridge Installation and Removal

3. Separate the bottom dust cover from the cartridge by pushing the cover release button toward the center of the cartridge.

4. Disengage the bottom dust cover from the cartridge and set the cover upside down to prevent dust from collecting within the cover.

5. Slide the cartridge into the receiver track, ensuring that the head opening is toward the rear of the disk drive.

6. Push the cartridge handle down; then push the cartridge fully to the rear.

7. Close the cartridge access door and press the door closed until it latches. The cartridge slides into place on the spindle and automatically engages as the access door is latched.

8. Press the START/STOP switch to apply power to the spindle motor.

NOTE

If the spindle motor does not rotate, the cartridge access door may not be completely closed, the cartridge may not be properly seated on the spindle, or the cartridge receiver/base may not be fully seated on the lower chassis.

Disk Cartridge Removal
The following procedure describes cartridge removal under normal conditions. If for any reason the door cannot be opened, verify that power is on, the START/STOP switch is out, and the READY and FAULT lamps are off. If these conditions are met

and the door cannot be opened, refer the problem to the system manager.

CAUTION

Do not attempt to force the door or defeat the interlocks. Do not attempt to remove the cartridge during a power failure.

To remove the disk cartridge, perform the following steps:

1. Disengage the START/STOP switch (switch out).

2. Wait until the READY indicator stops blinking and goes out.

3. Pull down the cartridge access door.

4. Pull the cartridge out of the receiver with sufficient force to overcome the detent action.

5. Place the bottom dust cover on the cartridge and fold over the top handle. The handle may be swung out to carry the cartridge, but do not push the cover release button.

6. Install another cartridge as described in Disk Cartridge Installation. Always keep a cartridge in the receiver to ensure that the shroud remains sealed and contaminants do not enter the disk drive.

WRITE-PROTECTING DISK AND DISK CARTRIDGE

Write-protecting disk media prevents the information on them from being erased or overwritten with other data. To write-protect a disk cartridge, press the WRITE PROTECT CART switch. To write-protect the fixed disk, press the WRITE PROTECT FIXED switch. The appropriate indicator will light, verifying that the disk or cartridge is write-protected.

CARE AND STORAGE

Care of Disk Cartridges
Observe the following guidelines to properly maintain disk cartridges on a daily basis:

• Always keep the bottom cover on the cartridge to reduce contamination when the cartridge is not installed in the drive.

• Periodically clean the inside and outside of the bottom cover by wiping it with a lint-free cloth dampened in alcohol.

• Carry cartridges by the handle at the end, which is designed to support the cartridge.

• Never set the cartridge on any surface unless the bottom cover is in place. The exposed hub diaphragm could be bent.

The disk cartridge requires special care to maintain optimum performance. All disk cartridges should be removed from service to undergo preventive maintenance by a qualified vendor or manufacturer every six months. Regular preventive maintenance is necessary to prevent damage to disk drives, costly system crashes, and loss of valuable data. Contact your local TI sales and service office for help in locating a qualified vendor

convenient to you. Preventive maintenance is normally performed at the customer's location. Be sure to call in advance to schedule this maintenance.

Storage of Disk Cartridges
Never expose disk cartridges to extreme heat, direct sunlight, or magnetic fields. Store them in an environment with a temperature ranging between –40 to 66 degrees C (–40 to 150 degrees F) with a relative humidity of 8 to 80 percent (noncondensing). Disk cartridges that have been stored in or subjected to temperatures outside the operating range of the disk drives must be conditioned to the computer environment for at least 24 hours before use. During this period of conditioning, remove the disk cartridges from their shipping box.

For long-term storage, place the disk cartridges in their canisters or original shipping containers stacked no more than eight high. The containers provide protection against dust and debris, significant environmental changes, and contamination by chemicals.

Care of the CD1400 Disk Drive
Dust the exterior surfaces of the CD1400 disk drive once a month and clean the air filter twice yearly; monthly in areas that are not temperature-controlled.

To clean the exterior of the disk drive:

1. Verify that the disk drive is not in use and will not be needed for 20 minutes.

2. If the START/STOP indicator is on, press the START/STOP switch and wait for the indicator to go out.

3. If the CD1400 is housed in the enclosure, turn off enclosure power. If the drive is separate from the enclosure, it is necessary only to turn off drive power.

4. Spray a mild detergent on a soft, clean cloth and wipe the external surfaces clean. Do not spray detergent directly on the disk drive. Clean the fan exhaust grill on the pedestal cover.

5. Restore power to the drive and press the START/STOP switch to return the drive to operating service.

Cleaning the air filter usually requires about 20 minutes. If the CD1400 is housed in the enclosure, it will be necessary to turn off power to the computer system during this time. If the drive is separate, it is necessary only to turn off the drive power. To clean the air filter:

1. If the START/STOP indicator is on, press the START/STOP switch and wait for the indicator to go out.

2. Turn off the enclosure or drive power.

3. Pull forward on the filter cover to lift it out. The filter cover is located at the front of the disk drive, and is held in place by two pins, one at each end.

4. Remove the foam filter from the filter cover and wash it in a weak solution of mild detergent and water. Rinse the filter thoroughly in clear water. Shake all excess water from the filter and either blot it dry with lint-free towels or air blow the filter absolutely dry.

5. Reinstall the clean, dry filter (or a new filter if the old one shows signs of deterioration) by placing it in position in the filter cover. Reinstall the filter cover in its recess in the disk drive front panel.

6. Turn on the power and press the START/STOP switch to restore the drive to operating service.

OPERATOR-CORRECTABLE PROBLEMS

If the CD1400 FAULT indicator lights during operation or power-up, take the following steps:

1. Press the FAULT switch. If the FAULT indicator goes out, normal operation can be resumed. If the FAULT indicator does not go out, proceed with step 2.

2. Press the START/STOP switch to STOP and wait until the READY indicator goes out.

3. Press the START/STOP switch to START. If the FAULT indicator goes out, normal operation can be resumed. If the FAULT indicator remains on, contact your system manager.

RELATED INFORMATION

Expendable Supplies
The expendable supplies for the CD1400 are:

• CD1400 disk cartridge, part number 2269886-0001

• CD1400 intake air filter, part number 2213589-0056

NOTE

All disk cartridges not purchased from Texas Instruments must meet TI specifications. The recording surfaces on the disk cartridge must be error-free or have an error map label attached to the cover that contains the manufacturer's name, the part number, the serial number for the disk cartridge, and the addresses of all bad tracks.

Publications
The *Model CD1400 Disk System Installation and Operation Manual,* part number 2272081-9701, contains more information on the CD1400 disk drive.
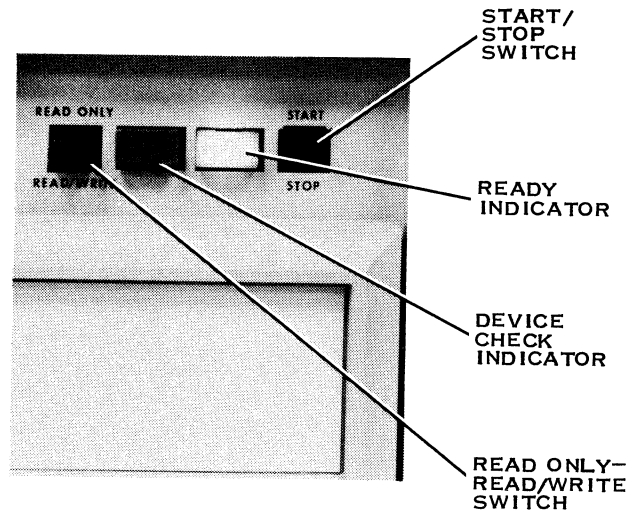
SWITCHES AND INDICATORS

Normal operation of the DS80 and DS300 disk systems requires that you be familiar with the switches and indicators described in the following paragraphs.

READ ONLY-READ/WRITE
The READ ONLY-READ/WRITE switch protects data on the disk pack by inhibiting writing when the switch is in the READ ONLY position. When the switch is in the READ/WRITE position, data can be written to the disk pack. Refer to Write-Protecting Disk Packs for instructions on using the READ ONLY-READ/WRITE switch.

DEVICE CHECK
The DEVICE CHECK indicator lights when an error has been detected by the drive. Refer to Operator-Correctable Problems for information on what to do if the DEVICE CHECK indicator lights.

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DS80/DS300 Disk Drive Switches and Indicators

READY
The READY indicator flashes during the power-up, power-down, and start-up sequences. When the indicator lights without blinking, the drive is ready for use.

START/STOP
Placing the START/STOP switch in the START position causes the drive to come up to operating speed. Placing the switch in the STOP position stops rotation of the disk pack.

POWER-UP

There are two methods for turning on the DS80 or DS300 disk drive and bringing it up to operating speed. The method you use depends on whether the enclosure power is turned on or off.

Power-Up When Enclosure Power Is Off
When you turn on the enclosure, you can start up the DS80 or DS300 disk drive(s) at the same time by taking the following steps:

1. Ensure that the ac power switch at the rear of each disk drive is ON (up position).

2. Install a disk pack in the drive according to the instructions in Installing and Removing Disk Packs.

3. Set the START/STOP switch on each drive to START.

4. Turn on the enclosure power.

When the enclosure is turned on, the disk drives are started up one at a time.

Power-Up When Enclosure Power Is On
When the enclosure is already on, perform the following procedure to power up each drive:

1. Ensure that the START/STOP switch is in the STOP position.

NOTE

Since a disk drive draws a large amount of current when it is started, disk drives in multiple-drive computer systems should be turned on one at a time, allowing each drive to reach operating speed before starting another. The READY indicator stops blinking when the drive reaches operating speed.

2. Set the ac power switch at the rear of the drive to ON.

3. Install a disk pack into the drive according to the instructions in Installing and Removing Disk Packs.

4. Set the START/STOP switch to START.

5. Verify that the READY indicator stops blinking and remains on.

6. Verify that the FAULT indicator is off.

Repeat this procedure for each drive in the computer system.

INSTALLING AND REMOVING DISK PACKS

CAUTION

Do not install disk packs that are damaged or of questionable quality into the disk drive. To do so can damage read/write heads, causing extensive (and costly) replacement and alignment procedures. Do not use disk drives without a clean and serviceable air filter. (See Care and Storage.)

Disk Pack Installation
Before installing the disk pack in the DS80 or DS300 disk drive, turn on the power as described in Power-Up. To install a disk pack:

1. Verify that the START/STOP switch is in the STOP position and the READY indicator is out.

2. Unlatch the air shroud lid of the disk drive and open the lid. The lid latch is located just below the front edge overhang at the center.

3. Check the interior of the air shroud. It should be clean and the heads should be completely retracted from the disk pack area.

CAUTION

The DS300 disk pack is heavy; take extra care when handling it to prevent damage.

4. Remove the lower cover from the disk pack by pinching in the two plastic bars on either side of the larger plastic bar across the bottom of the lower cover.

5. With the disk pack still inside the top cover, lower the cover carefully onto the disk drive spindle.

6. Using the top cover handle, gently rotate the pack in alternating directions until the spindle-locking mechanism is engaged. (You will feel the pack drop into place.)

7. Rotate the top cover handle clockwise until the stop is reached, and lift to disengage the top cover. Do not turn the cover after the stop is reached.
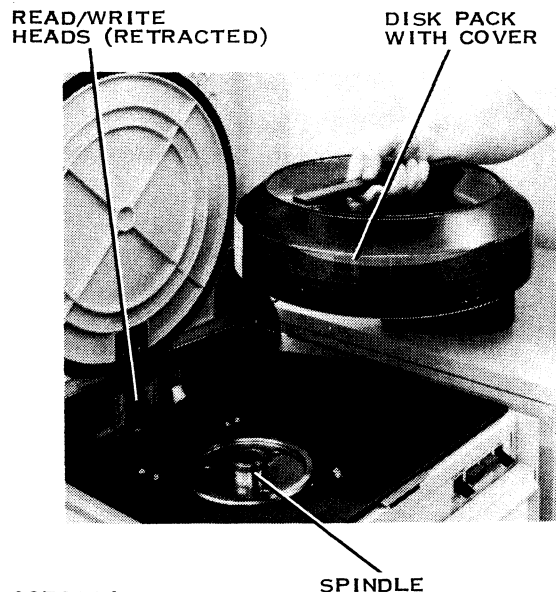

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**Removing the DS80/DS300 Disk Pack
Lower Cover**

8. Carefully lift the top cover and remove it from the disk pack. Close the air shroud lid; make sure the lid latch locks.

9. If you want to protect the information on the disk pack from being altered or erased, set the READ ONLY-READ/WRITE switch to the READ ONLY position to prevent writing on the pack. If writing is permitted, set the switch to the READ/WRITE position.

10. Store the top and bottom covers of the disk pack together to minimize dust accumulation inside the covers.

11. Set the START/STOP switch to START. The READY indicator flashes for about 20 seconds, then remains lighted, indicating that the drive is ready for use.

READ/WRITE
HEADS (RETRACTED)

DISK PACK
WITH COVER

SPINDLE

2278901

**Installing/Removing the DS80/DS300
Disk Pack With Top Cover**

Disk Pack Removal

To remove the DS80 or DS300 disk pack:

1. Stop the rotation of the disk drive spindle by setting the START/STOP switch to STOP. The READY indicator will start flashing.

2. Wait until the READY indicator stops flashing (about 30 seconds) and goes out. Unlatch the disk drive air shroud lid and open it.

3. Pick up the disk pack top cover by the handle and lower the top cover over the disk pack.

4. Gently rotate the top cover handle in alternating directions to engage the spindle-locking mechanism. (You will feel the top cover drop into place.) Rotate the handle counterclockwise to unlock the disk pack from the spindle and to reengage the top cover and the disk pack. (The cover is engaged when it clicks as you rotate it.)

5. Lift the top cover and disk pack carefully from the disk drive and close the air shroud lid.

6. Replace the bottom cover on the disk pack and return the pack to storage.

WRITE-PROTECTING DISK PACKS

Write-protecting disk packs prevents the information on them from being erased or overwritten with other data. To write protect a DS80 or DS300 disk pack, set the READ ONLY-READ/WRITE switch on the front panel of the disk drive to the READ ONLY position. The drive does not have to be restarted.

CARE AND STORAGE

The following paragraphs describe proper care and storage of disk packs and the DS80/DS300 disk drives.

Care of Disk Packs

The following tips will help you maintain your disk packs more effectively.

- Never place disk packs on top of equipment cabinets. The fans associated with the equipment may contaminate the disk by blowing dirt into the disk package.

- Handle disk packs carefully. A bent disk resulting from a drop or blow can cause a head crash. If a disk is dropped, it should be inspected by qualified service personnel for damage.

- Do not touch the recording disk. Microscopic oil particles can interfere with the read/write heads.

- Do not stack disk packs on top of one another.

- Store disk packs with the cover sets properly mounted and closed.

- Always carry the disk pack with the top and bottom covers assembled.

- Mount the cover sets together with the top and bottom covers straight and even. Covers tilted to one side can cause bent disks.

- Do not use anything other than a felt-tip pen to mark the plastic trim shield and do not stick any labels on the shield. The disk packs are balanced dynamically to 1/28 ounce; labels can distort this balance and be a source of contamination.

- When the disk pack is on the drive, store the cover sets with the top and bottom covers assembled to prevent dust accumulation.

- Keep disk packs away from X-ray machines. The X rays themselves are not harmful, but most X-ray machines generate powerful magnetic fields that can distort the disk pack's recorded data.

Disk packs require special care to maintain optimum performance. Every six months, all packs should be removed from service to undergo preventive maintenance, cleaning, and inspection by a qualified vendor or manufacturer. Regular preventive maintenance is necessary to prevent damage to the disk drives, costly system crashes, and loss of valuable data. Contact your local TI sales and service office for help in locating a qualified vendor convenient to you. Preventive maintenance is usually performed at the customer's location. Be sure to call in advance to schedule this maintenance.

NOTE

Although preventive maintenance does not alter any data on a disk pack, it is recommended that all data be copied onto a backup disk or tape prior to shipment of any disk pack.

Storage of Disk Packs
Never place disk packs in a place exposed to extreme heat, direct sunlight, or magnetic fields. Store the disk packs in an environment with a temperature ranging between -40 to 66 degrees C (-40 to 150 degrees F) with a relative humidity of 8 to 80 percent (noncondensing). Disk packs that have been stored in or subjected to temperatures outside the operating range of the disk drives must be conditioned to the computer environment for at

least 24 hours before use. During this period of conditioning, remove the disk packs from their shipping box.

For long-term storage, store the disk packs in a horizontal position in the original shipping containers stacked no more than six high. The containers provide protection against dust and debris, significant environmental changes, and contamination by chemicals.

Care of the DS80 and DS300 Disk Drives
The DS80 and DS300 disk drive operator maintenance consists of:

- Preventive maintenance every six months or more often when the drive is operated in dusty environments or areas where the temperature is not controlled.

- Cleaning the disk pack area.

- Cleaning the exterior of the drive once a month using the following procedure:

   a. Verify that the disk drive is not in use and will not be needed for 15 minutes.

   b. Place the START/STOP switch in the STOP position.

   c. Set the ac power switch (PWR ON/OFF) to the OFF position.

d. Spray a mild commercial cleaner on a soft, clean cloth and wipe the external cabinet surfaces until dry. Do not spray cleaner directly on the disk drive.

e. If a disk pack is installed, remove it and wipe the disk pack cavity thoroughly with a clean, dry, lint-free cloth. Do not attempt to clean or touch the heads.

f. Set the ac power switch to the ON position. Verify that the unit is operating normally.

OPERATOR-CORRECTABLE PROBLEMS

The following list describes operator-correctable problems that may occur and the necessary corrective actions.

Power indicators do not light.

Ensure that all power cord connections are correct and all power switches are ON.

The DEVICE CHECK indicator lights, indicating that an error has been detected.

Clear the device check condition by placing the START/STOP switch in the STOP position. Then wait until the READY indicator stops flashing and verify that the DEVICE CHECK indicator is out. If the DEVICE CHECK indicator remains lighted, contact your system manager.

RELATED INFORMATION

Expendable Supplies
The following are expendable supplies for the DS80 and DS300:

- DS80 disk pack, part number 2308475-0001

- DS300 disk pack, part number 2308505-0001

NOTE

All media not purchased from Texas Instruments must meet TI specifications. The recording surfaces in the disk pack must be error-free or have an error map label attached to the cover that contains the manufacturer's name, the part number, the serial number for the disk pack, and the addresses of all bad tracks.

Publications

The following publications are available for the DS80 and DS300 disk systems:

- *Model 990 Computer Model DS80 Disk System Installation and Operation*, part number 2302629-9701.

- *Model 990 Computer Model DS300 Disk System Installation and Operation*, part number 2302631-9701.
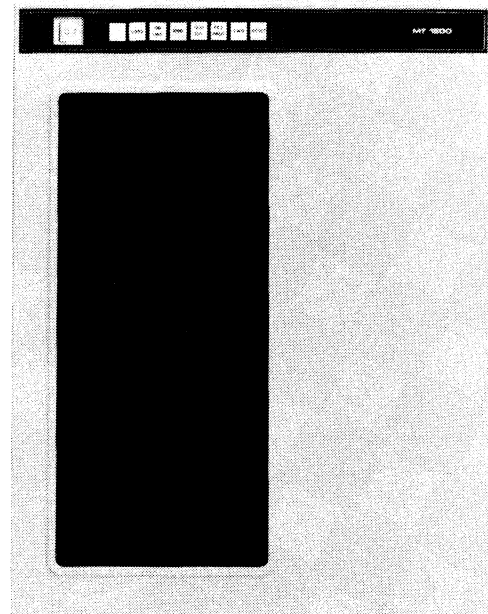
SWITCHES AND INDICATORS

Operation of the MT1600 magnetic tape system re-
quires familiarity with the switches and indicators
on the transport operator panel.

0/1 (Power Switch)
The power switch (0/1) is an alternate-action
rocker switch. It is normally left on, with ac power
controlled by the enclosure power switch. The 1
position on the switch denotes the power-on con-
dition and the 0 position denotes off. The power
indicator is immediately to the right of the power
switch.

LOAD
The LOAD switch positions the tape at the
beginning-of-tape (BOT) marker. When the begin-
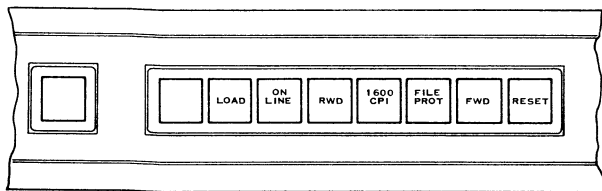ning of the tape is reached, the LOAD indicator
lights.

2283123

MT 1600 Magnetic Tape System

2282519

MT1600 Switches and Indicators

ONLINE
The ONLINE switch places the tape transport in
the online condition. When the transport is online,
the ONLINE indicator is lighted, and the computer
automatically controls tape transport operations.

RWD
The rewind switch (RWD) rewinds the tape to the
BOT marker. If the tape is already positioned at
the BOT, pressing RWD unloads the tape from the
take-up reel. This switch is operational only when
the tape transport is offline.

1600 CPI
This indicator is always on when the power is on.

FILE PROT
The file protect indicator (FILE PROT) is lighted
when the write-enable ring, which permits writing
on the tape, is not present in the tape reel. (See
Write-Protecting Tapes.)

FWD

The forward switch (FWD) advances the tape forward. This switch is operational only when the transport is offline.

RESET

The RESET switch is used to:

- Take the tape transport offline (removed from the control of the computer)

- Stop a rewind operation

- Stop forward motion of the tape

POWER-UP

Power to the tape transport is normally controlled by the enclosure power switch, with the transport power switch left in the on position (1). If enclosure power is off, set the transport power switch to 1 and turn on enclosure power. If enclosure power is already on but the transport is off, set the transport power switch to the 1 position.

INSTALLING AND REMOVING A TAPE

The following paragraphs explain how to load and remove a reel of tape from the MT1600 tape transport.

Tape Reel Installation

To load a reel of tape on the tape transport, proceed as follows:

1. Turn the power switch ON.

2. Place the file reel on the lower reel hub and firmly press the hub assembly home

against the transport wall. Then press on the hub locking mechanism.

3. Thread the tape from the file reel (the reel that contains the tape) to the takeup reel as shown in the illustration. Wind five or six turns of tape around the takeup reel, taking up any slack in the tape.

NOTE

When a tape is first loaded, it must be tight across the top and bottom rollers of the tension arms.

4. Close the door of the transport.

2283104
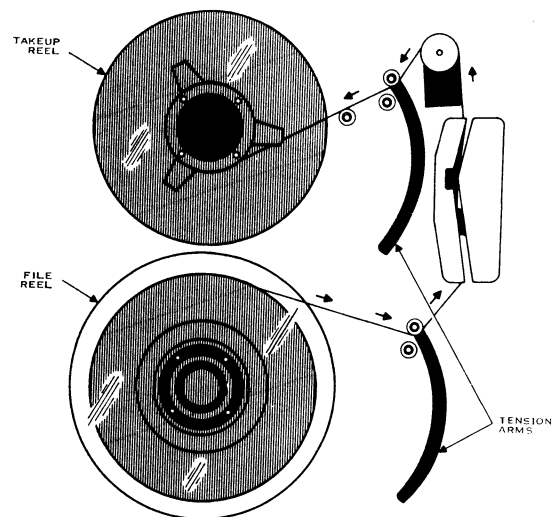
Tape Loading Diagram

5. Press the LOAD switch. The tape will wind several turns onto the takeup reel, and the transport will position the tape at the BOT marker.

6. When the LOAD indicator lights, press ONLINE to bring the tape transport online so the computer can directly control the transport. The MT1600 is now ready for use.

Tape Reel Removal

To remove a reel of tape from the transport:

1. Press the RESET switch to take the transport offline. The ONLINE indicator should be off.

2. Press RWD. The tape rewinds to the BOT marker. If it is already at the BOT, the tape reel rewinds until the end of the tape is freed from the takeup reel.
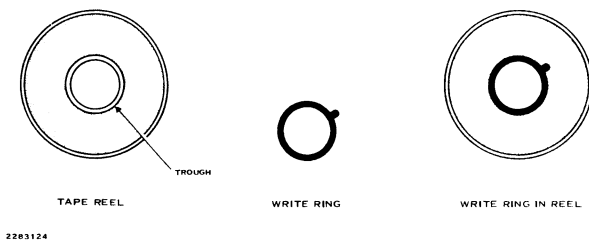
3. If tape does not unload when you press RWD one time, press RWD again to unload the tape.

