

**CONTENTS**

45-010 Introduction  
 45-100 System Preparation and Checks  
 45-200 Disk Storage Drives  
 45-210 62EH Disk Storage Drive  
 45-220 62PC Disk Storage Drive  
 45-300 Diskette Drive  
 45-400 Line Printers and Data Communications  
 Cables  
 45-405 IBM 3262 Printer  
 45-410 IBM 5211 Printer  
 45-420 External Modem EIA/CCITT  
 45-430 Digital Data Service Adapter  
 45-440 IBM 1200 BPS Integrated Modem  
 45-450 IBM 2400 BPS Integrated Modem  
 45-460 IBM 4800 BPS Integrated Modem  
 45-470 Analog Wideband Adapter  
 45-480 Autocall Adapter  
 45-490 X.21 Line Adapter  
 45-500 IBM 5250 Information Display System  
 45-510 Twinaxial Signal Cables  
 45-520 IBM 5251 Display Stations  
 45-525 IBM 5252 Dual Display Stations  
 45-527 IBM 5255 Display Stations  
 45-530 IBM 5256 Printer  
 45-540 IBM 5225 Printer  
 45-550 IBM 5224 Printer  
 45-600 System Tests  
 45-610 Power-On Tests  
 45-620 Initial Program Load Operation from  
 Diskette  
 45-630 System Diagnostics  
 45-700 Data Communications (First or Second  
 Communications Adapter or MLCA)  
 45-710 External Modem EIA/CCITT Connection  
 45-720 Digital Data Service Adapter  
 45-730 IBM 1200 BPS Integrated Modem  
 45-740 IBM 2400 BPS Integrated Modem  
 45-750 IBM 4800 BPS Integrated Modem  
 45-760 Analog Wideband Adapter  
 45-770 Autocall Adapter  
 45-780 X.21 Line Adapter  
 45-790 Communications Testing  
 45-800 Completing the System Installation

## 45-010 INTRODUCTION

The following list is a guide for installing the IBM System/34. No voltage adjustments are necessary while installing the system.

- Follow the installation sequence shown in Figure 45-1 and check off each step as you do it.
- Report any problems that occur while you are installing the system. Record these problems on the *Installation Activity Document*, Z130-0080. (Use the correct major, minor, and cause codes.) When recording problems, use a separate document for each work station and for the system unit.
- Always work safely. Observe all the safety rules printed in the front of this manual.
- If you are installing a system with an integrated modem, you may need either a dB meter (IBM part 453545), or a multimeter (IBM part 1749231) and a dB adapter (IBM part 1749299) for modem adjustments. The installation data table (Figure 45-14 for line 1, Figure 45-15 for line 2, and Figure 45-16 for MLCA) is used for installing data communications.

The customer must unpack and prepare the IBM 5250 Information Display System work stations. Unpacking instructions are included with each work station. Preparation instructions are contained in the following manuals:

- *IBM 5251 Model 1 and 11 Display Station Setup Procedure*, GA21-9286
- *IBM 5252 Dual Display Station Setup Procedure*, GA21-9288
- *IBM 5255 Display Station Model 1 Setup Procedure*, GA09-1624
- *IBM 5255 Display Station Model 2 Setup Procedure*, GA09-1627
- *IBM 5224 Printer Models 1, 2, and 12 Setup Procedure*, GA34-0093
- *IBM 5225 Printer Models 1, 2, 3, 4, 11, and 12 Setup Procedure*, GA34-0085
- *IBM 5256 Printer Setup Procedure*, GA21-9290

Get a copy of the *Work Station Network Diagram* from the *IBM System/34 Installation and Modification Reference Manual: Program Products and Physical Setup*, SC21-7689. Have the customer fill out this form while you continue the installation if he has not already done so. If the system that you are installing has any data communications features, fill out the installation data table (Figure 45-14 for line 1, Figure 45-15 for line 2, and Figure 45-16 for MLCA). It is important that you do this because the MAPs contain references to this table. The table will also aid you in answering configuration questions and installing data communications features.

The following signal cables are supplied with the System/34 to attach 5250 work stations to the system:

- One twinaxial cable (IBM part 4236482) is supplied for the display station that will be used as the system console.
- One twinaxial cable (IBM part 4236482) is supplied when an IBM 5225 or 5256 Printer will be used as the system printer.

*Note:* A 5256 printer can be used as the system printer only when an IBM 5211 Printer is not installed on the system.

The customer must supply the twinaxial cables for all other work stations that will be attached to the system.

In order to perform the System/34 system tests (paragraph 45-600), you will need to use the system console and the system printer. Before you run these tests, the customer preparation procedure that does not need an operational System/34 should be completed for the display station that will be the system console and for the 5256 Printer that will be the system printer.

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System/34 Installation Sequence									
Step 1	45-100 System Preparation and Checks	Unpack and remove any shipping brackets							
		Check system and power source compatibility.							
Step 2	45-210 62EH Disk Storage Drive	Drive							
		A B							
		Unlock spindle							
		Check drive motor							
		Check drive belt							
		Unlock actuator							
	45-220 62PC Disk Storage Drive	Drive							
		A B C D							
		Unlock actuator							
		Check voltage connectors							
		Check drive belt							
		Check belt tensioner							
		Check card and cable seating							
Check drive motor ground									
Step 3	45-300 Diskette Drive	Check drive pulley for free rotation.							
		Check card and cable seating.							

Figure 45-1 (Part 1 of 3). System/34 Installation Sequence Chart

Step 4 45-400 Line Printers and Data Communications Cabling

		Line 1	Line 2	Line 3	Line 4
45-405 IBM 3262 Printer	Install, using 3262 installation instructions.				
	Connect cables.				
	Check adapter card jumpers.				
45-410 IBM 5211 Printer	Install, using 5211 installation instructions.				
	Connect cables.				
	Check adapter card jumpers.				
45-420 External Modem EIA/CCITT	Connect communications cable in cable tower.				
45-430 Digital Data Service Adapter	Connect communications cable in cable tower.*				
45-440 IBM 1200 BPS Integrated Modem	Connect communications cable in cable tower.				
	Route communications cable thru adapter plate				
45-450 IBM 2400 BPS Integrated Modem	Connect communications cable in cable tower.				
	Route communications cable thru adapter plate.				
45-460 IBM 4800 BPS Integrated Modem	Remove communications cable from inside machine.				
	Connect communications cable in cable tower.				
45-470 Analog Wideband Adapter	Connect communications cable in cable tower.				
45-480 Autocall Adapter	Connect communications cable in cable tower.				
45-490 X.21 Line Adapter	Connect communications cable in cable tower.				
Install all cable retainers and cable tower cover					

Step 5 45-500 IBM 5250 Information Display System

45-510 Twinaxial Signal Cables	Ensure twinaxial cables connected to system output ports.		
45-520 IBM 5251 Display Stations	Ensure twinaxial cables connected to display stations.		
	Set address and terminator switches (if present).		

\*For MLCA installation, this cable goes through tower opening D-B8.

Figure 45-1 (Part 2 of 3). System/34 Installation Sequence Chart

	45-525 IBM 5252 Dual Display Stations	Ensure twinaxial cables connected to display stations.		
		Set address and terminator switches (if present)		
	45-527 IBM 5255 Display Stations	Ensure twinaxial cables connected to display station.		
		Set address and terminator switches (if present).		
	45-530 IBM 5256 Printer	Ensure twinaxial cable connected to printer.		
		Set address and terminator switches (if present).		
	45-540 IBM 5225 Printer	Ensure twinaxial cable connected to printer.		
		Set address and terminator switches (if present).		
	45-550 IBM 5224 Printer	Ensure twinaxial cable connected to printer.		
		Set address and terminator switches (if present).		
Step 6	45-600 System Tests			
	45-610 Power-on Tests	Power on system and check for failing conditions.		
	45-620 IPL Operation from Diskette	Verify that CSIPL/MSIPL works from diskette.		
	45-630 System Diagnostics	Verify system configuration.		
		Run MDI tests for system unit and base I/O.		
Step 7	45-700 Data Communications (first or second communications adapter or MLCA)		Line 1	Line 2
	45-710 External Modem EIA/CCITT Connection			
	45-720 Digital Data Service Adapter			
	45-730 IBM 1200 BPS Integrated Modem			
	45-740 IBM 2400 BPS Integrated Modem (not used with MLCA)			
	45-750 IBM 4800 BPS Integrated Modem (not used with first or second communications adapter)			
	45-760 Analog Wideband Adapter (not used with first or second communications adapter)			
	45-770 Autocall Adapter (not used with first or second communications adapter)			
	45-780 X.21 Line Adapter (not used with first or second communications adapter)			
	45-790 Data Communications Testing			
Step 8	45-800 Completing the System Installation			
		Check CE panel switches.		
		Fill out installation logs and IAD.		

Figure 45-1 (Part 3 of 3). System/34 Installation Sequence Chart

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## 45-100 SYSTEM PREPARATION AND CHECKS

1. Check to ensure that all shipping brackets are removed as described in the unpacking instructions.
2. Open the left side cover and find the voltage label and the power rating plate **A** as shown in Figure 45-2. Ensure that the power supplied by the customer has the same voltage and frequency as that shown on these labels. If the voltage supplied does not match that shown on the labels, change the connections **B** at TB1, TB5, TB6, TB7, TB8, and TB10 as shown in Figure 45-2, and at TB9 located in the rear chassis section for systems with more than two 62PC disk drives.
3. Ensure that the customer's power has a suitable third-wire ground.
4. Ensure that the customer's socket matches the system plug (United States only).
5. With an ohmmeter, check for continuity (less than 5 ohms) from the machine frame to the ground connector on the AC line cord. (This check is to ensure that the machine frame is correctly grounded).
6. Open all containers and check the contents against the bill of material for the shipping group.

