GA23-0023-2
File No. S360/S370/S3/4300/8100-09

Systems

IBM 3270 Information Display System 3274 Control Unit Operator's Guide

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Preface

This manual is written for persons who will be operating the IBM 3274 Control Unit.

For information concerning the operation of other units of the IBM 3270 Information Display System, see the appropriate operator's guide.

For information concerning the setup of the 3274 Models 1C and 51C, refer to the appropriate setup instructions.

While IBM makes available many basic functions, the user chooses those he will utilize and in what manner. It is the responsibility of the user to establish and maintain appropriate operating procedures for the equipment.

Some of the units, devices, options, and features described in this manual may not be available in every locale. Ask your local IBM marketing representative for information about product availability.

Second Edition (July 1980)

This edition is a major revision of, and obsoletes, GA23-0023-1. Changes are made periodically to the information herein; before using this publication, refer to the latest *System/360 Bibliography*, GA22-6822, and *IBM System/370 and 4300 Processors Bibliography*, GC20-0001, for the editions that are applicable and current.

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Chapter 1. Introduction

First Words to the Operator

This Operator's Guide provides operating instructions and operating tips for the IBM 3274 Control Unit.

Readers of this manual need no previous knowledge of host systems, display system equipment, or data processing. General background information is provided to introduce you to data processing and host systems. If you have no experience in this area, begin by reading "Data Processing" and "The Data Processing System" in this chapter.

Chapter 2 of this manual discusses in detail the operator controls, indicators, and typical operating procedures for the 3274 Control Unit.

Data Processing

The following discussion briefly describes data processing and the part you and your display system equipment play in the data processing of your organization.

First, you must understand that *data* in *data processing* refers to all the information or records that your organization requires to conduct its business. This is a lot of information to think about, so, for our discussion, let us consider only the data required for payroll administration, a common part of all business. The data (information) required to perform this function includes the names of all employees, the number of hours each employee worked, his or her rate of pay, the number of overtime hours he or she worked (if any), the amount of money to be withheld, and all other facts needed to pay everyone the correct amount.

The *processing* in *data processing* refers to all the work involved in accomplishing a particular data processing job. In a data processing *payroll* job, the processing involves providing the host system with the required data, determining (with the data) each employee's paycheck amount, printing all the checks, and updating the records.

Putting the two together then, data processing is the performance of jobs or tasks by processing the required data.

Although data processing has always been a major part of running an organization, it has not always been called data processing. Before the development of the data processing system, almost all processing of data was done by hand. Today, most of it is done by data processing systems and in much less time than before.

The Data Processing System

You will be operating a machine that is part of your organization's data processing system. To give you some knowledge of the other machines in that system, we will now examine the different groups of machines that make up a typical data processing system. The points discussed will hold true even though some of the machines that are mentioned may not be included in all data processing systems.

Regardless of the information to be processed or the equipment used, all data processing systems can be divided into the three basic sections shown in Figure 1-1: Input, Processing, and Output.

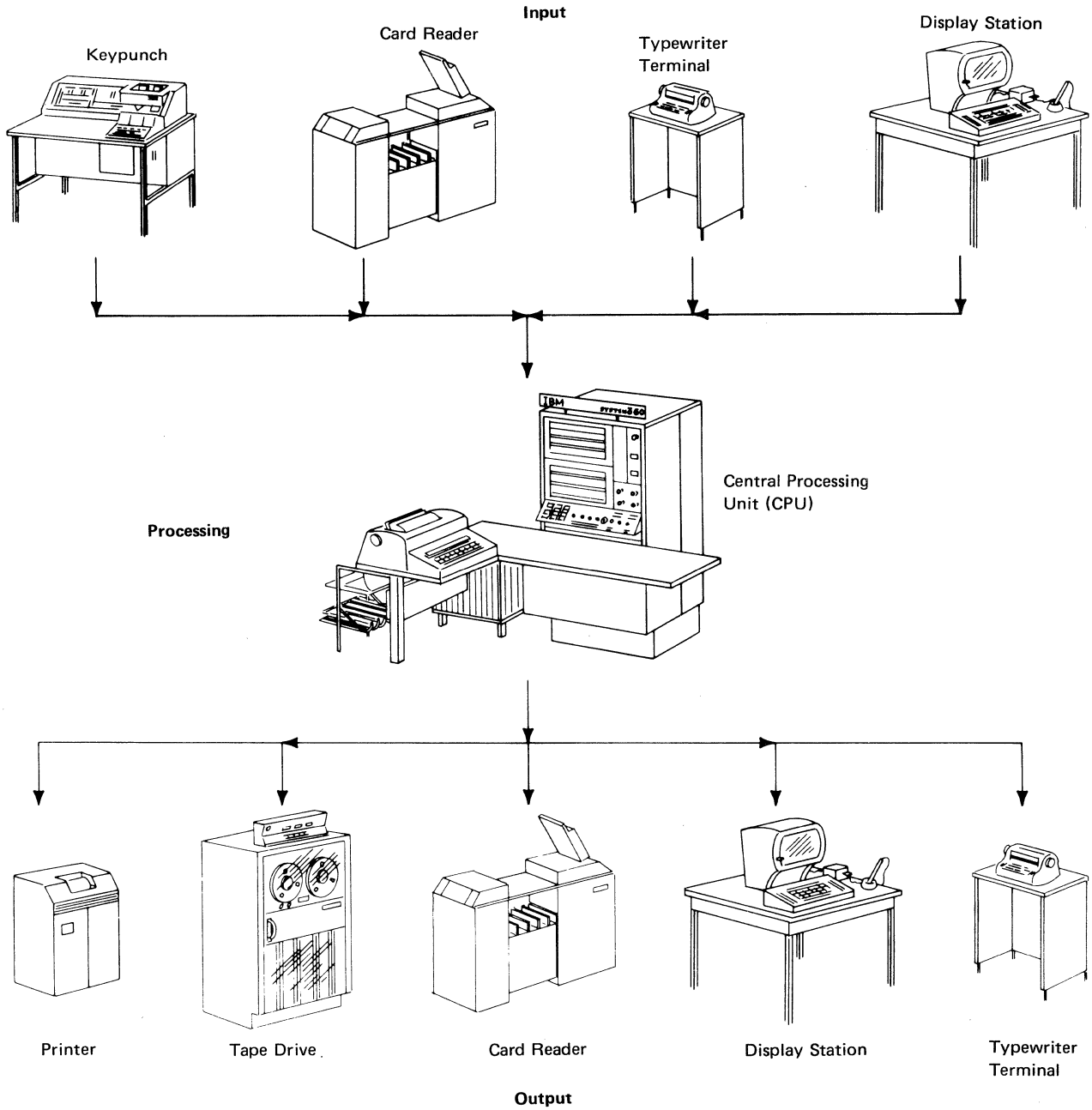


Figure 1-1. All data processing systems have Input, Processing, and Output sections.

Input Section

An input machine is any machine that provides for entry of outside data (information) into the host system. This definition can be used to determine if a machine is part of the input section of a data processing system. Input machines may be located at the host system site or at remote locations where they communicate with the host system over telephone lines.

Most of the data needed to perform a job is produced by people. As a result, it is handwritten or typed on one kind of form or another. A host system cannot process this data. These forms are the source of the input data to be entered into the host system. Thus, the data at this point is called *source data.*

Part of the job of the machines in the input section of a data processing system is the translation of the source data into a form that the host system can understand. These machines translate the source data and record it in the host system's language; also, and perhaps most important, they enter it into the data processing system. As you type from the source documents, you will be performing this type of work. Note that the selector light pen, operator identification card reader, and magnetic slot reader are also input devices which assist you in communicating with the host system.

The machines that make up the input section, though small compared with some of those in the processing section, are vital to the success of the data processing system. Keypunches and card readers, typewriter terminals, and display stations are some types of input machines.

Processing Section

The host system site, as you might guess, is where the host system is located. Once the system has all the information it needs for the intended job, the required work must be performed. This is done at the host system site by the group of machines that make up the processing section of a data processing system.

Several types of machines at the host system site process the data. Working together, they are used to sort the data, test it, perform computations on it, and otherwise use it to accomplish the assigned job.

Note that we said these machines are used to process data. The host system program uses the host system's capabilities.

Although a host system is a group of machines capable of doing many jobs, its actions must be directed. The machines and the program are two separate things; however, they must work together to form an operating data processing system. One can do nothing without the other. The program operates within the host system and directs the machines in the host system to accomplish the assigned job.

Output Section

After the work has been completed, the results must be made available. This is done by the machines that make up the output section of a data processing system.

Output from a data processing system can be in various forms. Printers, tape drives, card punches, and display stations are only a few examples of output machines; the most widely used is the printer. Printers can provide printed checks for payroll jobs, printed bills for customer billing jobs, printed reports, or any number of other types of output for all kinds of jobs.

You are now ready to learn how to operate your 3274 control unit. Chapter 2 of this manual discusses in detail the operator controls, indicators, and typical operating procedures for the IBM 3274 Control Unit.

Chapter 2. The IBM 3274 Control Unit

Introduction

The function of the IBM 3274 Control Unit is to take care of all communication between the host system and your organization's display stations and printers. The 3274 and the attached display stations or printers form a cluster of terminals that is used to perform your organization's applications. The 3274 can control the following terminals:

IBM 3262 Line Printer
IBM 3277 Display Station
IBM 3278 Display Station
IBM 3279 Color Display Station
IBM 3284 Printer
IBM 3286 Printer
IBM 3287 Printer
IBM 3288 Line Printer
IBM 3289 Line Printer

The 3274 is available in five models:

- Models 1A, 1B, and 1D attach directly to a host system and can control up to 32 of the above-listed terminals. Of the 32 terminals that can be attached, a maximum of 16 can be 3277s, 3284s, 3286s, 3287s, and 3288s.
- Model 1C attaches to a host system through a communication facility and can control the same mix of terminals as the Models 1A, 1B, and 1C.
- Model 51C, a small control unit, attaches to a host system through a communication facility or an IBM 8100 Information System loop and can control up to 12 of the above-listed terminals. Of the 12 terminals that can be attached, a maximum of four can be 3277s, 3284s, 3286s, 3287s, and 3288s.

A 3274 Model 1A, 1B, or 1D is shown in Figure 2-1. The 3274 Model 1C looks like the Models 1A, 1B, and 1D, but does not have the Power/Interface rotary switch and the Local/Offline indicator installed on the control panel. (See Figures 2-4 and 2-5.) A 3274 Model 51C is shown in Figure 2-2.

Figure 2-1. IBM 3274 Control Unit Model 1A, 1B, or 1D

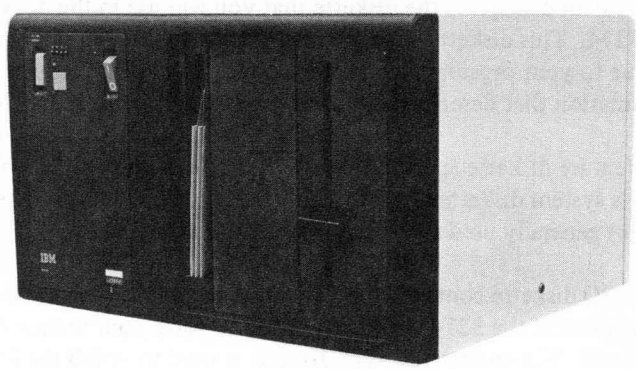


Figure 2-2. IBM 3274 Control Unit Model 51C

After the 3274 is set up or installed and customized (configured for your installation), you will normally only have to turn on the 3274 (with the correct system diskette loaded) to prepare it for operation. However, depending upon your organization's applications, you may be required to load different diskettes for different system applications. In addition, you should know how to prepare an offline 3274 for online service.

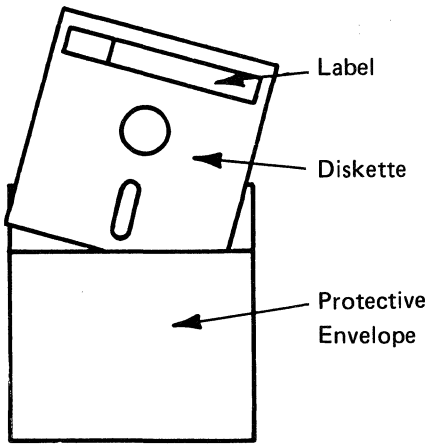
For information concerning the setup of the 3274 Models 1C and 51C (Models 1A, 1B, and 1D are installed by an IBM service representative), refer to the *IBM 3270 Information Display System: 3274 Control Unit Planning, Setup, and Customizing Guide,* GA27-2827, the *IBM 3274 Model 1C Control Unit Setup Instructions,* GA27-2855, and the *IBM 3274 Model 51C Setup Instructions,* GA23-0047.

For information concerning 3274 device cable connection and customizing (all models), refer to the *IBM 3270 Information Display System: 3274 Control Unit Planning, Setup, and Customizing Guide,* GA27-2827.

The remainder of this chapter describes the handling and loading of the 3274 diskettes, 3274 operating controls, and basic 3274 operating procedures. However, details that are special to your organization are not contained in this chapter. Operating procedures that are unique to your organization are provided by the appropriate person in your organization and are found in your organization's user's program guide.

3274 Diskettes

A diskette (shown at right) is a thin, flexible magnetic disk and a protective jacket in which the disk is enclosed.



Caution: Do NOT try to remove the flexible magnetic disk from its black protective jacket.

The function of the diskette is to store information that the 3274 needs for operation. There are five types of diskettes associated with the 3274: the system diskette, feature diskette, language diskette, RPQ diskette, and encrypt/decrypt diskette.

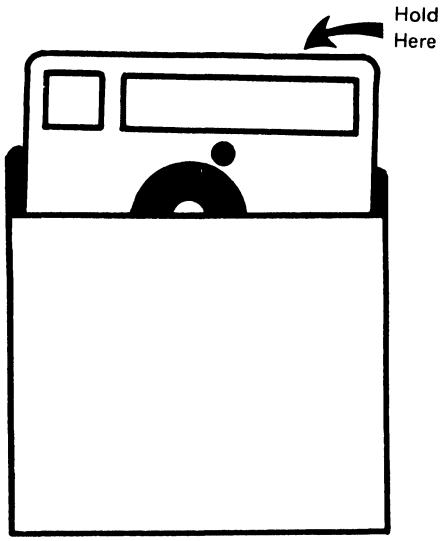
The system diskette is the diskette that you will use in the daily operation of the 3274. This diskette contains tests and configuration information that is unique to your organization. For example, the system diskette contains information that describes all the terminals attached to the 3274.

The feature diskette and the language diskette are used to customize the 3274's system diskette after the 3274 is installed or set up. These diskettes are not generally used in the daily operation of the 3274.