4. Pull out the hub locking assembly and remove the tape reel.

5. Place the tape in a storage canister or install a protective guard around the exposed portion of the tape.

WRITE-PROTECTING TAPES

The writing of data on the tape is enabled by the presence of a write ring installed on the tape reel. To write-protect a tape, ensure that a write ring is not installed in the back of the reel. To install a write ring:

1. Turn the tape reel over so that the back of the reel is toward you.

2. Snap the write ring in the circular trough next to the inner edge of the reel.

TAPE REEL   WRITE RING   WRITE RING IN REEL

2283124

Write Ring Installation

CARE AND STORAGE

Cleanliness is an absolute must in the handling, care, and storage of magnetic tapes. Dust on tapes will cause excessive tape wear and head wear, leading to data loss. The transport surfaces that contact the tape must also be kept free of dust and oxide buildup. Tape handling precautions and cleaning procedures for the tape transport are given in the following paragraphs. Be sure to unload the transport and remove the tape before cleaning.

In cases of erratic operation, perform the cleaning procedures before calling maintenance personnel.

Tape Handling

To avoid damage to the tape, take the following precautions:

- Keep the tape away from magnetic fields or magnetic materials. Magnetic fields distort the tape's recorded data.

- Avoid X-ray machines. The X rays themselves do not harm the tape, but most X-ray machines generate powerful magnetic fields.

- Do not expose the tape to direct sunlight or extremes in temperature or humidity.

- Keep the tape away from sticky, oily, or abrasive substances.

Daily Cleaning of the MT1600

The following procedures should be performed every 24 hours or every eight operating hours, whichever occurs first:

NOTE

Before beginning the cleaning procedure, remove the reel of tape from the transport.

1. Clean the transport door interior and housing with a lint-free cloth. Open the transport door and wipe all exposed surfaces, including the inside of the door.

2. Remove the access covers by pulling them gently towards you.

3. Clean the tape guides with denatured alcohol and a lint-free cloth. Wipe off the tape guide surfaces and check for loose oxide under the lower ceramic guide ring. If necessary, brush out with a small brush.

4. Wipe the surfaces of the tape heads and cross-talk shield with cotton swabs moistened with denatured alcohol.

5. Inspect the tape cleaner and lightly brush off dust and oxide contaminants using a small brush.

6. Inspect the capstan for oxide deposits and other contamination. Wipe clean with Freon™ Type TF and a lint-free cloth as necessary. Do not substitute other cleaners as they can damage the rubber surface of the capstan.

7. Allow all surfaces to dry before loading a tape.

Freon is a trademark of E.I. Dupont de Nemours and Co., Inc.

Periodic Cleaning of the MT1600

The entire surface of the tape transport should be wiped with a lint-free cloth every four months to remove any accumulations of dust around the hold-down knobs and in the head. In addition, the turnaround rollers should be checked for oxide deposits and foreign matter. Clean the rollers with Freon Type TF and cotton swabs as necessary.
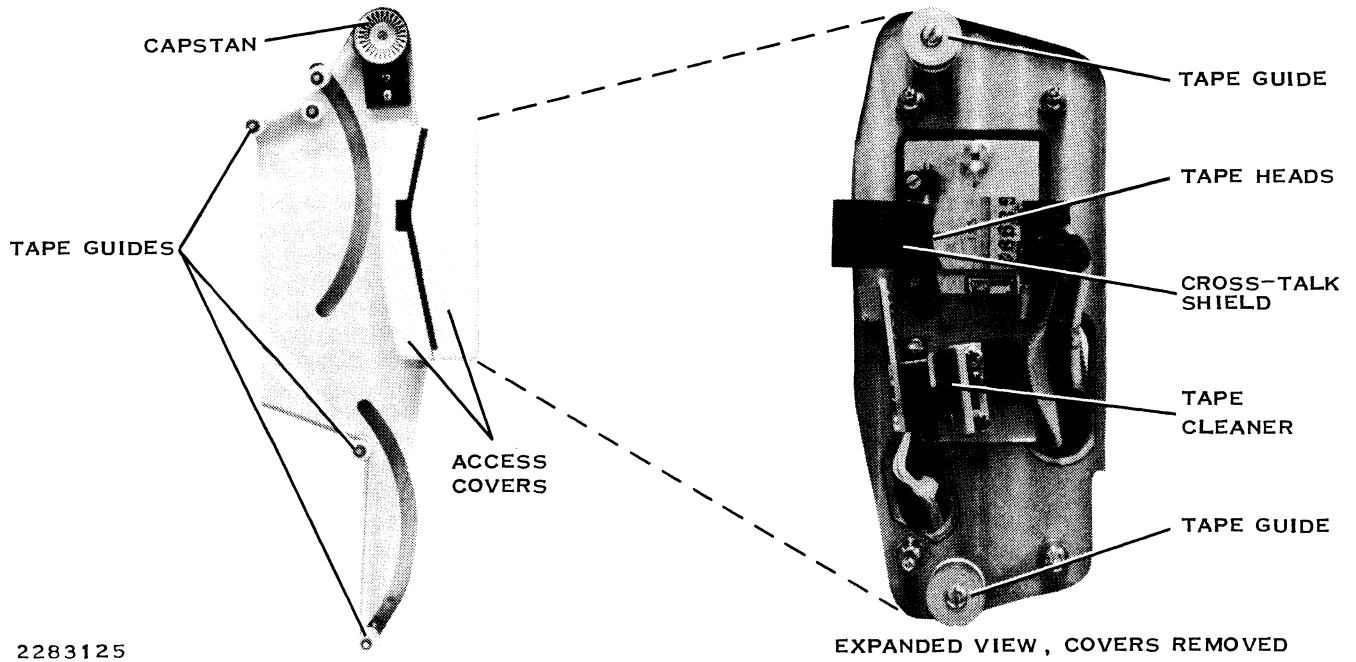
OPERATOR-CORRECTABLE PROBLEMS

In case of a computer system power failure, take the following steps:

1. Open the transport door and ensure that there is no slack in the tape.

2. Close the door and press LOAD.

3. When the LOAD indicator comes on, press ONLINE to bring the transport online.

CAPSTAN

TAPE GUIDES

ACCESS
COVERS

2283125

TAPE GUIDE

TAPE HEADS

CROSS—TALK
SHIELD

TAPE
CLEANER

TAPE GUIDE

EXPANDED VIEW, COVERS REMOVED

Tape Guides, Tape Heads, and Capstan Detail

RELATED INFORMATION

All tapes used with the MT1600 tape transport should conform to ANSI standards for one-half-inch tapes recorded at 1600 characters per inch.

The manual *Model 990 Computer MT1600 Magnetic Tape System Installation and Operation*, part number 2302642-9701, provides more information about the MT1600 tape transport.

SWITCHES AND INDICATORS

Operation of the MT3200 magnetic tape system requires familiarity with the switches and indicators on the transport operator panel.

0/1 (Power Switch)
The power switch (0/1) is an alternate-action rocker switch. It is normally left on, with ac power controlled by the enclosure power switch. The 1 position on the switch denotes the power-on condition and the 0 position denotes off. The power indicator is immediately to the right of the power switch.
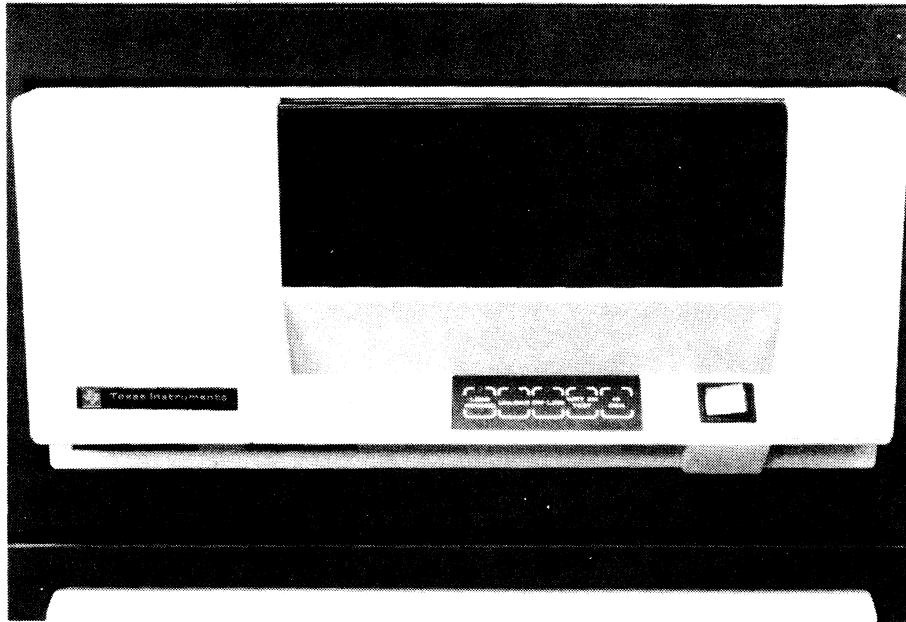
LOAD/REWIND
The LOAD switch positions the tape at the beginning-of-tape (BOT) marker. When the beginning of the tape is reached, the LOAD indicator lights. The indicator flashes while the drive is executing a load or rewind sequence.
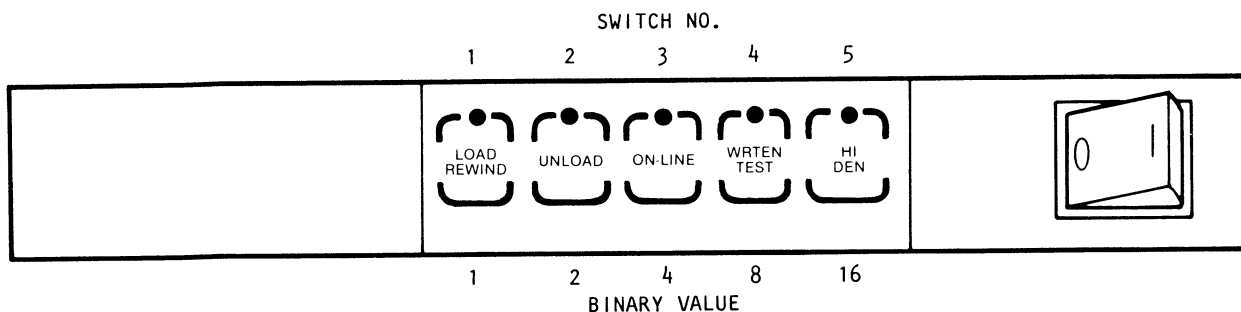
2285677

MT3200 Magnetic Tape System

```
                              SWITCH NO.
              1        2        3        4        5

            [LOAD   [        [        [WRTEN   [HI
            REWIND]  UNLOAD]  ON-LINE] TEST]    DEN]

              1        2        4        8       16
                         BINARY VALUE
```

2285699

MT3200 Switches and Indicators

ON-LINE
The ON-LINE switch places the tape transport in the online condition. When the transport is online, the ON-LINE indicator is lighted and the computer automatically controls tape transport operations.

UNLOAD
The UNLOAD switch unloads the tape from the take-up reel.

HI DEN
This switch selects data density in characters per inch (cpi). The indicator is off for 1600 cpi and on for 3200 cpi.

WRTEN TEST
The WRTEN TEST indicator is lighted when the write-enable ring, which permits writing on the tape, is not present in the tape reel. (See the paragraph entitled Write Protecting Tapes.)

POWER-UP

Power to the tape transport is normally controlled by the enclosure power switch, with the transport power switch left in the on position (1). If enclosure power is off, set the transport power switch to 1 and turn on enclosure power. If enclosure power is already on but the transport is off, set the transport power switch to the 1 position.

INSTALLING AND REMOVING A TAPE

The following paragraphs explain how to load and remove a reel of tape from the MT3200 tape transport.

Tape Reel Installation

To load a reel of tape on the tape transport, proceed as follows:

CAUTION

Do not attempt to open the top cover or the front-panel door during tape loading functions or while the tape is in the transport. The front panel door and top cover are locked during the tape loading operation.

1. Apply power to the unit and verify that the UNLOAD indicator is on (allow for normal delay of 5 seconds).

2. Prepare tape-leader, if required, by trimming with scissors to a convex shape and by pinching end to form a short (3/8 inch) lengthwise crease.

3. Verify that the write-enable ring, if used, is fully seated.

4. Ensure that tape is wound completely onto reel.

5. Open front-panel door by pressing down gently on top (center) of door.

6. Insert tape into front of unit with write-enable ring side down. Tip the edge of the reel inside of the unit slightly upward to clear the supply hub and place tape well inside unit. The door, when closed, should not touch the reel.

7. Close front-panel door.

8. Actuate LOAD switch. Access doors are now locked. When load sequence is completed, LOAD indicator will remain on.

NOTE

During the load sequence, actuation of the ON-LINE switch will place transport online when BOT marker is sensed.

2285676

Tape Loading

Tape Reel Removal

To remove a reel of tape from the transport:

1. Actuate UNLOAD switch. Transport must be in offline mode (ON-LINE indicator extinguished).

NOTE

During the unload sequence, UNLOAD indicator will flash and access doors will remain locked. When the unload sequence is completed, UNLOAD indicator will remain illuminated and access doors will unlock.

2. Open front-panel door when UNLOAD indicator remains illuminated.

   a. Carefully lift up the reel to clear the supply hub and remove reel.
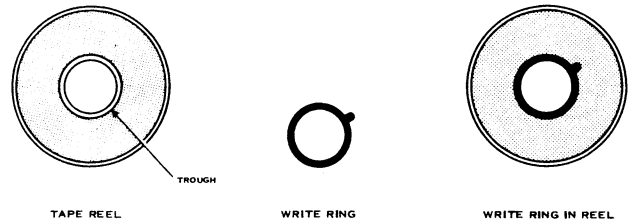
3. Close front-panel door.

WRITE-PROTECTING TAPES

The writing of data on the tape is enabled by the presence of a write ring installed on the tape reel. To write-protect a tape, ensure that a write ring is not installed in the back of the reel. To install a write ring:

1. Turn tape reel over so that back of reel is toward you.

2. Snap write ring in circular trough next to inner edge of reel.

TAPE REEL   WRITE RING   WRITE RING IN REEL

2283124

Write Ring Installation

CARE AND STORAGE

Cleanliness is an absolute must in the handling, care, and storage of magnetic tapes. Dust on tapes will cause excessive tape wear and head wear, leading to data loss. The transport surfaces that contact the tape must also be kept free of dust and oxide buildup. Tape handling precautions and cleaning procedures for the tape transport are given in the following paragraphs. Be sure to unload the transport and remove the tape before cleaning.

In cases of erratic operation, perform the cleaning procedures before calling maintenance personnel.

Tape Handling
To avoid damage to the tape, take the following precautions:

- Keep the tape away from magnetic fields or magnetic materials. Magnetic fields distort the tape's recorded data.

- Avoid X-ray machines. The X rays themselves do not harm the tape, but most X-ray machines generate powerful magnetic fields.

- Do not expose the tape to direct sunlight or extremes in temperature or humidity.

- Keep the tape away from sticky, oily, or abrasive substances.

Daily Cleaning of the MT3200

The following procedures should be performed every 24 hours or every eight operating hours, whichever occurs first:

1. Power the system down.

2. Unlatch the slides of the MT3200 by grasping the lower left corner of the front panel with your hand and squeezing. Pull the tape drive out on its slides.

3. Open the top cover of the tape drive by lifting the sides of the cover directly behind the front panel. Place the cover stay in the slot provided to support the cover in the open position.

CAUTION

Do not apply a cleaner directly from the container to the surface to be cleaned, even though instructions on the container of the cleaner may indicate to do so. Always apply the cleaner to a swab or wiper first, carefully removing any excess. The tachometer roller and roller guides contain precision bearings. Solvents allowed to run into the bearings will break down the lubricant.

NOTE

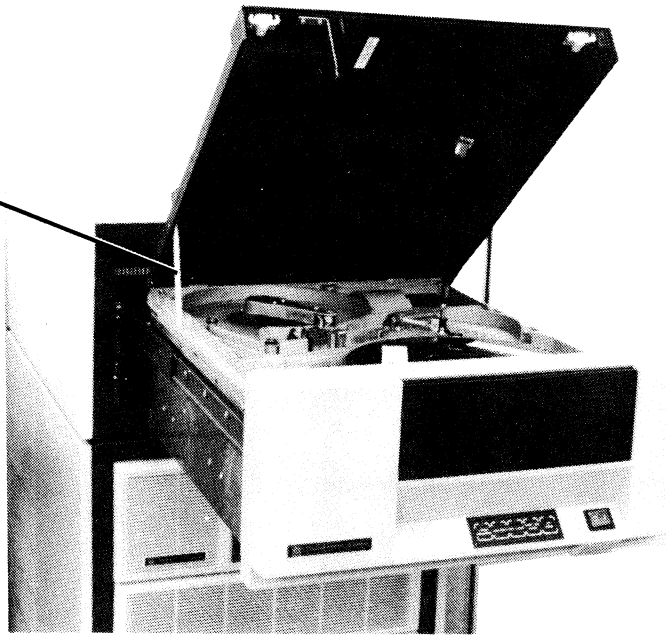For steps 4 through 9, the numbers in parentheses pertain to the figure entitled Tape Path and Related Parts.
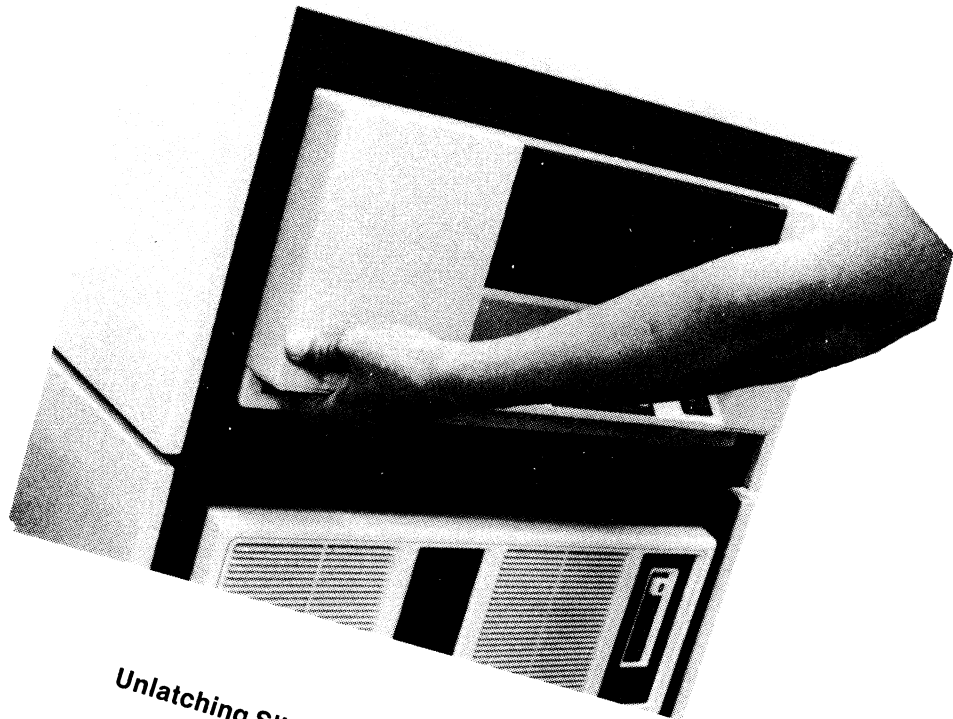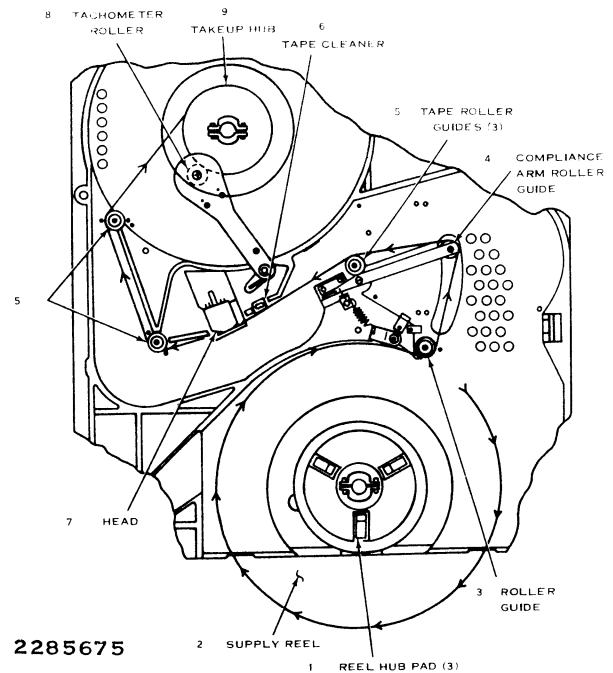
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Unlatching Slides on MT3200

COVER STAY

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Operator Maintenance Access Position

4. Clean the tachometer roller (8) by using a swab moistened with tape path cleaner. Gently wipe the entire roller surface. The roller can be rotated by slowly turning the take-up hub manually.

5. Clean the take-up hub (9) by using a swab or wiper moistened with tape path cleaner. Rotate the hub manually while gently wiping the tape wrapping surface.

6. Clean the roller guides (3, 4 and 5) by using a swab moistened with tape path cleaner. Rotate each roller and gently wipe the tape contact surface flanges or washers.

7. Clean the reel hub pads (1) by using a swab or wiper moistened with tape path cleaner. Wipe the contact surface of each pad and remove any debris around the pad.

2285675

Tape Path and Related Parts

8. Clean the head (7) by using a swab or wiper moistened with head cleaner. Wipe the entire face of the head and attached erase bar, paying particular attention to the recessed areas.

CAUTION

Rough or abrasive materials can scratch sensitive surfaces of the head, resulting in permanent damage. Other cleaners, such as alcohol based types, can cause read/write errors.

9. Clean the tape cleaner (6) by using a swab moistened with head cleaner. Wipe each blade along its length. Remove accumulated oxides from the recessed area between the blades.

CAUTION

Exercise care to avoid damage to sharp edges of tape cleaner blades.

10. Clean the front panel and door by using a wiper moistened with plastic cleaner.

11. Clean the top plate casting by using a wiper moistened with plastic cleaner. Wipe away the oxide dust in the tape path area. Be careful not to get dirt on the head, rollers, and so forth. Avoid disturbing the sensors.

12. To clean the filter, remove it from inside the air duct opening at the lower left of the front panel. Either clean the filter with low pressure compressed air, or vacuum it. Make sure that the direction of the air you are using to clean the filter flows in the opposite direction of the normal airflow. Reinstall the filter.
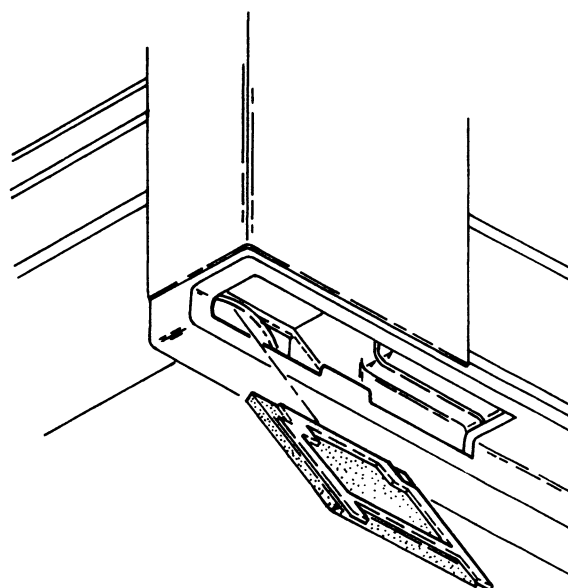
2285681

Air Filter Removal

OPERATOR-CORRECTABLE PROBLEMS

Operator Error Codes

These fault indications occur during normal tape loading operation. They produce error codes which will be displayed as an even ON/OFF pattern of the indicators on the front panel. Refer to the Operator Error Front Panel Indication table. When the problem is corrected (by closing the front panel door) actuate the LOAD switch to clear the error condition and reenter the load sequence. If the error codes occur when proper operating procedures have been followed, a machine malfunction is indicated.

Operator Error Front Panel Indicator

Error Code*	Indication	Conditions
22	All indicators except LOAD and TEST flashing	Early end-of-tape (EOT) marker encountered. EOT marker located greater than 25 feet prior to actual EOT. Used with switch U3T-1 ON only. Relocate EOT marker.
23	All indicators except REST flashing	A load operation was attempted without inserting a tape reel into the transport, the reel of tape is not properly seated, or the supply reel was not locked when attempting a manual load. Check if file project and hub seat sensor are working properly. Attempt another LOAD operation.
25	All indicators except UNLOAD and ON-LINE flashing	An insufficient amount of tape was wrapped around the takeup hub when attempting a manual load. Attempt another LOAD operation.
26	All indicators except LOAD and ON-LINE flashing	Tape end did not peel off of reel. Remove antistatic tape/foam block if used. If caused by static charge buildup, refer to the paragraph entitled Manual Load.

27	All indicators except ON-LINE flashing	A load or unload operation was attempted with the front-panel door or top cover in the open position.
28	All indicators except LOAD and UNLOAD flashing	Tape reel prevented movement of the supply reel hub. Remove and reinsert tape reel to clear.
29	All indicators except UNLOAD flashing	Tape reel was inserted upside-down. The bottom of the tape reel is identified by the write-enable ring groove of the write enable ring (when installed) near the inside mounting circumference.
30	All indicators except LOAD flashing	The BOT marker was not detected within the first 35 feet of tape. The leader must be a minimum of 6 feet in length.
31	All indicators flashing	After four attempts, the unit did not successfully complete the load sequence. The tape leader should be checked for excessive damage or static charge buildup. If a second attempt at autoloading fails, refer to the paragraph entitled Manual Load.