**Note:**

TB1—Base Ferro (see FSL page YA040)

TB5—Feature Power Supply A Ferro (see FSL page YA100)

TB6—Feature Power Supply B Ferro (see FSL page YA120)

TB7—Feature Power Supply C Ferro (see FSL page YA130)

TB8—Feature Power Supply D Ferro (see FSL page YA140)

TB9—Feature Power Supply G Ferro in rear chassis section for systems with more than two 62PC disk drives (see FSL page YA180)

TB10—Control Supply Ferro (see FSL page YA020)



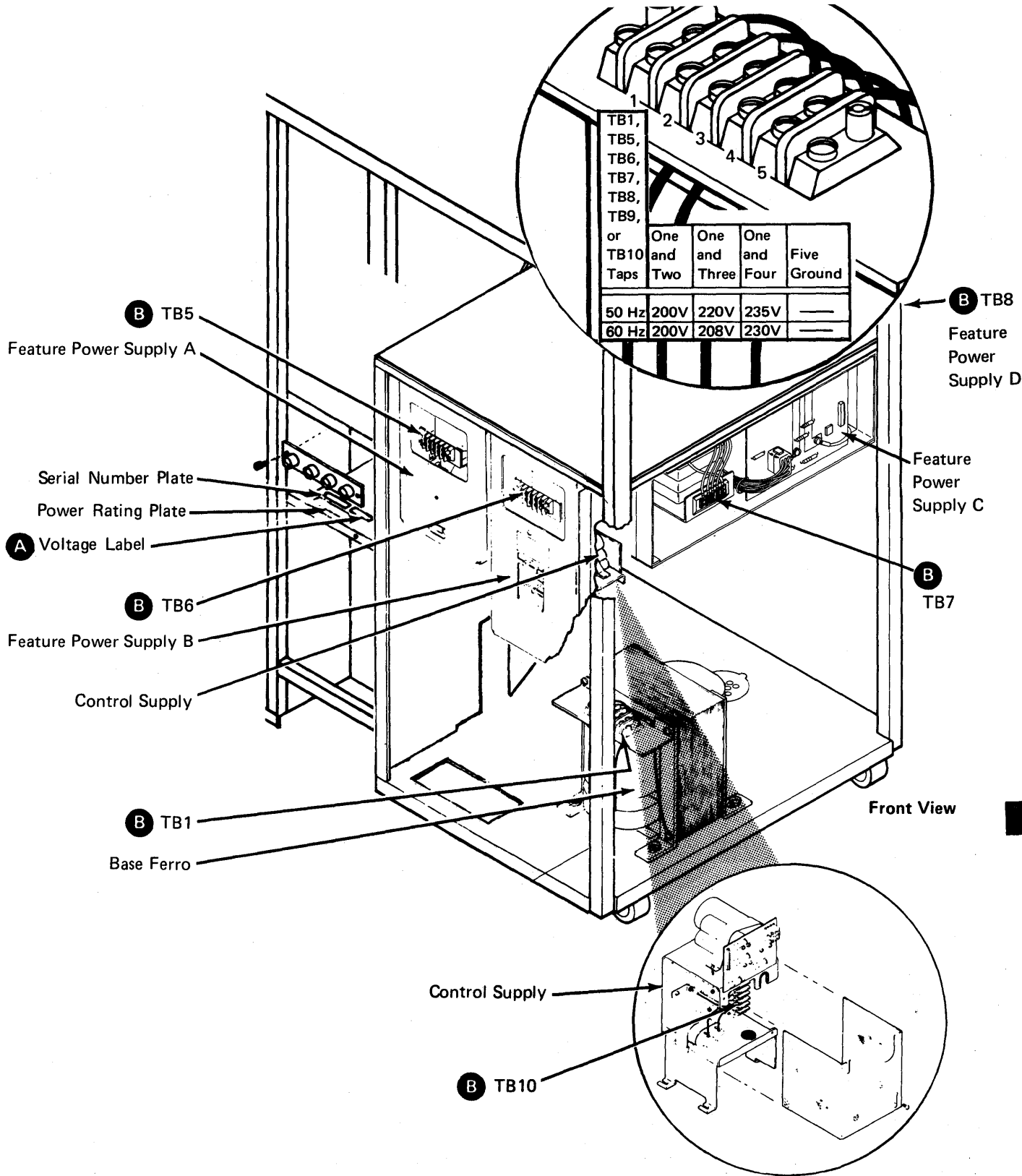


Figure 45-2. Voltage Label and TB Locations

## 45-200 DISK STORAGE DRIVES

If the System/34 that you are installing has a 62EH drive, see paragraph 45-210; but if the system has a 62PC drive, see paragraph 45-220

### 45-210 62EH Disk Storage Drive

See Figure 45-3 and do the following (to both disk drives, if two are installed).

**Note:** Any time you move the system, ensure that the actuator lock handle **(A)** is in the On position and the spindle locking arm **(D)** is in the locked position.

1. Remove the drive belt cover **(F)**.
2. Loosen the two screws that hold the spindle locking arm **(D)**. Slide the spindle locking arm to the right, so that the long finger becomes the spindle ground. Tighten the two screws.
3. For old style motor only: If the motor lockscrew **(C)** was not loosened during the unpacking, loosen the motor lockscrew, press the motor toward the disk, and turn the lockscrew into the disk casting until it is tight. Also, ensure that the motor tension spring **(E)** is seated in its plastic socket.

For new style motor only: If the motor lockscrew **(C)** was not removed during the unpacking, remove the motor lockscrew, and install it into the hole **(J)** on the rear of the disk casting.

4. Ensure that the smooth side of the drive belt **(G)** is toward the pulley **(H)**, and that the belt does not touch the disk speed transducer.
5. Reinstall the drive belt cover **(F)**.
6. Turn the actuator lock handle **(A)** from the On (vertical) position to the Off (horizontal) position.
7. Remove retainer brace **(B)** to ensure that all cables and cards are seated correctly. Then, reinstall the retainer brace.
8. With an ohmmeter, check for continuity (less than 5 ohms) from the disk drive(s) A and/or B drive motor frame to the ground connector on the AC line cord. (This check is to ensure that the drive motor(s) is correctly grounded.)

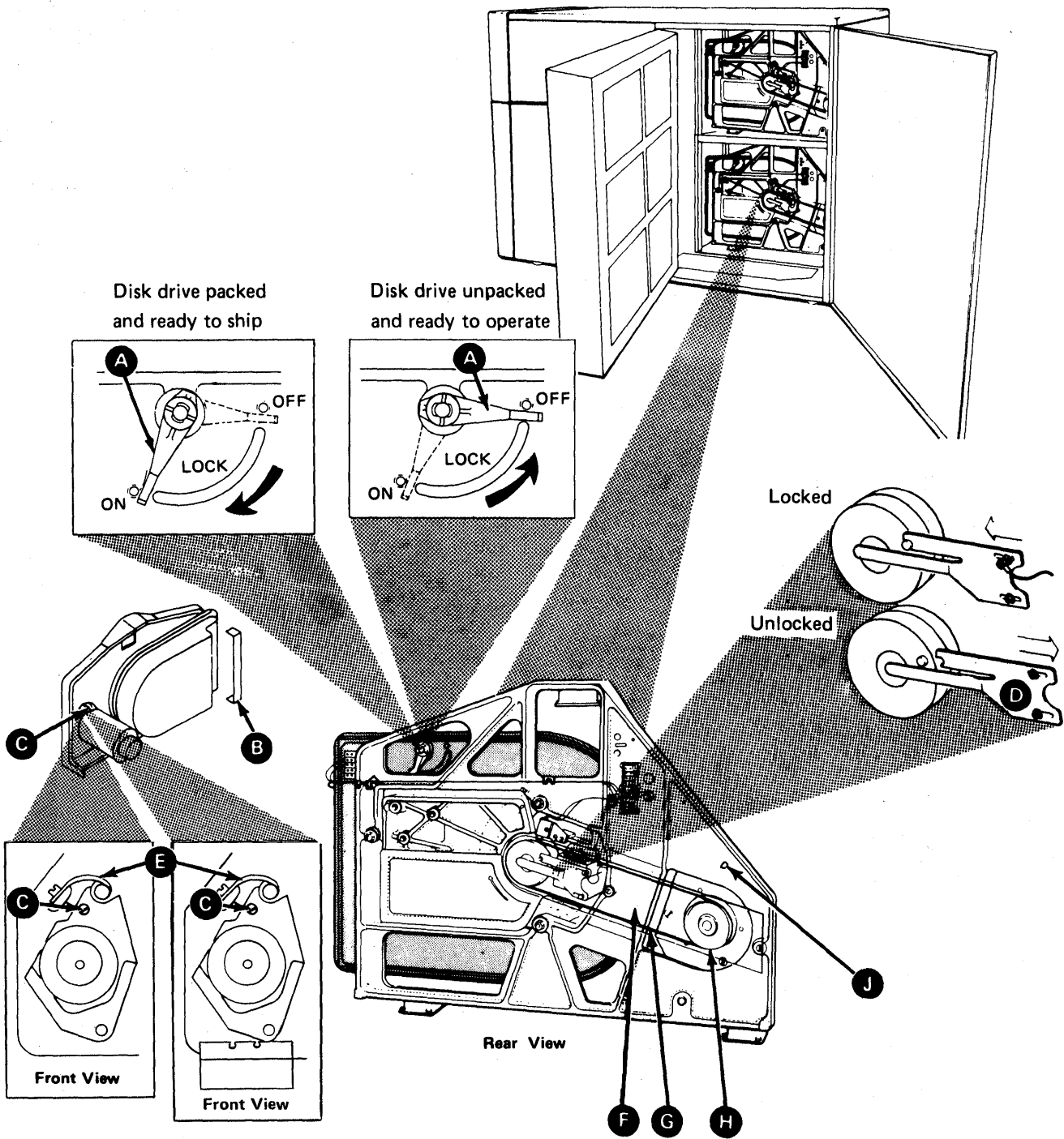


Figure 45-3. 62EH Disk Drive

## 45-220 62PC Disk Storage Drive

See Figure 45-4 and do the following (to all disk drives that are installed):

*Note:* When you move the system, ensure that the actuator lock knob **D** is in the locked position (turned fully clockwise).

1. Turn screw **A** counterclockwise and open the card gate.
2. Turn the actuator lock knob **D** counterclockwise (through 120 degrees) until the actuator lock reaches its stop. Ensure that the voltage connectors **C** are seated on the disk board **B**. Close the card gate and tighten the screw **A**.
3. If the disk has a motor lock **V**, loosen the two screws **W**, lift the motor lock, and tighten the two screws.
4. Ensure that the smooth side of the drive belt **F** is against the pulleys **E** and **G**. If not, loosen the two screws **H** and remove the belt guard **J**. Reinstall the belt (smooth side against the pulleys) and reinstall the belt guard.

5. Lift the motor against the belt tensioner spring **P**. When the pin **L** in the shaft **N** is free of the opening **M**, turn the shaft 90 degrees to hold the spring and lower the motor. Ensure that there is no gap at **S**. If there is a gap at **S**, loosen the two screws **K** and place the belt tensioner so that there is no gap at **S** and tighten the screws. Lift the motor against the belt tensioner spring **P**, turn the shaft **N** 90 degrees to place the pin **L** in the opening **M**, and lower the motor.

*Note:* The retaining bracket **R** must overlap the motor bracket **Q** as shown.

6. Remove the two screws **U** and the card gate cover **T**. Ensure that all the cables and cards are seated. Reinstall the card gate cover and the two screws.
7. With an ohmmeter, check for continuity (less than 5 ohms) from the disk drive motor frame to the ground connector on the AC line cord. (This check is to ensure that the drive motor is correctly grounded.)