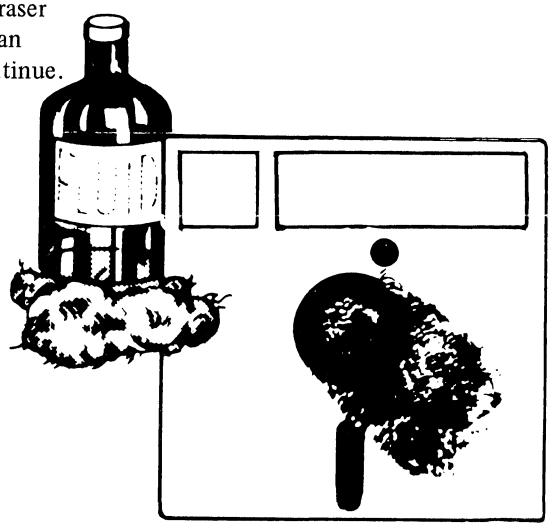
The RPQ diskette contains the alterations or additions to the functional capabilities of the 3274 that are required to solve your unique data processing problems. The encrypt/decrypt diskette is used to install the Encrypt/Decrypt feature, including the Terminal Master Key, in the 3274 Models 1C and 51C.

Care of Diskettes

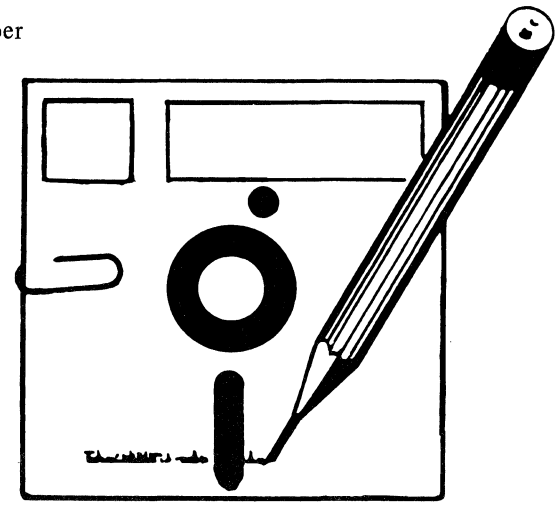
You can avoid possible damage to diskettes if you observe the precautions described below. Whenever a diskette is not loaded in the 3274, it should be stored inside the customer access door–Models 1A, 1B, 1C, and 1D (Figure 2-3) or in the front slot–Model 51C (Figure 2-4). While they are not extremely fragile, diskettes can be easily damaged. When handling the diskette, grasp it only by the top edge.



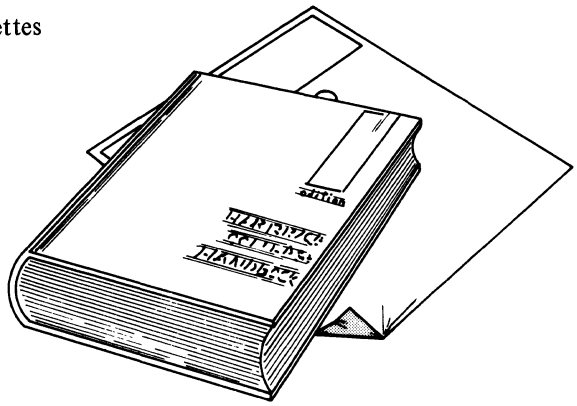
Do not try to clean the surface of a diskette. If it is contaminated (by eraser dust, finger prints, spills, or cleaning fluid), discard it. Failure to do so can cause the 3274 to fail and require service before your operations can continue.



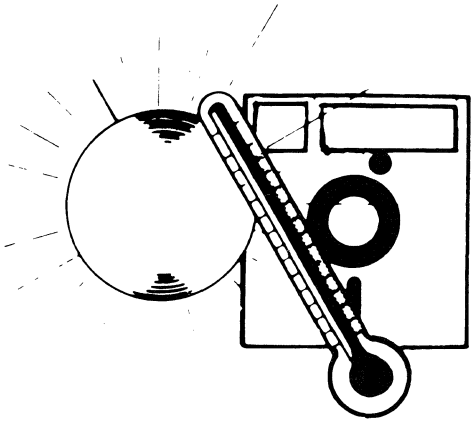
Never write on a diskette. Pencil lead or ink can contaminate the surface and cause errors. The pressure of a pencil or pen point can also damage the surface–even through the protective paper envelope. And never use paper clips or staples on a diskette.



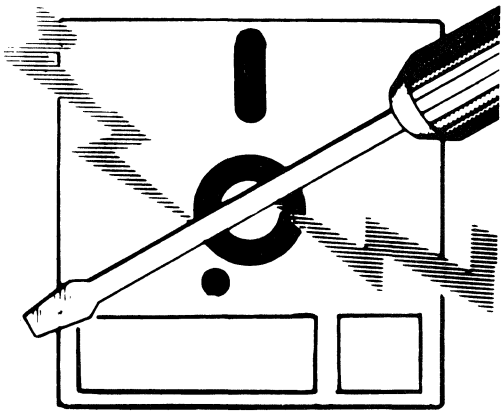
Never place heavy objects on a diskette. Warped, torn, or creased diskettes will not work properly.



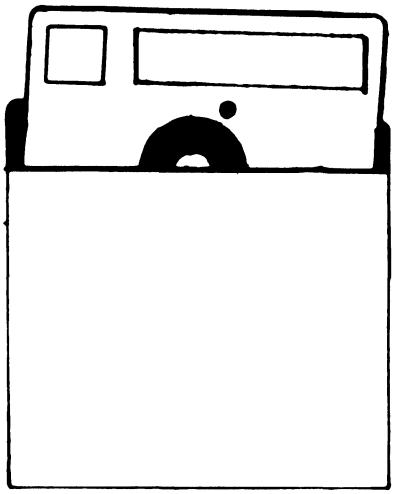
Never expose a diskette to direct sunlight for a long period or to excessive heat.



Always keep diskettes away from magnetic fields or materials.



Always place each of your diskettes in its gray protective envelope before storing it.



Diskette Shipping and Receiving

Diskettes should always be shipped inside the original shipping carton; an ordinary envelope does not provide enough protection. Also, be sure to label the package: DO NOT EXPOSE TO EXCESSIVE HEAT (temperatures above 51.5°C or 125°F) OR DIRECT SUNLIGHT.

Upon receiving diskettes, check for carton or diskette damage. Save the carton for storing the diskette and for later shipment.

Diskette Long Term Storage

Place diskettes in their protective envelopes and store them in the following environment:

- Temperature: 10° to 51.5°C (50° to 125°F)
- Relative humidity: 8% to 80%

Before using a diskette that has been exposed to temperatures outside of the above environmental range, allow the diskette to adjust to room temperature for 5 minutes. The diskette can be removed from its shipping container while adjusting to room temperature, but should be kept in its protective envelope.

Loading a Diskette (Models 1A, 1B, 1C, and 1D)

1. Open the customer access door (Figure 2-3).

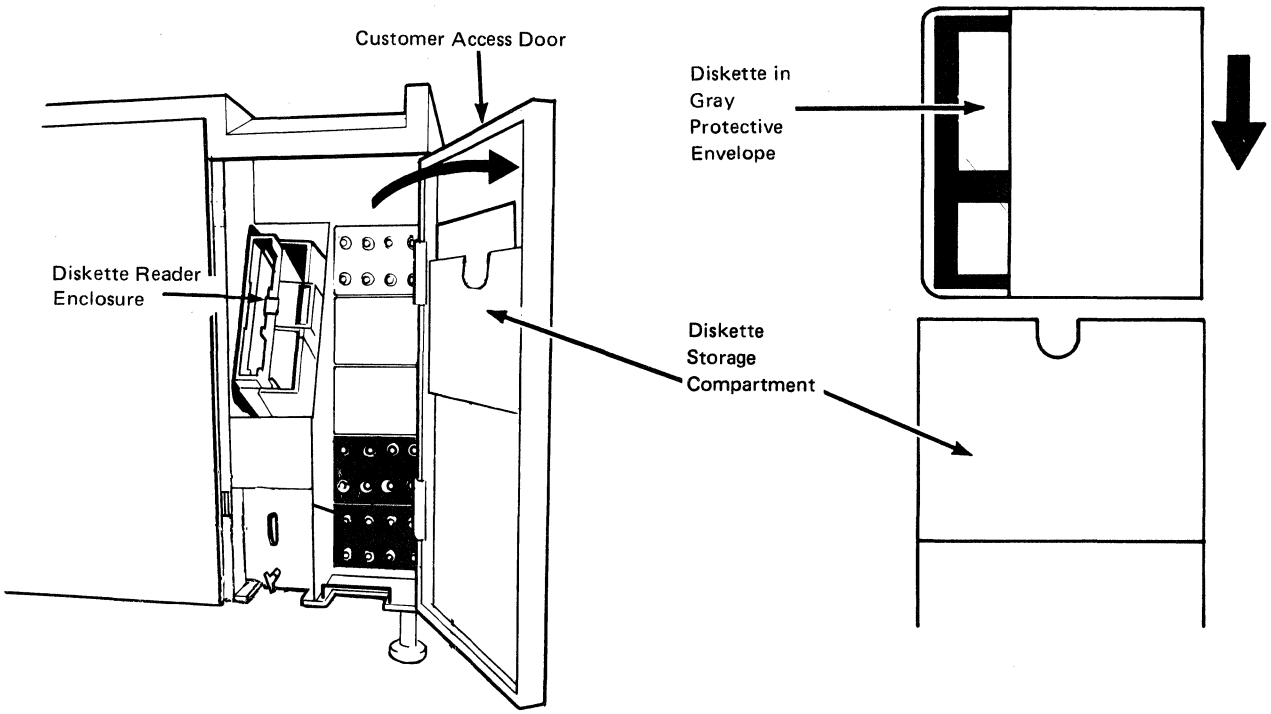
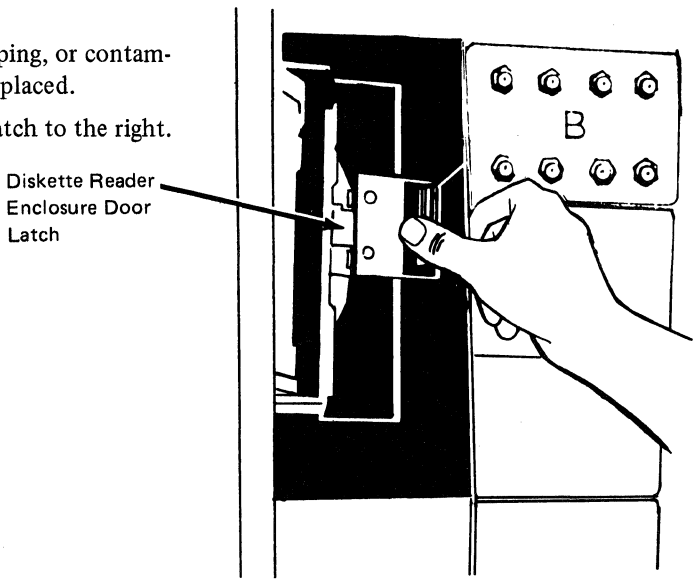
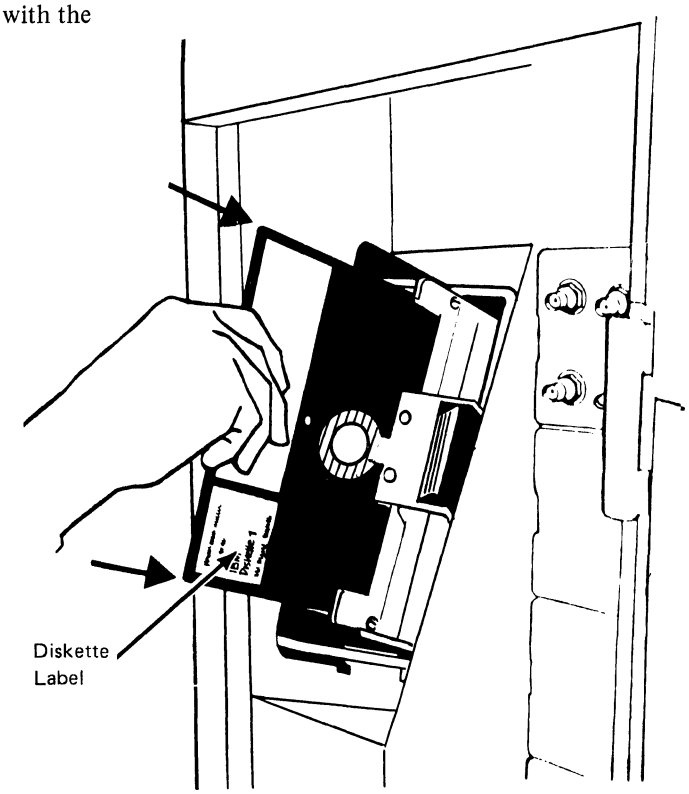


Figure 2-3. 3274 Control Unit Models 1A, 1B, 1C, and 1D: Diskette Enclosure and Diskette Storage Compartment

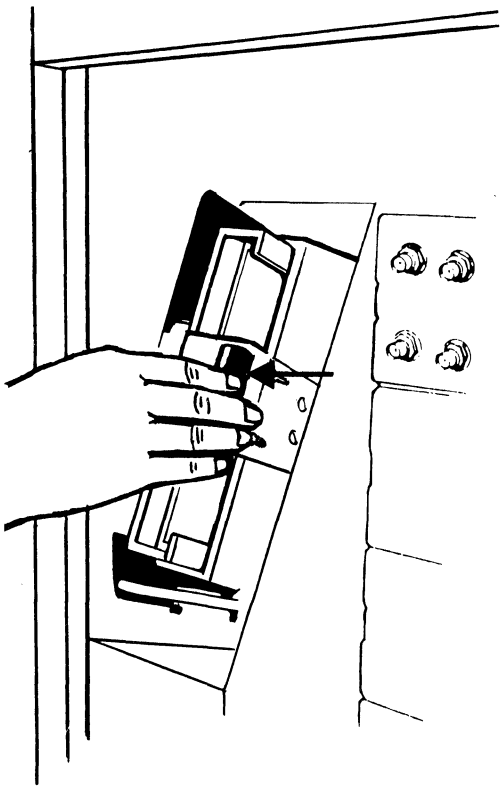
2. Grasp the diskette by its upper edge, and remove it from its gray protective envelope. To avoid confusion, have only one diskette removed from its envelope at any time.
3. Inspect the diskette for damage such as tears, creases, warping, or contamination. If damaged, the diskette must be discarded and replaced.
4. Open the diskette reader enclosure door by pressing the latch to the right.



5. Insert the diskette squarely into the diskette reader enclosure with the label facing to the right as shown.



6. Close the diskette reader enclosure by pushing the enclosure door to the left until it latches with a noticeable snap.