* The error code number is the decimal equivalent of the front panel binary indication (LSB—left, MSB—right).

Manual Load
To load tape after a failure of the autoloading routine, proceed as follows:

1. Extend unit on its slides to clear equipment rack.

2. Place transport in operator maintenance access position by lifting top cover sides behind front panel. Place cover stay in slot provided.

3. Place reel of tape on supply hub. Ensure that reel is evenly seated on hub.

4. Depress and hold the manual unlock button, located behind front-panel door on bottom left hand side of tape reel opening, and simultaneously rotate the supply hub clockwise until supply reel is locked in place.

5. Thread tape along the tape path. Carefully move the tachometer assembly away from takeup hub, and, making one wrap of tape clockwise around takeup hub, gently replace tachometer assembly. Continue to wrap tape for five (5) more revolutions of the takeup hub. Check that tape is seated correctly on guides and threaded properly over head assembly.

6. Close top cover, and place transport in normal operating position.

7. Depress and hold the HI DEN switch, then actuate the LOAD switch and release both. The tape should tense and advance forward until BOT tab is positioned at photosensor. The LOAD indicator will illuminate, indicating that the unit is ready for use.

Manual Unload

If for any reason the unit cannot complete the rewind/unload sequence, the tape reel may be rewound manually as follows:

1. Place transport in operator maintenance access position (refer to paragraph entitled Operator Maintenance Access).

2. Rotate supply reel in a counterclockwise direction to rewind tape onto supply reel.

3. Depress and hold the manual unlock button, located behind front-panel door on bottom left-hand side of the tape reel opening, and simultaneously rotate the supply reel counterclockwise until it rotates freely and can be removed from the transport.

RELATED INFORMATION

Expendable Supplies

The expendable supplies for the MT3200 are:

- Tape reel (1200 foot), part number 973718-0005

- Freon type TF

- Cotton swabs

NOTE

All tapes used with the MT3200 tape transport should conform to ANSI standards for one-half-inch tapes recorded at 1600/3200 characters per inch.

Publications

The manual *WD900/MT3200 General Description*, part number 2246134-9701, provides more information about the MT3200 tape transport.

SWITCHES AND INDICATORS

Daily operation of the WD500 mass storage system requires familiarity with the switches and indicators on the control panel.

NOTE

Throughout this subsection references to the WD500 also apply to the WD500A unless otherwise indicated.
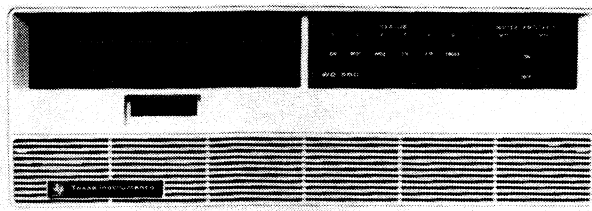
2283675

WD500 Subsystem Chassis

WD1 and WD2

The WD1 and WD2 switches inhibit writing on the first and second Winchester disks, respectively. When write-protection is in effect, the appropriate indicator for the switch is on. See Write-Protecting Disk and Diskette for more information on write-protecting data.

ON

When the ON indicator is lighted, ac power is on and the disks are up to operating speed.

WD1

The WD1 indicator is lighted when the first disk is being used by the computer. When this indicator is out and the ON indicator is lighted, the disk is ready.

WD2

The WD2 indicator is lighted when the second disk is being used by the computer. The disk is ready to be used when this indicator is out and the ON indicator is lighted.

FD

The FD indicator is on when the diskette is being used by the computer.

I/F

The I/F indicator comes on when the WD500 is attempting to verify that it is connected to the computer. If it does not go out, check the cable connections between the chassis and the WD500.

FAULT

When the FAULT indicator is on or is blinking after power has been on for more than 30 seconds, an internal error has occurred, and you should notify the computer system manager.
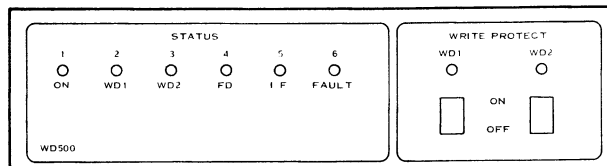
2283127

WD500 Control Panel

POWER-UP

Ac power to the WD500 drive is normally controlled by the enclosure power switch, with the power switch (ON/OFF) at the rear of the drive left on. If enclosure power is off, ensure that the drive power switch is on and turn on enclosure power. If enclosure power is already on but the drive is off, set the drive power switch to ON. The ON indicator on the control panel lights about 30 seconds after power is applied to the drive.

INSTALLING AND REMOVING DISKETTES

The following paragraphs explain how to insert and remove diskettes from the WD500. (The Winchester disks are permanently installed and cannot be removed.) Diskettes are inserted and removed through an access door at the front of the drive. The access door handle is a flange located immediately above the door opening. The door release is a rectangular button centered below the door opening.

Diskette Insertion
Diskettes can be inserted with the drive power off, or with power on and the drive spindle rotating. To load a diskette into the drive:

1. Press the door release so that the access door pops open.

2283128

Orientation of Diskette for Insertion

2. Remove the diskette from its storage envelope and orient it with the manufacturer's label facing up and to the right.

3. Insert the diskette into the slot. The eject spring latches when the diskette is fully inserted.

4. When the spring latches, press downward on the door handle, clamping the diskette into position on the spindle.

Diskette Removal
To remove a diskette from the drive, press the door release. If the diskette is not currently being used, the access door pops open and the diskette is ejected. If the diskette is being used, the access door is locked.

WRITE-PROTECTING DISK AND DISKETTE

Write-protecting disk media prevents the information on them from being erased or overwritten with other data. The following paragraphs explain how to protect the information on both the Winchester disk and diskettes.

Write-Protecting the Winchester Disk
To write-protect the Winchester disk, move the appropriate switch (that is, WD1 or WD2) to the up position. The indicator for the write-protected disk then lights. Enable writing by moving the switch down.

Write-Protecting the Diskette
The bottom edge of the diskette jacket contains a small cutout known as the write-protect notch.

While the write-protect notch remains exposed, the diskette is write-protected and data cannot be transferred to it, erased, or altered. The diskette can be written on when a piece of opaque tape is placed over the write-protect notch. Spare tapes are provided in packages of diskettes.

CARE AND STORAGE

The following paragraphs explain how to care for the removable diskettes and for the WD500 drive.

Care of Diskettes
The following precautions should be taken when handling diskettes:

- Handle with care. When filing a diskette, take care not to fold or bend it as the stored data can be destroyed.

- Keep the diskette away from magnetic fields (such as those found in X-ray machines or in the electric motors of fans or typewriters) and potentially damaging substances such as sticky, oily, or abrasive materials.

- Always return the diskette to its storage envelope when it is not being used.

- Do not smoke while handling diskettes.

- Use only a felt-tip pen to write on the plastic jacket or diskette labels. Do not try to erase written information from the jacket since the eraser dust may contaminate the diskette surface.

- Keep the diskette away from excessive heat, direct sunlight, and moisture.

NOTE

A diskette that has been exposed to extreme temperatures (beyond 10 to 50 degrees C or 50 to 125 degrees F) but which is otherwise clean and dry, may be serviceable after about five minutes at room temperature. However, prolonged exposure to such extremes can warp the jacket or damage the diskette, rendering it unserviceable.

- Do not touch or attempt to clean the exposed portion of the diskette.

- Do not attempt to load or use diskettes that have been damaged or contaminated as they may damage internal parts of the drive.

Care of WD500 Drive
Operator maintenance of the WD500 drive consists of keeping the drive and general area clean and dust-free. You may clean the control panel of the drive with a mild detergent in water and a clean cloth. Do not use strong solvents to clean the control panel.

OPERATOR-CORRECTABLE PROBLEMS

The following list describes operator-correctable problems that may arise and the necessary corrective actions.

System operating problems are being experienced.

Replace the diskette(s). If the problems recur, notify the computer system manager.

The drive door does not open to release the diskette when the latch release is pressed.

The diskette is being used by the computer. When the access is complete, the diskette can be removed.

RELATED INFORMATION

Texas Instruments offers single-sided, single-density diskettes (part number 945065-0001) or double-sided, double-density diskettes (part number 2261687-0001) for use with the WD500. These diskettes are manufactured to TI specifications by major media suppliers.

Use of diskettes that do not meet TI specifications can cause degraded system performance, loss of recorded data, and eventual read/write head damage.

The following manuals provide more information about the WD500:

* *WD500/WD500A Mass Storage System Installation and Operation*, part number 2302688-9701

* *Model 990 Computer WD500/WD500A Mass Storage System Field Theory and Maintenance*, part number 2302689-9701

SWITCHES AND INDICATORS

Daily operation of the WD800 mass storage system requires familiarity with the switches and indicators described in the following paragraphs.

NOTE

Throughout this subsection references to the WD800 also apply to the WD800A unless otherwise indicated.

TEST STATUS/TAPE UNLOAD
The TEST STATUS/TAPE UNLOAD switch is a three-position control that automatically returns to the center position after being moved up or down and released. The center position is IDLE.

When the switch is moved down to the TAPE UNLOAD position, the drive delays about 10 seconds and then moves an installed tape to the unload point. While tape activity is in progress (reads, writes, and other operations with the computer), the TAPE UNLOAD switch position is temporarily ignored by the system.

The TEST STATUS position allows read-out of diagnostic information. This position is not normally used by the operator.
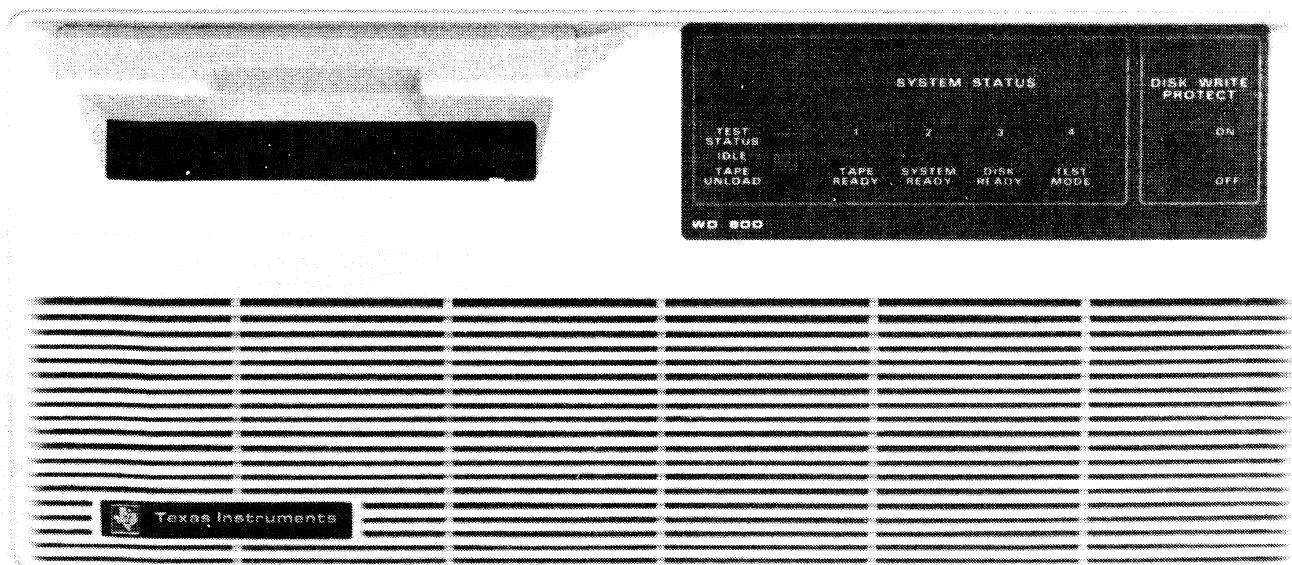
DISK WRITE-PROTECT
The DISK WRITE-PROTECT switch on the front panel inhibits writing or erasing data on the disk. When the switch is ON (in the up position), the disk is write-protected. (This switch does not write-protect the tape cartridge. See Tape Write-Protection.)

2283129

WD800 Mass Storage System

TAPE READY
The TAPE READY indicator shows the status of the tape subsystem. When the indicator is on, the tape subsystem is powered up, has a tape cartridge installed, and is ready for operation. A blinking TAPE READY indicator signals that a tape is being loaded or unloaded.

SYSTEM READY
The SYSTEM READY indicator shows the status of the WD800. When the indicator is on, the WD800 is powered up and has successfully completed a self-test. A blinking SYSTEM READY indicator means that the drive is undergoing self-test or that an internal fault has been detected.

DISK READY
The DISK READY indicator shows the status of the Winchester disk. When the indicator is on, the power is on and the disk subsystem has successfully completed a self-test. A blinking DISK READY indicator means that the disk self-test is in progress or that the computer is using the disk (irregular blink).

TEST MODE
The TEST MODE indicator lights when internal self-tests are being performed. It may also turn on momentarily as a result of a reset from the computer.

226.31 30
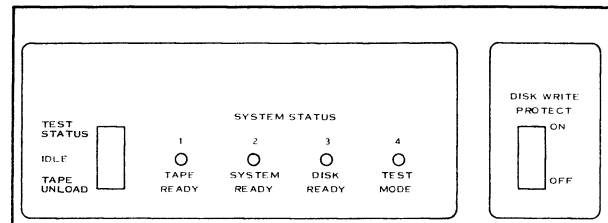
WD800 Switches and Indicators

POWER-UP

Ac power to the WD800 drive is normally controlled by the enclosure power switch, with the power switch at the rear of the drive left on. To apply power to the WD800:

1. Ensure that a cartridge tape is not installed in the drive.

2. Turn the enclosure power on. (If enclosure power is already on but the drive is not on, turn on the drive power switch.) The front panel indicators respond to power-up in the following way:

    a. All four indicators light for 10 seconds.

    b. All indicators except TEST MODE turn off and then blink as internal self-tests execute (approximately 30 seconds).

c. The DISK READY indicator lights.

d. The SYSTEM READY indicator lights.

e. The TEST MODE indicator turns off.

NOTE

Disk drives draw large amounts of current when they are started. In multiple drive installations, it is recommended that the drives be started one at a time, allowing each drive to reach operating speed before starting another.

Installing and Removing Tape Cartridges
The following paragraphs describe how to install and remove tape cartridges from the tape drive. The disk drive is permanently sealed within the WD800 chassis and requires no operator interaction.
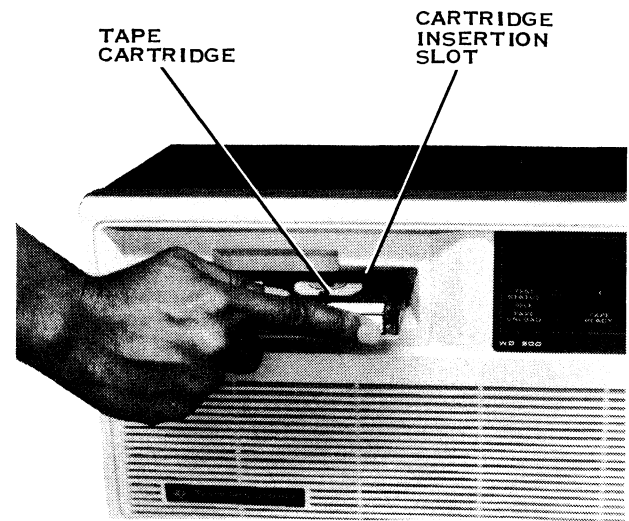
Tape Cartridge Insertion

To insert the tape cartridge:

1. Ensure that the TAPE READY indicator is off.

2. Remove the cartridge from its storage container.

3. Orient it right side up (that is, with the clear plastic up and the metal base down).

4. Insert the cartridge gently into the access slot in the front panel until it latches into place.

5. The TAPE READY indicator will blink as the tape is loaded and rewound to the beginning. When the load operation completes (about one minute), this indicator stays on.

2283131

Tape Cartridge Insertion

Tape Cartridge Removal

To unload a tape cartridge:

1. Move the TAPE UNLOAD switch to the down position and release it. This initiates an unload sequence, which is indicated by a blinking TAPE READY light. (The switch is ignored if it is pressed while the computer is using the cartridge.)

NOTE

There is a 10-second delay between the pressing of the TAPE UNLOAD switch and the point at which the unload sequence begins. This allows time to ensure that the computer is not initiating tape activity.

2. When the unload sequence is complete (about a minute), the TAPE READY indicator turns off to indicate that it is safe to remove the cartridge from the access slot and insert another.

3. Remove the cartridge by gently pulling it straight out of the cartridge tape opening. Put it into its storage container to protect it against contaminants.

WRITE-PROTECTING DISK AND TAPE CARTRIDGE

Write-protecting the disk or tape cartridge prevents the information on them from being erased or overwritten with other data. The following paragraphs explain how to write-protect the disk and tape cartridges.

Disk Write-Protection

To write-protect the fixed disk, flip the DISK WRITE-PROTECT switch on the front panel to the ON (up) position.

Tape Write-Protection

A slotted plug on the upper left corner of the cartridge can be turned in either of two directions for write-protected or unprotected operation. The write-protected position is marked SAFE on the cartridge housing.

CARE AND STORAGE

Cartridge Handling

To avoid damage to the tape within the cartridge, take the following precautions:

- Keep the cartridge away from magnetic fields or magnetic materials. Magnetic fields distort the tape's recorded data.

2282717

Tape Cartridge Write-Protect Plug

- Avoid X-ray machines. The X rays themselves do not harm the tape, but most X-ray machines generate powerful magnetic fields.

- Do not expose the cartridge to direct sunlight or extremes in temperature and humidity.

- Keep the cartridge away from sticky, oily, or abrasive substances.

- Use the TAPE UNLOAD switch before removing a tape to ensure that the data is physically protected from contaminants.

Care of WD800 Drive

Operator maintenance of the WD800 drive consists of cleaning the tape heads and capstan and vacuuming the air filters. The exterior of the WD800

can be cleaned with a mild detergent diluted in water and a lint-free cloth.

CAUTION

Do not use strong solvents to clean the front panel of the drive.

Tape Head and Capstan Cleaning. Failure to keep the tape heads and capstan clean can result in read/write errors. Clean the heads, tape cleaner, and capstan once a week (or more if necessary) in the following manner:

1. Turn off the enclosure power. (If the WD800 is not installed in the enclosure, it is necessary only to turn off the drive power.)

2. Remove the tape cartridge from the access slot. This exposes the head assembly, tape cleaner, and capstan.

3. While holding the access door open, insert a cotton swab dampened with denatured alcohol through the access slot and apply to each assembly.

4. When the assemblies are clean, turn on the enclosure (or drive) power.

Air Filter Cleaning.   The cleanliness of the air that enters the WD800 can affect the lifetime of the system. Keep the drive and general area clean and dust-free.

Clean the air filter every six weeks in the following manner:

1. Turn off enclosure power. If the WD800 is not installed in the enclosure, it is necessary only to turn off drive power.

2. Remove the front panel from the drive.

3. Use a vacuum cleaner with a brush tool to remove accumulated dust from the air filter front. If you accidentally damage the filter or cannot get it clean, replace it with a new filter.

4. Reinstall the front panel.
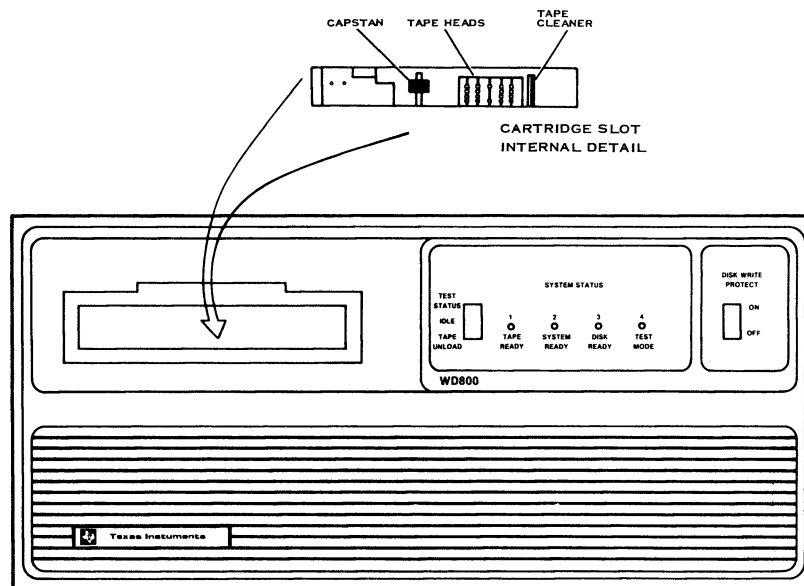
2283071

Tape Guides, Heads, and Cleaner Detail
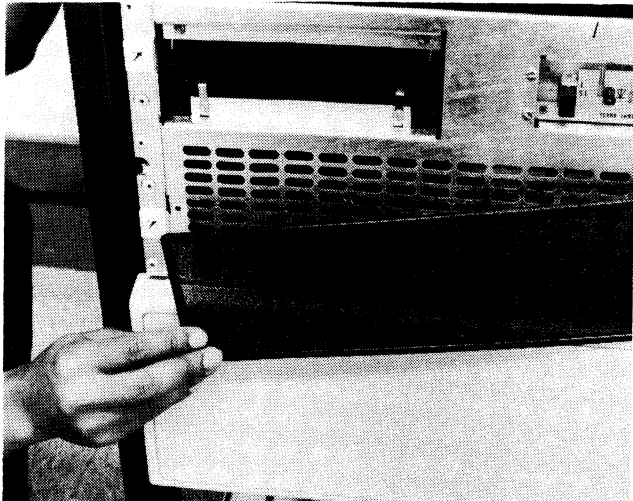
2283133

Air Filter Removal

5.   Restore power to the enclosure (or drive).

Replace the air filter every six months.

OPERATOR-CORRECTABLE PROBLEMS

The following list describes operator-correctable problems that may occur and the necessary corrective actions.

The TAPE READY indicator is off.

Ensure that a tape cartridge is installed.

The tape unload switch does not respond and the TAPE READY indicator stays on when you press TAPE UNLOAD.

The computer system is using the tape. Try the unload later.

The TAPE READY indicator went off without an unload.

An internal tape error was detected. Replace the cartridge with a known good tape.

Status indicators do not light.

Ensure that all power cord connections are correct and all power switches are on.

Disk write-protect error.

This error is reported when the computer system cannot write to the disk. Ensure that the DISK WRITE-PROTECT switch is in the down position.

Cartridge tape write-protect error.

This error is reported when the computer system cannot write to the cartridge tape. Unload the tape and ensure that the write-protect arrow is rotated 180 degrees away from the SAFE position.

Read, write, or verify difficulties are experienced with the cartridge tape.

Clean tape heads as outlined in Care and Storage.

The TAPE READY indicator continues to blink for more than two minutes after you loaded a cartridge tape.

The tape has failed an internal self-test. Replace the cartridge with a known good tape and report the failure to your system manager.

NOTE

If a cartridge tape containing vital data fails the load test, you can still load it by settting the tape write protection control to the SAFE position. This allows you to read data from the tape but it cannot be accessed by write operations.

NOTE

All media not purchased from Texas Instruments must meet TI specifications.

- Intake air filters, part number 2270848-0001 (rectilinear version)

Publications

The manuals *WD800/WD800A Mass Storage System Installation and Operation,* part number 2306140-9701, and *WD800/WD800A Mass Storage System Field Maintenance,* part number 2306142-9701, provide additional information about the WD800/WD800A drives.

RELATED INFORMATION

Expendable Supplies

Supplies for the WD800 system include:

- Tape cartridges, part number 2270391-0001

Mass Storage (WD900)
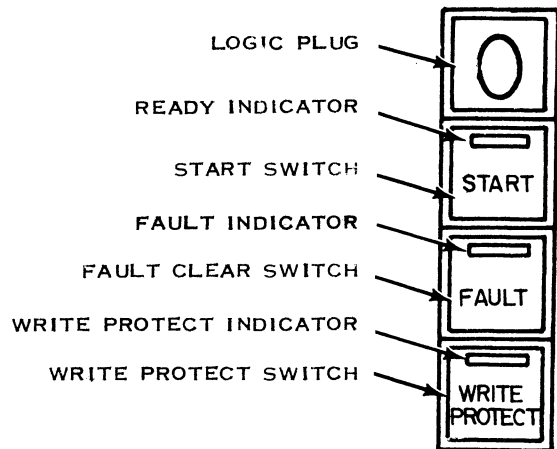
SWITCHES AND INDICATORS

Normal operation of the WD900 disk system requires familiarity with the switches and indicators described in the following paragraphs.

START
When the START switch is pressed, the READY indicator lights, and the drive comes up to operating speed. When the switch is pressed a second time, power is removed from the disk drive and the indicator goes out.