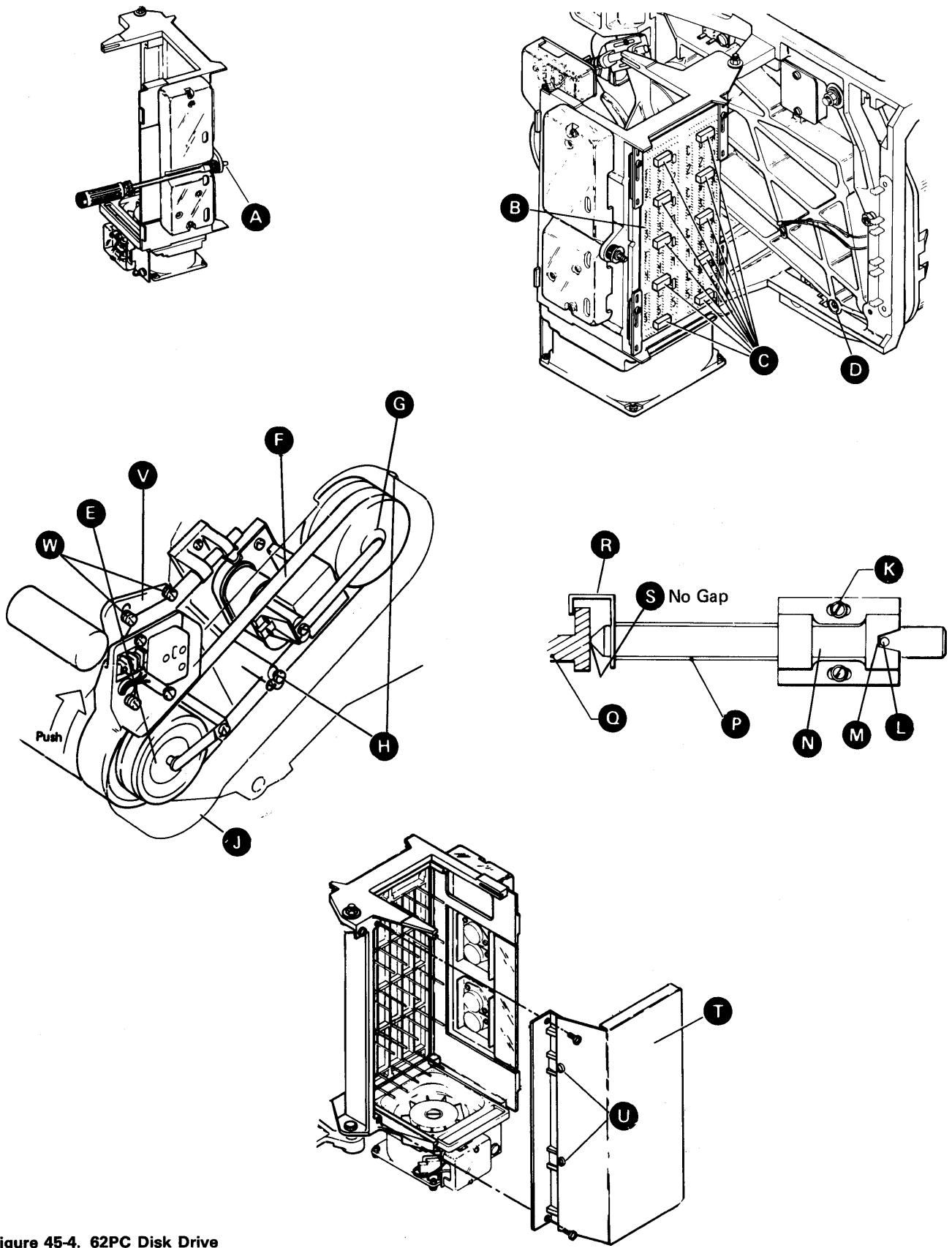


Figure 45-4. 62PC Disk Drive

### 45-300 DISKETTE DRIVE

See Figure 45-5 and do the following:

1. Remove the safety cover **C** if it was not removed earlier.
2. Ensure that the diskette drive logic card and all cables and connectors are correctly seated **A**.
3. Turn the drive pulley **B** by hand to ensure that it turns freely.
4. With an ohmmeter, check for continuity (less than 5 ohms) from the diskette drive motor frame to the ground connector on the AC line cord. (This check is to ensure that the drive motor is correctly grounded.)
5. Reinstall the safety cover **C**.

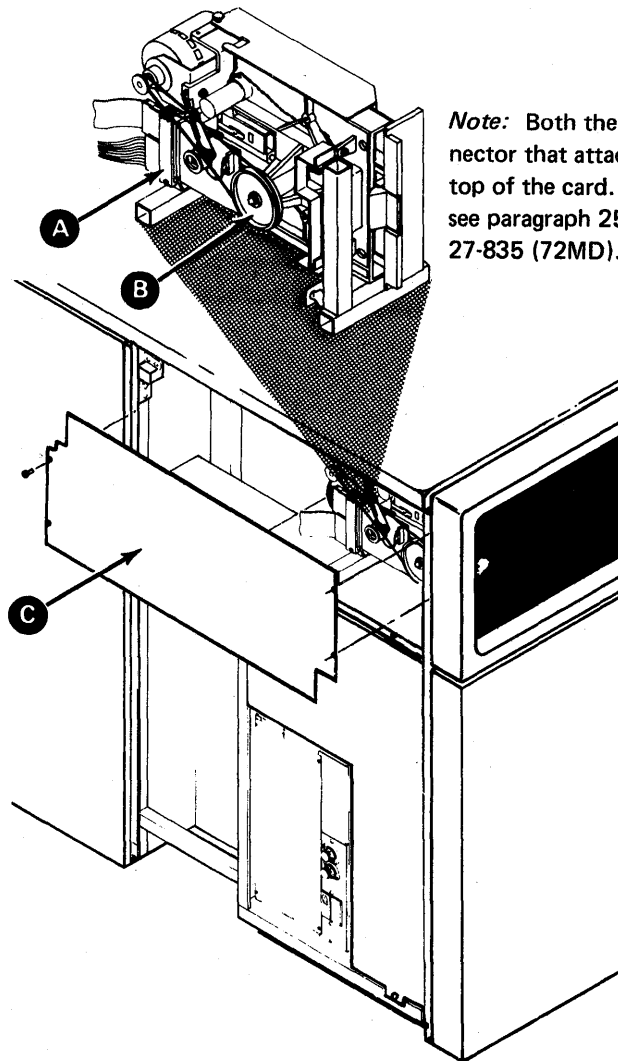


Figure 45-5. Diskette Drive

#### **45-400 LINE PRINTERS AND DATA COMMUNICATIONS CABLES**

If the System/34 that you are installing does not have a line printer or data communications, go to paragraph 45-500.

#### **45-405 IBM 3262 Printer**

If the System/34 that you are installing does not have a 3262 Printer, go to paragraph 45-410.

1. Unpack and install the 3262 Printer as described in the 3262 Printer unpacking and installation instructions.
2. Remove the cable tower cover and connect the 3262 Printer I/O cables and the ground strap to the cable tower as shown in Figure 45-6. Do not install the cable retainer until all cables are attached to the cable tower.
3. Verify that the jumpers on the 3262 adapter cards (A-A2T2 and A-A2U2) are in the correct locations for the printer being installed. (See paragraph 08-500.)
4. If the System/34 that you are installing does not have data communications, install the cable retainer and reinstall the cable tower cover (Figure 45-6).
5. Go to paragraph 45-500.

#### **45-410 IBM 5211 Printer**

If the System/34 that you are installing does not have a 5211 Printer, go to paragraph 45-420.

1. Unpack and install the 5211 Printer as described in the 5211 Printer unpacking and installation instructions.
2. Remove the cable tower cover and connect the 5211 printer I/O cables and the ground strap to the cable tower as shown in Figure 45-6. Do not install the cable retainer until all cables are attached to the cable tower.
3. Verify that the jumpers on the 5211 adapter card (A-A2T2) are in the correct locations for the printer being installed. (See paragraph 07-500.)
4. If the System/34 that you are installing does not have data communications, install the cable retainer and reinstall the cable tower cover (Figure 45-6).
5. Go to paragraph 45-500.

#### **45-420 External Modem EIA/CCITT**

If the System/34 that you are installing does not have an external modem, go to paragraph 45-430. If the System/34 that you are installing has an MLCA (multiline communications adapter), go to step 2.

1. Attach the communications cable to D-B7 (line 1) or to D-B6 (line 2) as shown in Figure 45-6. The other end of the cable is to be attached later. Go to step 3.
2. Attach the communications cable to D-B6-1 (line 1), D-B6-2 (line 2), D-B7-1 (line 3), or D-B7-2 (line 4) as shown in Figure 45-7. The other end of the cable is to be attached later.
3. If this is the last communications line to be installed, install the cable retainer and reinstall the cable tower cover (Figure 45-6).
4. Go to paragraph 45-430.

#### 45-430 Digital Data Service Adapter

If the System/34 that you are installing does not have a DDSA (digital data service adapter), go to paragraph 45-440. If the System/34 that you are installing has an MLCA (multiline communications adapter), go to step 2.

1. Attach the communications cable to D-B7 (line 1) or to D-B6 (line 2) as shown in Figure 45-6. The other end of the cable is to be attached later. Go to step 3.
2. Remove the D-B8 plate (if installed) from the cable tower (see Figure 45-7) and pull the communications cable through the D-B8 opening.
3. If this is the last communications line to be installed, install the cable retainer and reinstall the cable tower cover (Figure 45-6).
4. Go to paragraph 45-440.

#### 45-440 IBM 1200 BPS Integrated Modem

If the System/34 that you are installing does not have a 1200-bps integrated modem, go to paragraph 45-450.

1. If the communications cable is not attached to the system, attach the cable to the cable tower connector D-B7 (line 1) or to D-B6 (line 2) as shown in Figure 45-6 (for first or second communications adapter). For MLCA, see Figure 45-7 to attach the cable to the cable tower.
2. If the communications cable is attached to the system:
  - a. Remove the D-B8 plate (if installed) from the cable tower (see Figure 45-6 for first or second communications adapter, or Figure 45-7 for MLCA).
  - b. Pull the communications cable through the D-B8 opening.
  - c. Reinstall the D-B8 plate (first or second communications adapter only) with the cable placed in the correct location, as shown in Figure 45-6. For MLCA, do not reinstall the D-B8 plate.

The other end of this cable is to be installed later.

**Note:** For a first or second communications adapter, paragraphs 31-110 through 31-150 describe the internal connection of the cable that is passed through the D-B8 plate. For MLCA, see the location section for the line adapter or modem to be installed.

3. If this is the last communications line to be installed, install the cable retainer and reinstall the cable tower cover (Figure 45-6).
4. Go to paragraph 45-450.



#### **45-450 IBM 2400 BPS Integrated Modem**

If the System/34 that you are installing does not have a 2400-bps integrated modem, go to paragraph 45-460.

1. If the communications cable is not attached to the system, attach the cable to the cable tower connector D-B7 (line 1) or to D-B6 (line 2) as shown in Figure 45-6.
2. If the communications cable is attached to the system:
  - a. Remove the D-B8 plate from the cable tower (see Figure 45-6).
  - b. Pull the communications cable through the D-B8 opening.
  - c. Reinstall the D-B8 plate with the cable placed in the location shown in Figure 45-6.

The other end of this cable is to be installed later.

*Note:* Paragraph 31-150 describes the internal connection of the cable that is passed through the D-B8 plate.

3. If this is the last communications line to be installed, install the cable retainer and reinstall the cable tower cover (Figure 45-6).
4. Go to paragraph 45-460.