7. Place the empty protective envelope in the diskette storage compartment in the customer access door (Figure 2-3).

   Caution: Do not fold the diskette or its gray protective envelope when storing it in the diskette storage compartment. Insert the protective envelope (with or without the diskette) into the diskette storage compartment as shown in Figure 2-3.

8. Close the customer access door.

The diskette is now loaded in the 3274 and is ready to be used.

Unloading a Diskette (Models 1A, 1B, 1C, and 1D)

1. Open the customer access door (Figure 2-3).

2. Open the diskette reader enclosure by pressing the enclosure door latch to the right. [See step 4 of "Loading a Diskette (Models 1A, 1B, 1C, and 1D)."]

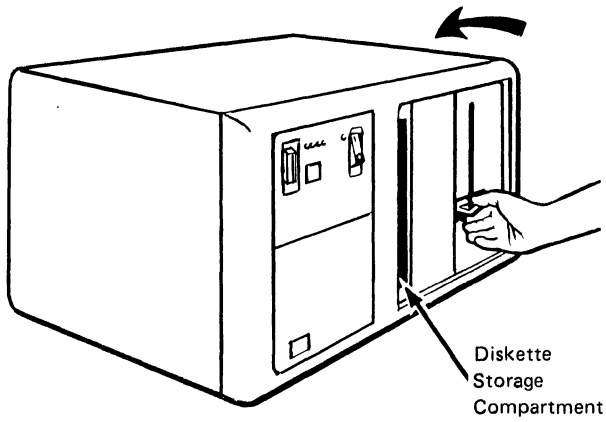
3. Grasp the diskette by its upper edge, and remove it from the diskette reader enclosure.

4. Place the diskette in its protective envelope, being careful to handle the diskette by the upper edge only. Store the diskette (in its proper envelope) in the diskette storage compartment in the customer access door (Figure 2-3).

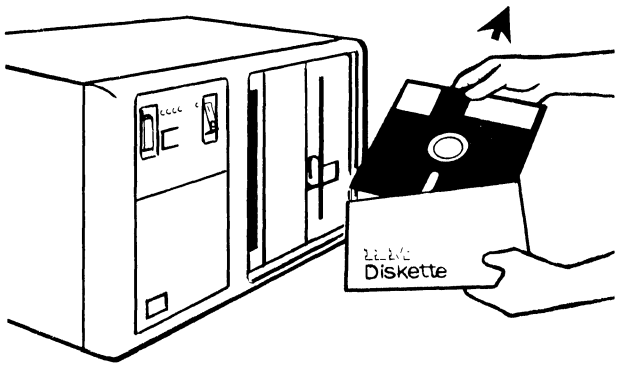
   Caution: Do not fold the diskette or its gray protective envelope when storing it in the diskette storage compartment. Insert the diskette, in its protective envelope, into the diskette storage compartment as shown in Figure 2-3.

Loading a Diskette (Model 51C)

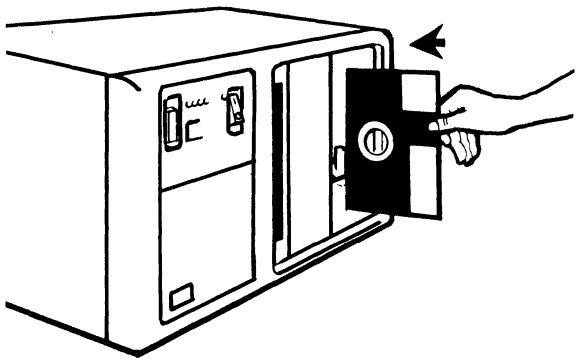
1. Open the diskette reader enclosure by turning the operator lever counterclockwise to the vertical position.



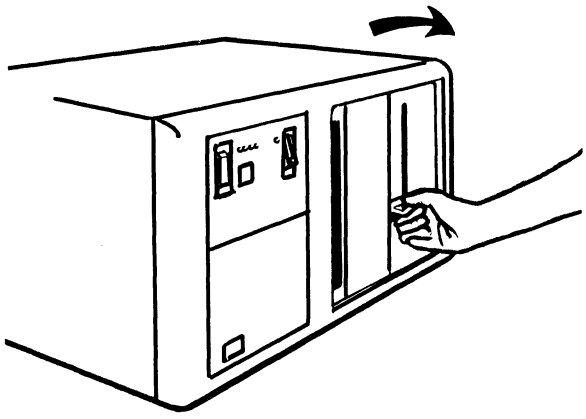
2. Remove the system diskette from its gray protective envelope.



3. Insert the system diskette squarely into the diskette reader enclosure, with the label facing left as shown.

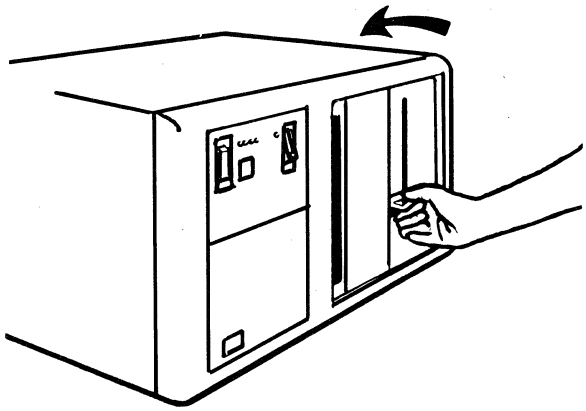


4. Close the diskette reader enclosure by turning the operator lever clockwise to the horizontal position.

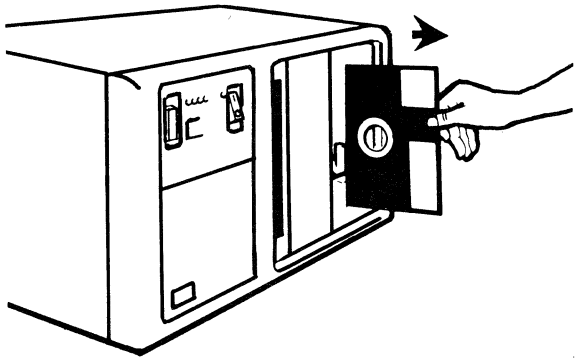


Unloading a Diskette (Model 51C)

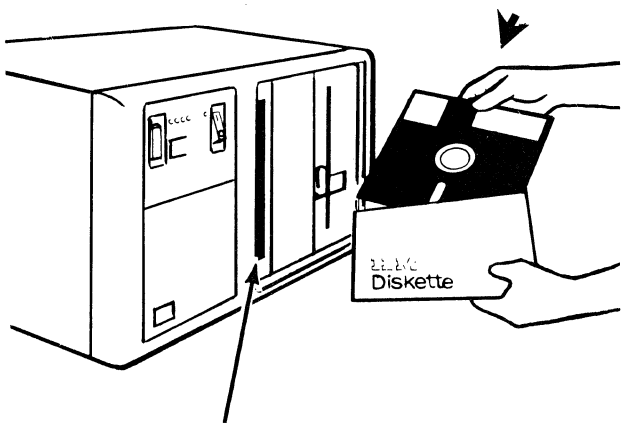
1. Open the diskette reader enclosure by turning the operator lever counterclockwise to the vertical position.



2. Remove the system diskette from the diskette reader enclosure.



3. Insert the system diskette into its gray protective envelope. Store the diskette in the diskette storage compartment.



Diskette
Storage
Compartment

3274 Problem Determination

The *3274 Problem Determination Guide,* GA27-2850, should be stored in the diskette storage compartment in the customer access door on Models 1A, 1B, 1C, and 1D (Figure 2-3) and in the diskette storage compartment on the front of Model 51C [see step 1 of "Loading a Diskette (Model 51C)"]. Whenever you have a problem with all or a group of attached terminals, refer to the *3274 Problem Determination Guide* to determine the appropriate action. In addition to the problem determination procedures, the guide contains (1) descriptions of the 3274 switches and indicators and (2) a sample 3274 Problem Report Form, GX23-0203.

Turning On the 3274

The 3274 control panels are shown in Figures 2-4 through 2-11.

1. Make sure the system diskette is loaded in the 3274 diskette reader enclosure. [See "Loading a Diskette (Models 1A, 1B, 1C, and 1D)" or "Loading a Diskette (Model 51C)."]
2. If the 3274 is a Model 1A, 1B, or 1D, set the Power/Interface rotary switch to the Local/Offline position.
3. Press the top portion (| 1 |) of the On/Off switch (if the 3274 is a Model 1A, 1B, or 1D, the On/Off switch will return to the center position); the On indicator should turn on. The 8 4 2 1 indicators should flash on and off (in various patterns) for 1 to 3 minutes, ending with all four indicators off. If the 3274 is a Model 1C or 51C, it is now ready for normal operation. If the 3274 is a Model 1A, 1B, or 1D, go to step 4.

   Note: *If the 3274 is a Model 1C or 51C and is attached to a modem that has a switch for Switched Network Backup (SNBU) operation or half-speed backup operation, make sure that the switch or switches are set to the correct settings for the diskette loaded in the 3274. If you are not familiar with the proper procedure for setting these switches, ask the appropriate person in your organization for instructions.*
4. Set the Power/Interface rotary switch to the Local/Online position; the 3274 Model 1A, 1B, or 1D is now ready for operation.

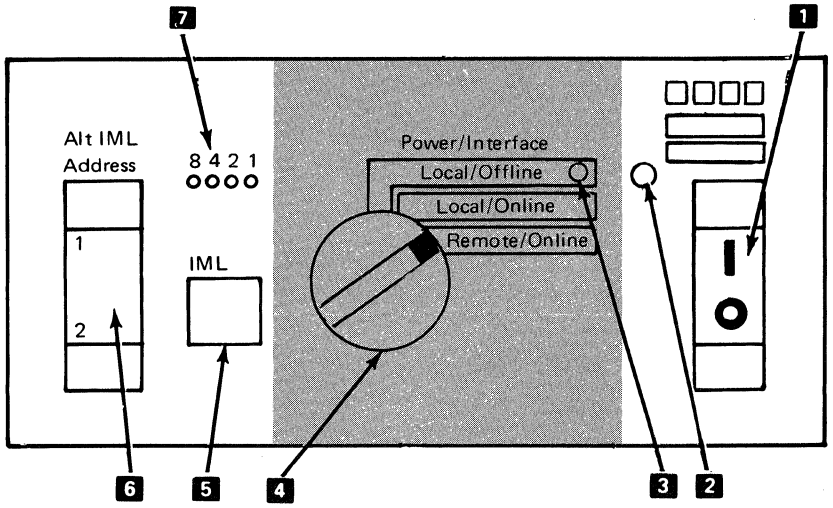
Turning Off the 3274

The 3274 control panels are shown in Figures 2-4 through 2-11.

1. If any terminals attached to the 3274 are in use, notify all terminal operators that the 3274 is going to be turned off; then wait until all operations are ended.
2. If the 3274 is a Model 1C or 51C, go to step 3; if the 3274 is a Model 1A, 1B, or 1D, skip step 3 and go to steps 4, 5, and 6.
3. Models 1C and 51C only: Press the bottom portion (| O |) of the On/Off switch to turn off the 3274.
4. Models 1A, 1B, and 1D only: Set the Power/Interface rotary switch to the Local/Offline position, and wait for the Local/Offline indicator to turn on.
5. Models 1A, 1B, and 1D only: If the Local/Offline indicator does not turn on within 2 minutes after the Power/Interface rotary switch is set to Local/Offline, inform the host system operator and wait for instructions.
6. Models 1A, 1B, and 1D only: When these steps have been performed, press the bottom portion (| O |) of the On/Off switch to turn off the 3274.

3274 Control Panel (Models 1A, 1B, and 1D)

All the switches and indicators that you will use to operate a 3274 Model 1A, 1B, or 1D are located on the control panel shown in Figure 2-4.



1 **On/Off (| /O) Switch** – The On/Off (| /O) switch is a *three*-position rocker switch that is used in conjunction with the Power/Interface rotary switch **4** to turn the 3274 on (|) or off (O). Refer to the Power/Interface rotary switch description for an example of the (On/Off) switch operation.
Note: *Before turning off the 3274, inform all the operators of the attached terminals.*

Notes:

1. *The 3274 does not supply power to the attached display stations or printers. Each terminal has its own On/Off switch. However, the 3274 does control all the attached terminals, and the 3274 must be turned on for the terminals to operate.*
2. *Use the On/Off switch only to turn the 3274 on and off. Do not use this switch to reset and reload the 3274. Use the IML switch* **5** *for that function.*

2 **On Indicator** – This indicator turns on when the 3274 is turned on and turns off when the 3274 is turned off.

3 **Local/Offline Indicator** – This indicator is installed only on 3274 Models 1A, 1B, and 1D. You will use this indicator in conjunction with the Local/Offline position of the Power/Interface rotary switch and with the On/Off switch to turn off the 3274. When this indicator is on, the 3274 is in Local/Offline mode and you can turn off the 3274 without causing a host system failure; you should always wait for this indicator to turn on before you turn off the 3274. The use of the Local/Offline indicator is described in **4**, Power/Interface Rotary Switch.

4 **Power/Interface Rotary Switch** – The 3274 Models 1A, 1B, and 1D can be turned on and off by either the host system (remote power control/unattended turn-on or turn-off) or the 3274 operator (local power control), depending upon the position of this switch, as follows:

- Remote/Online: When the switch is in this position, the 3274 is turned on by the host system and turned off by either the host system or the operator as follows:
  a. If the On/Off (| /O) switch is set to the center position, the host system can turn the 3274 on and off.
  b. If the On/Off switch is set to the Off O position, the host system cannot turn on the 3274.
  c. The operator can turn off the 3274 by pressing the bottom portion O of the On/Off switch. However, it is recommended that you place the Power/Interface rotary switch in the Local/Offline position before you turn off the 3274, because turning off the 3274 when the Power/Interface rotary switch is in any position except Local/Offline may cause a host system failure.
- Local/Online: Use this position of the switch to turn on the 3274 with the On/Off (| /O) switch.
- Local/Offline: Use this position of the switch when you turn off the 3274. To turn off the 3274, (1) set the Power/Interface rotary switch to Local/Offline, (2) wait for the Local/Offline indicator **3** to turn on, and (3) press the bottom portion O of the On/Off switch.

Figure 2-4 (Part 1 of 2). 3274 Model 1A, 1B, and 1D Control Panel

5 **IML (Initial Machine Load) Pushbutton** — Whenever the 3274 is turned on with the system diskette loaded in the diskette reader enclosure, the 3274 automatically runs tests and loads information from the diskette that is required for 3274 operation. The tests, and the subsequent machine loading, prepare the 3274 for operation and are called the IML (Initial Machine Load).