READY
The READY indicator lights when the disk drive is up to operating speed and no fault exists that

LOGIC PLUG

READY INDICATOR

START SWITCH

FAULT INDICATOR

FAULT CLEAR SWITCH

WRITE PROTECT INDICATOR

WRITE PROTECT SWITCH

2285682

WD900 Disk Drive Switches and Indicators

requires manual intervention. The READY indicator blinks throughout the start and stop procedure.

FAULT
The FAULT indicator lights during any disk drive fault condition except ac power failure. If a momentary nondamaging fault occurs, press the FAULT switch to extinguish the indicator. If the FAULT indicator remains lighted, the problem requires further attention. Refer to the paragraph entitled Operator-Correctable Problems.

WRITE PROTECT
The WRITE PROTECT switch protects the information on the fixed disk by inhibiting writing to the disk. The WRITE PROTECT indicator lights when write protection of the disk is in effect. Pressing the switch removes write protection and turns off the indicator.

POWER-UP

There are two methods for turning on a WD900 disk drive and bringing it up to operating speed. The method you use depends on whether the enclosure power is turned on or off.

Power-Up When Enclosure Power Is Off
When you turn on the enclosure power, you can start up the WD900 drive(s) at the same time by taking the following steps:

1. Ensure that the ac power switch at the rear of each drive is ON (in the up position).

2. Set the START switch on each drive to START.

3. Turn on the enclosure power.

When the enclosure power comes on, the disk drives will be started up one at a time.

Power-Up When Enclosure Power Is On
When the enclosure power is already on, perform the following procedure to power up each drive:

1. Ensure that the START switch is off.

NOTE

Since a disk drive draws a large amount of current when it is started, disk drives in multiple-drive computer systems should be turned on one at a time, allowing each drive to reach operating speed before starting another.

2. Set the ac power switch at the rear of the drive to ON.

3. Set the START switch to START.

4. Verify that the READY indicator stops blinking and remains on.

5. Verify that the FAULT indicator is off.

Repeat this procedure for each drive in the computer system.

WRITE-PROTECTING DISK

Write-protecting disk media prevents the information on them from being erased or overwritten with other data. To write-protect the fixed disk, press the WRITE PROTECT switch. The appropriate indicator will light, verifying that the disk is write-protected.

NOTE

If the drive is configured as two logical units, both units will be simultaneously protected or unprotected.

CARE AND STORAGE

Care of the WD900 Disk Drive
Dust the exterior surfaces of the WD900 disk drive once a month and clean the air filter twice yearly (monthly in areas that are not temperature-controlled).

To clean the exterior of the disk drive:

1. Verify that the disk drive is not in use and will not be needed for 20 minutes.

2. If the READY indicator is on, press the START switch and wait for the indicator to go out.

3. If the drive is housed in the enclosure, turn off enclosure power. If the drive is separate from the enclosure, it is necessary only to turn off drive power.

4. Spray a mild detergent on a soft, clean cloth and wipe the external surfaces clean. Do not spray detergent directly on the disk drive. Clean the fan exhaust grill on the pedestal cover.

5. Restore power to the drive and press the START switch to return the drive to operating service.

Cleaning the air filter usually requires about 20 minutes. If the WD900 is housed in the enclosure, it will be necessary to turn off power to the computer system during this time. If the drive is separate, it is necessary only to turn off the drive power. To clean the air filter:

1. If the READY indicator is on, press the START switch and wait for the indicator to go out.

2. Turn off the enclosure or drive power.

3. Pull forward on the filter cover to lift it out. The filter cover is located at the front of the disk drive, and is held in place by two pins, one at each end.

4. Remove the foam filter from the filter cover and wash it in a weak solution of mild detergent and water. Rinse the filter thoroughly in clear water. Shake all excess water from the filter and either blot it dry with lint-free towels or air blow the filter absolutely dry.

5. Reinstall the clean, dry filter (or a new filter if the old one shows signs of deterioration) by placing it in position in the filter cover. Reinstall the filter cover in its recess in the disk drive front panel.

6. Turn on the power and press the START switch to restore the drive to operating service.

OPERATOR-CORRECTABLE PROBLEMS

If the FAULT indicator lights during operation or power-up, take the following steps:

1. Press the FAULT switch. If the FAULT indicator goes out, you can resume normal operation. If the FAULT indicator does not go out, proceed with step 2.

2. Press the START switch and wait until the READY indicator goes out.

3. Press the START switch again. If the FAULT indicator goes out, you can resume normal operation. If the FAULT indicator remains on, turn the ac power off and then back on. If the FAULT indicator remains on, contact your system manager.

RELATED INFORMATION

Expendable Supplies
The expendable supplies for the WD900 consist of the intake air filter, part number 2244849-0001.

Publications
The manual *WD900/MT3200 General Description*, part number 2234398-9701, contains more information on the WD900 disk drive.

Printers (PR)

This section describes the printers for the Business Systems 600 and 800 computers:

- Model 810 Printer

- Model 850/860 Printers

- Model 855/865 Printers

- Model 880 Printer

- Model LP300/LP600 Line Printers

Each subsection contains the following information:

- Switches and Indicators

- Power-Up

- Paper Loading and Adjustments

- Ribbon Installation

- Care and Cleaning

- Operator-Correctable Problems

- Related Information

SWITCHES AND INDICATORS

Normal operation of the Model 810 Printer requires familiarity with the switches and indicators on the operator and auxiliary control panels.

ON LINE
The ON LINE switch on the operator control panel places the printer in the online or offline condition. When the printer is online, the ON LINE indicator is lighted and the computer is in control of the printer. This is the normal operating position.

RESET/TAB
The RESET switch on the operator control panel clears paper-out and error conditions. The alternate TAB function is active only when the printer is in TEST/VFC mode.

ON/OFF SWITCH
(LEFT REAR)

OPERATOR CONTROL
PANEL
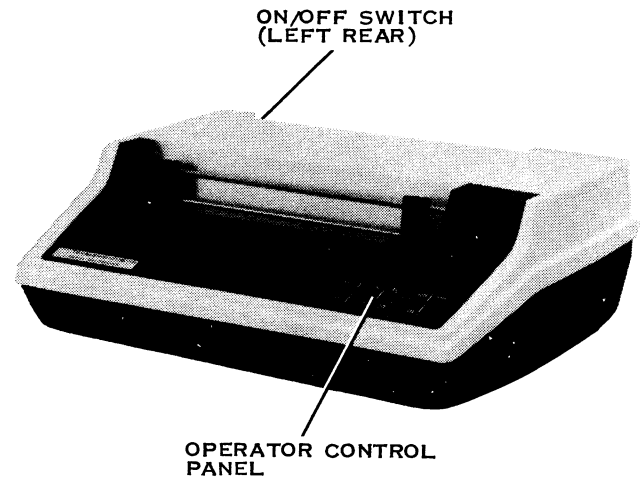
2278910

Model 810 Printer

FORM ALIGN/TAB SET
The FORM ALIGN (↑) switch on the operator control panel moves the paper up 1/72 inch. Holding the switch down advances the paper by three 1/72-inch steps and then by continuous full lines. The alternate TAB SET function is active only when the printer is in TEST/VFC mode.

FORM ALIGN/TAB CLEAR
The FORM ALIGN (↓) switch on the operator control panel retracts the paper 1/72 inch. When the switch is held down, the paper continues to retract in 1/72-inch increments. The alternate TAB CLEAR function is active only when the printer is in TEST/VFC mode.

FORM FEED/SET TOP OF FORM
The FORM FEED switch on the operator control panel moves the paper to the top of the next form. The alternate SET TOP OF FORM function, which adjusts the form length, is active only when the printer is in TEST/VFC mode.

LINE FEED
The LINE FEED switch on the operator control panel advances the paper one full line. It is active only when the printer is offline or in TEST/VFC mode.
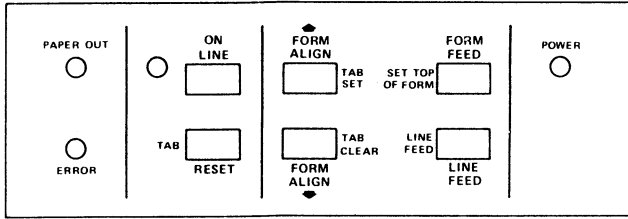
POWER, PAPER OUT, and ERROR
The POWER indicator comes on when power is applied to the printer. When the printer is out of

paper, the PAPER OUT indicator lights until you install more paper and press the RESET switch. The ERROR indicator lights when an internal error occurs. For recovery from errors, see Operator-Correctable Problems.

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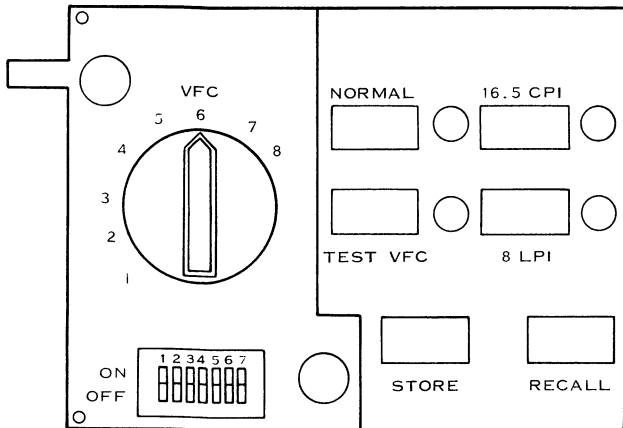**810 Printer Operator Control Panel**

16.5 CPI
Pressing the 16.5 CPI switch causes the 16.5 CPI indicator to light and the printer to print 16.5 characters per inch (cpi). Pressing the 16.5 CPI switch a second time returns the printer to the standard 10 cpi.

8 LPI
Pressing the 8 LPI switch causes the 8 LPI indicator to light and the printer to print 8 lines per inch (lpi). Pressing the 8 LPI switch a second time returns the printer to the standard 6 lpi.

For more information on the auxiliary control panel, refer to the manual listed in Publications.

2277113

810 Printer Auxiliary Control Panel

POWER-UP
Place the ac power switch at the rear of the printer to the ON (up) position. The POWER indicator lights and the printhead shifts to the right, then moves to the left, coming to rest in column 1.

PAPER LOADING AND ADJUSTMENTS

The following paragraphs describe paper loading, top of form adjustment, printhead adjustment, and form length adjustment for the 810 printer.

Loading Paper
The 810 printer may have the paper loaded in two ways: path A is used for table-mounted printers, and path B is for stand-mounted printers.

TRACTORS

ACCESS DOOR

REAR

PRINTHEAD
ADJUST LEVER

PLATEN

PATH A

FRONT

2278890

PATH B
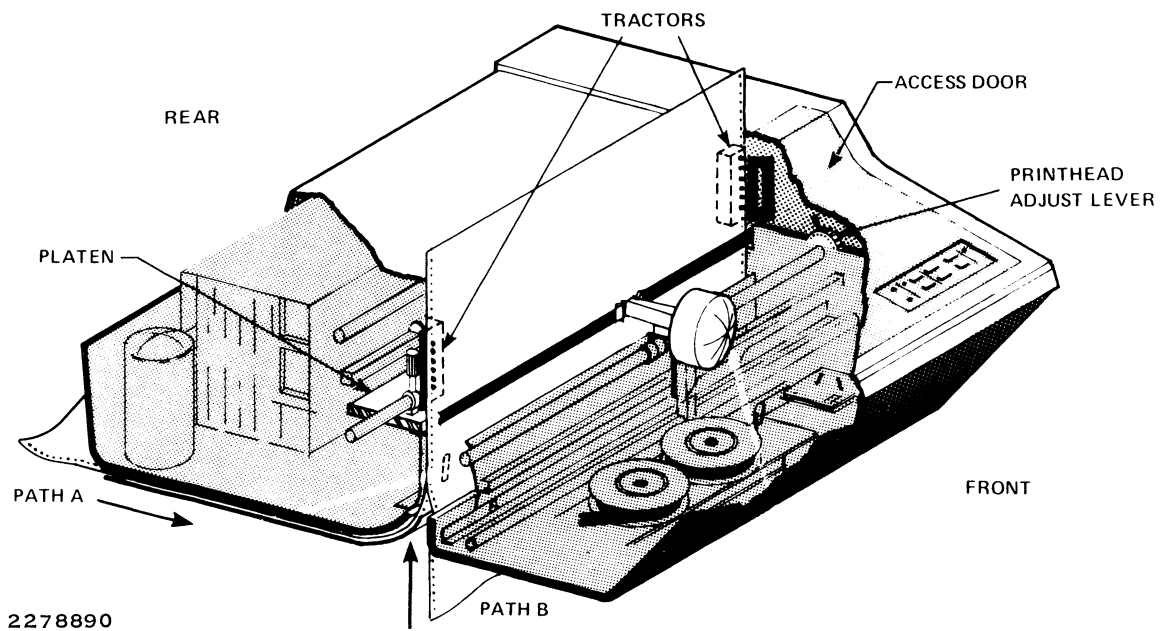
810 Printer Paper Loading Diagram

It is not necessary to turn the power off when loading paper into the printer. To load the paper, proceed as follows:

1. Press the ONLINE switch to take the printer offline. (The ONLINE indicator goes out.)

2. Remove the clear printer cover and lift up the access door.

3. Ensure that the left paper feed tractor is in the desired position (usually the far left margin) and tighten the lock knob.

4. Open both tractor flaps.

5. Note the setting of the printhead adjustment lever. Then using this lever, move the printhead away from the platen.

6. Feed the paper into the paper chute at the rear (path A, printing side down) or up through the bottom (path B, printing side toward the front) until the paper reaches the platen.

7. Loosen the lock lever on the right tractor and adjust as necessary to accommodate the paper.

8. Place the paper in both tractors so that the holes engage corresponding tractor pins.

9. Close the tractor flaps and adjust the right tractor as necessary to remove the slack in the paper; then tighten the lock lever.

10. Check that the paper is properly aligned. The paper should not rub either side of the chute.

11. Adjust the printhead (see Printhead Adjustment) and close the printer access door.

12. Set the top of form. (See Top of Form Adjustment.)

13. Replace the clear cover and press ONLINE to return the printer to service. The ONLINE indicator should come on.

Printhead Adjustment
The printhead of the 810 printer may be adjusted to accommodate various forms and paper thicknesses by moving the printhead adjustment lever towards the front of the printer for thicker (multicopy) paper or toward the rear of the printer for thinner (single-copy) paper.

In order to check the character print quality, you must either print data being received from the computer or perform the printer self-test. To perform the self-test, set the NORMAL/TEST/VFC switch (on the auxiliary control panel) to the TEST/VFC position and press the ONLINE switch to start printing. (Select 16.5 cpi when using 8 1/2-inch wide paper.)

Print a series of characters and observe the results. If the characters are not fully formed or appear too light, move the printhead adjustment lever toward the rear of the printer. When the adjustment is completed, return the NORMAL/TEST/VFC switch to NORMAL and press the ONLINE switch.

Top of Form Adjustment
With power on, set the top of form for the 810 printer as follows:

1. Press the ONLINE switch to take the printer offline. (The ONLINE indicator goes out.)

TO REAR FOR THINNER FORMS

TO FRONT FOR THICKER FORMS
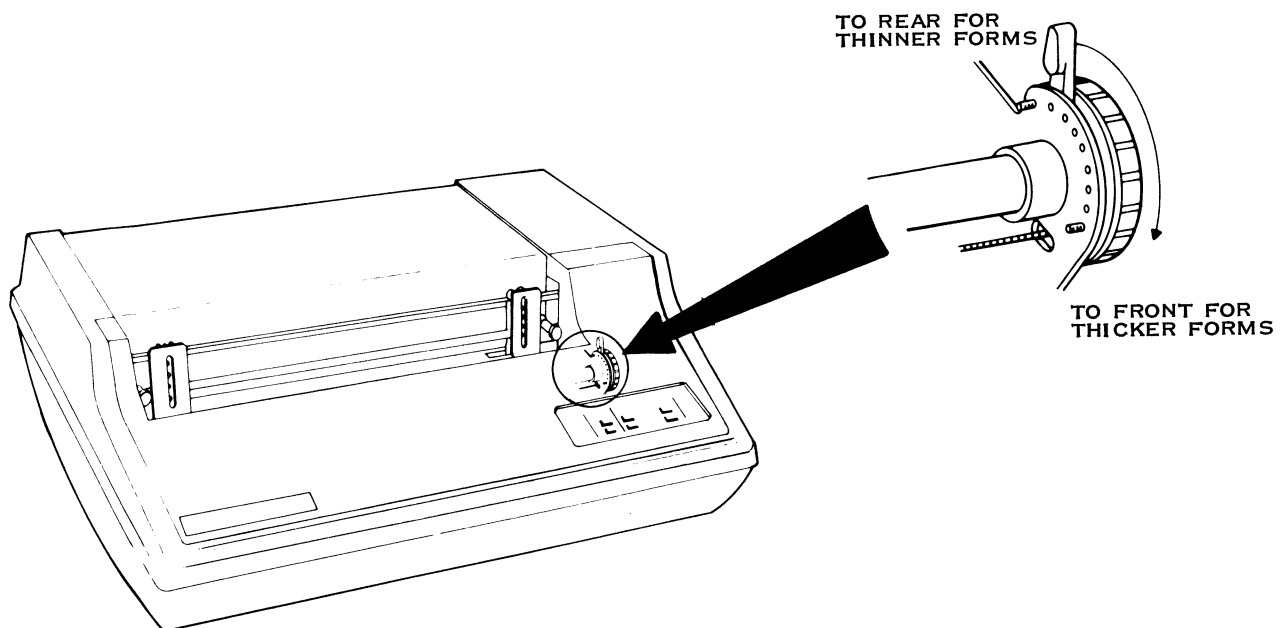
2278889

810 Printer Printhead Adjustment Lever

2. Press the FORM FEED switch.

3. Press the FORM ALIGN (up) or the FORM ALIGN (down) switch until the printhead is at the point where the first line of the form is to be printed.

4. Press the FORM FEED switch. The paper should feed to the top of the next form. If it does not, the form length needs to be set as described in Form Length Adjustment.

Form Length Adjustment

With power on, adjust the form length for the 810 printer as follows:

1. Press the ONLINE switch to take the printer offline. (The ONLINE indicator goes out.)

2. Perform steps 1 and 2 of the top of form adjustment procedure.

3. Remove the clear printer cover.

4. If desired, place a piece of adhesive tape (or similar marker) on a tractor door at the point of the paper perforation. This can be used as a reference mark for the top of the form.

5. Open the access door.

6. On the auxiliary control panel, press the TEST/VFC switch.

7. On the operator control panel, press the SET TOP OF FORM switch.

8. Press the LINE FEED switch until the paper is advanced to the top of the next form.

9. Press the SET TOP OF FORM switch.

10. On the auxiliary control panel, press the NORMAL switch.

11. Close the access door and replace the clear cover.
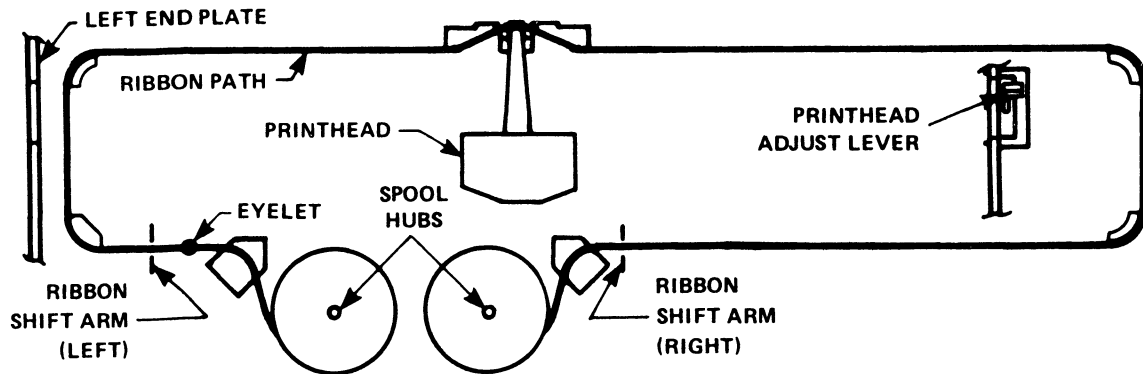
RIBBON INSTALLATION

To install a ribbon in the 810 printer, proceed as follows:

1. Set the power switch at the rear of the printer to OFF.

2. Remove the clear printer cover and open the access door.

3. Move the printhead adjustment lever all the way toward the front of the printer to move the printhead away from the platen.

4. Remove the old ribbon.

5. Install the new ribbon by placing the full spool on the right spool hub with the feedout side toward the front of the printer. Feed the ribbon out along the ribbon path shown in the illustration.

6. Verify that the ribbon eyelet is located on the side of the left ribbon shift arm closest to the spool hub; otherwise, the ribbon will not reverse.

LEFT END PLATE

RIBBON PATH

PRINTHEAD

PRINTHEAD ADJUST LEVER

EYELET

SPOOL HUBS

RIBBON SHIFT ARM (LEFT)

RIBBON SHIFT ARM (RIGHT)

2278885

810 Printer Ribbon Installation Diagram

7. Place the empty spool on the left spool hub with the feedout toward the front of the printer, removing the slack in the ribbon.

8. Verify that the ribbon is between the vertical guides on each side of the printhead.

9. Set the printer power switch to ON.

10. Adjust the printhead (see Printhead Adjustment), close the access door, and replace the printer cover.

CARE AND CLEANING

Caring for the 810 printer includes periodic cleaning of the interior and exterior of the printer:

1. Set the ac power switch to OFF.

2. Wipe the exterior of the printer with a clean, slightly damp cloth.

3. To clean the interior, lift the printer cover and access door and use a vacuum cleaner to remove dust and paper particles that have accumulated inside.

4. When cleaning is complete, set the power switch to ON.

OPERATOR-CORRECTABLE PROBLEMS

The following list describes operator-correctable problems that may occur and the necessary corrective actions.

The printer prints characters that are smudged, partially formed, or too light.

Perform the procedure in Printhead Adjustment.

The ERROR indicator stays lighted and a special parity error symbol (⚡) is printed.

This denotes a parity error. Clear the error by pressing RESET.

The ERROR indicator blinks, power to the printhead motor is off, and a beep sounds five times.

This denotes a printhead malfunction. Clear any obstructions from around the printhead and press RESET.

The printer emits a beep and the PAPER OUT indicator lights.

The printer is out of paper. Refer to Loading Paper.

RELATED INFORMATION

Expendable Supplies

The expendable supplies for the 810 printer are as follows:

- 810 printer ribbon (six pack), part number 0992641-0002, 13 mm x 36.6 m (0.5 in. x 120 ft).

- Printer paper. The 810 printer uses continuous-form paper with standard perforations along both edges. Single-part forms may be from 6.8 kilograms (15 to 20 pounds) per ream. Multiple-part forms have three weight specifications: original copy from 5.4 to 6.8 kilograms (12 to 15 pounds); duplicate copies from 4.1 to 5.4 kilograms (9 to 12 pounds) per ream; and the last

copy, which should not exceed 6.8 kilograms (15 pounds). Card stock used in the 810 printer should not exceed 0.25 millimeter (0.01 inch). The total forms thickness should not exceed 0.5 millimeter (0.02 inch).

Publications

The manual *Model 810 Printer Installation and Operation*, part number 2311356-9701, provides more information about the 810 printer.

POWER-UP

Each time you apply power to a Model 850 or 860 Printer, a brief, nonprinting self-test is initiated. If the printer fails to pass any part of the self-test, all of the panel indicators blink simultaneously. On successful completion of the self-test, the control electronics configures the printer as follows:

- Lines per inch — 6

- Pitch (characters per inch) — 10

- Form length — 66 lines

- Left margin position — column 1

- Right margin position — column 80

- Top margin — at line 1

- Bottom margin — at line 66

- Horizontal tabs — none defined

- Vertical tabs — none defined

- Primary character set — ASCII (normal)

- Secondary character set — mosaic graphics

- Online/offline status — online

CONTROLS AND INDICATORS

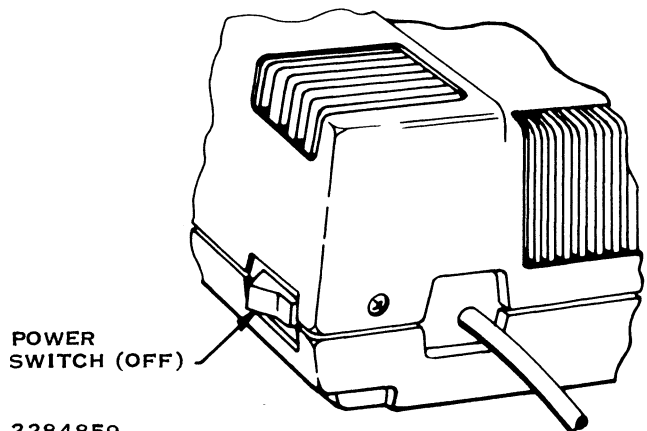Normal operation of the Model 850/860 Printer requires familiarity with its controls and indicators.