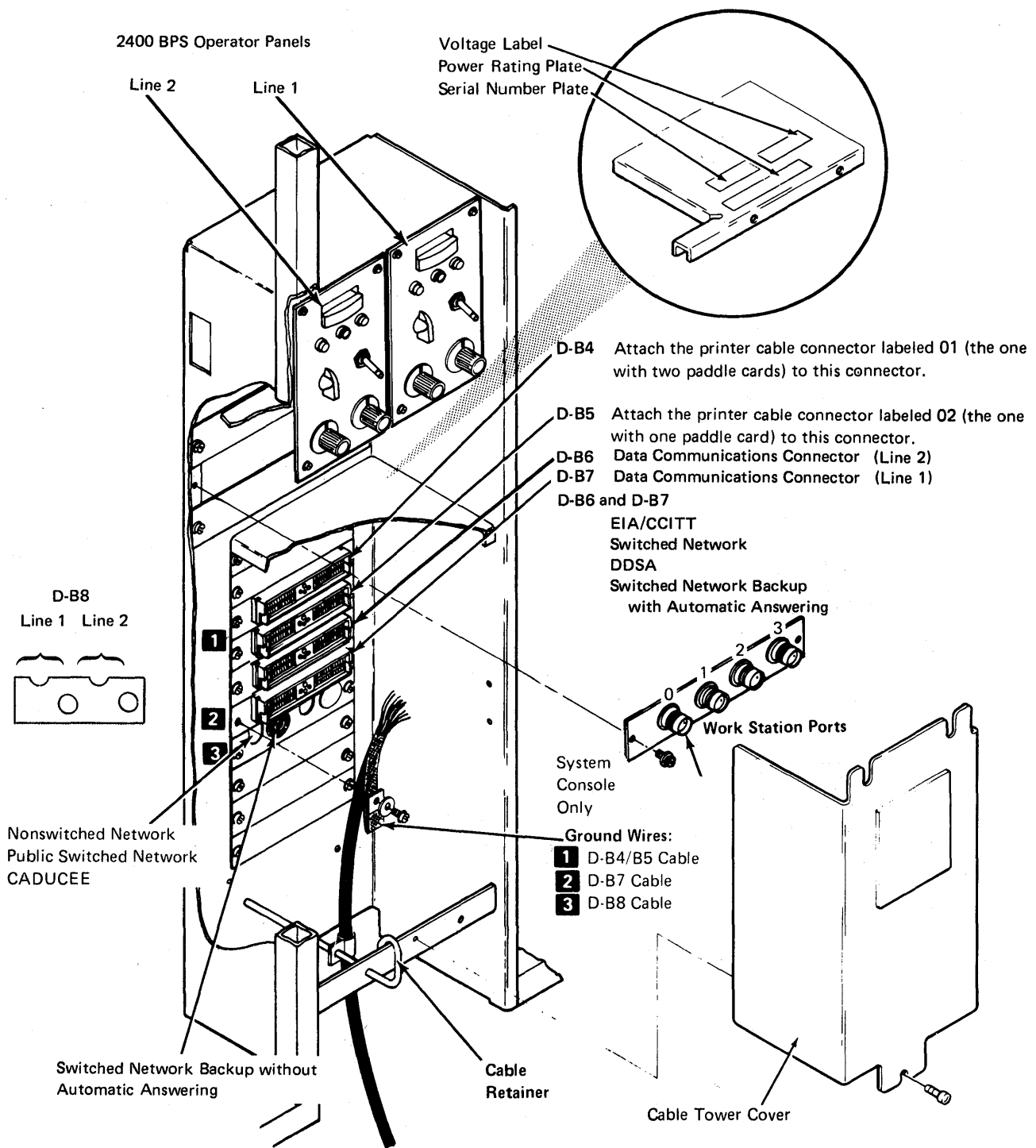


Figure 45-6. 5340 Cable Tower (With First or Second Communications Adapter)

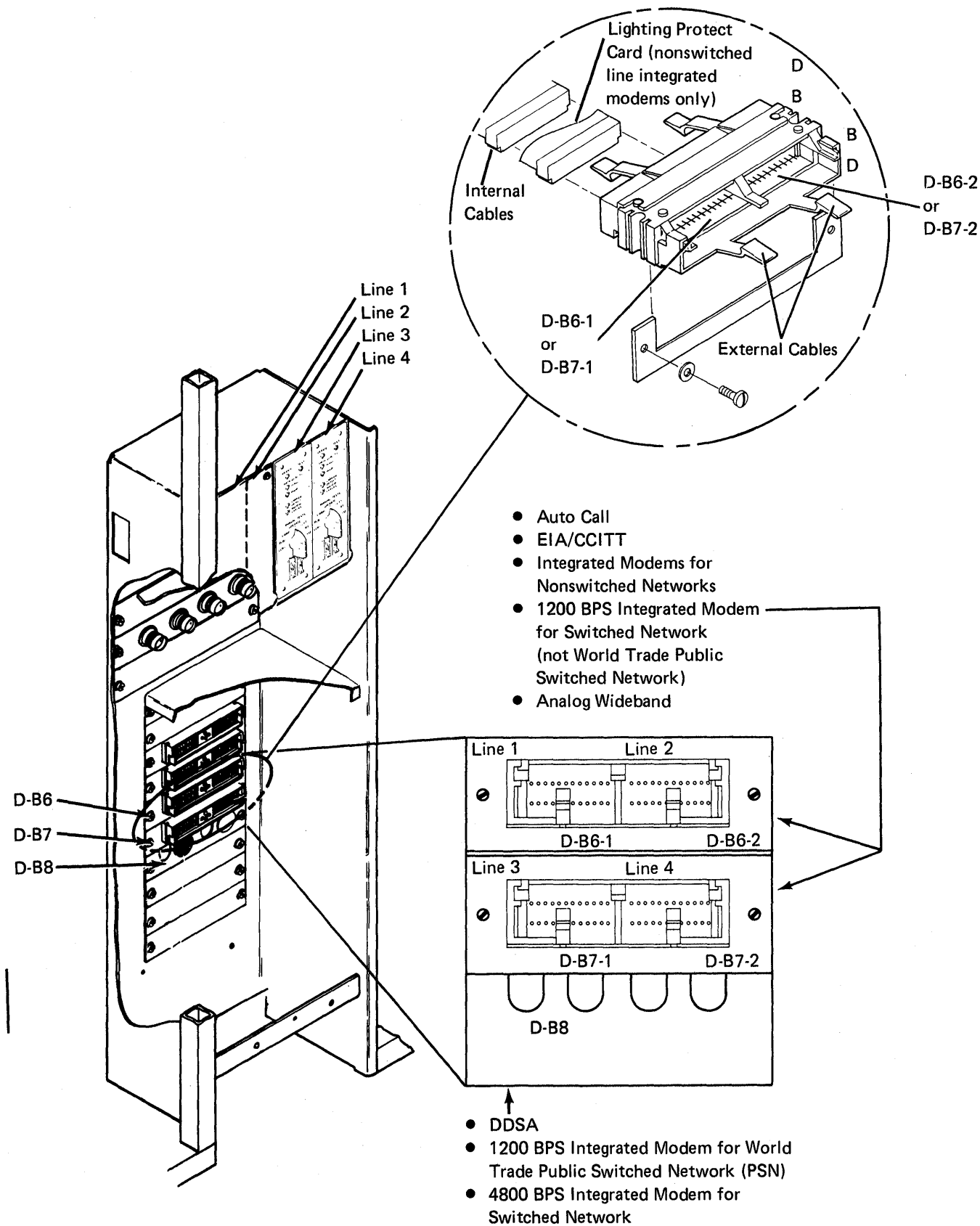


Figure 45-7. Cable Tower Locations for MLCA External Cables

#### 45-460 IBM 4800 BPS Integrated Modem

If the System/34 that you are installing does not have a 4800-bps integrated modem, go to paragraph 45-470.

1. If the communications cable is not attached to the system, attach the cable to the cable tower connector as shown in Figure 45-7.
2. If the communications cable is attached to the system, remove the D-B8 plate (if installed), and pull the communications cable(s) through the D-B8 opening. (This plate will not be reinstalled.)

Note: See paragraph 30-400 for descriptions of the internal connections of the cables that go through the D-B8 opening.

3. If this is the last communications line to be installed, install the cable retainer and reinstall the cable tower cover (Figure 45-6).
4. Go to paragraph 45-470.

#### 45-470 Analog Wideband Adapter

If the System/34 that you are installing does not have an analog wideband adapter, go to paragraph 45-480.

1. Attach the communications cable to D-B6-1 (line 1), D-B6-2 (line 2), D-B7-1 (line 3), or D-B7-2 (line 4) as shown in Figure 45-7. The other end of the cable is to be attached later.
2. If this is the last communications line to be installed, install the cable retainer and reinstall the cable tower cover (Figure 45-6).
3. Go to paragraph 45-480.

#### 45-480 Autocall Adapter

If the System/34 that you are installing does not have an external autocall unit, go to paragraph 45-490.

1. Attach the communications cable to D-B6-1 (line 1), D-B6-2 (line 2), D-B7-1 (line 3), or D-B7-2 (line 4) as shown in Figure 45-7. The other end of the cable is to be attached later.
2. If this is the last communications line to be installed, install the cable retainer and reinstall the cable tower cover (Figure 45-6).
3. Go to paragraph 45-490.

#### 45-490 X.21 Line Adapter

If the System/34 that you are installing does not have an X.21 line adapter, go to paragraph 45-500.

1. Attach the communications cable to D-B6-1 (line 1), D-B6-2 (line 2), D-B7-1 (line 3), D-B7-2 (line 4) as shown in Figure 45-7. The other end of the cable is to be attached later.
2. If this is the last communications line to be installed, install the cable tower cover (Figure 45-6).
3. Go to paragraph 45-500.

## 45-500 IBM 5250 INFORMATION DISPLAY SYSTEM

The following manuals (or translated editions for World Trade) contain instructions that let the customer prepare work stations that are part of the IBM 5250 Information Display System:

- *IBM 5251 Model 1 and Model 11 Display Station Setup Procedure, GA21-9286*
- *IBM 5252 Dual Display Station Setup Procedure, GA21-9288*
- *IBM 5255 Display Station Model 1 Setup Procedure, GA09-1624*
- *IBM 5255 Display Station Model 2 Setup Procedure, GA09-1627*
- *IBM 5224 Printer Models 1, 2, and 12 Setup Procedure, GA34-0093*
- *IBM 5225 Printer Models 1, 2, 3, 4, 11, and 12 Setup Procedure, GA34-0085*
- *IBM 5256 Printer Setup Procedure, GA21-9290*

If you aid the customer in preparing any of the 5250 Work Stations, report this work on the *Installation Activity Document* sent with the work station.

## 45-510 Twinaxial Signal Cables

1. Copy the information on the *Work Station Network Diagram* that the customer filled out, onto the form attached inside the 5340 system unit near the system output ports.
2. See the *Work Station Network Diagram* and ensure that the twinaxial cables are connected to their assigned ports as described in paragraphs 45-520 through 45-530.