Notes:

1. *Pressing the IML pushbutton interrupts the operation of the 3274 and all the terminals attached to the 3274. Therefore, it is important that you do not use the IML pushbutton unless instructed to do so by the appropriate person in your organization, your organization's operating procedures, or the 3274 Problem Determination Guide.*
2. *Pressing the IML pushbutton temporarily disables all terminals attached to the 3274. If any attached terminals are in use, all terminal operators should be notified before proceeding.*
3. *If the 3274 is a Model 1A, 1B, or 1D, before pressing the IML pushbutton, make sure the Power/Interface rotary switch is in the Local/Offline position and the Local/Offline indicator is on.*

The IML pushbutton enables you to initiate a manual IML operation. It is not operative on a 3274 Model 1A, 1B, or 1D when the Power/Interface rotary switch is set to the Remote/Online or Local/Online position. Pressing and holding the IML pushbutton causes a basic test to run; if the basic test is successful, each of the 8 4 2 1 indicators **7** turns on. When the IML pushbutton is released, the IML tests and subsequent machine loading begin. The 8 4 2 1 indicators should flash on and off (in various patterns) for 1 to 3 minutes, ending with all four indicators off.

6 **Alternate IML Address Switch** — You will use this switch (1) in conjunction with the IML pushbutton when you perform the 3274 problem determination procedures and (2) during 3274 customizing and diskette updating. For information concerning the use of this switch during customizing and diskette updating, refer to *IBM 3270 Information Display System: 3274 Control Unit Planning, Setup, and Customizing Guide,* GA27-2827.

Holding the Alternate IML Address switch in position 1 (top portion), while pressing the IML pushbutton, bypasses the IML tests and loads the machine directly. This procedure should be used only when the normal loading procedure fails and useful work can still be done.

Position 2 (bottom portion) of the Alternate IML Address switch is used for diskette updating.

7 **8 4 2 1 Indicators** — These four indicators turn on when the IML pushbutton is pressed and held; when the IML pushbutton is released, they indicate test sequence information as the IML tests progress. During normal operation, these indicators indicate the operational status of the 3274.

Figure 2-4 (Part 2 of 2). 3274 Model 1A, 1B, and 1D Control Panel

3274 Control Panels (Model 51C)

Operator controls for the 3274 Model 51C are located on two panels mounted on the left front of the control unit as shown in Figure 2-6. The exposed panel **1** contains the controls that are more frequently used (I/O switch, IML pushbutton, etc.). The control panel in the customer access area **2** contains controls for modems, loops, and encrypt/decrypt. These controls are used initially to set up the machine and are used less frequently.

There are five possible control panel configurations, depending on the features installed. Figures 2-7 through 2-11 show the various panel configurations.

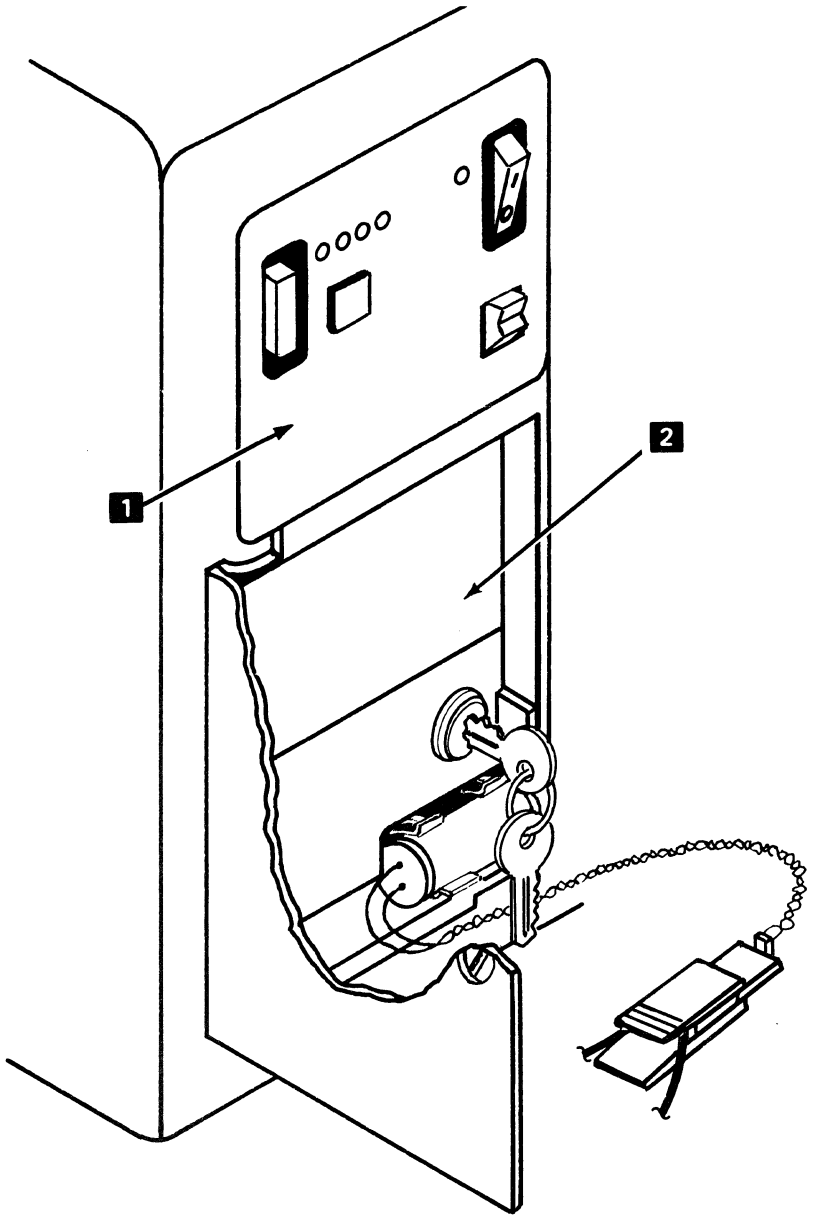
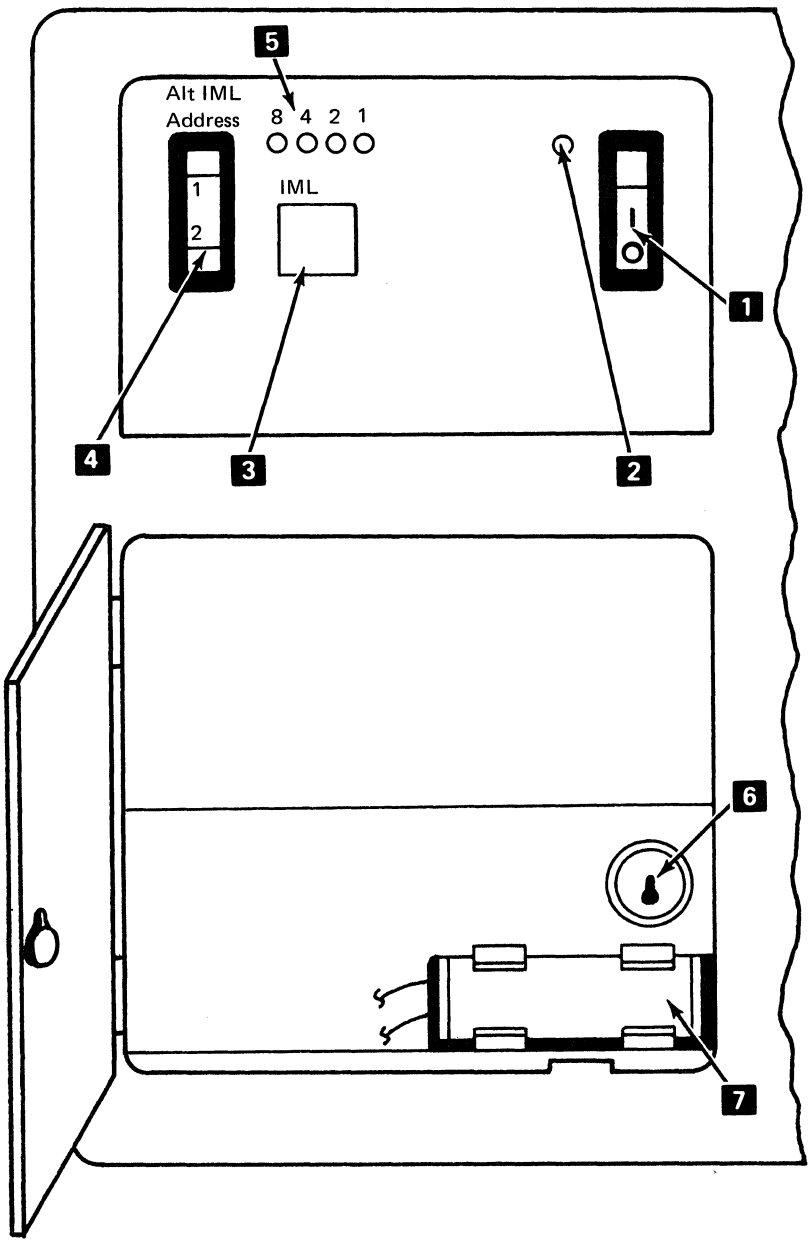


Figure 2-6. 3274 Model 51C Operator Controls



1 **On/Off (|/O) Switch** – The On/Off (|/O) switch is a *two*-position rocker switch used to turn the 3274 on or off. To turn on the 3274, press the top portion (|) of the On/Off switch; to turn off the 3274, press the bottom portion (O) of the switch. **Note:** *Before turning off the 3274, inform all the operators of the terminals attached to the 3274 that the 3274 is going to be turned off.*

2 **On Indicator** – This indicator turns on when the 3274 is turned on and turns off when the 3274 is turned off.

Notes:

1. *The 3274 does not supply power to the attached display stations or printers. Each terminal has its own On/Off switch. However, the 3274 does control all the attached terminals, and the 3274 must be turned on for the terminals to operate.*
2. *Use the On/Off switch only to turn the 3274 on and off. Do not use this switch to reset and reload the 3274. Use the IML switch* **3** *for that function.*

Figure 2-7 (Part 1 of 2). 3274 Model 51C Operator Controls for Digital Data Service Adapter, Nonswitched Line, for X.21 Feature, Switched/Nonswitched Line, and for External Modem Interface Feature without Business Machine Clock, Switched/Nonswitched Line

3 **IML (Initial Machine Load) Pushbutton** – Whenever the 3274 is turned on with the system diskette loaded in the diskette reader enclosure, the 3274 automatically runs tests and loads information from the diskette that is required for 3274 operation. The tests, and the subsequent machine loading, prepare the 3274 for operation and are called the IML (Initial Machine Load).

Note: *Pressing the IML pushbutton temporarily disables all terminals attached to the 3274. If any attached terminals are in use, all terminal operators should be notified before proceeding.*

The IML pushbutton enables you to initiate a manual IML operation. Pressing and holding the IML pushbutton causes a basic test to run; if the basic test is successful, each of the 8 4 2 1 indicators **5** turns on. When the IML pushbutton is released, the IML tests and subsequent machine loading begin. The 8 4 2 1 indicators should flash on and off (in various patterns) for 1 to 3 minutes, ending with all four indicators off.

4 **Alternate IML Address Switch** – You will use this switch (1) in conjunction with the IML pushbutton when you perform the 3274 problem determination procedures and (2) during 3274 customizing and diskette updating. For information concerning the use of this switch during customizing and diskette updating, refer to *IBM 3270 Information Display System: 3274 Control Unit Planning, Setup, and Customizing Guide,* GA27-2827.

Holding the Alternate IML Address switch in position 1 (top portion), while pressing the IML pushbutton, bypasses the IML tests and loads the machine directly. This procedure should be used only when the normal loading procedure fails and useful work can still be done.

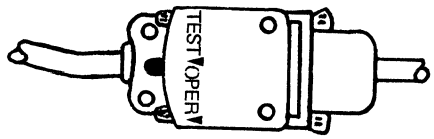
Position 2 is used to run the 3274 Model 51C remote interface tests. To run these tests: (1) set the TEST/OPER switch (shown at right) on the 3274 communication cable (cable between the 3274 and the modem) to the TEST position, (2) hold the Alternate IML Address switch in position 2, and (3) press the IML pushbutton while holding the Alternate IML Address switch.

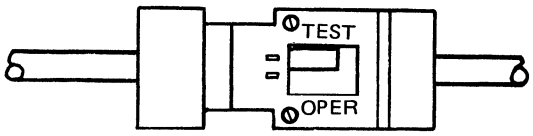
Before resuming normal operation, return the TEST/OPER switch to the Normal position. Position 2 of the Alternate Address switch is also used during the diskette update procedure.

5 **8 4 2 1 Indicators** – These four indicators turn on when the IML pushbutton is held; when the IML pushbutton is released, they indicate test sequence information as the IML tests progress. During normal operation, these indicators indicate the operational status of the 3274.

6 **Encrypt/Decrypt Key Switch** – Allows a new master key to be entered when in the horizontal position.

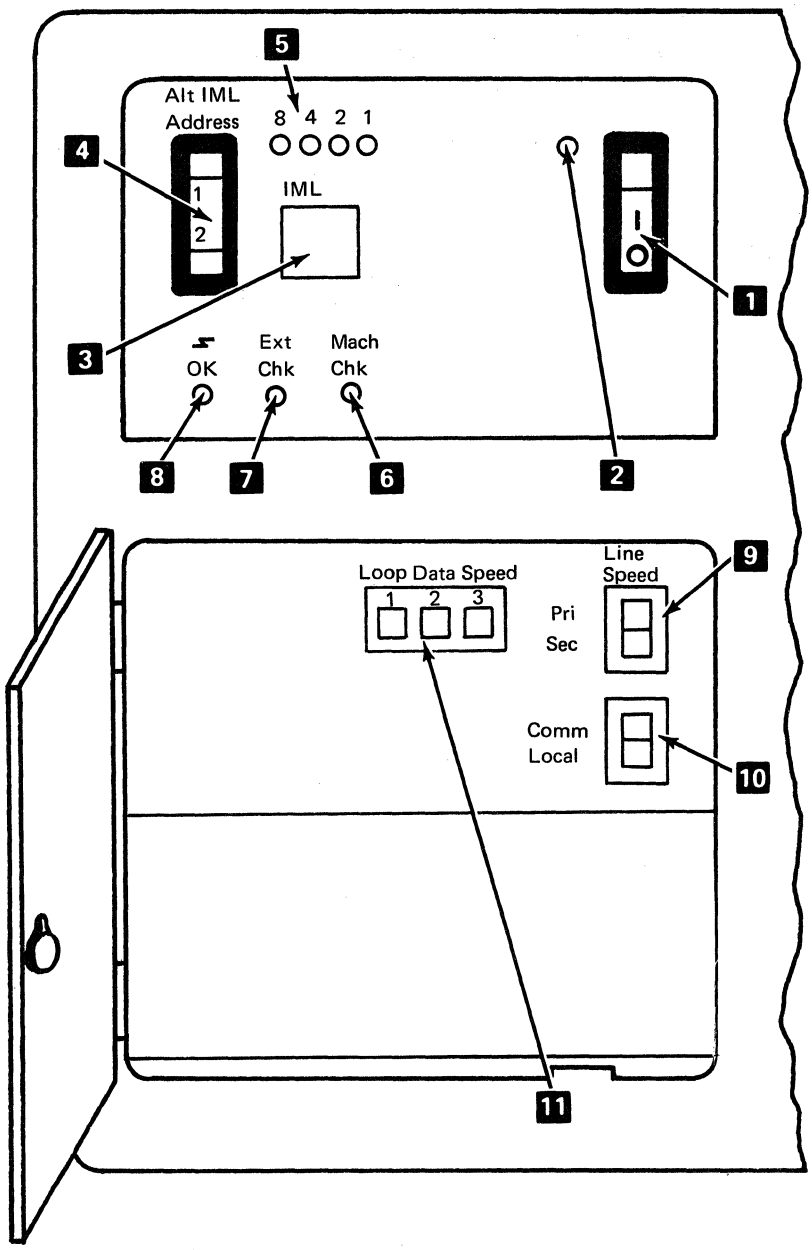
7 **Encrypt/Decrypt Battery** – Allows the master key to be maintained in the 3274 when power is off.