Power Switch
The power switch is a rocker switch located on the right-hand side near the rear of the printer. To apply power to the printer, ensure that its power cord is connected, then press the front of the rocker.

Power Indicator
The power indicator is located on the printer control panel. Its functions are as follows:

- On — Indicates that power is applied to the printer.

- Off — Indicates that power is not applied.

POWER
SWITCH (OFF)

2284859

Power Switch

- Flashing — Indicates that the printer is out of paper.

Operator Switches and Indicators

Press to:

POWER — On – Power Applied / Off – Power not Applied / Flashing – Out of Paper

ONLINE / OFFLINE — Change Between Online and Offline — On – Printer Ready / Off – Printer not Ready / Flashing – Data Overflow Error

FORM FEED — Advance Paper to Preset Top-of-Form

LINE FEED — When Offline: Advance Paper One Line

PITCH / SFL — When Online: Change Between Compressed and Standard Print / When Offline: Set Form Length — When Online: On – Compressed Print / Off – Standard Print / When Offline: On – Form Length Being Set

2284860 **Operator Switches and Indicators**

ONLINE/OFFLINE Switch and Indicator

Pressing the ONLINE/OFFLINE switch changes the printer from the offline to the online mode or from the online to the offline mode. When in the online mode, the printer can receive and print data from the communication line. The ONLINE indicator functions are as follows:

* On — The printer is in the online mode.

* Off — The printer is in the offline mode.

* Flashing — The printer has received more data than its receive buffer can handle.

FORM FEED Switch

Pressing the FORM FEED switch causes the printer to advance the paper to the top of the following sheet. If you press the switch while the printer is printing, the paper will not advance until the end of the line has been printed. You cannot use the FORM FEED switch while any indicator is flashing or while setting the form length.

LINE FEED Switch

Pressing the LINE FEED switch while the printer is offline advances the paper one line. If you hold the switch down, the paper advances continuously line-by-line until you release it. The LINE FEED switch functions only when the printer is in the offline mode.

PITCH/SFL (Set Form Length) Switch and Indicator

The PITCH/SFL switch is a dual-purpose switch that allows you to adjust the pitch (number of characters per inch), or the form length (number of lines per sheet). The following paragraphs describe these functions.

Pitch Selection. You can set the 850/860 printer to either standard pitch (10 characters per inch), or compressed pitch (16.7 characters per inch). At power-up, the control electronics automatically adjusts the pitch to the standard value. You can select compressed pitch by pressing the PITCH/SFL switch while the printer is online. To return to standard pitch, press the switch again. The PITCH/SFL indicator is illuminated to indicate that the printer is set for compressed pitch.

Form Length Selection. At power-up, the control electronics automatically sets the form length to its standard value of 66 lines per sheet. If you want to set the form length to some other value, proceed as follows:

1. Press the ONLINE/OFFLINE switch to set the printer offline. The ONLINE indicator should extinguish.

2. Use the paper-advance knob to set the top-of-form (first line to be printed) even with the printhead.

3. Press the PITCH/SFL switch. The PITCH/SFL indicator should light.

4. Press the LINE FEED switch once for each line of form length. If the form to be used is in the printer, press the LINE FEED switch repeatedly until the first line to be printed on the following form is in line with the printhead.

5. Press the PITCH/SFL switch. The PITCH/SFL indicator should extinguish.

6. Press the ONLINE/OFFLINE switch. The ONLINE indicator should light.

The form length is now set for the form in use and will remain at that setting until the printer is reset.
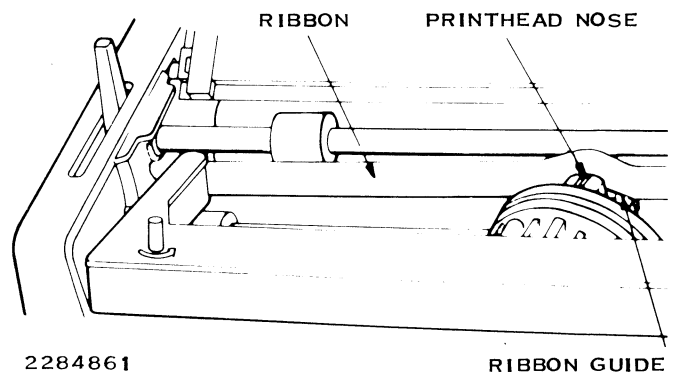
RIBBON CARTRIDGE
REMOVAL AND REPLACEMENT

The 850 or 860 printer uses a disposable, operator-replaceable ribbon cartridge. To remove and replace the ribbon cartridge, proceed as follows:

CAUTION

If the printer has been in operation for a while, the printhead may be hot. Avoid touching the printhead.

1. Pull up on the front of the cartridge, pull it slightly forward to unhook the arms, and lift it out.

2. Turn off the printer power, and open the access door at the top front of the printer.

3. Move the carriage to the right or left to position the printhead at about the center of the printer.
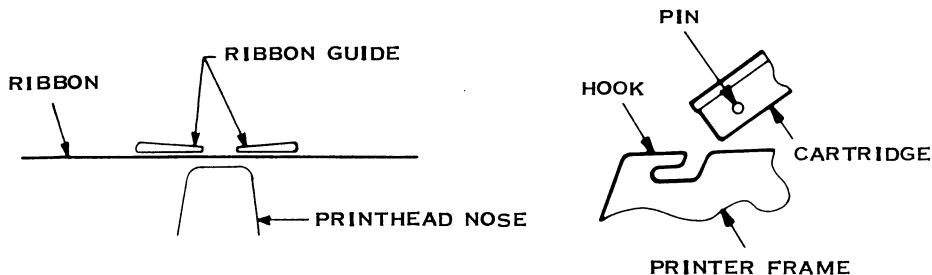

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**Positioning the Ribbon Between
the Printhead and Ribbon Guides**

4. Holding the ribbon cartridge by the ends, slide the ribbon between the printhead nose and the ribbon guides.

5. While tilting the cartridge arms down, insert the pins on each end of the cartridge arms into the hooks on the printer frame.

6. Push down on the front of the cartridge until it snaps into position. You may have to turn the ribbon knob slightly to allow the cartridge to seat fully.
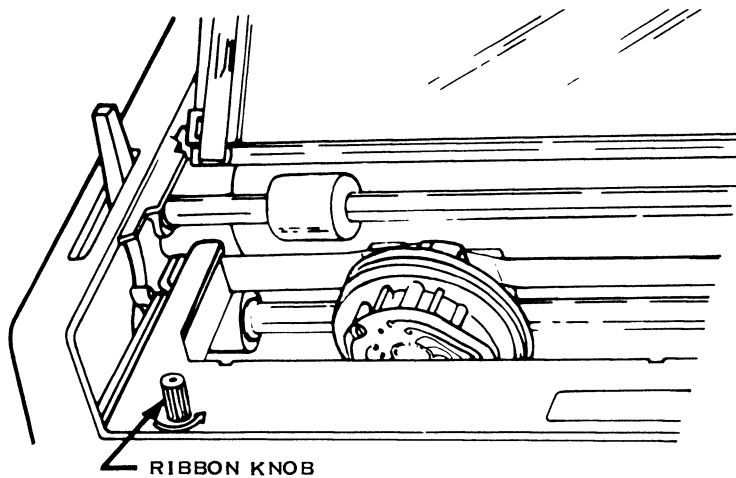

2284862
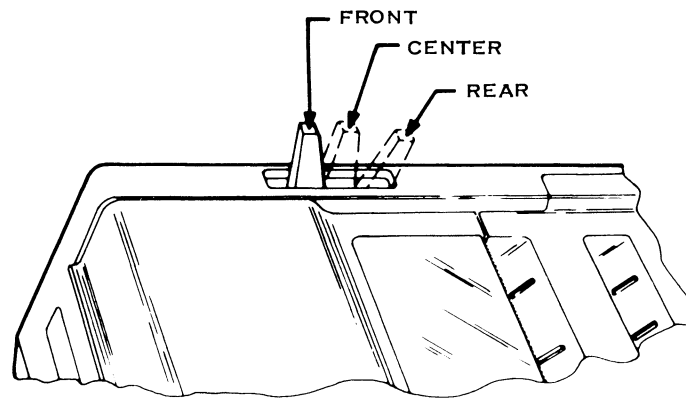
Inserting the Ribbon Cartridge in the Printer Frame

2284863

The Ribbon Knob

FRONT

CENTER

REAR

2284864

Printhead Adjustment Lever

7. Ensure that the ribbon is smooth across the face of the printhead and the ribbon guides. Remove any slack in the ribbon by turning the ribbon knob in the direction of the arrow.

8. If the printhead was properly adjusted prior to changing the ribbon and the paper thickness has not changed, no further adjustment is necessary. If printhead adjustment is necessary, set the printhead

adjustment lever at about the center position. It may need to be readjusted after printing tests. If so, refer to the paragraph entitled Adjusting the Printhead.

LOADING PAPER IN THE PRINTER

The Model 850 and 860 Printers are similar in most features, but the Model 860 offers a wide carriage that will accept 16-inch paper.

The following paragraphs describe the procedures for loading single-sheet, fanfold, or roll paper in the printer.

Loading Single-Sheet Paper
The friction rollers under the platen hold the paper against the platen so that the paper can be advanced. The paper-guide rollers hold the paper against the platen above the printhead. To install single-sheet paper in the printer, proceed as follows:

1. Place the platen release lever in the front position to release the friction rollers and the paper-guide rollers from the platen.

2. Slide the paper behind the platen from the top until it curves around the platen to a position just above the paper-guide rollers.
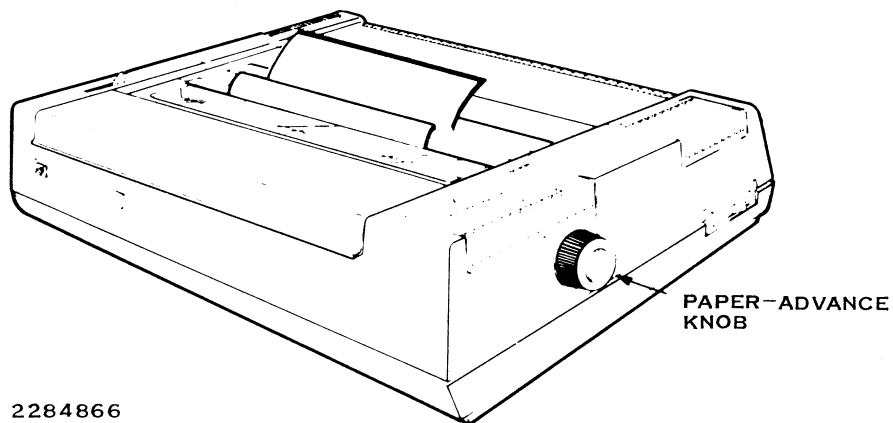

PRINTHEAD-ADJUSTMENT LEVER

HOOK FOR RIBBON CARTRIDGE

2284865
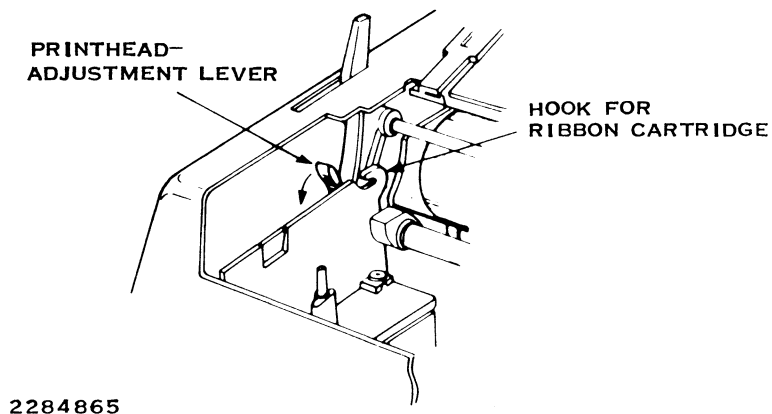
Platen Release Lever

PAPER-ADVANCE KNOB

2284866

Paper Advance Knob

3. Place the platen release lever in the center position and advance the paper by turning the paper advance knob clockwise.

4. Manually straighten the paper in the same manner as you would in a typewriter.

5. Return the platen release lever to the rear position and use the paper advance knob to move the paper to the desired position.

Loading Fanfold Paper

To use fanfold paper you need to have a tractor-drive assembly to pull the paper from the supply container. The tractor-drive option includes a separator that keeps the blank paper from tangling with the printed paper. It is also convenient to have a stacking tray when using fanfold paper.
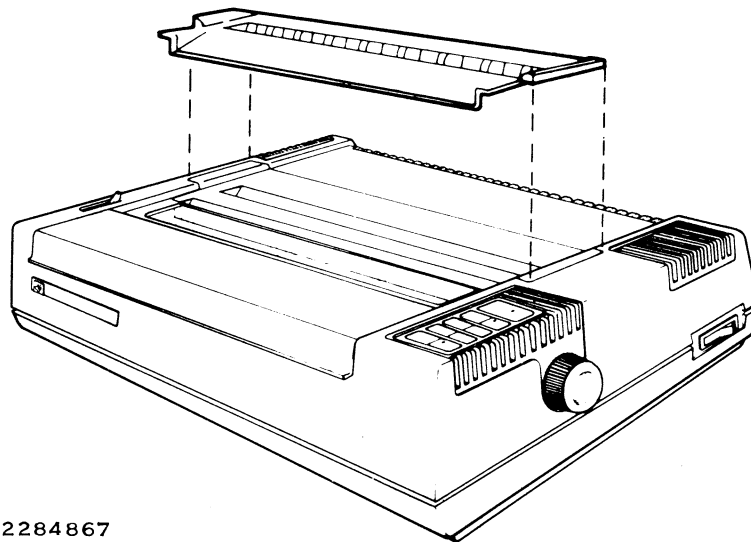
You can attach both of these options without tools. Use the following procedure to load fanfold paper:

NOTE

If the tractor assembly and stacking tray are already installed, disregard steps 1 through 4.
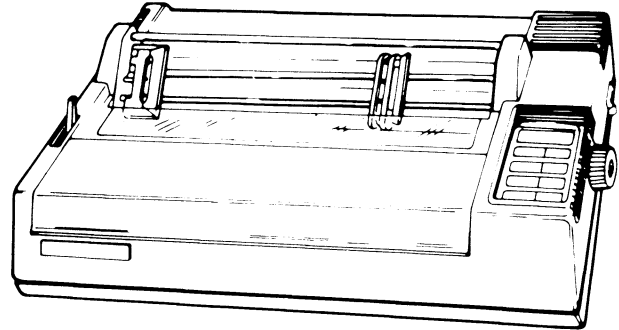
1. Remove the platen cover.

2284867

Removing the Platen Cover
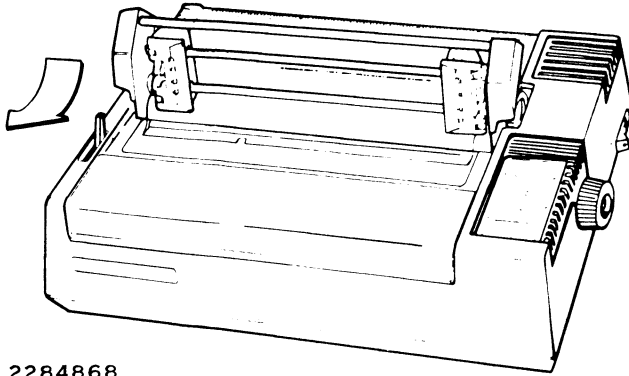
2. Hook the ends of the tractor-drive assembly under the framework at each end of the platen, and tilt the assembly until it rests on top of the printer where the platen cover was removed.
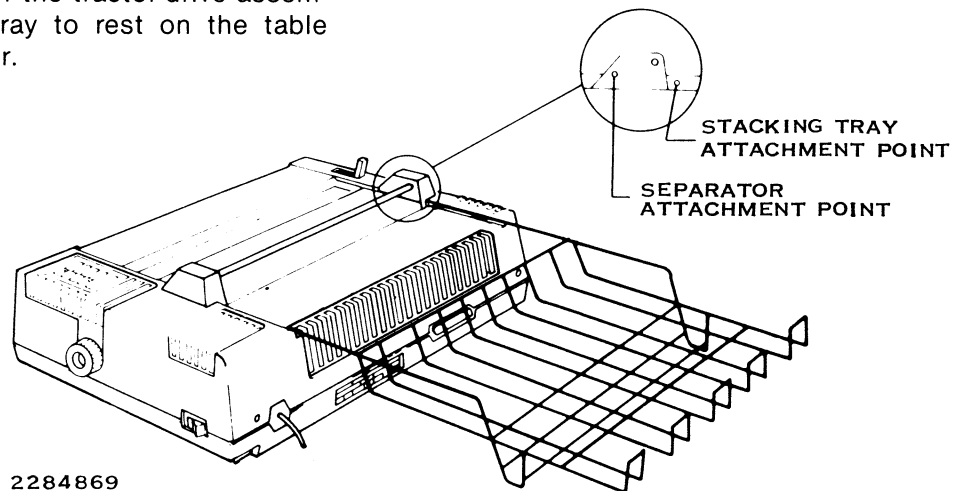
2284868

Installing the Tractor-Drive Assembly

3. Attach the stacking tray by inserting the ends of the two wire arms into the holes just to the rear of the tractor-drive assembly. Allow the tray to rest on the table behind the printer.

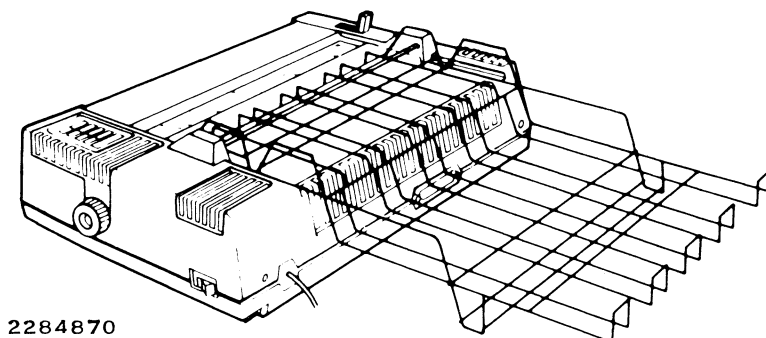STACKING TRAY ATTACHMENT POINT

SEPARATOR ATTACHMENT POINT

2284869

Installing the Stacking Tray

4. Attach the separator by inserting the ends of the two wire arms into the holes in the side of the tractor-drive assembly end plates.

2284870

Installing the Separator

NOTE

The printer has a paper-out switch located about 38 millimeters (1.5 inches) from the left end of the platen. When loading fanfold paper, insert it so that it touches the switch lever.

5. Place the box or stack of paper behind the table so that the paper path is as shown in the next figure. Ensure that the paper stack is directly behind the printer so that the paper feeds straight into the printer.

2284871
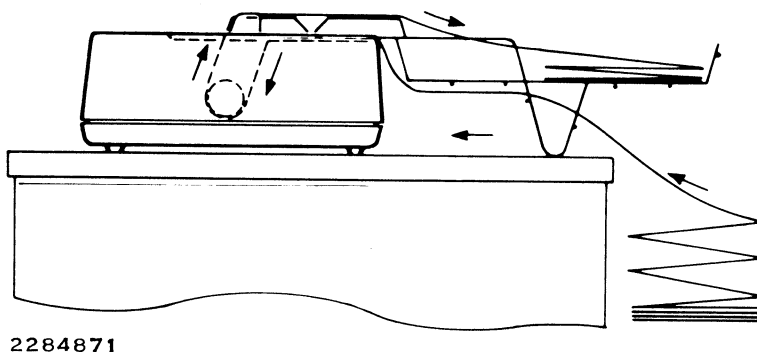
Printer Paper Path (Fanfold Paper)

6. Set the platen release lever in the forward position and open the tractor covers.

2284872
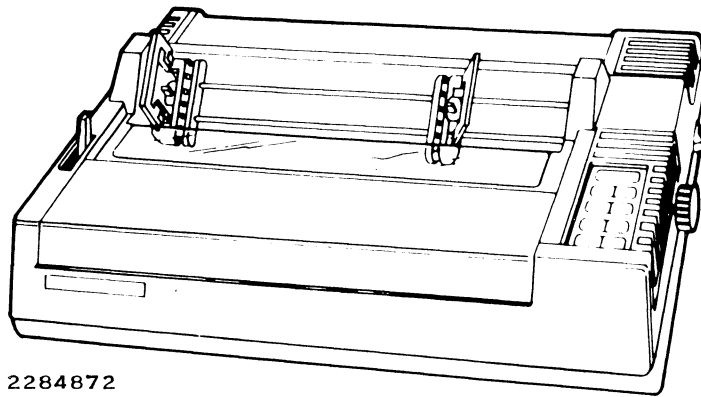
Paper Tractors (Open)

7. After initial adjustment, you normally do not need to move the left tractor from side to side. You can move it to change the width of the left margin. You may have to move the right tractor from side to side to make the paper fit over the tractor pins. If you need to adjust the tractor-drive assembly, proceed as follows:

a. Move the left tractor locking lever upward to release it.

LOCKING LEVER

TRACTOR COVER

2284873
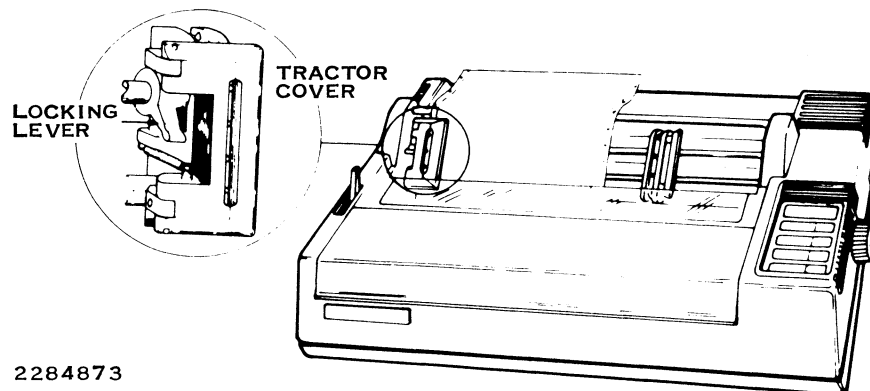
Tractor Locking Lever

b. Open the left tractor cover.

c. Move the left tractor to a position about 12 millimeters (0.5 inch) from the left end of the platen or to the desired position.

d. Push the left tractor locking lever to its locked position.

e. Release the right tractor locking lever. Move the tractor to the approximate position required to accommodate the paper to be used.

f. Open the right tractor cover.

g. Lay the paper over the left tractor pins so that the paper holes engage the pins. Close the left tractor cover.

h. Adjust the right tractor position for the paper width so that the paper holes engage the tractor pins. Close the right tractor cover and move the right tractor to tighten the paper.

NOTE

The paper should be tight enough between the tractors to prevent bulging or wrinkling but not so tight as to tear the paper holes during paper feeding.

i. Push the right tractor locking lever to its locked position.

8. Lay the paper over the tractor pins and close the tractor covers. (Disregard this step if you performed the tractor adjustments.)

9. Use the paper advance knob to advance the paper around the platen until the leading edge of the paper touches the plastic window in the access door.

10. Set the platen release lever to its rear position.

Loading Roll Paper

Installation of the paper-roll option and separator option allows you to use roll paper of widths in the range of 75 to 254 millimeters (3 to 10 inches), and up to 125 millimeters (5 inches) in diameter. You do not need the tractor-drive assembly when using roll paper. The platen cover should be in place on the top of the printer. To load roll paper in the printer, proceed as follows:

1. Attach the paper-roll holder by inserting the ends of the wire arms in the positioning holes. Allow the holder to rest on the table behind the printer.

POSITIONING HOLES FOR
PAPER—ROLL HOLDER (2)

KEEPER

ROD

2284874
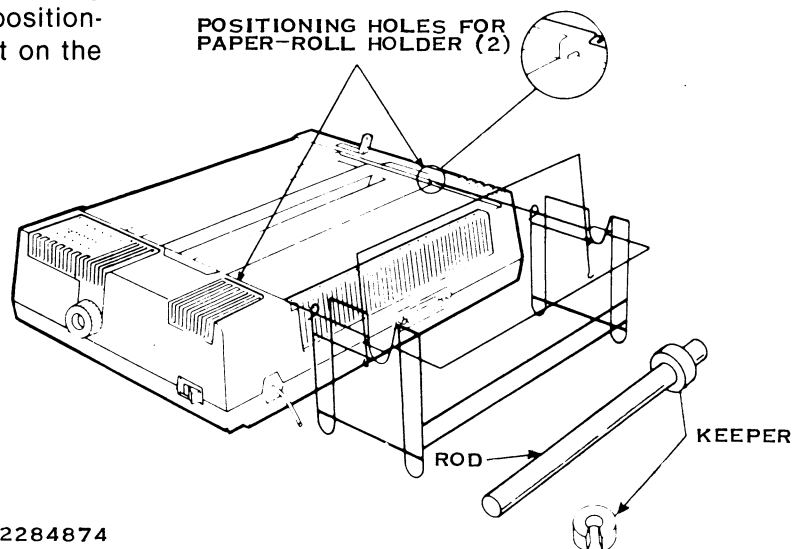
Installing the Paper-Roll Holder

2. Install a roll of paper on the paper rod, and a keeper on each side of the roll.

3. Place the paper rod in the two slots on the sides of the paper-roll holder. Ensure that the paper feeds toward the printer from the bottom of the roll.