## 45-520 IBM 5251 Display Stations

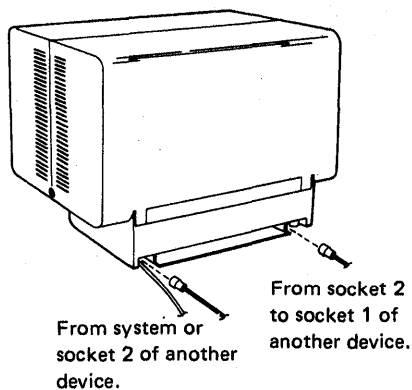
If the System/34 that you are installing does not have an IBM 5251 Display Station, go to paragraph 45-525.

Ensure that Section I of the *IBM 5251 Model 1 and Model 11 Display Station Setup Procedure, GA21-9286*, has been completed for all 5251 Display Stations that will be used on the system that you are installing.

The IBM 5251 Display Station that will be used as the system console must be connected to port 0 on the 5340. The twinaxial cable that is included in the System/34 shipping group is to be used to attach the system console. All other 5251 Display Stations must be connected to ports 1 through 3, or to another display station or printer (5224, 5225, or 5256) that has the Cable Thru feature installed.

To attach a 5251 Display Station as the system console:

1. Connect the twinaxial cable from port 0 on the cable tower in the 5340 System Unit (see Figure 45-6) to the system console.
  - a. Insert the cable that comes from port 0 through the opening on the back of the display station.
  - b. Connect the cable to socket 1 (see Figure 45-8).
2. If the system console does not have the Cable Thru feature as shown in **A** of Figure 45-8, the installation of the system console is complete.
3. If the system console has a group of four switches and a second cable socket (Cable Thru feature is installed), set the switches as shown in **B** of Figure 45-8.



To attach a 5251 Display Station as a work station other than the system console:

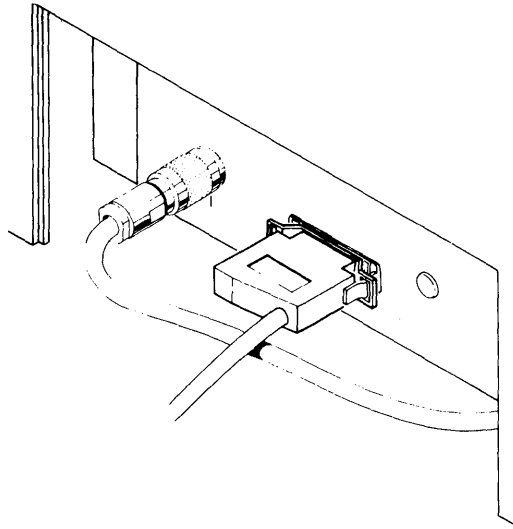
1. Connect a twinaxial cable from port 1, 2, or 3 of the 5340 to socket 1 of the display station. This cable may also come from the output socket of another display station or printer (5224, 5225, or 5256) that has the Cable Thru feature.
  - a. Insert the cable that comes from the 5340 or from another work station through the opening on the back of the display station.
  - b. Connect the cable to socket 1 on the front of the display station (see Figure 45-8).
2. If the display station does not have the Cable Thru feature, it must be the last work station on the port.

**Note:** Each work station connected to the same port must be assigned a different address (7 is not a valid address). Since a display station without the Cable Thru feature has a station address of 0, no other work station attached to the same port can be assigned an address of 0.

3. If the display station has the Cable Thru feature, set the switches as assigned in the *Work Station Network Diagram* and described in **B** and **C** of Figure 45-8.

**A Without Cable Thru Feature**

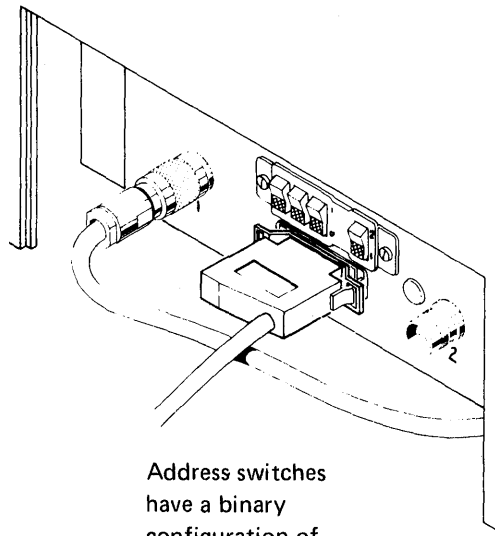
Station address is automatically set to 0 and the line is terminated.



**B With Cable Thru Feature Not Being Used**

(Used for the system console or for the last station on a port.)

Address and terminator switches are shown in the correct position for the system console; that is, the address switches are set for an address of 0 and the terminator switch is set to 1 to terminate the line. For the last station on a port, the address switches can be set to any valid address, and the terminator switch must be set to 1.



Address switches have a binary configuration of 4, 2, and 1 (left to right).

**C With Cable Thru Feature Being Used**

The address switches are set for an address of 5 and the terminator switch is set to 2 to permit cable thru.

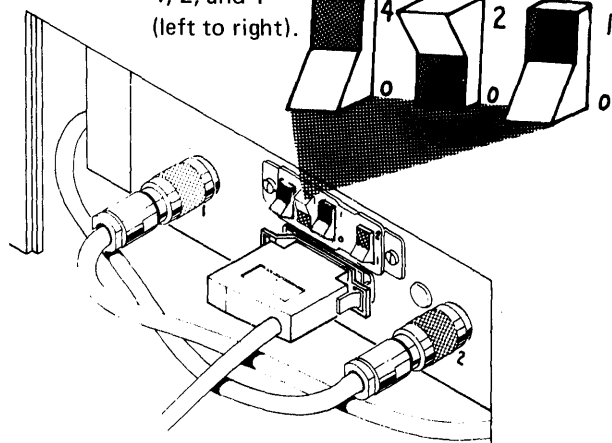


Figure 45-8. 5251 Switches and Cable Connections

## 45-525 IBM 5252 Dual Display Stations

If the System/34 that you are installing does not have an IBM 5252 Dual Display Station, go to paragraph 45-527.

Ensure that Section 1 and Section 2 of the *IBM 5252 Dual Display Station Setup Procedure*, GA21-9288, have been completed for all 5252 Display Stations that will be used on the system that you are installing.

If the IBM 5252 Display Station will be used as the system console, it must be connected to port 0 on the 5340. The twinaxial cable that is included in the System/34 shipping group is to be used to attach the system console. All other 5252 Display Stations must be connected to ports 1 through 3, or to another display station or printer (5224, 5225, or 5256) that has the Cable Thru feature installed.

To attach a 5252 Display Station as the system console:

1. Connect the twinaxial cable from port 0 on the cable tower in the 5340 System Unit (see Figure 45-6) to socket 1 on the system console.
2. If the system console does not have a terminator switch or any address switches as shown in **A** of Figure 45-9, the installation of the system console is complete.
3. If the system console has a terminator switch, two address switches, and a second cable socket (Cable Thru feature is installed), set the switches as shown in **B** of Figure 45-9.

To attach a 5252 Display Station as a work station other than the system console:

1. Connect a twinaxial cable from port 1, 2, or 3 of the 5340 to socket 1 of the display station. This cable may also come from the output socket of another display station or printer (5224, 5225, or 5256) that has the Cable Thru feature.
2. If the display station does not have the Cable Thru feature, it must be the last work station on the port.

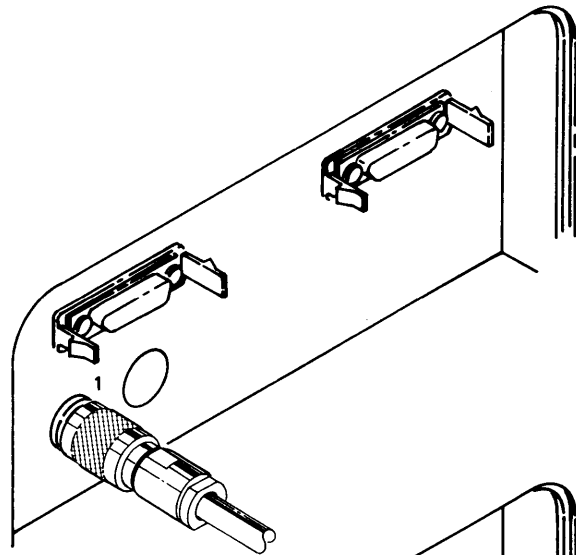
*Note:* Each work station connected to the same port must be assigned a different address (addresses of 6 and 7 are not valid for the 5252). Because a display station without the Cable Thru feature has station addresses of 0 and 1, no other work station attached to the same port can be assigned an address of 0 and 1.

3. If the display station has the Cable Thru feature, set the switches as assigned in the *Work Station Network Diagram* and described in **B** and **C** of Figure 45-9.



**A Without Cable Thru Feature**

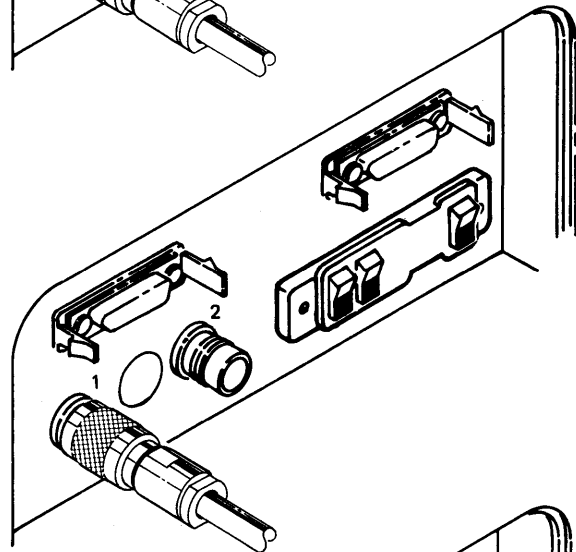
Station address is automatically set to 0 and 1.



**B With Cable Thru Feature Not Being Used**

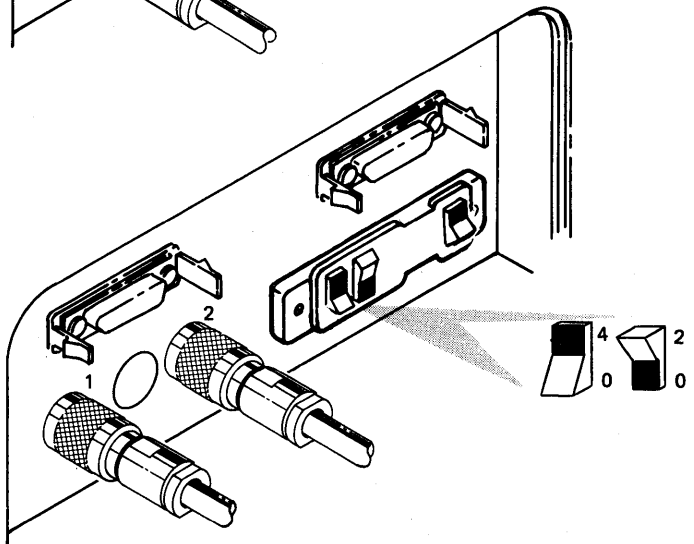
(Used for the system console or for the last station on a port.)