Note: *Your cable may have either of the switches shown above.*

Figure 2-7 (Part 2 of 2). 3274 Model 51C Operator Controls for Digital Data Service Adapter, Nonswitched Line, for X.21 Feature, Switched/Nonswitched Line, and for External Modem Interface Feature without Business Machine Clock, Switched/Nonswitched Line



1 **On/Off (| /○) Switch** – The On/Off (| /○) switch is a *two*-position rocker switch used to turn the 3274 on or off. To turn on the 3274, press the top portion (| |) of the On/Off switch; to turn off the 3274, press the bottom portion (|○|) of the switch. **Note:** *Before turning off the 3274, inform all the operators of the terminals attached to the 3274 that the 3274 is going to be turned off.*

2 **On Indicator** – This indicator turns on when the 3274 is turned on and turns off when the 3274 is turned off.

Notes:

1. *The 3274 does not supply power to the attached display stations or printers. Each terminal has its own On/Off switch. However, the 3274 does control all the attached terminals, and the 3274 must be turned on for the terminals to operate.*
2. *Use the On/Off switch only to turn the 3274 on and off. Do not use this switch to reset and reload the 3274. Use the IML switch* **3** *for that function.*

Figure 2-8 (Part 1 of 2). 3274 Model 51C Operator Controls, Loop Attachment

3 **IML (Initial Machine Load) Pushbutton** — Whenever the 3274 is turned on with the system diskette loaded in the diskette reader enclosure, the 3274 automatically runs tests and loads information from the diskette that is required for 3274 operation. The tests, and the subsequent machine loading, prepare the 3274 for operation and are called the IML (Initial Machine Load).

Note: *Pressing the IML pushbutton temporarily disables all terminals attached to the 3274. If any attached terminals are in use, all terminal operators should be notified before proceeding.*

The IML pushbutton enables you to initiate a manual IML operation. Pressing and holding the IML pushbutton causes a basic test to run; if the basic test is successful, each of the 8 4 2 1 indicators **5** turns on. When the IML pushbutton is released, the IML tests and subsequent machine loading begin. The 8 4 2 1 indicators should flash on and off (in various patterns) for 1 to 3 minutes, ending with all four indicators off.

4 **Alternate IML Address Switch** — You will use this switch (1) in conjunction with the IML pushbutton when you perform the 3274 problem determination procedures and (2) during 3274 customizing and diskette updating. For information concerning the use of this switch during customizing and diskette updating, refer to *IBM 3270 Information Display System: 3274 Control Unit Planning, Setup, and Customizing Guide,* GA27-2827.

Holding the Alternate IML Address switch in position 1 (top portion), while pressing the IML pushbutton, bypasses the IML tests and loads the machine directly. This procedure should be used only when the normal loading procedure fails and useful work can still be done.

Position 2 is used to run the 3274 Model 51C interface tests. To run these tests: (1) hold the Alternate IML Address switch in position 2, and (2) press the IML pushbutton while holding the Alternate IML Address switch.

Position 2 of the Alternate Address switch is also used during the diskette update procedure.

5 **8 4 2 1 Indicators** — These four indicators turn on when the IML pushbutton is held; when the IML pushbutton is released, they indicate test sequence information as the IML tests progress. During normal operation, these indicators indicate the operational status of the 3274.

6 **Machine Check Indicator** — Indicates problems internal to the 3274.

7 **External Check Indicator** — Indicates errors external to the 3274.

8 **OK Line Ready Indicator** — Indicates that a valid message was received within the last eight seconds.

9 **Line Speed** — In the Primary position, the modem operates at normal speed; in the Secondary position, the modem operates at half-speed.

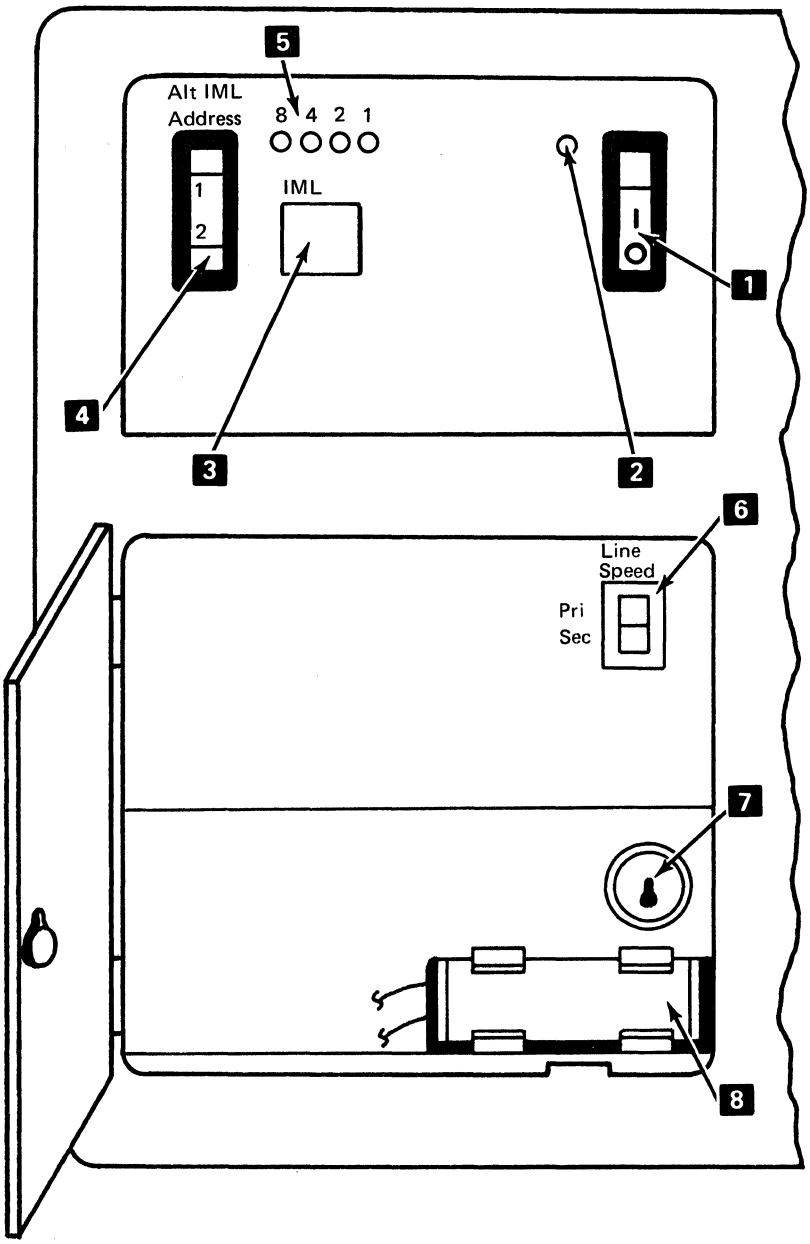
10 **Local/Communicate Switch** — Used to isolate problems on the loop. In the Local position, the 3274 is disconnected from the loop; in the Communicate position, the 3274 is connected to the loop.

11 **Loop Data Speed Switches (up is On, down is Off)**

Setting			Speed (bps)	
1	2	3	Primary	Secondary
Off	Off	Off — — —	9600	4800
Off	Off	Off — — —	38,400*	None
Off	Off	On — — —	9600	2400
Off	On	Off — — —	4800	2400
On	Off	Off — — —	2400	1200

*Direct Link only

Figure 2-8 (Part 2 of 2). 3274 Model 51C Operator Controls, Loop Attachment



1 **On/Off (|/○) Switch** – The On/Off (|/○) switch is a *two*-position rocker switch used to turn the 3274 on or off. To turn on the 3274, press the top portion (|) of the On/Off switch; to turn off the 3274, press the bottom portion (○) of the switch. **Note:** *Before turning off the 3274, inform all the operators of the terminals attached to the 3274 that the 3274 is going to be turned off.*

2 **On Indicator** – This indicator turns on when the 3274 is turned on and turns off when the 3274 is turned off.

Notes:

1. *The 3274 does not supply power to the attached display stations or printers. Each terminal has its own On/Off switch. However, the 3274 does control all the attached terminals, and the 3274 must be turned on for the terminals to operate.*
2. *Use the On/Off switch only to turn the 3274 on and off. Do not use this switch to reset and reload the 3274. Use the IML switch* **3** *for that function.*

Figure 2-9 (Part 1 of 2). 3274 Model 51C Operator Controls for 1200-bps Integrated Modem, Nonswitched Line, and for External Modem Interface Feature with Business Machine Clock, Switched/Nonswitched Line

3 **IML (Initial Machine Load) Pushbutton** — Whenever the 3274 is turned on with the system diskette loaded in the diskette reader enclosure, the 3274 automatically runs tests and loads information from the diskette that is required for 3274 operation. The tests, and the subsequent machine loading, prepare the 3274 for operation and are called the IML (Initial Machine Load).

Note: *Pressing the IML pushbutton temporarily disables all terminals attached to the 3274. If any attached terminals are in use, all terminal operators should be notified before proceeding.*

The IML pushbutton enables you to initiate a manual IML operation. Pressing and holding the IML pushbutton causes a basic test to run; if the basic test is successful, each of the 8 4 2 1 indicators **5** turns on. When the IML pushbutton is released, the IML tests and subsequent machine loading begin. The 8 4 2 1 indicators should flash on and off (in various patterns) for 1 to 3 minutes, ending with all four indicators off.

4 **Alternate IML Address Switch** — You will use this switch (1) in conjunction with the IML pushbutton when you perform the 3274 problem determination procedures and (2) during 3274 customizing and diskette updating. For information concerning the use of this switch during customizing and diskette updating, refer to *IBM 3270 Information Display System: 3274 Control Unit Planning, Setup, and Customizing Guide,* GA27-2827.

Holding the Alternate IML Address switch in position 1 (top portion), while pressing the IML pushbutton, bypasses the IML tests and loads the machine directly. This procedure should be used only when the normal loading procedure fails and useful work can still be done.

Position 2 is used to run the 3274 Model 51C interface tests. To run these tests: (1) set the TEST/OPER switch (if present) (shown at right) on the 3274 communication cable (cable between the 3274 and the modem) to the TEST position, (2) hold the Alternate IML Address switch in position 2, and (3) press the IML pushbutton while holding the Alternate IML Address switch.

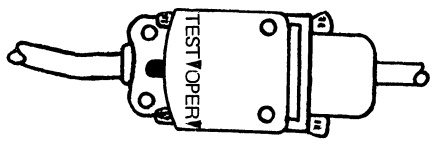
Before resuming normal operation, return the TEST/OPER switch to the Normal position. Position 2 of the Alternate Address switch is also used during the diskette update procedure.

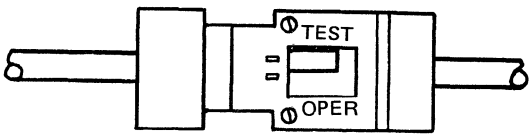
5 **8 4 2 1 Indicators** — These four indicators turn on when the IML pushbutton is held; when the IML pushbutton is released, they indicate test sequence information as the IML tests progress. During normal operation, these indicators indicate the operational status of the 3274.

6 **Line Speed** — In the Primary position, the modem operates at normal speed; in the Secondary position, the modem operates at half-speed.

7 **Encrypt/Decrypt Key Switch** — Allows a new master key to be entered when in the horizontal position.

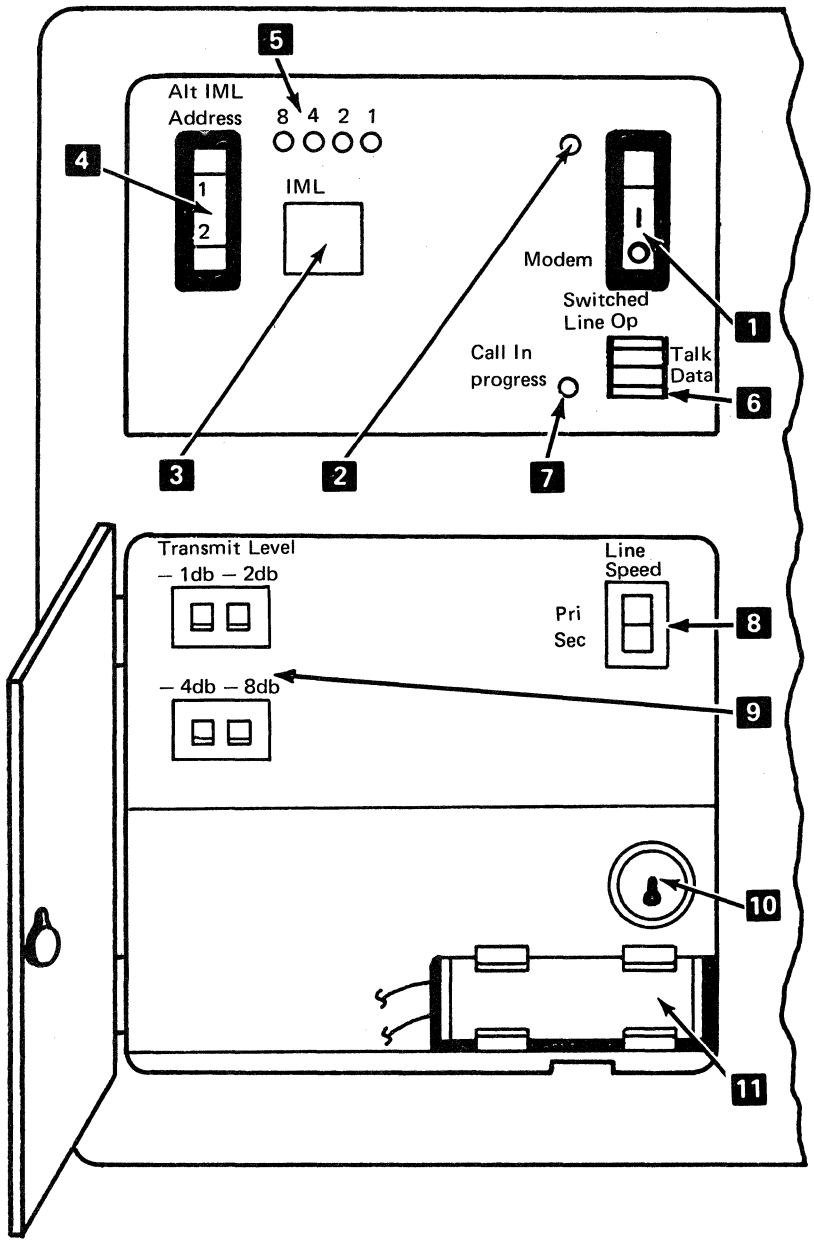
8 **Encrypt/Decrypt Battery** — Allows the master key to be maintained in the 3274 when power is off.