PAPER—TENSION BAR

2284875
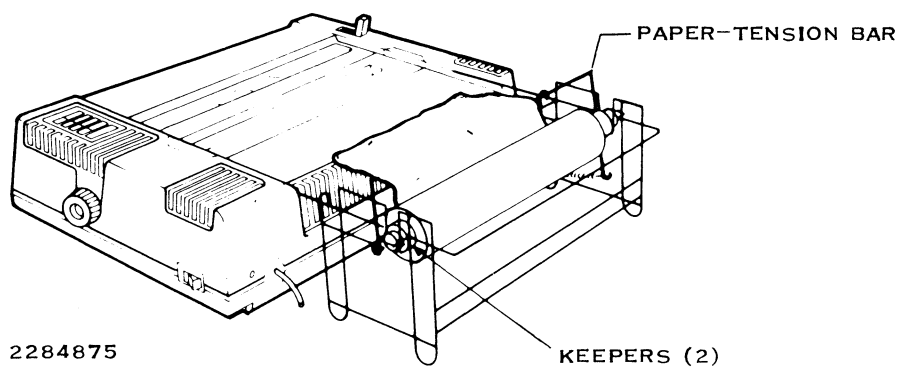
KEEPERS (2)

Installing a Paper Roll in the Paper-Roll Holder

4. Slide the paper roll to the left on the paper rod so that the paper contacts the paper-out switch when fed into the printer. Move the keepers to hold it in that position.

5. Install the separator so that it engages the paper-roll holder as shown.
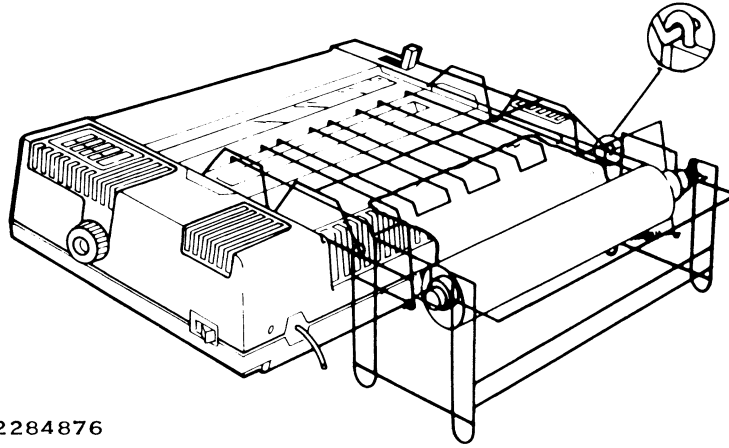
2284876

Installing the Separator With the Paper-Roll Holder

6. Move the platen release lever to the forward position.

7. Feed the paper through the paper path until the top of the paper appears above the printhead.
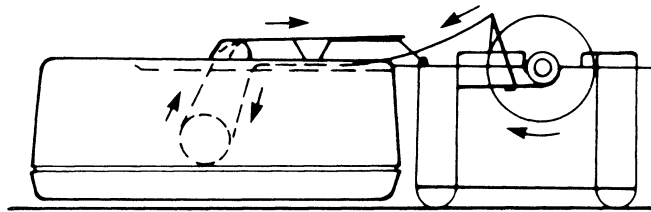
2284877

Printer Paper Path (Roll Paper)

8. Move the platen release lever back to its rear position.

9. Use the paper advance knob to advance the paper until it clears the slot at the top of the printer.

10. If the paper needs to be adjusted, move the platen release lever to the front and move the paper to the desired position as you would in a typewriter. Push the lever back to the rear.

11. Tear off excess paper by pulling it against the tear bar.

ADJUSTING THE PRINTHEAD

Each time you change the paper thickness or form thickness, you need to adjust the printhead. To adjust the printhead, proceed as follows:

CAUTION

Attempting to move the printhead adjustment level while the printhead is moving can cause damage to the printing mechanism.

1. Remove power from the printer.

2. Push the printhead adjustment lever toward the rear for single-sheet printing or toward the front for multiple copies.

3. Restore printer power and ensure that the print quality is as desired. If not, repeat these steps until you have achieved the desired print quality.

PRINTHEAD-ADJUSTMENT LEVER

SINGLE

MULTIPLE
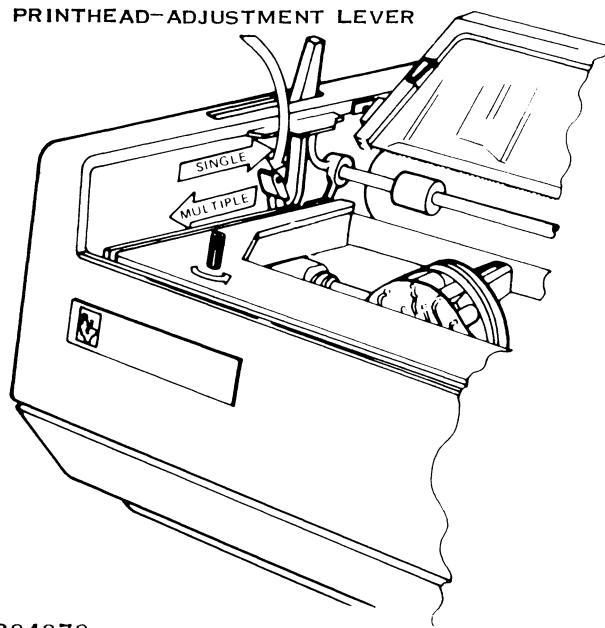
2284878

Adjusting the Printhead

CARE AND CLEANING

To maintain a high standard of print quality and prevent carriage jams, it is important to keep the carriage-guide rods and platen clean. Clean the printhead and ribbon area whenever dust appears on the printhead tip or the carriage-guide rods. Perform the following procedure at least every three months.

WARNING

Voltages and moving parts in the printer are potentially hazardous. Always disconnect the printer power cord before cleaning the printer.

1. Remove power from the printer and disconnect the printer power cord.

2. Remove the ribbon cartridge.

3. Carefully vacuum the paper particles from the printhead and ribbon area. Move the carriage by hand to vacuum under the printhead.

4. If ink residues have accumulated, use a clean cloth moistened with denatured alcohol to clean the platen, paper-guide rollers, and ribbon guide.

5. Use a clean dry cloth to wipe the paper particles and dust from the carriage-guide rods. *Do not* use any solvents.

CAUTION

Never oil the carriage-guide rods. No lubricant is required, and use of a lubricant can cause faulty carriage movement due to oil and dirt buildup. Cleaning solvents used to remove such residue can damage plastics used in the printer.

Clean the plastic parts of the case with a clean cloth dampened with water and a mild detergent. *Do not* use an abrasive cleaner. Wipe with a clean, dry cloth. Avoid getting the detergent on the electronic or electric circuits of the printer.

OPERATOR CORRECTABLE PROBLEMS

Faulty printer operation can occur because of loose connections, an incorrect electrical ground, power spikes, or electrical interference. Make sure that all cables are tightly connected at both the printer and the computer. The center prong of the printer power cord must be connected to an earth ground.

A flashing POWER indicator means the printer is out of paper. A flashing ONLINE indicator means data overflow has occurred. This indicates a communication problem between the printer and the computer. See the appropriate printer manual for the proper corrective action.

Each time you turn the power on, the printer tests itself. If there is a problem, all three indicators flash or stay lighted when the test is completed. In that case, turn the power off and then back on. If the indicators still show a problem, service is needed.

RELATED INFORMATION

Expendable Supplies, Model 850

- 850 printer ribbon, TI Part No. 2222454-0001

- Printer paper. The 850 printer uses sheet, roll, or fanfold paper. For sheet paper, maximum width is 279.4 mm (11 in), maximum thickness is 0.127 mm (0.005 in), and maximum weight is 9.1 kg (20 lb). For roll paper, maximum width is 266.7 mm (10.5 in), maximum diameter is 127 mm (5 in), maximum weight is 6.8 kg (15 lb). For fanfold paper, maximum width is 254 mm (10 in). For single part fanfold, maximum thickness is 0.254 mm (0.01 in), maximum weight is 6.8 kg (15 lb). For multipart fanfold, the maximum thickness is 0.34 mm (0.014 in) for original plus two copies, no cards permitted except on last copy. The maximum weight is 5.44 kg (12 lb) plus 3.40 kg (7.5 lb) for each of two copies.

Publications, Model 850

More information about the 850 printer can be found in the *Model 850 Printer User's Manual*, TI Part No. 2219890-0001, the *Model 850 Printer Maintenance Manual*, TI Part No. 2219896-0001, the *Model 850 XL Printer User's Manual*, TI Part No. 2243250-0001, and the *Model 850 XL Quick Reference Guide*, TI Part No. 2243249-0001.

Expendable Supplies, Model 860

- 860 printer ribbon cartridge six pack, TI Part No. 2239391-0001

- Printer paper. The 860 printer uses single sheet or fanfold paper. For sheet paper, maximum width is 279.4 mm (11 in), maximum thickness is 0.127 mm (0.005 in), maximum weight is 9.1 kg (20 lb). For single sheet fanfold, maximum width is 406.4 mm (16 in), maximum thickness is 0.102 mm (0.004 in), maximum weight is 6.8 kg (15 lb). For multipart fanfold, maximum width is 406.4 mm (16 in), maximum thickness is 0.34 mm (0.014 in) for an original plus two copies with no cards permitted. Maximum weight is 5.9 kg (13 lb) plus 3.4 kg (7.5 lb) for each of two copies.

Publications, Model 860

More information about the 860 printer can be found in the *Model 860 XL Printer User's Manual*, TI Part No. 2239401-0001, the *Model 860 XL Printer Maintenance Manual*, TI Part No. 2239427-0001 and the *Model 860 XL Printer Quick Reference Card*, TI Part No. 2239402-0001.

SWITCHES AND INDICATORS

The Model 855/865 Printers have nine switches for operator use: the eight touch switches on top of the printer and the power switch near the right rear corner. Twelve indicator lights are in the touch switch pad.

- POWER switch — Pressing the 1 (ON) side of the POWER switch applies power to the printer, lighting the power indicator and initiating a series of self tests. The printer powers up with the following default settings:

  - 6 lines per inch (lpi)

  - The pitch of the font module installed in the lowest numbered socket. (If no font module is installed, it defaults to the internal draft default of 10 characters per inch.)

  - 66-line form length

  - No horizontal tabs defined

  - No vertical tabs defined

After the default parameters are loaded, the printer connects to the computer (goes online) and is ready to print.

- ALERT indicator — The ALERT indicator lights when the printer is out of paper or when the receive buffer overflows. When the receive buffer overflows, the printer goes offline but continues to print the data in the buffer. The overflow data is lost and must be retransmitted. The ALERT indicator flashes when the printer has an internal problem.

PR   855/865

Change 2
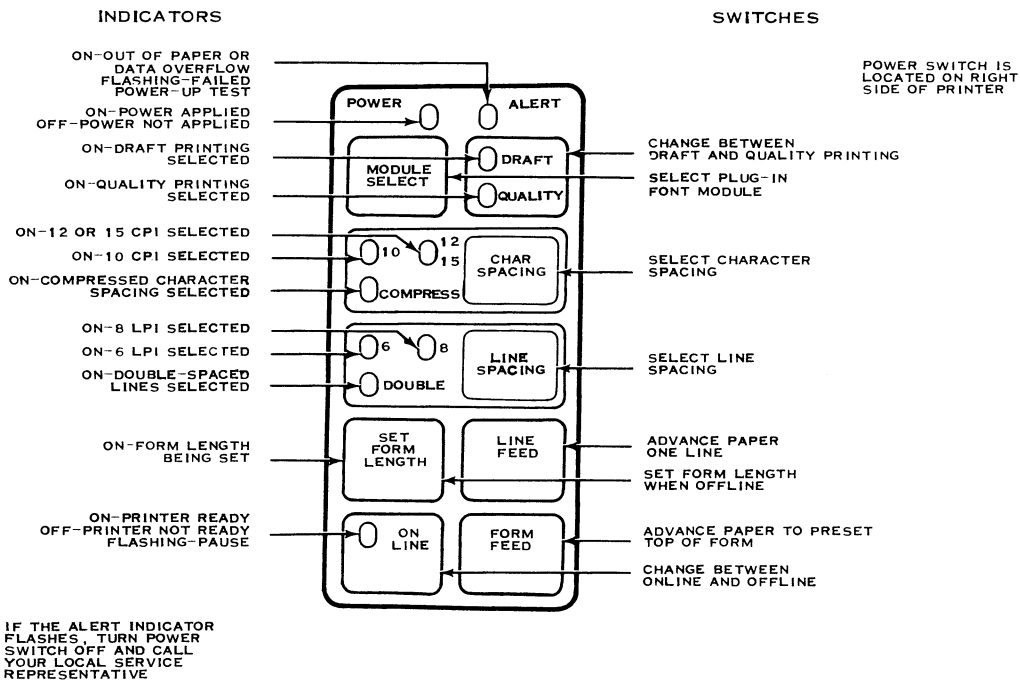
Model 855/865 Printer Control Panel

PR   855/865

Change 2

- MODULE SELECT switch — The MODULE SELECT switch allows you to select any one of up to three plug-in font modules. Press the switch until the indicator light on the desired font module lights.

- DRAFT/QUALITY switch — Pressing the DRAFT/QUALITY switch selects between draft and quality printing. Either the DRAFT or QUALITY indicator will light to show which printing method is selected. You must have a font module installed to select quality printing. When the printer is online and accepting commands from the computer, the computer command overrides the switch selection.

- CHAR SPACING switch and indicator — You can set the pitch of the printed line by pressing the CHAR SPACING switch. If you start with the 10 pitch indicator lighted and press the switch once, the printer changes to 12/15 pitch and the 12/15 indicator lights. If you press the CHAR SPACING switch again, the printer changes to compressed print and the COMPRESS indicator lights. COMPRESS indicates narrow character spacing: 16.7 characters per inch (cpi) if the font module is 10 or 12 cpi, or 20 cpi if the font module is 15 cpi.

- LINE SPACING switch and indicators — The LINE SPACING switch selects the spacing of text on the printed page. The selected spacing is shown on indicators 6, 8, and DOUBLE as follows:

  — 6 indicator on — indicates 6 lpi

  — 8 indicator on — indicates 8 lpi

  — 6 and DOUBLE indicators on — indicates 6 lpi, double spaced

  — 8 and DOUBLE indicators on — indicates 8 lpi, double spaced

When the printer is online, line spacing selected by the computer overrides the selection on the switch. If the selection made by the computer is other than the ones listed, none of the indicators will light.

- SET FORM LENGTH switch and indicator — To set the form length, the printer must be offline, and the printhead must be set at the very top of the form. First, press the SET FORM LENGTH switch. The indicator will light. Then:

  — To set to 72 lines at 6 lpi (European standard forms), press the ON LINE switch. The SET FORM LENGTH indicator will go out.

  — To set the form length to 16.5 inches for bin feeder operation, press the FORM FEED switch. The SET FORM LENGTH indicator goes out.

— To change the form length to some other value, press the LINE FEED switch once for each line of form length or until the first printing location of the next form is at the printhead. Then press the SET FORM LENGTH switch. The SET FORM LENGTH indicator goes out.

Press the ON LINE switch to go back online. See the appropriate printer operator's manual for details of single sheet operation.

- LINE FEED switch and indicator — Each time you press the LINE FEED switch, the paper advances one line. If you hold the switch down, the paper advances line by line until you release the switch.

- ON LINE switch and indicator — The ON LINE switch controls the connection to the host computer. You can press the ON LINE switch to connect or disconnect the printer from the computer. The ON LINE indicator is lighted when the printer is online. The ON LINE indicator flashes when the computer sends a pause command. To place the printer back online after a pause command, press the ON LINE switch.

- FORM FEED switch — The FORM FEED switch causes the printer to feed paper until it reaches the top of the next sheet.

NOTE

Many of the switches are disabled when the SET FORM LENGTH indicator or the ALERT indicator is lighted.

RIBBON REPLACEMENT, PAPER LOADING, CARE AND CLEANING

These subjects are covered in detail in pages 6 through 31 of the 850/860 printer section of this manual. The 855/865 printers are physically similar but the 865 printer offers a wide carriage that will accept 16-inch paper.

OPERATOR CORRECTABLE PROBLEMS

Faulty printer operation can occur because of loose connections, an incorrect electrical ground, power spikes, or electrical interference. Make sure that all cables are tightly connected both at the printer and the computer. The center prong of the printer power cord must be connected to an earth ground.

The ALERT indicator shows a steady light if the printer is out of paper or if a buffer overflows. To correct the out-of-paper condition, load paper into the printer and press the ON LINE switch. If the receive buffer overflows, this indicates a communication problem between the computer and printer. See the appropriate printer manual for the proper corrective action.

If you are having a problem, use the power switch to turn the printer off and then back on. The printer will execute the self-test cycle. If the ALERT indicator displays a steady blink, service is required.

To start the barber pole printing test, hold down the MODULE SELECT switch and turn on the power switch. Hold the MODULE SELECT switch until the printer starts printing. Be sure to have full width paper in the printer, because the barber pole test prints full width. Press ON LINE to stop the test.

For more information on problem correction, see the service checklist in the printer operator's manual.

RELATED INFORMATION

Expendable Supplies, Model 855

- Model 855 Printer ribbon, TI Part No. 2222454-0001

- Printer paper. The 855 printer uses sheet, roll, or fanfold paper. For sheet paper, maximum width is 279.4 mm (11 in), maximum thickness is 0.127 mm (0.005 in), and maximum weight is 9.1 kg (20 lb). For roll paper, maximum width is 266.7 mm (10.5 in), maximum diameter is 127 mm (5 in), maximum weight is 6.8 kg (15 lb). For fanfold paper, maximum width is 254 mm (10 in). For single part fanfold, maximum thickness is 0.102 mm (0.004 in), maximum weight is 6.8 kg (15 lb). For multipart fanfold, the maximum thickness is 0.34 mm (0.014 in) for original plus two copies, no cards permitted except on last copy. The maximum weight is 5.44 kg (12 lb) plus 3.40 kg (7.5 lb) for each of two copies.

Publications, Model 855

More information about the 855 printer can be found in the *Model 855 Printer Operator's Manual* (TI Part No. 2225911-0001), from the *Model 855 Printer Technical Reference Manual* (TI Part No. 2232822-0001), and the *Model 855/856 Printer Maintenance Manual* (TI Part No. 2225914-0001).

Expendable Supplies, Model 865

- 865 printer ribbon cartridge six pack, TI Part No. 2239391-0001

- Printer paper. The 865 printer uses single sheet or fanfold paper. For sheet paper, maximum width is 279.4 mm (11 in), maximum thickness is 0.127 mm (0.005 in), maximum weight is 9.1 kg (20 lb). For single sheet fanfold, maximum width is 406.4 mm (16 in), maximum thickness is 0.102 mm (0.004 in), maximum weight is 6.8 kg (15 lb). For multipart fanfold, maximum width is 406.4 mm (16 in), maximum thickness is 0.34 mm (0.014 in) for an original plus two copies with no cards permitted. Maximum weight is 5.9 kg (13 lb) plus 3.4 kg (7.5 lb) for each of two copies.

Publications, Model 865

More information about the 865 printer can be found in the *Model 865 Printer Operator's Manual* (TI Part No. 2239405-0001), from the *Model 865 Printer Technical Reference Manual* (TI Part No. 2239407-0001), and the *Model 865 Printer Maintenance Manual* (TI Part No. 2239428-0001).

SWITCHES AND INDICATORS

The Model 880 Printer offers a wide range of features and configurations. The features can be selected by the host computer software, or they can be keyed in manually. The Model 880 operates in four modes to allow manual selection of printer features:

- Normal mode — for normal operation

- Command mode — for manual setting of form length and vertical tabs

- Menu mode — for printing setup configurations and menus

- Text mode — for troubleshooting printer problems

NORMAL MODE FUNCTIONS

The printer powers up in Normal mode. In Normal mode the external keys and indicator lights perform the following functions:

ON LINE
The ON LINE switch on the operator control panel places the printer in the online or offline condition. When the printer is online, the ON LINE indicator is lighted and the computer is in control of the printer. This is the normal operating position.
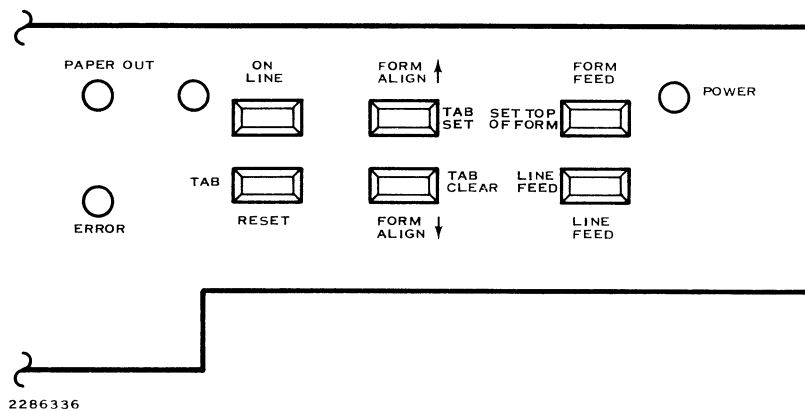
RESET/TAB
The RESET switch on the operator control panel clears paper-out and error conditions. The alternate TAB function is active only in Command mode.

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External Sector of 880 Control Panel

FORM ALIGN/TAB SET

The FORM ALIGN (^) switch on the operator control panel moves the paper up 1/72 inch. Holding the switch down advances the paper by ten 1/72-inch steps and then by full lines. The alternate TAB SET function is active only in command mode.

FORM ALIGN/TAB CLEAR

The FORM ALIGN (^) switch on the operator control panel retracts the paper 1/72 inch. When the switch is held down, the paper continues to retract in 1/72-inch increments. The alternate TAB CLEAR function is active only when the printer is in Command mode.

FORM FEED/SET TOP OF FORM

The FORM FEED switch on the operator control panel prints the contents of the print buffer and moves the paper to the top of the next form. The alternate SET TOP OF FORM function, which adjusts the form length, is active only in Command mode.

LINE FEED

The LINE FEED switch on the operator control panel prints the contents of the print buffer and advances the paper one full line.

POWER, PAPER OUT, AND ERROR

The POWER indicator turns on when power is applied to the printer. When the printer is out of paper, the PAPER OUT indicator blinks until you install more paper and press the RESET switch. The ERROR indicator turns on when a nonrecoverable power-up error is detected. It blinks five times a second when a carriage movement error is detected. It blinks once per second when a communication or operator error is detected.

COMMAND MODE FUNCTIONS

The following functions are controlled from the command mode:

- Setting form length

- Setting the top of form

- Setting and clearing vertical tabs

- Advancing the form by lines to position new tabs

- Advancing the form to next vertical tab

- Printing the contents of receive buffer

- Clearing the contents of receive buffer

- Entering the menu mode and printing the form report

- Entering the menu mode and printing the configuration report

- Entering the menu mode and printing the character set report

- Entering the test mode and printing the status report

- Returning to normal mode

MENU MODE FUNCTIONS

The following functions are controlled from the menu mode:

- Changing font

- Changing characters per inch (cpi)

- Changing lines per inch (lpi)

- Selecting the PERFSKIP (perforation-skip) feature

- Checking the host-software-controlled margins

- Printing the configuration report and menu

- Printing the character set report and menu

- Entering the test mode and printing the status report

- Returning to normal mode

TEST MODE FUNCTIONS

Test mode is used for printing the printer status report and the barber pole test.

The *Model 880 Printer User's Manual* provides detailed instructions for using the command, menu, and test modes. These modes are selected using the keys on the internal control panel.

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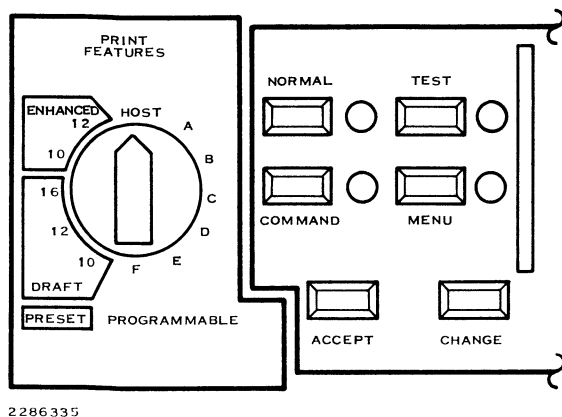
Internal Sector of 880 Control Panel

PRINT FEATURES SWITCH

The Print Features switch has twelve positions:

- Host — With the Print Features switch in the Host position, the host can control all printer features.