Address and terminator switches are shown in the correct position for the system console; that is, the address switches are set for an address of 0 and the terminator switch is set to 1 to terminate the line. For the last station on a port, the address switches can be set to any valid address, and the terminator switch must be set to 1.



**C With Cable Thru Feature Being Used**

The address switches are set for addresses of 4 and 5; the terminator switch is set to 2 to permit cable thru.



*Note:* The address switches can be set for addresses of 0, 2, or 4 for one of the dual stations. The other station is automatically set for an address of 1, 3, or 5 respectively.

**Figure 45-9. 5252 Switches and Cable Connections**

## 45-527 IBM 5255 Display Stations

If the System/34 that you are installing does not have an IBM 5255 Display Station, go to paragraph 45-530.

Ensure that Section 1 and Section 2 of the *IBM 5255 Display Station Model 1 Setup Procedure*, GA09-1624, or *IBM 5255 Display Station Model 2 Setup Procedure*, GA09-1627, have been completed for all 5255 Display Stations that will be used on the system that you are installing.

If the IBM 5255 Display Station will be used as the system console, it must be connected to port 0 on the 5340. The twinaxial cable that is included in the System/34 shipping group is to be used to attach the system console. All other 5255 Display Stations must be connected to ports 1 through 3, or to another display station or printer (5224, 5225, or 5256) that has the Cable Thru feature installed.

*Note:* The IBM 5255 Display Station can be used only when work station control expansion C is installed.

To attach a 5255 Display Station as the system console:

1. Connect the twinaxial cable from port 0 on the cable tower in the 5340 System Unit (see Figure 45-6) to socket 1 on the system console.
2. If the system console does not have a terminator switch or any address switches as shown in **A** of Figure 45-10, the installation of the system console is complete.
3. If the system console has a group of four switches, and a second cable socket (Cable Thru feature is installed), set the switches as shown in **B** and **D** of Figure 45-10.

To attach a 5255 Display Station as a work station other than the system console:

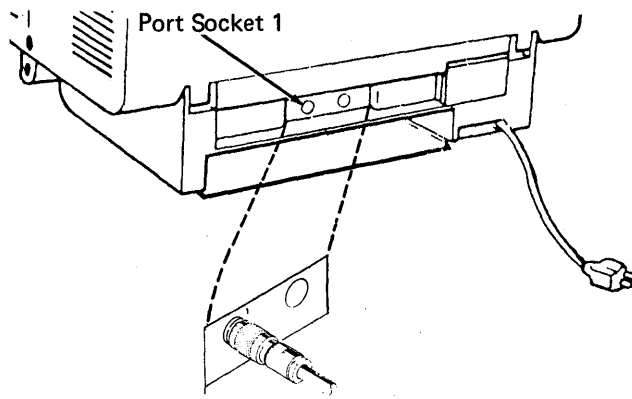
1. Connect a twinaxial cable from port 1, 2, or 3 of the 5340 to socket 1 of the display station. This cable may also come from the output socket of another work station (display station or printer) that has the Cable Thru feature.
2. If the display station does not have the Cable Thru feature, it must be the last work station on the port.

*Note:* Each work station connected to the same port must be assigned a different address (address 7 is not valid for the 5255). Because a display station without the Cable Thru feature has station addresses of 0, no other work station attached to the same port can be assigned an address of 0.

3. If the display station has the Cable Thru feature, set the switches as assigned in the *Work Station Network Diagram* and described in **B**, **C**, and **D** of Figure 45-10.

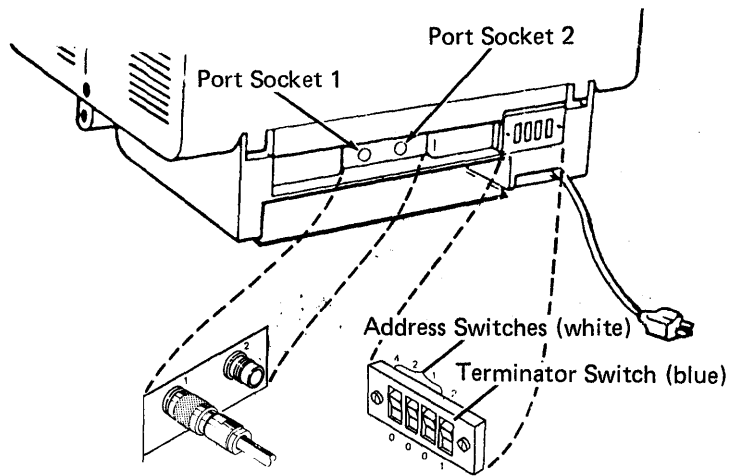
**A Without Cable Thru Feature**

Station address is automatically set to 0 and 1.



**B With Cable Thru Feature Not Being Used**  
(Used for the system console or for the last station on a port.)

Address and terminator switches are shown in the correct position for the system console; that is, the address switches are set for an address of 0 and the terminator switch is set to 1 to terminate the line. For the last station on a port, the address switches can be set to any valid address, and the terminator switch must be set to 1 (see **D**).



**C With Cable Thru Feature Being Used**

The address switches are set for addresses of 4 and 5; the terminator switch is set to 2 to permit cable thru.

For any other station on a port, the address switches can be set to any valid address (see **D**).

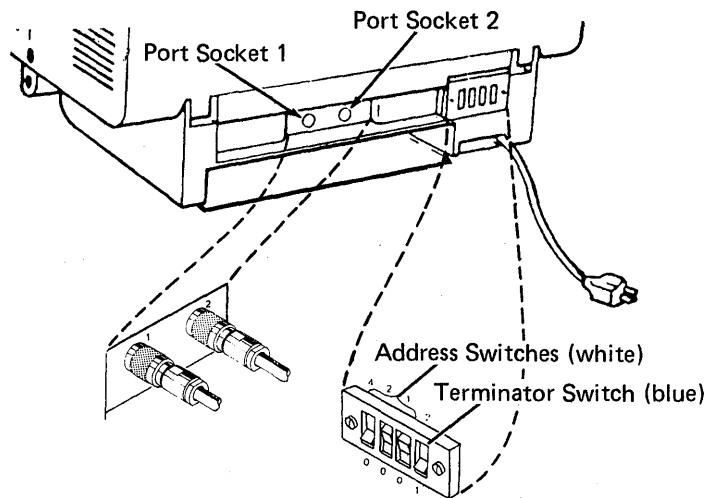
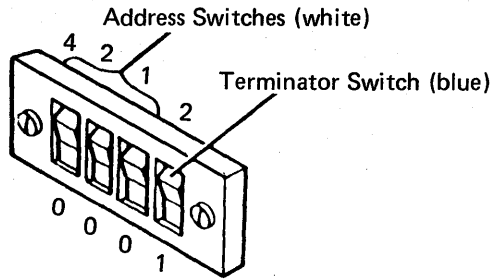


Figure 45-10 (Part 1 of 2). 5255 Switches and Cable Connector

## Setting the Switches

There are two types of switches to set: address and terminator.



Set the switches:

1. Contact the person responsible for assigning the work station address (for example, your supervisor or system operator). Ask for your work station address, which will be a number from 0 through 6.
2. Set the address switches to the address you have received. Use the table below to determine the settings of the three address switches.

Work Station Addresses	Switches
0	
1	
2	
3	
4	
5	
6	
7	

*Note:* The address switches can be set for addresses of 0, 2, or 4 for one of the dual stations. The other station is automatically set for an address of 1, 3, or 5, respectively.

Figure 45-10 (Part 2 of 2). 5255 Switches and Cable Connector

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#### 45-530 IBM 5256 Printer

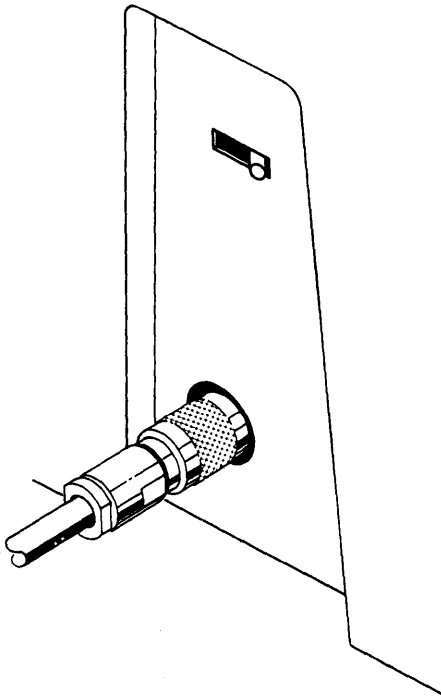
If the System/34 that you are installing does not have an IBM 5256 Printer, go to paragraph 45-540.

Ensure that Section I of the *IBM 5256 Printer Setup Procedure*, GA21-9290, has been completed for all 5256 printers that will be used on the system you are installing.

To attach a 5256 Printer to the system:

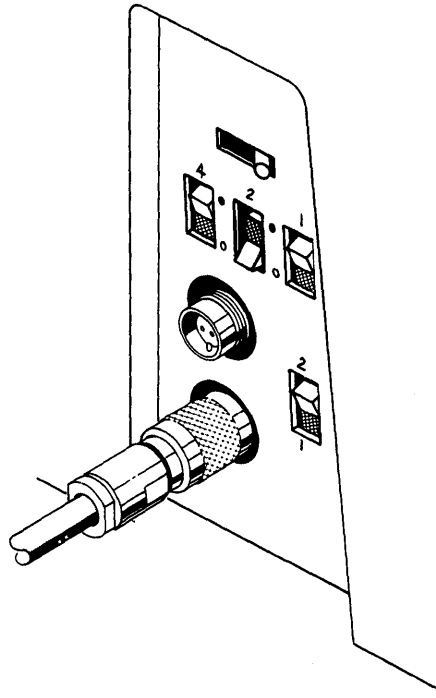
1. Connect a twinaxial cable from port 1, 2, or 3 of the 5340 to the bottom cable socket on the rear of the 5256 Printer. This cable may also come from the output of another work station (display station or printer) that has the Cable Thru feature.
2. If the printer does not have the Cable Thru feature as shown in **A** of Figure 45-11, it must be the last work station on the port. Its address will be 0.
3. If the printer has the Cable Thru feature, set the switches as assigned in the *Work Station Network Diagram* and described in **B** and **C** of Figure 45-11. (7 is an invalid address.)

**A** Without Cable Thru Feature



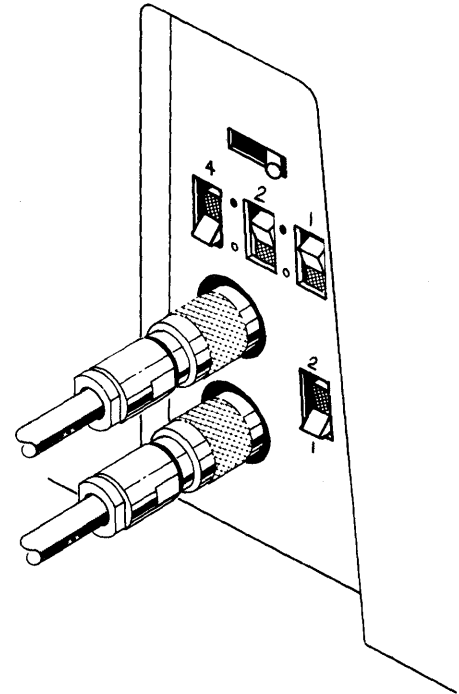
Station address is automatically set to 0.