Note: *Your cable may have either of the switches shown above.*

Figure 2-9 (Part 2 of 2). 3274 Model 51C Operator Controls for 1200-bps Integrated Modem, Nonswitched Line, and for External Modem Interface Feature with Business Machine Clock, Switched/Nonswitched Line



1 **On/Off (| /○) Switch** – The On/Off (| /○) switch is a *two*-position rocker switch used to turn the 3274 on or off. To turn on the 3274, press the top portion (|) of the On/Off switch; to turn off the 3274, press the bottom portion (○) of the switch. **Note:** *Before turning off the 3274, inform all the operators of the terminals attached to the 3274 that the 3274 is going to be turned off.*

2 **On Indicator** – This indicator turns on when the 3274 is turned on and turns off when the 3274 is turned off.

Notes:

1. *The 3274 does not supply power to the attached display stations or printers. Each terminal has its own On/Off switch. However, the 3274 does control all the attached terminals, and the 3274 must be turned on for the terminals to operate.*
2. *Use the On/Off switch only to turn the 3274 on and off. Do not use this switch to reset and reload the 3274. Use the IML switch* **3** *for that function.*

Figure 2-10 (Part 1 of 2). 3274 Model 51C Operator Controls for 1200-bps Integrated Modem, Switched Line, Auto Answer Feature, and for 1200-bps Integrated Modem, Nonswitched Line with Switched Network Backup (SNBU), Auto Answer Feature

3 **IML (Initial Machine Load) Pushbutton** — Whenever the 3274 is turned on with the system diskette loaded in the diskette reader enclosure, the 3274 automatically runs tests and loads information from the diskette that is required for 3274 operation. The tests, and the subsequent machine loading, prepare the 3274 for operation and are called the IML (Initial Machine Load).

Notes:

1. *Pressing the IML pushbutton temporarily disables all terminals attached to the 3274. If any attached terminals are in use, all terminal operators should be notified before proceeding.*
2. *The Talk/Data switch should be in the Data position.*

The IML pushbutton enables you to initiate a manual IML operation. Pressing and holding the IML pushbutton causes a basic test to run; if the basic test is successful, each of the 8 4 2 1 indicators **5** turns on. When the IML pushbutton is released, the IML tests and subsequent machine loading begin. The 8 4 2 1 indicators should flash on and off (in various patterns) for 1 to 3 minutes, ending with all four indicators off.

4 **Alternate IML Address Switch** — You will use this switch (1) in conjunction with the IML pushbutton when you perform the 3274 problem determination procedures and (2) during 3274 customizing and diskette updating. For information concerning the use of this switch during customizing and diskette updating, refer to *IBM 3270 Information Display System: 3274 Control Unit Planning, Setup, and Customizing Guide,* GA27-2827.

Holding the Alternate IML Address switch in position 1 (top portion), while pressing the IML pushbutton, bypasses the IML tests and loads the machine directly. This procedure should be used only when the normal loading procedure fails and useful work can still be done.

Position 2 is used to run the 3274 Model 51C interface tests. To run these tests: (1) set the Talk/Data switch **6** to the Talk position, (2) hold the Alternate IML Address switch in position 2, and (3) press the IML pushbutton while holding the Alternate IML Address switch.

Position 2 of the Alternate Address switch is also used during the diskette update procedure.

5 **8 4 2 1 Indicators** — These four indicators turn on when the IML pushbutton is held; when the IML pushbutton is released, they indicate test sequence information as the IML tests progress. During normal operation, these indicators indicate the operational status of the 3274.

6 **Talk/Data Switch** — In the Talk position, the operator may use the handset for voice communication. In the Data position, the handset is bypassed; only machine data is allowed on the communication line (switched network only).

7 **Call in Progress Indicator** — Indicates that a connection has been established and the handset is off-hook.

8 **Line Speed** — In the Primary position, the modem operates at normal speed; in the Secondary position, the modem operates at half-speed.

9 **Transmit Level Switches** — Four attenuation switches are installed on the 3274 Model 1C (U.S. and Canada Only) when attached to a switched network through an integrated modem. These switches are used to match the 3274 transmit level to the data coupler (CDT, CBS, or FCC-certified equivalent) that is attached to the communication line termination. Use the chart below to determine the correct setting of the switches for the dBm level required.

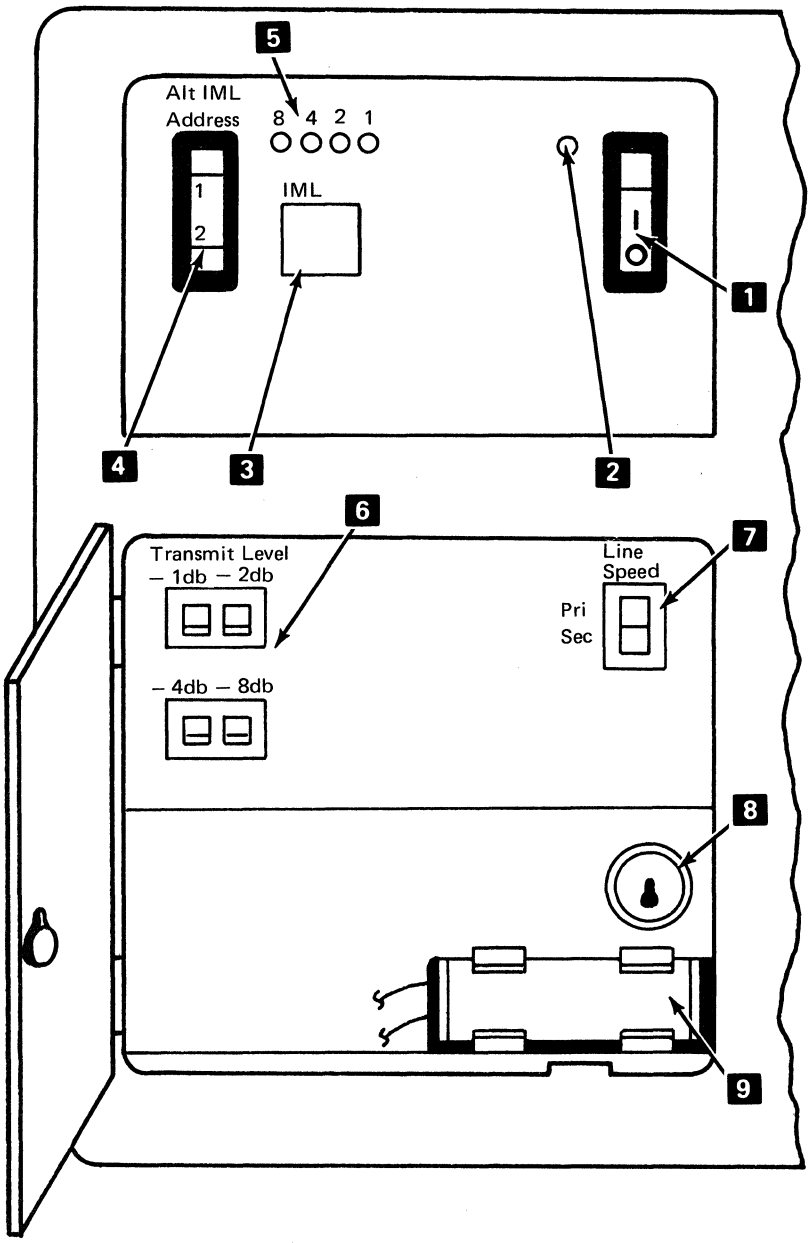
In countries other than the U.S. and Canada, the Transmit Level switches are not installed on the Integrated Modem Control Panel. In these countries, the transmit level is set by attenuation switches located on the Integrated Modem Card at the plant of manufacture in accordance with PTT specifications for the country.

dBM Level	Transmit Level Switches			
	−1dB	−2dB	−4dB	−8dB
0	OFF	OFF	OFF	OFF
−1	ON	OFF	OFF	OFF
−2	OFF	ON	OFF	OFF
−3	ON	ON	OFF	OFF
−4	OFF	OFF	ON	OFF
−5	ON	OFF	ON	OFF
−6	OFF	ON	ON	OFF
−7	ON	ON	ON	OFF
−8	OFF	OFF	OFF	ON
−9	ON	OFF	OFF	ON
−10	OFF	ON	OFF	ON
−11	ON	ON	OFF	ON
−12	OFF	OFF	ON	ON
−13	ON	OFF	ON	ON
−14	OFF	ON	ON	ON
−15	ON	ON	ON	ON

10 **Encrypt/Decrypt Key Switch** — Allows a new master key to be entered when in the horizontal position.

11 **Encrypt/Decrypt Battery** — Allows the master key to be maintained in the 3274 when power is off.

Figure 2-10 (Part 2 of 2). 3274 Model 51C Operator Controls for 1200-bps Integrated Modem, Switched Line, Auto Answer Feature, and for 1200-bps Integrated Modem, Nonswitched Line with Switched Network Backup (SNBU), Auto Answer Feature



1 **On/Off (|/○) Switch** – The On/Off (|/○) switch is a *two*-position rocker switch used to turn the 3274 on or off. To turn on the 3274, press the top portion (|) of the On/Off switch; to turn off the 3274, press the bottom portion (○) of the switch. **Note:** *Before turning off the 3274, inform all the operators of the terminals attached to the 3274 that the 3274 is going to be turned off.*

2 **On Indicator** – This indicator turns on when the 3274 is turned on and turns off when the 3274 is turned off.

Notes:

1. *The 3274 does not supply power to the attached display stations or printers. Each terminal has its own On/Off switch. However, the 3274 does control all the attached terminals, and the 3274 must be turned on for the terminals to operate.*
2. *Use the On/Off switch only to turn the 3274 on and off. Do not use this switch to reset and reload the 3274. Use the IML switch* **3** *for that function.*

Figure 2-11 (Part 1 of 2). 3274 Model 51C Operator Controls for 1200-bps Integrated Modem, Switched Line, Manual Answer Feature, and for 1200-bps Integrated Modem, Nonswitched Line with Switched Network Backup (SNBU), Manual Answer Feature

3 **IML (Initial Machine Load) Pushbutton** — Whenever the 3274 is turned on with the system diskette loaded in the diskette reader enclosure, the 3274 automatically runs tests and loads information from the diskette that is required for 3274 operation. The tests, and the subsequent machine loading, prepare the 3274 for operation and are called the IML (Initial Machine Load).

Note: *Pressing the IML pushbutton temporarily disables all terminals attached to the 3274. If any attached terminals are in use, all terminal operators should be notified before proceeding.*

The IML pushbutton enables you to initiate a manual IML operation. Pressing and holding the IML pushbutton causes a basic test to run; if the basic test is successful, each of the 8 4 2 1 indicators **5** turns on. When the IML pushbutton is released, the IML tests and subsequent machine loading begin. The 8 4 2 1 indicators should flash on and off (in various patterns) for 1 to 3 minutes, ending with all four indicators off.

4 **Alternate IML Address Switch** — You will use this switch (1) in conjunction with the IML pushbutton when you perform the 3274 problem determination procedures and (2) during 3274 customizing and diskette updating. For information concerning the use of this switch during customizing and diskette updating, refer to *IBM 3270 Information Display System: 3274 Control Unit Planning, Setup, and Customizing Guide,* GA27-2827.

Holding the Alternate IML Address switch in position 1 (top portion), while pressing the IML pushbutton, bypasses the IML tests and loads the machine directly. This procedure should be used only when the normal loading procedure fails and useful work can still be done.

Position 2 is used to run the 3274 Model 51C interface tests. To run these tests: (1) hold the Alternate IML Address switch in position 2, and (2) press the IML pushbutton while holding the Alternate IML Address switch.

Position 2 of the Alternate Address switch is also used during the diskette update procedure.

5 **8 4 2 1 Indicators** — These four indicators turn on when the IML pushbutton is held; when the IML pushbutton is released, they indicate test sequence information as the IML tests progress. During normal operation, these indicators indicate the operational status of the 3274.

6 **Transmit Level Switches** — Four attenuation switches are installed on the 3274 Model 1C (U.S. and Canada Only) when attached to a switched network through an integrated modem. These switches are used to match the 3274 transmit level to the data coupler (CDT, CBS, or FCC-certified equivalent) that is attached to the communication line termination. Use the chart below to determine the correct setting of the switches for the dBm level required.

In countries other than the U.S. and Canada, the Transmit Level switches are not installed on the Integrated Modem Control Panel. In these countries, the transmit level is set by attenuation switches located on the Integrated Modem Card at the plant of manufacture in accordance with PTT specifications for the country.

dBM Level	Transmit Level Switches			
	−1dB	−2dB	−4dB	−8dB
0	OFF	OFF	OFF	OFF
− 1	ON	OFF	OFF	OFF
− 2	OFF	ON	OFF	OFF
− 3	ON	ON	OFF	OFF
− 4	OFF	OFF	ON	OFF
− 5	ON	OFF	ON	OFF
− 6	OFF	ON	ON	OFF
− 7	ON	ON	ON	OFF
− 8	OFF	OFF	OFF	ON
− 9	ON	OFF	OFF	ON
− 10	OFF	ON	OFF	ON
− 11	ON	ON	OFF	ON
− 12	OFF	OFF	ON	ON
− 13	ON	OFF	ON	ON
− 14	OFF	ON	ON	ON
− 15	ON	ON	ON	ON

7 **Line Speed** — In the Primary position, the modem operates at normal speed; in the Secondary position, the modem operates at half-speed.

8 **Encrypt/Decrypt Key Switch** — Allows a new master key to be entered when in the horizontal position.