- Preset — With the Print Features switch in any of the five Preset positions, characters-per-inch and font (draft or enhanced) are determined by the switch position. Other form report features and character set designations can be programmed in the menu mode.

- Programmable — With the Print Features switch in any of the six Programmable positions (A through F), the active print features can be those selected from the form and character set menus while the Print Features switch was in that position. Six different combinations of font, characters per inch, lines per inch, form length, perforation-skip, vertical tabs, and character set designations can be programmed from the control panel.

POWER UP

When the power switch is put in the ON position, the printer does an automatic test that takes about 30 seconds. While the test is being done, the following events should occur:

1. All indicator lights (except Command) turn on.

2. Indicator lights turn off in the following order:

    a. On Line

    b. Paper Out

    c. Test

    d. Menu

    e. Error

3. The carriage moves to the right bumper and then to the left bumper.

4. The printer makes a short audible tone.

5. The Power and Normal indicators remain on. The Paper-Out indicator flashes if you have not loaded paper. The On Line indicator turns on if the printer is configured to power-up online (configuration code 9B selected).

If your printer does its automatic power-up test without these results, see Section 4, Status Report and Problem Analysis, in the *Model 880 Printer User's Manual*.

LOADING THE PAPER

The Model 880 Printer has a bottom and rear paper path. Either path can be used for single-thickness forms. The bottom path is recommended for multiple-thickness forms. To load paper, complete the following steps.

1. Open the printhead door.

2. The left tractor must be to the left of the paper-out switch. If it is not, loosen the locking lever and slide the left tractor to the left so that when the paper is installed, the paper will cover the paper-out switch. Tighten the lock lever.

3. Open the covers on both tractors.

4. Use the printhead-adjustment lever to move the printhead away from the platen.

5. To load paper through the back paper path:

    a. Put the paper supply in back of the printer.

b. Insert the paper, with the side to be printed facing down, into the paper path at the back of the printer until the paper appears at the platen. Align the paper so that it does not rub against the sides of the paper chute.

c. Go to step 7.

6. To load paper through the bottom path:

a. Put the paper supply under the table or stand.

b. Insert the paper, with the side to be printed facing forward, into the bottom paper path until the paper appears at the platen. Align the paper so that it does not rub against the sides of the table slot or the sides of the bottom paper path.

c. Go to step 7.

7. Loosen the locking lever on the right tractor and adjust the tractor to accept the paper width.

8. Put the paper in both tractors with the holes on the tractor pins. Make sure you place corresponding holes on corresponding pins.

9. Close the tractor covers and move the right tractor to pull the paper tight across the platen. Then tighten the locking lever.

10. Check the alignment of the paper supply with the paper path. Paper must not touch either side of the path.

11. Return the printhead to its original position (step 4) using the printhead adjustment lever.

NOTE

To prevent possible damage to the printhead and platen, do not operate the printer without a ribbon and paper, or beyond the width of the paper.

ADJUSTING THE PRINTHEAD

The printhead must be adjusted to the thickness of the form used. For the initial adjustment, and to make corrections for different paper thicknesses, complete the following steps:

1. After loading paper, move the printhead toward the platen by pushing the printhead adjustment lever slightly to the right and then toward the back of the printer. Allow the printhead barely to touch the paper.

2. Print a barberpole test (described below). Ink smears will appear on the paper if the printhead is too close to the platen. Incomplete characters or no characters will appear if the printhead is too far from the platen.

3. Continue adjusting the printhead and printing barberpole tests until the print appears sharp and dark.

NOTE

Adjusting the printhead cannot compensate for a worn-out ribbon. Replace the ribbon if the printed characters are too light.
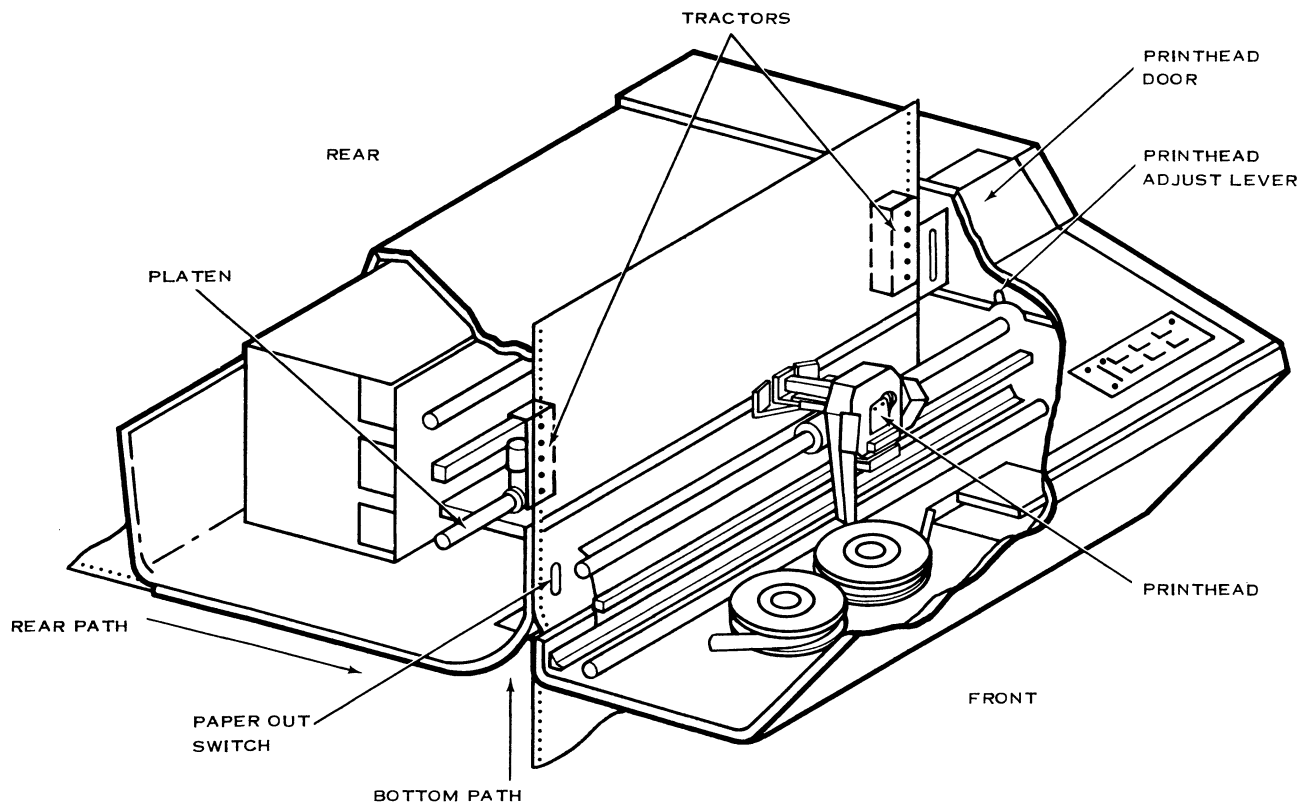
Loading the Paper

2286333

PRINTING THE BARBERPOLE

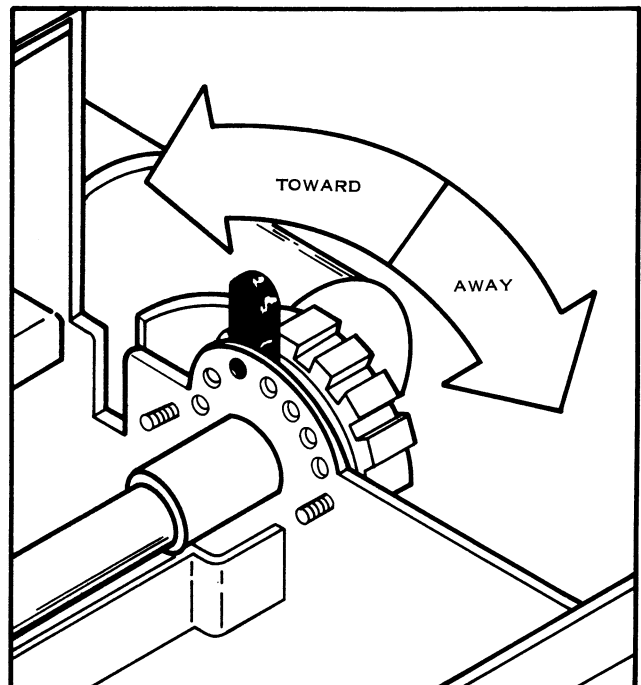Before printing the barberpole test, the printer must be offline. If the On Line indicator is on, press the On Line key once to set the printer off-line.

To print a barberpole test, sequentially press the Normal, Command, Test, and Change keys.

To stop the barberpole test, press the Accept or the Normal key.

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Printhead Adjustment Lever

INSTALLING THE RIBBON

Follow these steps to install a new ribbon.

1. Set the power switch to the OFF position.

2. Open the printhead door.

3. Make a note of the position of the print-head adjustment lever. Then move the lever away from the platen by pushing the lever slightly to the right and then pulling it to the front of the printer.

4. Lift the old ribbon spools off the hubs and lift the ribbon out of the ribbon path.

5. Set the empty spool of the new ribbon on the left spool hub with the ribbon toward the front of the printer. Pass the ribbon out along the ribbon path.

6. Set the full spool on the right hub. Rotate the hubs to pull the ribbon tight.

7. Return the printhead adjustment lever to its original position (step 3), or follow the procedure described in the paragraph entitled Adjusting the Printhead.
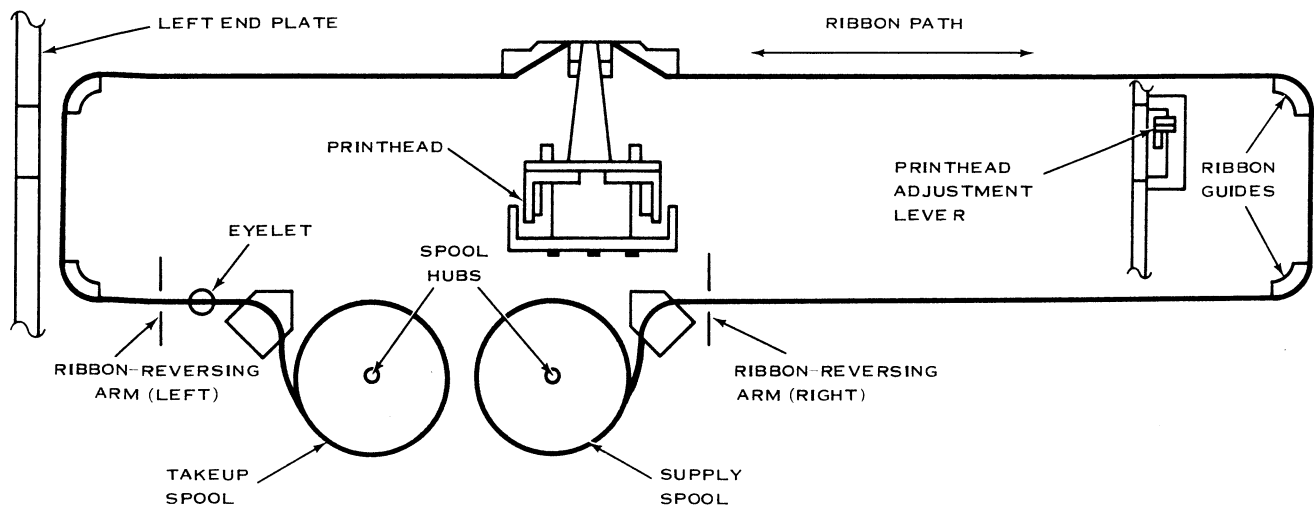
NOTE

Make sure that the ribbon-reversing eyelet is between the left ribbon-reversing arm and the left spool hub; if it is not, the ribbon will not reverse. Also make sure that the ribbon rides on the ribbon guides and inside the left end-plate.

2286334

Ribbon Path

OPERATOR-CORRECTABLE PROBLEMS

Faulty printer operation can occur because of loose connections, an incorrect electrical ground, power spikes, or electrical interference. Make sure that all cables are tightly connected at both the printer and the computer. The center prong of the printer power cord must be connected to an earth ground.

If the Error indicator is blinking rapidly, check for jammed paper or anything that may be blocking the movement of the printhead. Press the Reset key. If the Paper Out indicator is blinking, see that the paper covers the paper-out switch. Press the Reset key.

Use the power switch to turn the printer off and then back on. The printer will execute power-up self tests. If the On Line, Paper Out, Test, Menu, and Error indicators fail to turn off, the problem will require a service call. (On Line comes back on if the printer is configured to go online when it is powered up.

If you are not sure of the cause of a problem, go into the test mode and print a status report. The error code may contain the explanation of the problem. Section 4 of the *Model 880 Printer User's Manual* documents the test mode procedures and contains additional diagnostic information.

TEMPERATURE

The operating temperature range of the Model 880 Printer is from 41° to 104° F (5° to 40° C). The nonoperating temperature range is from −22° to 158° F (−30° to 70° C).

CAUTION

The Model 880 Printer is cooled by an internal cooling fan which pulls air from the right side vent of the printer and pushes air out the vent on the left side. Make sure that these vents are not obstructed.

CLEANING

For best performance, the printhead and ribbon area of the Model 880 Printer should be cleaned at least every 3 months. Clean whenever noticeable dust appears on the printhead tip or carriage rods.

WARNING

Set the printer ON/OFF switch to the OFF position to avoid electrical shock hazards.

1. Remove the power cable from the power receptacle.

2. Lift the printhead cover.

3. Carefully vacuum paper chaff from the printhead and ribbon areas.

4. Manually slide the carriage to the left and to the right in order to vacuum beneath the printhead.

5. Clean both carriage rods with a clean dry cloth.

CAUTION

DO NOT use cleaning agents on the Model 880 Printer, or oil the carriage rods.

6. Connect the power cable.

7. Close the printhead cover and set the ON/OFF switch to the ON position.

RELATED INFORMATION

Expendable Supplies — Paper and Ribbon

Paper width: 76.2 mm (3 in) to 481.0 mm (14-7/8 in)

Paper: Continuous feed, fanfold. Multiple parts: up to four parts (original plus 3 copies) at maximum print speed or up to nine parts (original plus 8 copies) at reduced print speed

Thickness: 0.53-mm (0.021-in) thickness maximum. No cardboard allowed except on last copy

Weight: Single part, 6.8 kg (15 lb), multi-part, 5.44 kg (12 lb) plus 3.40 kg (7.5 lb) for carbon copies (original plus three copies)

Ribbon: Model 880 Printer ribbon, TI Part No. 2246601-0001 for single ribbon, TI Part No. 2246601-0002 for six pack.

Publications

For more information about the Model 880 Printer see the *Model 880 Printer User's Manual*, TI Part No. 2222627-0001, and the *Model 880 Printer Maintenance Manual*, TI Part No. 2222628-0001.

SWITCHES AND INDICATORS

The switches and indicators used by the operator on the Model LP300 and LP600 Line Printers are described in the following paragraphs.
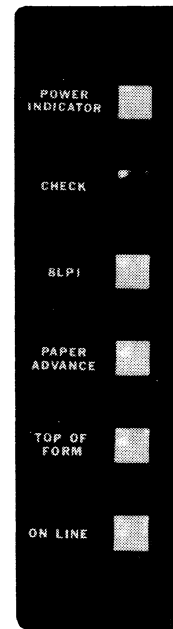
POWER INDICATOR
The POWER INDICATOR lights while power is applied to the printer.

CHECK
The CHECK switch is a combination control switch and status indicator. Press CHECK after an error condition is corrected to reset the printer. If the indicator remains lit, an additional error exists. All errors must be cleared before the printer can be operated.

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LP300/LP600 Printer Operator Panel

The CHECK indicator provides status information about certain printer functions. It lights for one or more of the following reasons:

- Form thickness adjustment lever is in the load position.

- Printer is out of paper.

- Internal voltage is abnormal.

If the CHECK indicator remains lit after all noticeable errors have been corrected, notify the computer system manager.

8LPI
The 8LPI switch selects line spacing of either eight lines per inch (lpi) or six lpi. The indicator is lit when 8 lpi is in effect. This switch is operational only when the printer is offline.

PAPER ADVANCE
The PAPER ADVANCE switch causes the paper to advance. Do not use the PAPER ADVANCE switch to feed printouts out of the printer as this destroys the top-of-form adjustment.

TOP OF FORM
The TOP OF FORM switch advances the paper to the top of the next form. Use this switch to feed completed printouts out of the printer. The TOP OF FORM switch is operational only when the printer is offline.

ON LINE
The ON LINE switch controls the online/offline condition of the printer. When the indicator is out, the printer is offline and cannot receive data from the computer.

POWER-UP

The POWER ON/OFF switch for the line printer is located on the left-hand side of the printer. Setting the switch to ON applies ac power to the printer and lights the POWER INDICATOR. When the ON LINE switch is pressed, the ON LINE indicator lights, indicating that the printer is ready for use.

Self-Test
To verify that the LP300 or LP600 printer is operating correctly, execute the following self-test:

1. Place the printer online by pressing the ON LINE switch. (The ON LINE indicator comes on.)

2. Simultaneously press the PAPER ADVANCE and CHECK switches. The printer will print 132-character lines of the letter E.

3. Terminate the self-test by releasing the PAPER ADVANCE and CHECK switches.

If an error is indicated during the self-test, repeat the procedure. If the error persists after several retry attempts, notify the computer system manager.

PAPER LOADING AND ADJUSTMENTS

To load paper into the LP300 or LP600 printer, use the following procedure:

1. Turn on power to the printer. (See Power-Up.)

2. Verify that the printer is offline. (The ON LINE indicator should be out.)

3. Place the fanfold paper under the printer and line it up with the printer's paper loading slot.

4. Press TOP OF FORM.

5. Open the front cover of the printer.

NOTE

If the original form thickness adjustment is to be maintained, note the position of the form thickness adjustment lever before going to step 6.

6. Move the form thickness adjustment lever to its fully raised position.

7. Open the left and right paper tractor gates.

8. Insert the top edge of the paper through the slot in the base of the printer and pass it above the left and right tractors.

9. Loosen the tractor lock knobs and reposition them as necessary to accommodate the width of the paper.

10. Move the paper up and down in both tractors until the holes are engaged with the corresponding tractor pins.

11. Close the tractor gates. If necessary, adjust the tractors to provide very slight tension across the form. Position the paper and the tractors so that the first character position on the upper scale falls approximately in the desired first-column position on the paper.

FORM WIDTH ADJUSTMENT
(TRACTOR KNOBS)

LEFT-HAND
TRACTOR
GATE

VERTICAL FORM
ADJUSTMENT KNOB

HORIZONTAL VERNIER
ADJUSTMENT KNOB

FORM THICKNESS
ADJUSTMENT LEVER

FORM THICKNESS
ADJUSTMENT SCALE

RIGHT-HAND
TRACTOR GATE

RIBBON ASSEMBLY

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PAPER LOADING PATH
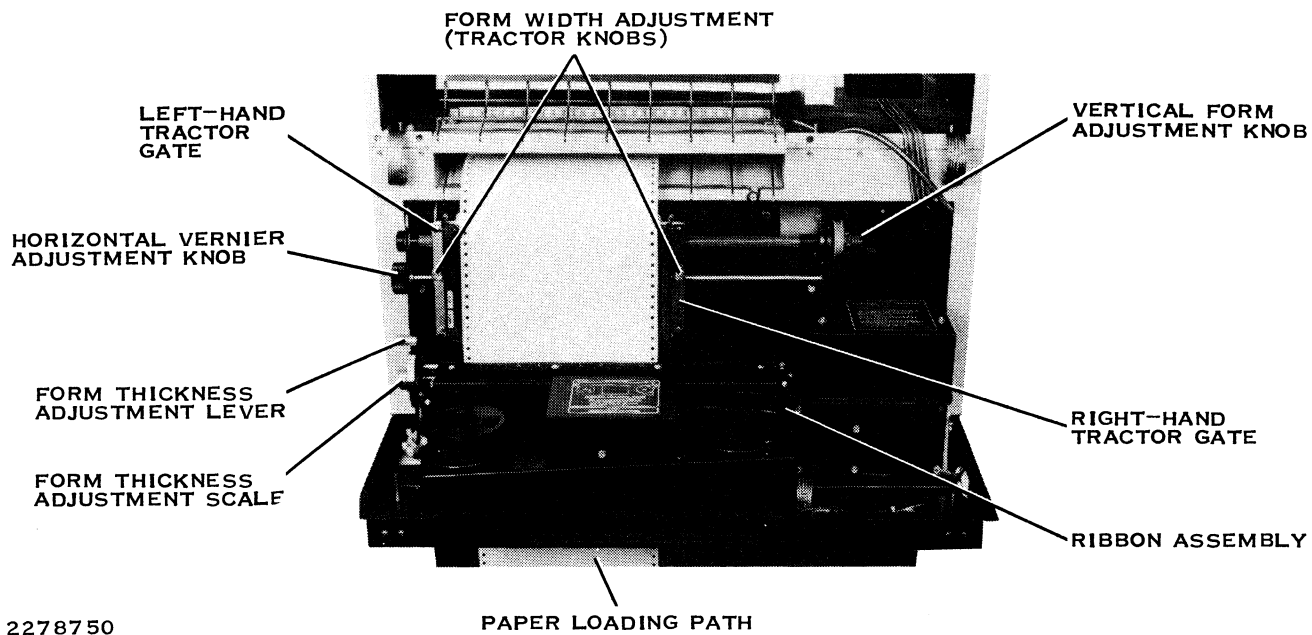
LP300/LP600 Printer Internal View

VERTICAL FORM
POSITIONER DISK

REFERENCE MARK

FIXED POINTER

VERTICAL FORM
ADJUSTMENT KNOB

2279354
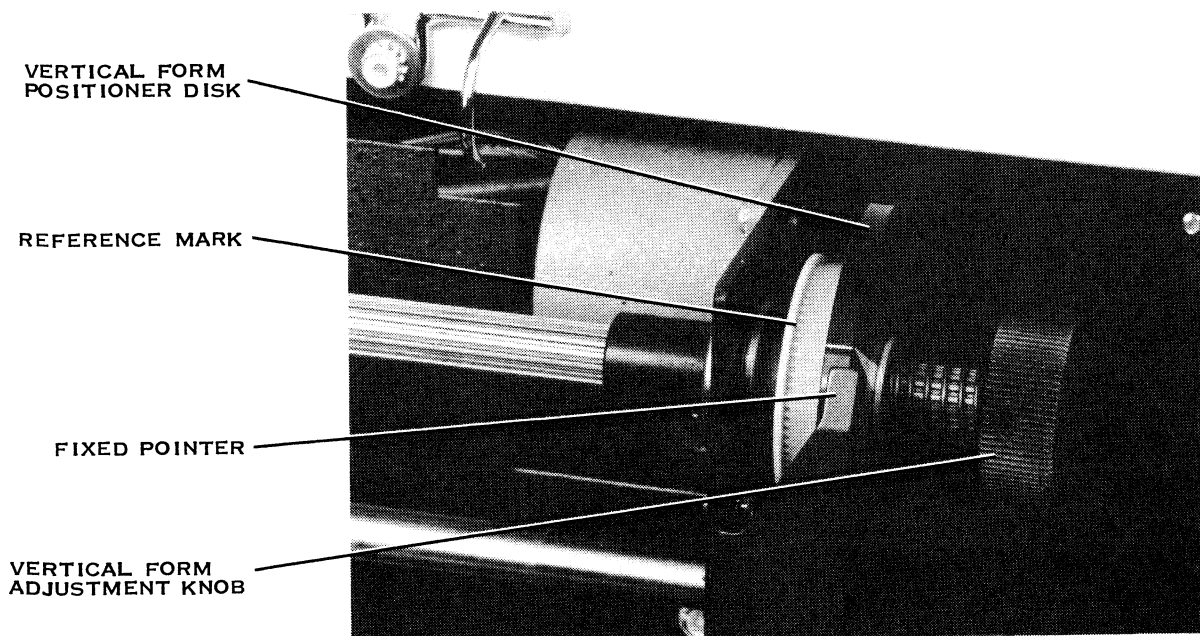
LP300/LP600 Printer Paper Positioning

NOTE

The horizontal vernier knob may be adjusted at any time to move the character to the correct location in the form within a three-character range.

12. Tighten the tractor lock knobs.

13. Turn the vertical form adjustment knob until the top edge of the form is opposite the top-of-form mark on the left-hand tractor.

14. Move the form thickness adjustment lever down to its previous position.

15. Rotate the white reference mark on the vertical form positioner disk until it is aligned with the fixed pointer.

16. Holding the vertical form positioner disk in position, rotate the vertical form position knob exactly one full revolution towards you.

17. Move the form thickness adjustment lever down to a suitable position for the paper or form in the printer. If the CHECK indicator is on, press it to clear any previous error. If CHECK remains on, there is still an error that you must correct.