**B** With Cable Thru Feature (used for the last device on a port)



In this example the address switches are set for an address of 2; the terminator switch must be set to position 1 to terminate the line.

**C** With Cable Thru Feature Being Used



In this example the address switches are set for an address of 4; the terminator switch must be set to position 2 to permit cable thru.

**Figure 45-11. 5256 Switches and Cable Connections**

#### 45-540 IBM 5225 Printer

If the System/34 that you are installing does not have an IBM 5225 Printer, go to paragraph 45-550.

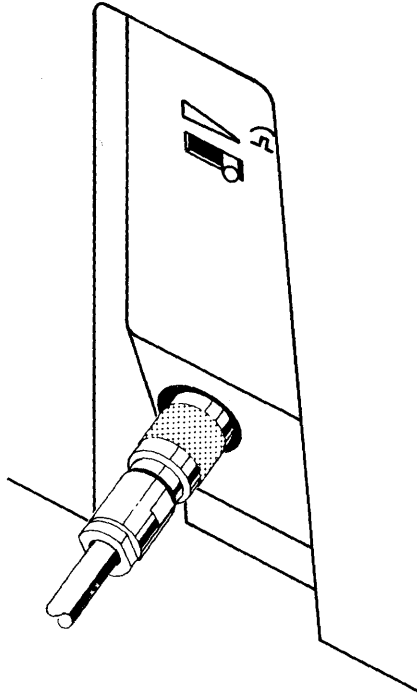
Ensure that Section I of the *IBM 5225 Printer Setup Procedure*, GA34-0085 has been completed for the 5225 Printer that will be used on the system you are installing.

To attach a 5225 Printer to the system.:

1. Connect a twinaxial cable from port 1, 2, or 3 of the 5340 to the left cable socket on the rear of the 5225 Printer. This cable may also come from the output socket of another work station (display station or printer) that has the Cable Thru feature.
2. If the printer does not have the Cable Thru feature as shown in **A** of Figure 45-12, it must be the last work station on the port. Its address will be 0.
3. If the printer has the Cable Thru feature, set the switches as assigned in the *Work Station Network Diagram* and described in **B** and **C** of Figure 45-12. (7 is an invalid address.)

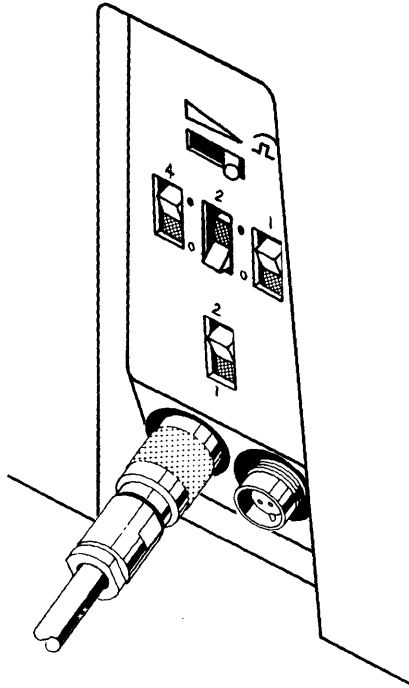


**A** Without Cable Thru Feature



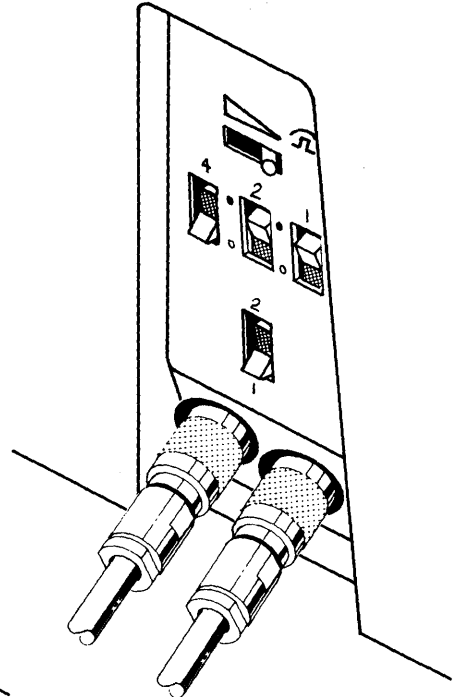
Station address is automatically set to 0.

**B** With Cable Thru Feature (used for the last device on a port)



In this example, the address switches are set for an address of 2; the terminator switch must be set to position 1 to terminate the line.

**C** With Cable Thru Feature Being Used



In this example, the address switches are set for an address of 4; the terminator switch must be set to position 2 to permit cable thru.

Figure 45-12. 5225 Switches and Cable Connections

#### 45-550 IBM 5224 Printer

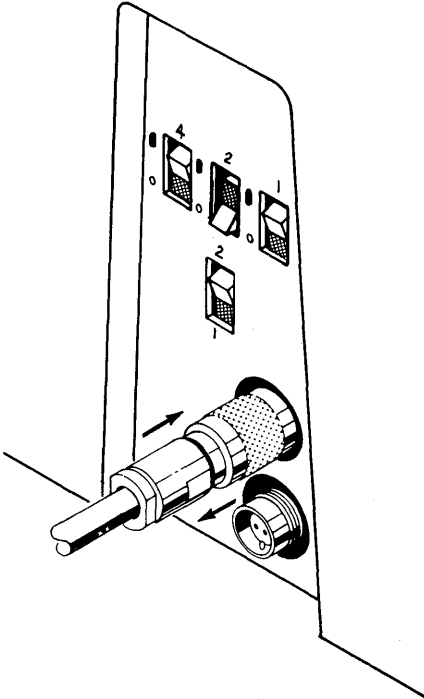
If the System/34 that you are installing does not have an IBM 5224 Printer, go to paragraph 45-600.

Ensure that Section I of the *IBM 5224 Printer Setup Procedure*, GA34-0093, has been completed for all 5224 Printers that will be used on the system you are installing.

To attach a 5224 Printer to the system:

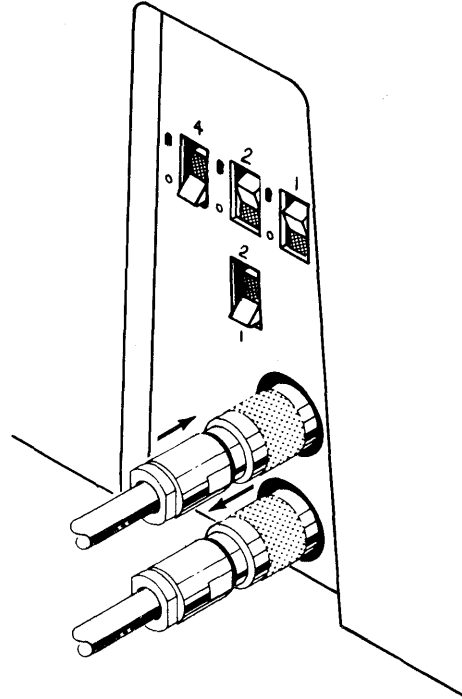
1. Connect a twinaxial cable from port 1, 2, or 3 of the 5340 to the top cable socket on the rear of the 5224 Printer. This cable may also come from the output of another work station (display station or printer) that has the Cable Thru feature.
2. Set the switches as assigned in the *Work Station Network Diagram* and described in **A** of Figure 45-13 (7 is an invalid address).
3. If the Cable Thru feature is used, connect the output twinaxial cable to another work station from the bottom cable socket at the rear of the 5224 Printer.
4. Set the switches as assigned in the *Work Station Network Diagram* and described in **B** of Figure 45-13 (7 is an invalid address).

**A** Used for  
Last Device  
on a Port



In this example, the address switches are set for an address of 2; the terminator switch must be set to position 1 to terminate the line.

**B** With Cable  
Thru Being  
Used



In this example, the address switches are set for an address of 4; the terminator switch must be set to position 2 to permit cable thru.

**Figure 45-13. 5224 Switches and Cable Connections**

## 45-600 SYSTEM TESTS

The physical installation of the base System/34 is now complete. You are now ready to check operation of the base System/34.

If IBM SSP is installed on your system, SYSTST (system test) can now be run (see paragraph 99-069 of this manual).

### CAUTION

Do not install any data communications equipment (paragraph 45-700) until you have completed the tests in paragraphs 45-610 through 45-630. Install the data communications equipment after the testing of the base system is complete.

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### 45-610 Power-On Tests

See Figure 45-14 and perform the following to ensure that the system can be powered on correctly:

1. Ensure that the following switches are in the Off position:
  - a. Power switch **G** is in the 0 position. If the keylock feature is installed, the key should be in the vertical (off) position.
  - b. CB1 **H** is down.
  - c. IPO switch **E** is in the 0 position.
2. Connect the power cord to the outlet.

3. Set circuit breaker CB1 **H** to the On (up) position. System power should not come on.
4. Press the Lamp Test switch **D** on the CE panel. The Power Check and Thermal Check indicators on the operator panel should come on. The control supply status indicator on the C-A1C2 card also comes on. (See the note in item 6 following.)
5. Set the IPO switch **E** to I (on). System power should not come on.
6. Set the Power switch **G** to I (on). If the keylock feature is installed, turn the key to the horizontal (on) position. System power should come on. The following indicate that the system powered on correctly:
  - The Power indicator on the operator panel is on.
  - The disk drive is turning.
  - The diskette drive is turning.
  - The gate fans are operating.
  - After power has been on for approximately 1 minute, the disk arm (for each disk drive) seeks to the home position of the disk.
  - When you press the Lamp Test switch **D** on the CE panel, all indicators on the operator panel and CE panel come on.
7. Power on the system console and the system printer.

Note: The control supply status indicator on the C-A1C2 card (located on the machine base below the CE panel) also comes on.