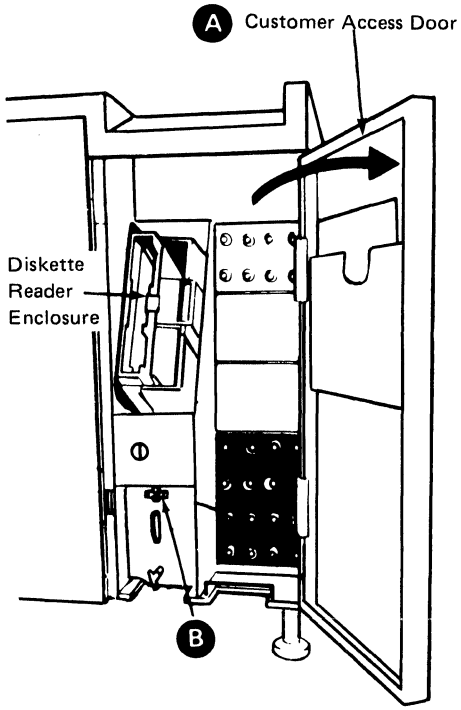
9 **Encrypt/Decrypt Battery** — Allows the master key to be maintained in the 3274 when power is off.

Figure 2-11 (Part 2 of 2). 3274 Model 51C Operator Controls for 1200-bps Integrated Modem, Switched Line, Manual Answer Feature, and for 1200-bps Integrated Modem, Nonswitched Line with Switched Network Backup (SNBU), Manual Answer Feature

3274 Encrypt/Decrypt Feature (Models 1C and 51C)

The 3274 Encrypt/Decrypt feature can be installed on the 3274 Models 1C and 51C. An organization using the Encrypt/Decrypt feature has the ability to protect the information transmitted and received through the communication network from unauthorized disclosure. The Encrypt/Decrypt feature accomplishes this data protection by encrypting (encoding) messages sent to the host system and decrypting (decoding) messages received from the host system. Messages from the host system to the 3274 (or its attached units) that have been encrypted are decrypted before being sent to the attached units to be displayed or printed; messages from the 3274 (or its attached units) will be encrypted before being sent over the communication line to the host system.

A 16-character Terminal Master Key and an 8-character Control Unit ID (CID) must be entered into the 3274 (by use of the 3278/3279 display station attached to the 3274 port A0) before the Encrypt/Decrypt feature can be used. When the 3274 is turned off, the Terminal Master Key is maintained by a mercury battery in the 3274. Following are the procedures for replacing the battery, entering the Terminal Master Key, verifying the Terminal Master Key, and testing the Encrypt/Decrypt feature.



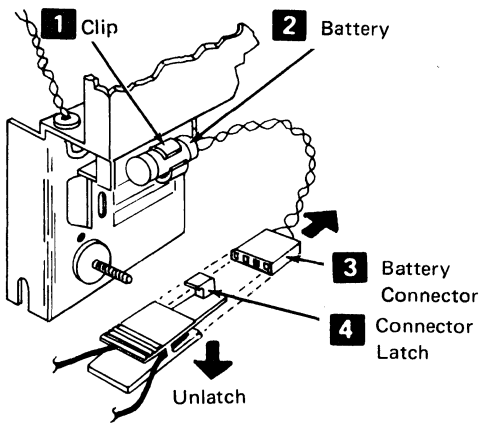
3274 Model 1C

Battery Replacement

Note: *After replacing the battery you may have to reenter the Terminal Master Key by performing the Entering the Terminal Master Key procedure. You will have to enter the Terminal Master Key if 3274 Power is off while the battery is being replaced.*

Model 1C

1. If any terminals attached to the 3274 are in use, notify all terminal operators that the 3274 is going to be turned off; then wait until all operations are completed.
2. Open the customer access door (A). The battery for the Encrypt/Decrypt feature is located in area (B) below the 3274 diskette reader enclosure.
3. Remove the old battery 2 from the clip 1 on the bracket.
4. Unlatch the connector latch 4, and disconnect the battery connector 3.
5. Connect the battery connector 3 to the new battery.
6. Insert the new battery into the clip 1 on the bracket.
7. Close the customer access door.

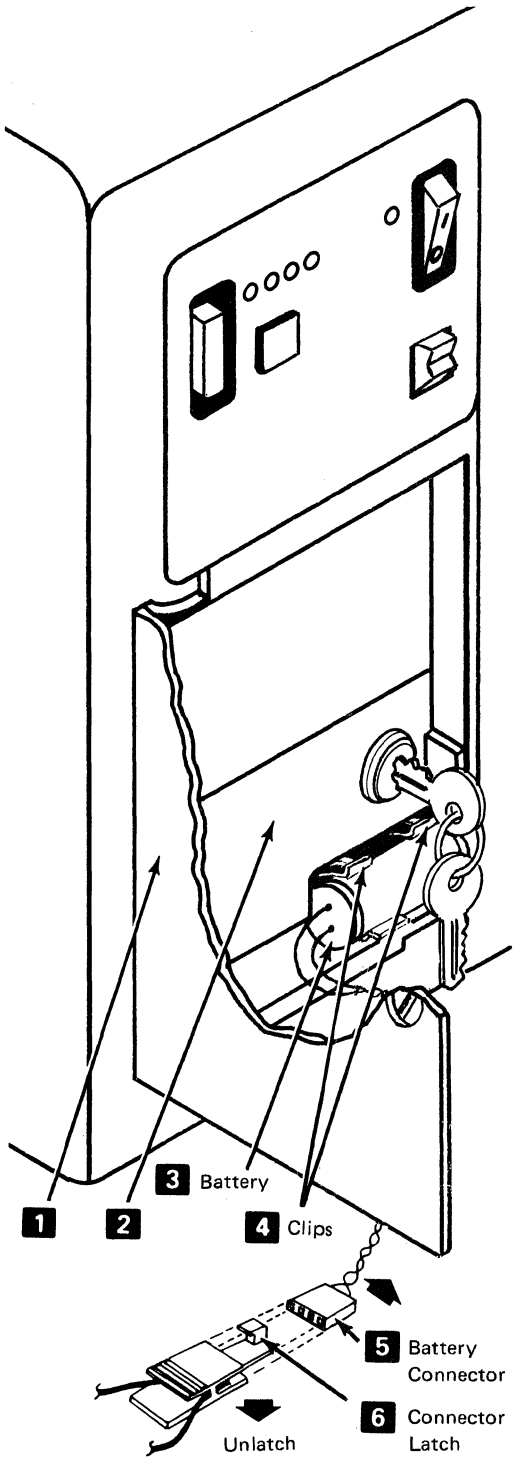


DANGER
When disposing of the replaced battery, observe the disposal instructions on the label attached to the 3274, near the battery location, and the battery manufacturer's instructions.

Model 51C

1. If any terminals attached to the 3274 are in use, notify all terminal operators that the 3274 is going to be turned off; then wait until all operations are completed.
2. The battery for the Encrypt/Decrypt feature is located in the customer access area **2** . Open the customer access door **1** .
3. Remove the old battery **3** from the clips **4** on the bracket.
4. Unlatch the connector latch **6** , and disconnect the battery connector **5** .
5. Connect the battery connector **5** to the new battery **3** .
6. Insert the new battery into the clips **4** on the bracket.
7. Close the customer access door.

DANGER
When disposing of the replaced battery, observe the disposal instructions on the label attached to the 3274, near the battery location, and the battery manufacturer's disposal instructions.



3274 Model 51C

Entering the Terminal Master Key

You should perform this procedure only if you are authorized to enter the Terminal Master Key. Contact the appropriate person in your organization to obtain the Terminal Master Key, Terminal Master Key Verification value (if available), and the Control Unit ID (CID).

1. If any terminals attached to the 3274 are in use, notify all terminal operators that the 3274 operation is going to be interrupted; then wait until all operations are ended.
2. Use the 3278/3279 display station attached to 3274 port A0 to perform this procedure. Locate this display station; then make sure it has a keyboard and is turned on.
3. ✖ 397, ✖ 398, or ✖ 399 code appearing in the Operator Information Area during this procedure indicates an Encrypt/Decrypt failure. Refer to the 3274 Problem Determination Guide for the recovery procedure.
4. Load the Encrypt/Decrypt diskette.
5. If the 3274 is turned on, press the IML pushbutton on the 3274 control panel; if the 3274 is turned off, press the | portion of the 3274 On/Off switch. IML is complete when the 8 4 2 1 indicators are all off.
6. If the security key is not inserted into the 3274 security keylock, obtain the security key from the appropriate person in your organization and insert the key into the security keylock.
7. Make sure the security keylock is in the fully clockwise (horizontal) position; if it is not, turn the key clockwise to the horizontal position.
8. Go to the 3278 or 3279 display station that is attached to 3274 port A0. The top two rows of the screen should contain the following information:

   001
   XXXXXXXXXXXXXXXX
9. Use the keyboard to enter the characters 1234567890ABCDEF into the character positions occupied by the X's. If you miskey any characters, use the cursor move keys (← and →) on the right side of the keyboard to move the cursor to the character position(s) to be corrected.
10. Press the ENTER key. The top two rows of the display screen should change to:

    EMKV

    ____ ____ ____ ____

    Note: *If a 1 or a 2 appears at the top center of the screen and EMKV does not appear, you entered the 1 through F characters incorrectly at step 9. To recover, enter the 1 through F characters correctly and press the ENTER key again.*
11. EMKV is a prompt message meaning "enter master key value." Use the keyboard to enter (without spaces) the 16 characters of the Terminal Master Key into the positions occupied by the hyphens; the valid characters that can be entered are the numbers 0 through 9 and the letters A through F. As each character is entered, the corresponding hyphen will be replaced by an asterisk (*). If you miskey a character, press the RESET key and enter all 16 characters of the Terminal Master Key again.

12. Press the ENTER key. The top two rows of the display screen should change to:

    CID

    ____ ____

    Note: *If CID is not displayed and a Do Not Enter symbol (✖) is displayed in the Operator Information Area, you did not enter the correct Terminal Master Key in step 11. The meaning of the Operator Information Area symbols is explained in the 3278 or 3279 display station Problem Determination Guide. To recover, press the RESET key, enter the correct Terminal Master Key, and press the ENTER key.*

13. Use the keyboard to enter the Control Unit ID (CID) into the positions occupied by the underscores. If the Control Unit ID is less than 8 characters, enter only as many characters as you have and the remainder of the field will be filled with zeros. As each character is entered, the corresponding underscore will be replaced by an asterisk (*). If you miskey a character, press the RESET key and enter the Control Unit ID again.

14. Press the ENTER key. The top two rows of the display screen should change to:

    VP 99
    YYYYYYYYYYYYYYYY

    The VP message means "verification pattern," and the Y characters represent the Terminal Master Key Verification value. If you have the Terminal Master Key Verification value for the Terminal Master Key just entered, make sure the verification value displayed is correct; if it is not, press the RESET key and return to step 5, and try to enter the Terminal Master Key again.

15. Press the ENTER key. When the ENTER key is pressed (second time), the top two rows of the display screen should change to:

    VP 99
    XXXXXXXXXXXXXXXX

    The keyboard is now disabled and cannot be reset until an IML operation is performed. To continue your operation, turn the 3274 Encrypt/Decrypt security keylock to the counterclockwise (vertical) position, remove the security key from the lock, remove the Encrypt/Decrypt diskette, perform an IML operation with the proper diskette loaded, and proceed with your normal operation.

Verifying the Terminal Master Key

Use the following procedure to verify that the Terminal Master Key has not been changed; this procedure will not alter the Terminal Master Key. This procedure causes an indication of whether or not the Terminal Master Key has been changed (99, if the Terminal Master Key has not been changed; 44, if the Terminal Master Key has been changed) to be displayed at the top center of the display screen on the 3278 or 3279 display station attached to 3274 port A0.

1. If any terminals attached to the 3274 are in use, notify all terminal operators that the 3274 operation is going to be interrupted; then wait until all operations are ended.
2. Use the 3278 or 3279 display station attached to 3274 port A0 to perform this procedure. Locate this display station, then make sure it has a keyboard and is turned on.

3. An ✕⧅397, ✕⧅398, or ✕⧅399 code appearing in the Operator Information Area during this procedure indicates an Encrypt/Decrypt failure. Refer to the 3274 Problem Determination Guide for the recovery procedure.
4. Load the Encrypt/Decrypt diskette.
5. If the 3274 is turned on, press the IML pushbutton on the 3274 control panel; if the 3274 is turned off, press the [|] portion of the 3274 On/Off switch. IML is complete when the 8 4 2 1 indicators are all off.
6. Make sure the security keylock is in the fully counterclockwise (vertical) position; if it is not, turn the key counterclockwise to the vertical position.
7. Go to the 3278/3279 display station that is attached to 3274 port A0. The top two rows of the screen should contain the following information:

   001
   XXXXXXXXXXXXXXXX
8. Use the keyboard to enter the characters 1234567890ABCDEF into the character positions occupied by the X's. If you miskey any characters, use the cursor move keys (←and→) on the right side of the keyboard to move the cursor to the character position(s) to be corrected.
9. Press the ENTER key. The top two rows of the display screen should change to:

   EMKV
   ———— ———— ———— ————

   Note: *If a 1 or a 2 appears at the top center of the screen and EMKV does not appear, you entered the 1 through F characters incorrectly at step 8. To recover, enter the 1 through F characters correctly and press the ENTER key again.*
10. Press the ENTER key. If the Terminal Master Key is as expected, 99 will appear at the top center of the screen; if it is not as expected, 44 will appear at the top center of the screen.
11. To continue your operation, remove the Encrypt/Decrypt diskette and proceed with your normal operation.

Encrypt/Decrypt Feature Test

The 3274 problem determination procedures may instruct you to perform this test procedure when you are having problems operating with the Encrypt/Decrypt feature. This test modifies the Terminal Master Key presently being used by the 3274.

This test involves entering a Terminal Master Key of "0123456789ABCDEF"; when this Terminal Master Key is entered, a verification value of "F188 D850 4894 139E" is displayed if the Encrypt/Decrypt feature is operating properly.

1. If any terminals attached to the 3274 are in use, notify all terminal operators that the 3274 operation is going to be interrupted; then wait until all operations are ended.
2. Use the 3278/3279 display station attached to 3274 port A0 to perform this procedure. Locate this display station, then make sure it has a keyboard and is turned on.
3. An ✕ ⧅ 397, ✕ ⧅ 398, or ✕ ⧅ 399 code appearing in the Operator Information Area during this procedure indicates an Encrypt/Decrypt failure. Refer to the 3274 Problem Determination Guide for the recovery procedure.