NOTE

If the form thickness adjustment lever is not adjusted properly, the data printed may be too dark or too light. If necessary, correct the problem by adjusting the lever.

Form Width Adjustment
The LP300 or LP600 printers may be adjusted for form width in two ways. First, the printer mechanism may be adjusted to accept paper forms from 100 to 400 millimeters (4 to 16 inches) wide by unlocking and repositioning the tractor knobs and repositioning the tractors that engage the holes in the paper. When the tractor knobs are unlocked, the right-hand tractor may be moved the full width of the hammer bank. However, the left-hand tractor may be moved only 28 millimeters (1.1 inches) outward (left) from print column one. This tractor also has a top-of-form mark for use in setting the top of form. In the second method of form width adjustment, the horizontal vernier adjustment knob allows both tractors to be moved simultaneously a maximum distance of two columns in either direction.

Form Thickness Adjustment
The form thickness adjustment lever is located on the left-hand side of the printer mechanism. The lever scale is marked for approximate locations for various thicknesses of forms. The actual thickness of form determines the proper lever setting.

To position the lever satisfactorily, initiate the self-test and observe the results. If the printed characters are too light, move the lever toward the rear of the printer. If the printed characters are too dark, move the lever toward the front of the printer.

Vertical Positioning Adjustment Knob
The vertical positioning adjustment knob moves the paper up or down. It is used primarily in conjunction with the top of form tractor marks to set the top of form.

FORM WIDTH ADJUSTMENT TRACTOR KNOB

HORIZONTAL VERNIER ADJUSTMENT KNOB

FORM THICKNESS ADJUSTMENT LEVER
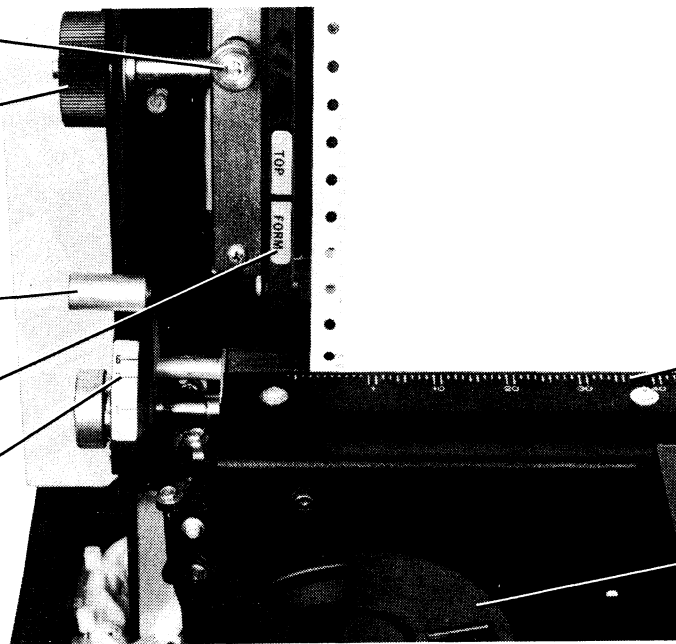
TOP OF FORM ALIGNMENT REFERENCE MARK

FORM THICKNESS ADJUSTMENT SCALE

PAPER SCALE

RIBBON SPOOL

2278749

Form Thickness Adjustment Control

RIBBON INSTALLATION

To change the LP300 or LP600 printer ribbon, perform the following steps:

1. Verify that the printer is offline and raise the front cover. (It is not necessary that the printer power be turned off.)

NOTE

If the original form thickness adjustment is to be maintained, note the position of the form thickness adjustment lever before performing step 2.

2. Place the form thickness adjustment lever in its fully raised position.

3. Unlock both spools of the old ribbon by pulling the latches toward the center of the hubs.

4. Lift the old ribbon spools from the hubs, clearing loose ribbon from the guides and ribbon slot. Discard the used ribbon and spools.

5. Place one new ribbon spool on the right spool hub, with the feed-out side of the spool toward the front of the printer, and feed the ribbon out along the ribbon path.

6. Place the remaining new ribbon spool on the left spool hub and rotate either spool to remove any ribbon slack.

7. Readjust the form thickness adjustment lever to the desired setting.

2278748

LP300/LP600 Printer Ribbon Assembly

RIBBON LOADING PATH

REPLACEMENT RIBBONS
REFER TO MANUAL FOR
ORDERING INFORMATION

NOTE:
REFER TO MANUAL FOR PERIODIC
MACHINE CLEANING INSTRUCTIONS
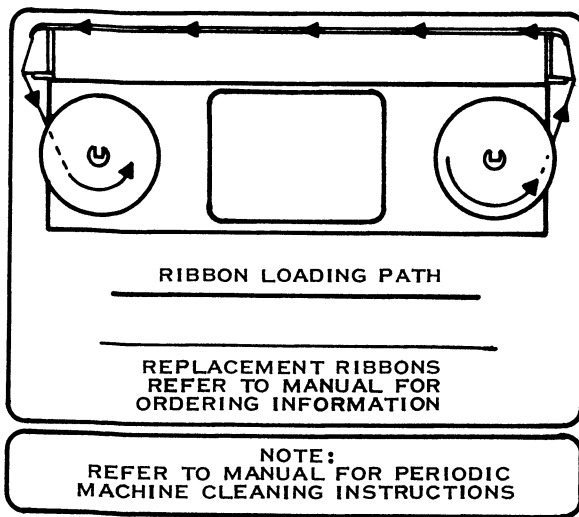
2278747

Ribbon Loading Path

8. Close the cover of the printer and bring the printer online.

CARE AND CLEANING

The exterior of the printer should be cleaned, and certain internal areas should be vacuumed every three months or 250 hours of operation. More frequent cleaning and vacuuming may be necessary depending upon site conditions.

The exterior of the printer can be cleaned with a mild detergent and a clean cloth. Spray the detergent on the cloth, not directly on the printer.

To clean the interior of the printer:

1. Turn off the printer power.

2. Open the front cover and unload the paper from the printer.

3. Using a vacuum cleaner with a soft brush attachment, remove dust, ribbon lint, and paper particles from the interior of the printer.

4. Reload paper into the printer.

5. Close the printer front cover.

6. Apply power to the printer and resume normal operation.

OPERATOR-CORRECTABLE PROBLEMS

The following list describes operator-correctable problems that may occur and the necessary corrective actions.

The CHECK indicator lights.

The printer has one of the following operator-correctable problems:

- The form thickness adjustment lever is in the load position. Set the level correctly (see Form Thickness Adjustment) and press CHECK.

- The printer has run out of paper. Load more paper (see Paper Loading) and press CHECK.

- There is no paper motion when the printer is operating. Verify that the paper is loaded properly and press CHECK.

Characters are smudged, partially formed, or too light.

Move the forms thickness adjustment lever toward the rear of the printer. (See Form Thickness Adjustment.)

RELATED INFORMATION

Expendable Supplies
The expendable supplies for the LP300 and LP600 printers are as follows:

- LP300/LP600 printer ribbon, part number 2271784-0001.

- Printer paper. The LP300/LP600 printer uses continuous form paper with standard perforations on each edge. Paper widths from 101.6 to 406.4 millimeters (4 to 16 inches) can be used. Single or multipart forms (one original with up to five carbon copies) can be printed on paper with the following weight specifications. Single-part forms may not exceed 6.8 kilograms (15 pounds) per ream. Multipart forms may not exceed 5.5 kilograms (12 pounds) per ream with carbon from 2.7 to 3.6 kilograms (6 to 8 pounds) per ream. Card stock up to 0.635 millimeter (0.025 inch) may be used in single or multipart forms.

Publications
The manual *Model 990 Computer Model LP300 and LP600 Line Printers Installation and Operation*, part number 0939460-9701, provides more information about the LP300 and LP600 printers.

Data Terminals (DT)

This section describes the data terminals for the Business Systems 600 and 800 computers:

- Model 911 Video Display Terminal (VDT)

- Model 931 Video Display Terminal (VDT)

The subsections each contain the following information:

- Controls and Keyboard

- Power-Up

- Care and Cleaning

- Operator-Correctable Problems

- Related Information

**DT**   1

CONTROLS AND KEYBOARD

Normal operation of the 911 VDT requires familiarity with the controls and keyboard discussed in the following paragraphs.

ON/OFF
Pressing the ON side of the ON/OFF switch applies power to the 911 VDT; pressing the OFF side turns the power off.

BRIGHTNESS and VOLUME
The BRIGHTNESS control adjusts the intensity of characters displayed on your screen, and the VOLUME control adjusts the level of the audio beep. To increase brightness or volume, turn the corresponding control clockwise. A counter-clockwise turn decreases the brightness or volume.
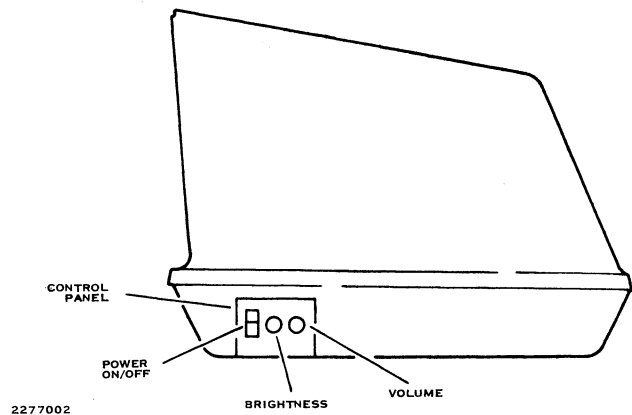
911 VDT Controls

NOTE

To help prolong the life of the 911 VDT screen, do not adjust the brightness to excessive levels. Also, when the VDT is not in use, turn the brightness down or turn the unit off.

911 Keyboard
The 911 VDT keyboard is arranged by function into four groups of keys as follows: data entry, cursor control and edit, numeric pad, and special control.

Data Entry Keys
Data entry keys on the 911 VDT keyboard permit you to enter information into the computer, such as commands and responses to requests for information. The data entry keys are the center cluster on the keyboard and resemble a standard electric typewriter keyboard.

Cursor Control and Edit Keys
The cursor control and edit keys on the left of the keyboard are used to position the cursor and to perform certain editing functions.

Numeric Keypad
A standard 10-key (plus decimal point) keypad is located on the right side of the keyboard. The keypad allows fast entry of numbers.
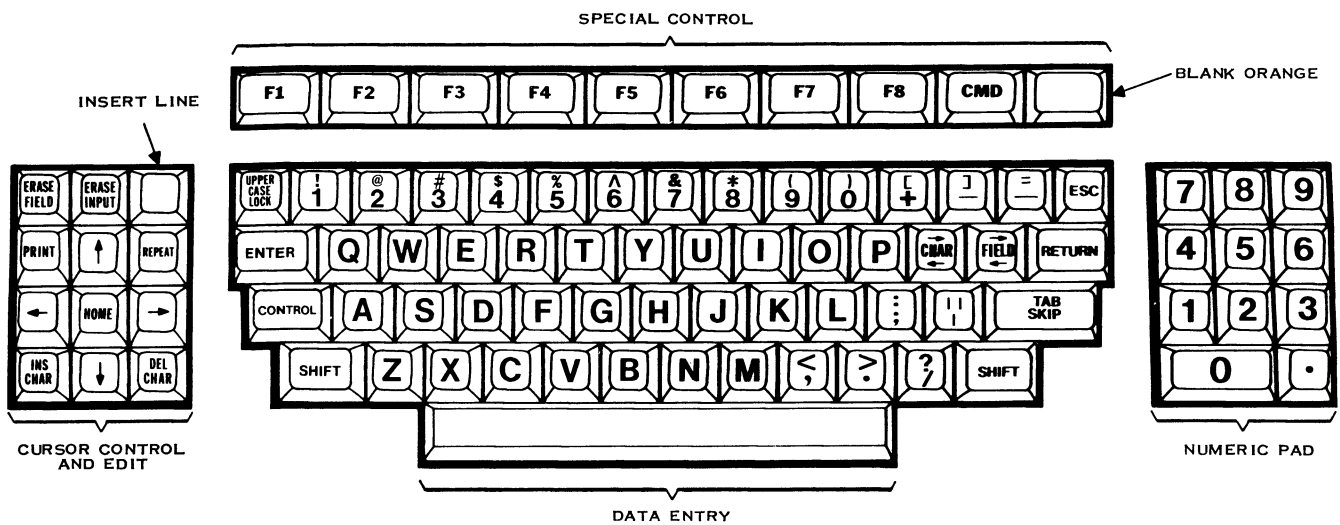
Special Control Keys
The 10 control keys are used to provide custom functions as determined by your operating system software.

The following illustration shows the 911 VDT keyboard.

2283043

Functions of 911 VDT Keyboard, United States Version

POWER-UP

Apply power to the 911 VDT by pressing the ON side of the power switch located on the right side of the display unit. When the terminal is warmed up, a raster (lined background) appears on the screen as the BRIGHTNESS control is turned clockwise.

CARE AND CLEANING

Before performing maintenance on the 911 VDT, set the ac power switch to OFF. The 911 VDT monitor and keyboard case may be cleaned with a damp cloth. The video screen may accumulate dust over a period of time and may be wiped with a clean cloth dampened with commercial glass cleaner. When cleaning is complete, set the ac power switch to ON.

RELATED INFORMATION

Additional information on the 911 VDT can be found in the manual *Model 990 Computer Model 911 Video Display Terminal Operation*, part number 0945423-9701.

CONTROLS AND KEYBOARD

Normal operation of the 931 VDT requires familiarity with the controls and keyboard as described in the following paragraphs.

ON/OFF
The 931 VDT power on/off switch is a rocker-type switch located at the lower right-hand corner of the terminal display. To apply power to the terminal, press the side of the switch labeled 1. To remove power, press the side labeled 0.

Online/Offline Selection
You can remove the 931 terminal from online to offline status by simultaneously pressing the ALT and numeric 4 keys. To return to online status, repeat the operation. (At power-up, the terminal defaults to online status.)

Status Selection
To blank the status line from view, press the ALT and numeric 2 keys simultaneously. The host CPU can still display messages on the display line. To restore the status line, repeat the operation.

Reverse Background Selection
You can select the reverse background mode by pressing the ALT and numeric 5 keys simultaneously. Dark characters are displayed on an illuminated background. Repeating the operation restores the display to its normal mode.

Display Brightness Selection
The 931 terminal has 16 levels of brightness which can be selected by simultaneously pressing the ALT and numeric 7 keys. Each time you press the numeric key while holding the alternate key, the brightness advances one level. Pressing the ALT and numeric 7 keys continuously automatically advances the display through all levels of brightness.

Display Dimness Selection
The display dimness feature is the opposite of the display brightness. The 16 dimness levels can be selected by simultaneously pressing the ALT and numeric 8 keys. This decreases the brightness by one level. To automatically decrease the brightness through various levels, press and hold the ALT and numeric 8 keys continuously.

Bell Volume Selection
The 931 bell can be set to four different volume levels: none, soft, medium, and loud. Each time you advance the volume, the bell sounds at the new volume level. If the volume is at its loud level when you begin the selection, the sequence starts from the beginning. To advance the bell volume, press the ALT and minus (−) keys simultaneously. To automatically advance through the volume levels, press and hold the ALT and minus (−) keys.

Tilt-Base Adjustment
The 931 display is mounted on a tilt-base that allows you to adjust the display to the desired viewing angle. To adjust the viewing angle, manually position the display as desired.

Keyboard Angle Adjustment
The keyboard has two latches located at its upper left and right corners. You can adjust the keyboard angle by simultaneously pressing and holding both of these latches in, and moving the keyboard to the desired angle.

POWER-UP

To apply power to the 931 VDT, press the side of the on/off switch labeled 1. Power-up initiates a self-test, requiring approximately 30 seconds to execute. Successful completion of the self-test is indicated by the message SELF-TEST PASSED being displayed on the display status line. Self-test failure is indicated by the message SELF-TEST FAILED, followed by an error message.

CARE AND CLEANING

Set the 931 VDT power on/off switch to 0 prior to performing any maintenance procedure. Use a damp cloth to clean the monitor and keyboard cases. Wipe the display screen with cloth dampened with a glass-cleaning compound.

OPERATOR-CORRECTABLE PROBLEMS

If your 931 VDT malfunctions during use, set the power on/off switch to 0 for a few seconds, then reset it to 1. This initiates the self-test.

If the unit fails to pass the self-test at initial power-up, consult the 931 general description manual to determine if the VDT is properly configured for your system.
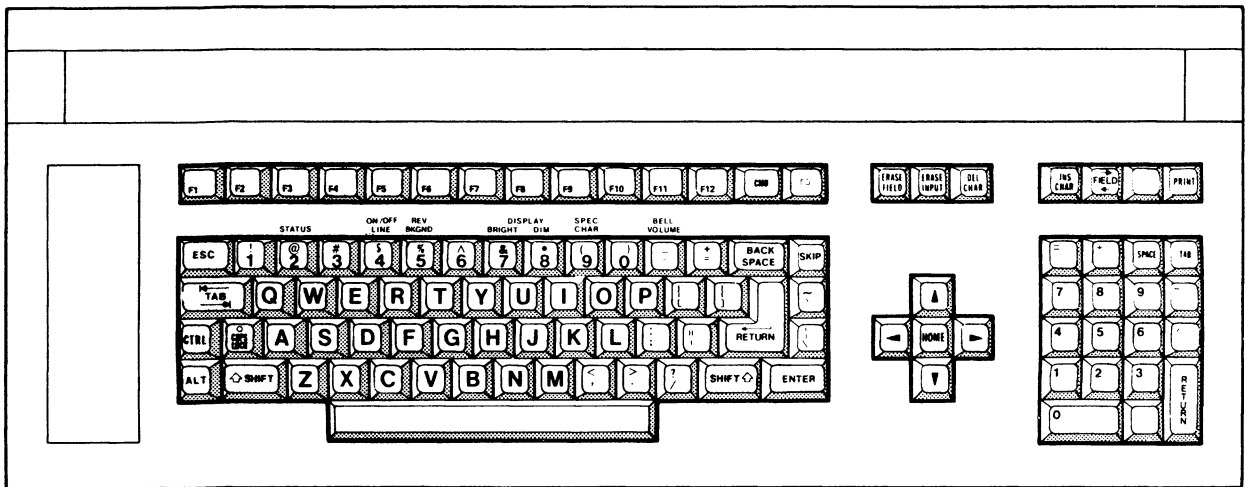
RELATED INFORMATION

The *Model 931 Video Display Terminal General Description Manual*, part number 2229228-0001, contains information of interest to the 931 VDT user.

2284879

Model 931 Video Display Terminal Keyboard

Loading Operating System Software (LS)

The operation of your Business Systems computer is dependent upon its operating system, a software package residing on a mass storage disk. TI operating systems are usually installed on the disk by the service representative installing the computer system. In order for the computer to be used, the operating system must be loaded from the disk into computer memory.

The operating system supplied with a Business Systems 600 or 800 may be one of the TI operating systems (DX10 or DNOS) or it may be software supplied by an intermediate vendor. The following paragraphs explain how to load a DX10 or DNOS operating system from the standard system disk into computer memory. Loading from the

removable disk cartridge in the CD1400 disk drive is also described. If the operating system is not installed on the standard system disk, refer to the paragraph titled Building an Operating System onto a Disk later in this section.

LOADING FROM THE STANDARD SYSTEM DISK

A DX10 or DNOS operating system can be loaded from one of the following disk media, provided that the selected drive contains the standard system disk for the computer system:

- The CD1400 fixed disk

- A DS80 or DS300 disk pack

- The primary fixed disk on a WD500 drive (WD1)

- The fixed disk on a WD800 drive

To load an operating system from the standard system disk, take the following steps:

1. Ensure that ac power is applied to the disk drive and computer chassis.

2. If you are loading from a DS80 or DS300, install the disk containing the operating system into the drive.

3. Remove write protection from the disk.

4. If you are loading from the CD1400, DS80, or DS300, place the START/STOP switch in the START position and wait until the READY indicator comes on. On the WD500, ensure that the WD1 indicator is out. On the WD800, wait until the DISK READY indicator is steadily lit (without blinking).

5. Press the HALT switch on the chassis.

NOTE

The chassis front panel switches will not respond unless the S-1-2 switch behind the upper trim panel is in the 1 position.

6. Press LOAD.

  a. On 600 models, the POWER and FAULT indicators come on and the four-digit hexadecimal display on the chassis flashes several number codes, indicating that the computer is undergoing a self-test. If the disk drive is not yet ready, the code 0007 is displayed until the drive is ready and the loading sequence proceeds.

  b. On 800 models, the POWER and FAULT indicators come on and the code 0100 is displayed while the computer undergoes a self-test. If the FAULT indicator stays on for more than 30 seconds, advise your system manager that an error has occurred in the self-test.

7. When the self-test has successfully completed, the FAULT indicator goes out. The POWER, IDLE, and RUN indicators come on and the code 0000 is displayed when the operating system has finished loading and the computer system is ready for use.

  Should the self-test or the load operation fail, the FAULT indicator will be on (steady for the self-test and blinking for the load). Consult the *Model 990/10A Computer Maintenance Manual — General Description,* part number 2302633-9701, for an explanation of the failure.

LOADING FROM A CD1400 DISK CARTRIDGE

An operating system can also be loaded from the removable disk cartridge in a CD1400 disk drive. To load by this method, take the following steps:

1. If the disk cartridge containing the operating system is not already installed in the CD1400:

  a. Ensure that the START/STOP switch on the CD1400 is in the stop position (out).

  b. Install the cartridge in the drive.

  c. Place the START/STOP switch in the start position.

2. Wait until the READY indicator comes on.

3. The disk cartridge should not be write-protected. Therefore, if the WRITE PROTECT CART indicator is on, press the WRITE PROTECT CART switch to turn off the indicator.

4. Write-protect the CD1400 fixed disk.

5. Place all other disk and tape media in a nonready state (offline or stopped).

6. Press HALT on the computer chassis.

7. Press ALT LOAD.

a. On 600 models, the POWER and FAULT indicators light and the number codes OF0F and F0F0 are alternately displayed for several seconds while the computer undergoes a self-test. If the CD1400 is not yet ready, the code 000F is displayed until the drive is ready and the loading sequence proceeds.

b. On 800 models, the POWER and FAULT indicators come on and the code 0100 is displayed, indicating that the computer is undergoing a self-test. If the FAULT indicator stays on for more than 30 seconds, advise your system manager that an error has occurred in the self-test.

8. When the FAULT indicator goes out, the self-test has successfully completed. The POWER, IDLE, and RUN indicators come on and the code 0000 is displayed when the computer system has finished loading and is ready for use.

9. Remove write protection from any disks that will be used to collect additional data.

BUILDING AN OPERATING SYSTEM ONTO A DISK

The DX10 or DNOS operating system is usually built onto the standard system disk by the service representative who installs the computer system.

Later on the operator may be required to perform this procedure if:

• A system crash or hardware failure destroys the existing operating system.

• A new or revised version of the operating system must be installed on the system disk.

To build a system disk, you need a backup copy of the operating system or a software kit supplied by TI that contains the operating system components. The operating system on the backup or kit is loaded into the computer using the ALT LOAD switch on the chassis. Then the new operating system is created from the backup or kit and installed on the system disk.

NOTE

The customer is responsible for making a backup copy of the operating system as well as his files and application programs so the data can be restored in the event of a system crash or hardware failure. Backup should be performed immediately after a new operating system is loaded. For information on backing up data, refer to the Copy Directory (CD) or Backup Directory (BD) command in the *DX10 Operating System Operations Guide* (part number 946250-9702) or the *DNOS Operations Guide* (part number 2270502-9701).

The steps for building the system disk once the operating system from the backup copy or software kit has been loaded are described in the DX10 operating system manuals and the DNOS object installation manual. As the operator of a 600 or 800 computer system, you need to understand how the operating system from the backup copy or software kit is loaded into these computers.

When you press ALT LOAD, a loader program checks each mass storage device in the computer system for a device from which to load the operating system. The loader program searches for a load device in the following order:

1. An online WD800 cartridge tape or MT1600 tape transport.

2. An online disk drive that is not write-protected.

3. The first online write-protected disk drive, if any, that was found in step 2.

When the loader program finds a device in the proper condition (for example, an online cartridge tape or a nonwrite-protected DS80), it attempts to load an operating system from that device, regardless of whether the device contains an operating system. Therefore, if your alternate load device is a cartridge tape drive, ensure that the WD800 is online, the tape is ready, and all other tape drives are offline. When performing an alternate load from a disk, take all tapes offline and write-protect all other disk media.

Once you have set up the alternate load device, press HALT and then ALT LOAD. Step 8 of Loading from a CD1400 Disk Cartridge describes the behavior of the 600 and 800 computer systems during an alternate load.

USER'S RESPONSE SHEET

Manual Title: __Business Systems 600/800 Operator's Guide (2311343-9701)__

Manual Date: __May 1985__   Date of This Letter:_____

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Company: _____   Office/Department:_____

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