4. Load the Encrypt/Decrypt diskette.
5. If the 3274 is turned on, press the IML pushbutton on the 3274 control panel; if the 3274 is turned off, press the ⌈ | ⌉ portion of the 3274 On/Off switch. IML is complete when the 8 4 2 1 indicators are all off.
6. If the security key is not inserted into the 3274 security keylock, obtain the security key from the appropriate person in your organization and insert the key into the security keylock.
7. Make sure the security keylock is in the fully clockwise (horizontal) position; if it is not, turn the key clockwise to the horizontal position.
8. Go to the 3278/3279 display station that is attached to 3274 port A0. The top two rows of the screen should contain the following information:

   001
   XXXXXXXXXXXXXXXX
9. Use the keyboard to enter the characters 1234567890ABCDEF into the character positions occupied by the X's. If you miskey any characters, use the cursor move keys (←and→) on the right side of the keyboard to move the cursor to the character position(s) to be corrected.
10. Press the ENTER key. The top two rows of the display screen should change to:

    EMKV
    ---- ---- ---- ----

    Note: *If a 1 or a 2 appears at the top center of the screen, you entered the 1 through F characters incorrectly at step 9. To recover, enter the 1 through F characters correctly and press the ENTER key again.*
11. **Note:** *The following sequence of characters is different from that used in the previous procedures.*

    Use the keyboard to enter (without spaces) the characters "0123456789 ABCDEF" into the positions occupied by the hyphens. As each character is entered, the corresponding hyphen will be replaced by an asterisk (*). A ✖ 人# ? symbol in the Operator Information Area or a keyboard lock are indications of miskeyed characters. If you miskey a character, press the RESET key and enter the 0 through F characters again.
12. Press the ENTER key. The top two rows of the display screen should change to:

    CID
    ---- ----

    Note: *If CID is not displayed and a Do Not Enter symbol (✖) is displayed in the Operator Information Area, you did not enter the correct Terminal Master Key in step 11. The meaning of the Operator Information Area symbols is explained in the 3278 or 3279 display station Problem Determination Guide. To recover, press the RESET key, enter the correct Terminal Master Key, and press the ENTER key.*
13. Press the ENTER key. The top two rows of the display screen should change to:

    VP 99
    F188D8504894139E

    If the above characters are not displayed, the Encrypt/Decrypt feature is not operating correctly.

14. To continue your operation you should now enter your organization's Terminal Master Key into the 3274 by performing the Entering the Terminal Master Key procedure, beginning at step 5.

3274 Model 51C Communication Attachment

Dial Operation

The 3274 Model 51C cluster (3274 and its attached display stations and printers) is connected to its host system by telephone lines. Telephone equipment can be attached to your 3274 that allows you to communicate with the host system by dialing the host system's telephone number. The host system may also communicate with your cluster by dialing the phone attached to the 3274. With the dial equipment installed, the phone lines are used to send and receive data processing information and at other times for normal phone conversations.

Either the control unit or the host system may initiate an operation. The main steps performed by the operator when sending information to the host system using the dial method are:

1. Dials the host system phone number and establishes a phone line connection.
2. When directed by the host system, performs the log-on procedure.
3. Enters the message and sends it to the host system.
4. Disconnects the control unit from the host system and the telephone line.

When the host system initiates an operation, it:

1. Dials the control unit phone.
2. Asks for operator identification.
3. Sends the message
4. Disconnects from the control unit and the phone line.

To reduce operating time, an automatic answering feature, called Auto Answer, can be added to the dial communications equipment. This means that when you dial the host system phone number, you need not speak to the host system operator to establish the phone connection; instead you will listen for an answer tone. The phone at your control unit may also respond automatically to calls from the host system.

3274 dial operation is possible if the 3274 has one of the following features installed:

1. Integrated Modem, Switched Line with Auto Answer
2. Integrated Modem, Switched Line without Auto Answer (U.S. and Canada only)
3. Integrated Modem, Nonswitched Line with SNBU (Switched Network Backup) and Auto Answer
4. Integrated Modem, Nonswitched Line with SNBU and without Auto Answer (U.S. and Canada only)
5. External Modem Interface (the modem attached to the 3274 should have switched network operation capability)

The SNBU capability is used when the nonswitched line (used for normal operation) has a transmission problem. When there is a problem with the nonswitched line, you may be instructed by the appropriate person in your organization or your organization's operating procedures to use a switched line (using SNBU) to continue operating.

Dial Operating Procedures

Step-by-step dial operation procedures for 3274 attached display stations are described in the following paragraphs. However, details that are special to your location are not contained in the procedures. For example, operator identification codes or operating instructions for non-IBM equipment attached to the 3274 are provided by the appropriate person in your organization or are found in the user's program guide.

Note: *In the following procedures the term "exclusion key" is used to describe the switch, knob, key, etc. that is used by your organization's communication equipment to connect the 3274 to the telephone line.*

Sending a Message to the Host System When an Integrated Modem with Auto Answer Feature Is Installed at the 3274

1. The Ready (4) symbol should be displayed in the display station Operator Information Area, indicating that the 3274 is ready.
2. Set the Data/Talk switch, on the control panel, to the Talk position. If necessary, set the Primary/Secondary Line Speed switch to the appropriate position.

3a. (U.S. and Canada Only)
Pick up the phone handset, pull up the exclusion key, and dial the host system's telephone number. If the host system is equipped with an Auto Answer feature, you should hear the answer tone; if it is not equipped with an Auto Answer feature, the host system operator should answer the call, verify when the host system is ready for data transmission, and set the host system's modem to data mode. Set the Data/Talk switch, on the control panel, to the Data position, and then hang up the phone handset. The Call In Progress indicator should turn on.

3b. (All countries except U.S. and Canada)
Pick up the phone handset and dial the host system's telephone number. If the host system is equipped with an Auto Answer feature, you should hear the answer tone; if it is not equipped with an Auto Answer feature, the host system operator should answer the call, verify when the host system is ready for data transmission, and set the host's system modem to data mode. Set the Data/Talk switch on the control panel to the Data position, and then hang up the phone handset. The Call In Progress indicator should turn on.

4. If your application requires that you perform a logon procedure before you can enter data, do so.
5. Key in the message data and press the ENTER key or the PF key specified for your application.
6. Note the formatted display or host system response on your screen. If required, press RESET and continue keying message data and pressing the ENTER key or PF key until you have finished your message.

7. When the data transmission is finished, disconnect the phone line by either (1) setting the Data/Talk switch to the Talk position, or (2) receiving a disconnect command from the host system (SDLC Mode operation only), or (3) receiving the automatic time-out of the 3274. When the phone line is disconnected, the Call In Progress light should turn off.
8. You are now free to send a new message or to receive a message from the host system.

Sending a Message to the Host System When an Integrated Modem without Auto Answer Feature Is Installed at the 3274 (U.S. and Canada Only)

1. The Ready (4) symbol should be displayed in the display station Operator Information Area, indicating that the 3274 is ready.
2. If necessary, set the Primary/Secondary Line Speed switch to the appropriate position.
3. Pick up the phone handset, dial the host system's telephone number, and wait for the answer tone to end. Pull up the exclusion key and put the phone handset aside. Do not hang up the phone handset.
4. If your application requires that you perform a logon procedure before you can enter data, do so.
5. Key in the message data and press the ENTER key or the PF key specified for your application.
6. Note the formatted display or host system response on your screen. If required, press RESET and continue keying message data and pressing the ENTER key or PF key until you have finished your message.
7. When the data transmission is finished, hang up the phone handset to disconnect the 3274 from the phone line.
8. You are now free to send a new message or to receive a message from the host system.

Sending a Message to the Host System When the External Modem Interface Feature Is Installed at the 3274

When the 3274 has the External Modem Interface feature, the phone connection procedure depends upon the modem attached to the 3274. To determine your organization's unique operating procedures, ask the appropriate person in your organization for instructions or refer to the appropriate user's program guide. The following procedure is a typical operating procedure for an IBM 3872 Modem that has an Auto Answer feature.

1. The Ready (4) symbol should be displayed in the display station Operator Information Area, indicating that the 3274 is ready.
2. Set the Mode Select switch on the 3872 modem to the EXTERNAL position. Set the Data/Talk switch on the 3872 modem to the Talk position. If necessary, set the 3274's Primary/Secondary Line Speed switch to the appropriate position.
3. Pick up the phone handset, pull up the exclusion key, and dial the host system's telephone number. If the host system is equipped with an Auto Answer feature, you should hear the answer tone; if it is not equipped with an Auto Answer feature, the host system operator should answer the call, verify when the host system is ready for data transmission, and set the host system's modem to data mode. Set the Data/Talk switch on the 3872 modem to the Data position, then hang up the phone handset. The Ready light on the 3872 modem should turn on.

4. If your application requires that you perform a logon procedure before you can enter data, do so.
5. Key in the message data and press the ENTER key or the PF key specified for your application.
6. Note the formatted display or host system response on your screen. If required, press RESET and continue keying message data and pressing the ENTER key or PF key until you have finished your message.
7. When the data transmission is finished, the phone line is disconnected by either (1) setting the 3872's Data/Talk switch to the Talk position, or (2) receiving a disconnect command from the host system (SDLC Mode operation only), or (3) receiving the automatic time-out of the 3274. When the phone line is disconnected, the 3872's Ready light should turn off.
8. You are now free to send a new message or to receive a message from the host system.

Receiving a Message from the Host System at a 3274 That Has an Integrated Modem with Auto Answer Feature Installed

1. When a 3274 has the Auto Answer feature installed and the host system operator wishes to send a message to one of the attached display stations or printers, the message is received automatically. You do not have to be present if the Data/Talk switch is set to the Data position. If necessary, set the Primary/Secondary Line Speed switch to the appropriate position.

   Note 1: *If the Data/Talk switch is set to Talk, and the phone rings, pick up the phone handset, pull up the exclusion key (U.S. and Canada only), and when instructed by the host system operator (1) set the Data/Talk switch to Data and (2) hang up the phone handset. The Call In Progress light (located next to the Data/Talk switch) should turn on.*

   Note 2: *If a call has been answered, and data or control information is not received or transmitted by the 3274 within approximately 60 to 75 seconds, the 3274 will automatically disconnect from the phone line. This time-out function prevents the 3274 from tieing up the phone line when it receives an erroneous phone call.*
2. If the message from the host system is a request to log on and send a message, key in the required information and press the ENTER key. You must press ENTER after the phone connection has been made, or else the host system will disconnect from the phone line in some applications.
3. When the data transmission is finished, the phone line is disconnected by either (1) setting the Data/Talk switch to the Talk position, or (2) receiving a disconnect command from the host system (SDLC Mode operation only), or (3) receiving the automatic time out of the 3274. When the phone line is disconnected, the Call In Progress light should turn off.
4. Your 3274 is now free to receive a new message or to send a message to the host system.

Receiving a Message from the Host System at a 3274 That Has an Integrated Modem without Auto Answer Feature Installed (U.S. and Canada Only)

1. If the phone rings, answer it, pull up the exclusion key when instructed by the host system operator, and place the phone handset aside. If necessary, set the Primary/Secondary Line Speed switch to the appropriate position.

2. You may now key in the logon information (if required), or, if you are to respond to the host system (as directed by the user's program guide), key in your message and press ENTER.

   When the host system has received your identification code or message, it responds by (1) sending a message to your display or attached printer, (2) sending a formatted display if you are to respond with message data, or (3) some other acknowledgment as specified in the user's program guide.
3. When the host system has finished sending messages, instructions will appear on your screen telling you to hang up the phone handset.
4. Your 3274 is now free to receive a new message or to send a message to the the host system.

Receiving a Message from the Host System at a 3274 That Has the External Modem Interface Feature Installed

When the 3274 has the External Modem Interface feature, the phone connection procedure depends upon the modem attached to the 3274. To determine your organization's unique operating procedures, ask the appropriate person in your organization for instructions or refer to the appropriate user's program guide. The following procedure is a typical operating procedure for an IBM 3872 Modem that has an Auto Answer feature.

1. When the host system operator wishes to send a message to one of the display stations or printers attached to the 3274, the message is received automatically. You do not have to be present if (1) the Data/Talk switch on the 3872 is set to the Data position, (2) the 3274 is powered on, and (3) the 3274's Primary/Secondary Line Speed switch is set to the appropriate position.

   Note 1: *If the 3872's Data/Talk switch is set to Talk and the phone rings, pick up the phone handset, pull up the exclusion key (U.S. and Canada only), and when instructed by the host system operator, (1) set the 3872's Data/Talk switch to Data and (2) hang up the phone handset. The Ready light on the 3872 modem should turn on.*

   Note 2: *If a call has been answered, and data or control information is not received or transmitted by the 3274 within approximately 60 to 75 seconds, the 3274 will automatically disconnect from the phone line. This time-out function prevents the 3274 from tieing up the phone line when it receives an erroneous phone call.*

2. If the message from the host system is a request to log on and send a message, key in the required information and press the ENTER key. You must press ENTER after the phone connection has been made, or else the host system will disconnect from the phone line in some applications.
3. When the data transmission is finished, the phone line is disconnected by either (1) setting the 3872's Data/Talk switch to the Talk position, (2) receiving a disconnect command from the host system (SDLC Mode operation only), or (3) receiving the automatic time-out of the 3274. When the phone line is disconnected, the 3872's Ready light should turn off.
4. Your 3274 is now free to receive a new message or to send a message to the host system.

Appendix A. Sample 3274 Problem Report Form

IBM 3274 Control Unit
Problem® Report Form

Please fill out this form before requesting service.

1. Are all attached terminals failing? YES NO
   If "NO" is checked, please identify all failing terminals:

2. Check any of the following symbols that are displayed in the operator information area of any failing display station:

   Subsystem Ready _____ 4

   Host Connection _____ A or B

   If one of these three symbols is displayed, please insert the 3-digit code following the symbol.

   Communication Problem ↯ _____

   Machine Check Problem ⊠ _____

   Program Error _____ PROG _____

3a. Record the status of the 8 4 2 1 indicators before initializing the 3274. (Check which indicators are on; if all are off, check "All Off.")

8	4	2	1
O	O	O	O

All Off

3b. If the 3274 has the Loop Attachment, record the status of the Loop Indicators (check which indicators are on).

↯ OK	External Check	Machine Check
O	O	O

4. Do all the 8 4 2 1 indicators light while the IML pushbutton is pressed and held? (If the 3274 is attached to a loop, the Line Ready, External, and Machine Check indicators should also light.) YES NO

5. Record the status of the 8 4 2 1 indicators after initializing the 3274. (Check which indicators are on; if all are off, check "All Off.")
   When requesting service, please report which of the indicators (step 5) are on.

8	4	2	1
O	O	O	O

All Off
Never Flashed

6. Comments (record any other symptom): _____

_____

_____

_____

Address comments concerning this form to IBM Corporation, Department 52Q, Neighborhood Road, Kingston, New York 12401.

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