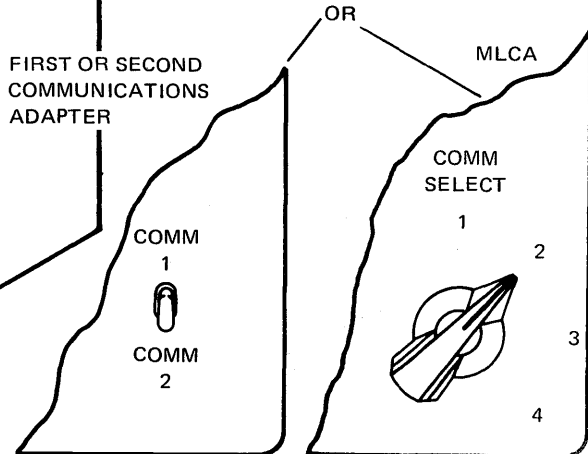
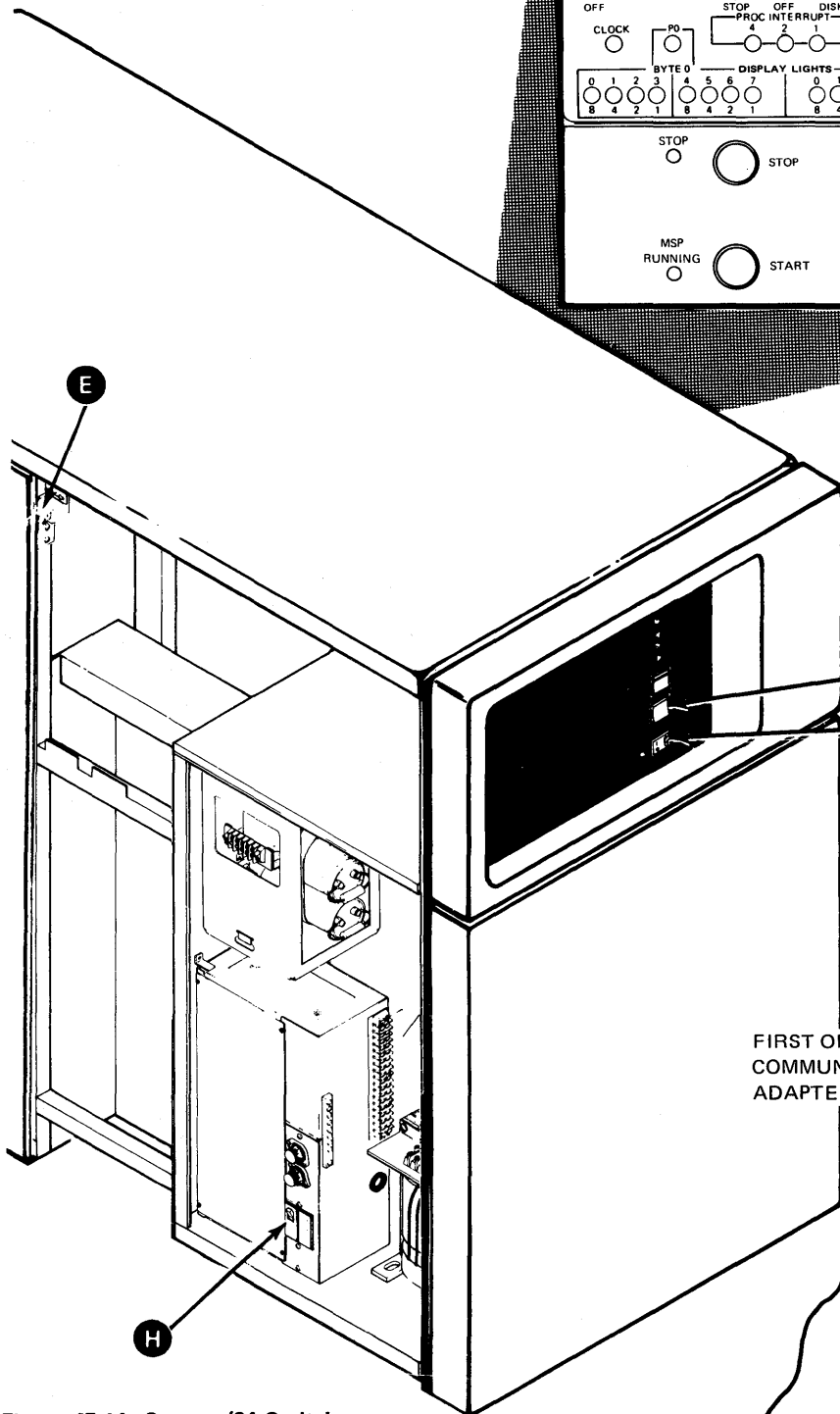
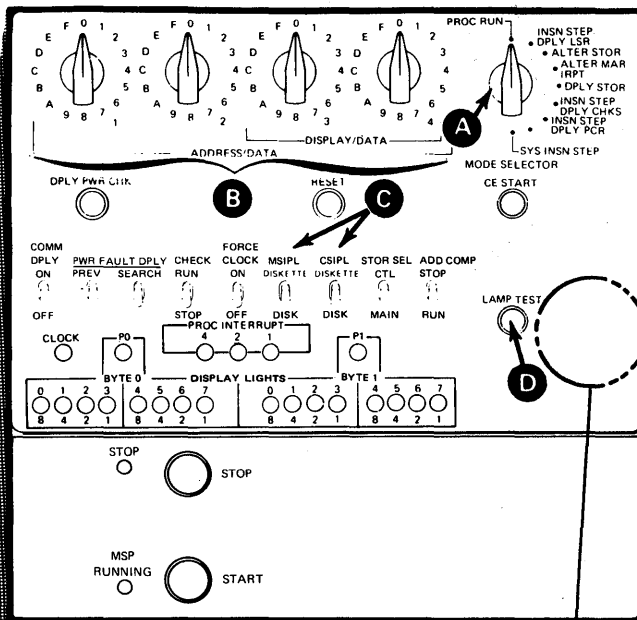


Figure 45-14. System/34 Switches

## 45-620 Initial Program Load Operation from Diskette

To do an initial program load operation from diskette:

1. Set the CE panel switches as follows (see Figure 45-14):
  - a. Set all four Address/Data switches **B** to 0000.
  - b. Set the CSIPL and MSIPL switches **C** to the Diskette position.
  - c. Set the Mode Selector switch **A** to the Proc Run position.
  - d. Set all other CE panel switches to the down position.
2. Insert diskette DIAGB1.
3. Press the Load switch **F** on the operator panel.
4. When the initial program load procedure is correctly completed, the Diagnostic Supervisor is loaded and the main menu is displayed on the system console. If there are any check conditions or control storage IPL wrap errors (except 80xx, 82xx, and 10xx checks, which are for data communications), use the maintenance documents to determine the cause.
5. Because the data communications installation is not complete, bypass data communications wrap errors that are displayed at this time by pressing the Enter key on the system console to continue the initial program load sequence.

## 45-630 System Diagnostics

1. Perform the following to verify that the system configuration is correct:

*Note:* If the configuration for the system printer is not correct, you cannot run a list on the printer. Return to the main menu, by pressing the Attn key, and select the PRINTER/DISPLAY option. Then, select the printer messages to system console option and continue with step a.

- a. Select the utilities option from the main menu.
  - b. Select the system configuration option from the utilities menu.
  - c. List the system configuration and verify that it matches the system you are installing. If data communications is to be installed, use the installation data table that you filled out earlier to answer the configuration questions for this feature now. Use Figure 45-15 for line 1, Figure 45-16 for line 2, or Figure 45-17 for MLCA. You will be instructed to install and test this feature later in the installation (see the machine history located in Volume D, *Field Service Logics*).
  - d. If the system configuration must be changed, make the necessary changes and run the CUSTOMIZ routine to move the microcode to the disk. After CUSTOMIZ is complete, do another initial program load operation from DIAGB1 (see paragraph 45-620), then continue with step 2.
2. Press the Attn key on the keyboard of the system console to return to the diagnostic supervisor main menu.

3. Select the MDI test option from the main menu and run the MDI tests for the disk and the system printer.
4. Run the work station controller MDI tests from the CE panel by using the following procedure:
  - a. Set the CE panel switches as follows:
    - Address/Data switches to F100
    - CSIPL to Diskette
    - MSIPL to Diskette
    - Mode Selector switch to Proc Run
    - All other CE panel switches to the down position
  - b. Insert DIAGB1 and press the Load switch.
  - c. When the system stops, set the Mode Selector switch to Insn Step/Dply LSR and display WRO. The work register display should be hex 0001.
  - d. Set the Mode Selector switch to Proc Run, insert DIAGB4 and press CE Start.
  - e. The tests should complete in 2 or 3 minutes. If the tests do not come to a normal end, see paragraph 99-062 for instructions.
5. Use the following procedure to run the diskette MDI tests:
  - a. Set the CE panel switches as follows:
    - Address/Data switches to F800
    - CSIPL and MSIPL switches to Disk
    - Mode Selector switch to Proc Run
    - All other CE panel switches to the down position
  - b. Press the Load switch on the operator panel.
  - c. Select the MDI MAPs option from the diagnostic supervisor main menu.
  - d. Select the DISKETTE option from the diagnostic supervisor menu to run the diskette MDI tests.
6. Go to paragraph 45-800 if the data communications feature is not installed.
7. Do not run the data communications MDI test at this time. You will be instructed to run these tests after you install any data communication equipment.

## 45-700 DATA COMMUNICATIONS (FIRST OR SECOND COMMUNICATIONS ADAPTER OR MLCA)

If the system that you are installing does not have any data communications features, go to paragraph 45-800.

If you are installing a system with an integrated modem, you may need either a dB meter (tool, IBM part 453545), or a multimeter (tool, IBM part 1749231) and a dB adapter (tool, IBM part 1749299) for modem adjustments.

1. Turn the system power off at the operator panel.
2. Ensure that the installation data tables are filled out for each line on the system. If you are installing the first or second communications adapter, these tables are Figures 45-15 for line 1 and Figure 45-16 for line 2. If you are installing MLCA, the table is Figure 45-17.
3. Set the switches on the communications adapter cards by using the installation data table. See paragraph 31-200 for the first or second communications adapter or paragraph 30-200 for MLCA.

**LINE 1 DATA COMMUNICATIONS INSTALLATION DATA TABLE (FIRST COMMUNICATIONS ADAPTER)**

Serial Number \_\_\_\_\_

Installation Date \_\_\_\_\_

Installing CE \_\_\_\_\_

The following information is needed to install data communications and to answer configuration questions correctly. It is important that you fill out this table because the MAPs contain reference to it. Some of the answers will depend on the communications configuration at the remote location.

To answer **A** and **B**, you will need information from the customer or the marketing representative. If necessary, get in touch with the customer or marketing representative at the central site where the order was made.

Enter a check (✓) in the box under your answers to the questions in **A**. In sections **B** through **F**, check only the boxes under the questions to which you answer yes.

**A COMMUNICATIONS ADAPTER (A-A2J2)**

Set the switches on the data communications adapter card in A-A2J2 as instructed in paragraph 31-200; then reinstall the adapter card.

The device address is hex 80  or hex 20 .

Does the modem need NRZI?

Yes  No  *Note:* NRZI can be used only in conjunction with SDLC. If the customer runs only BSC, select No. All data terminal equipment communicating with each other must select the same coding option (NRZI or not NRZI). Get in touch with your IBM marketing representative to identify those modems that have pattern sensitive synchronization problems and to determine which coding is to be used.

Does the modem use continuous carrier? (This option applies only to point-to-point nonswitched line.)

Yes  No

Does the modem use half-rate speed? (Even if the system that you are installing is to use half-rate speed, select full-rate speed during the system configuration.)

Yes  No

Figure 45-15 (Part 1 of 8). Line 1 Data Communications Installation Data Table (First Communications Adapter)



**B NETWORK TYPE**

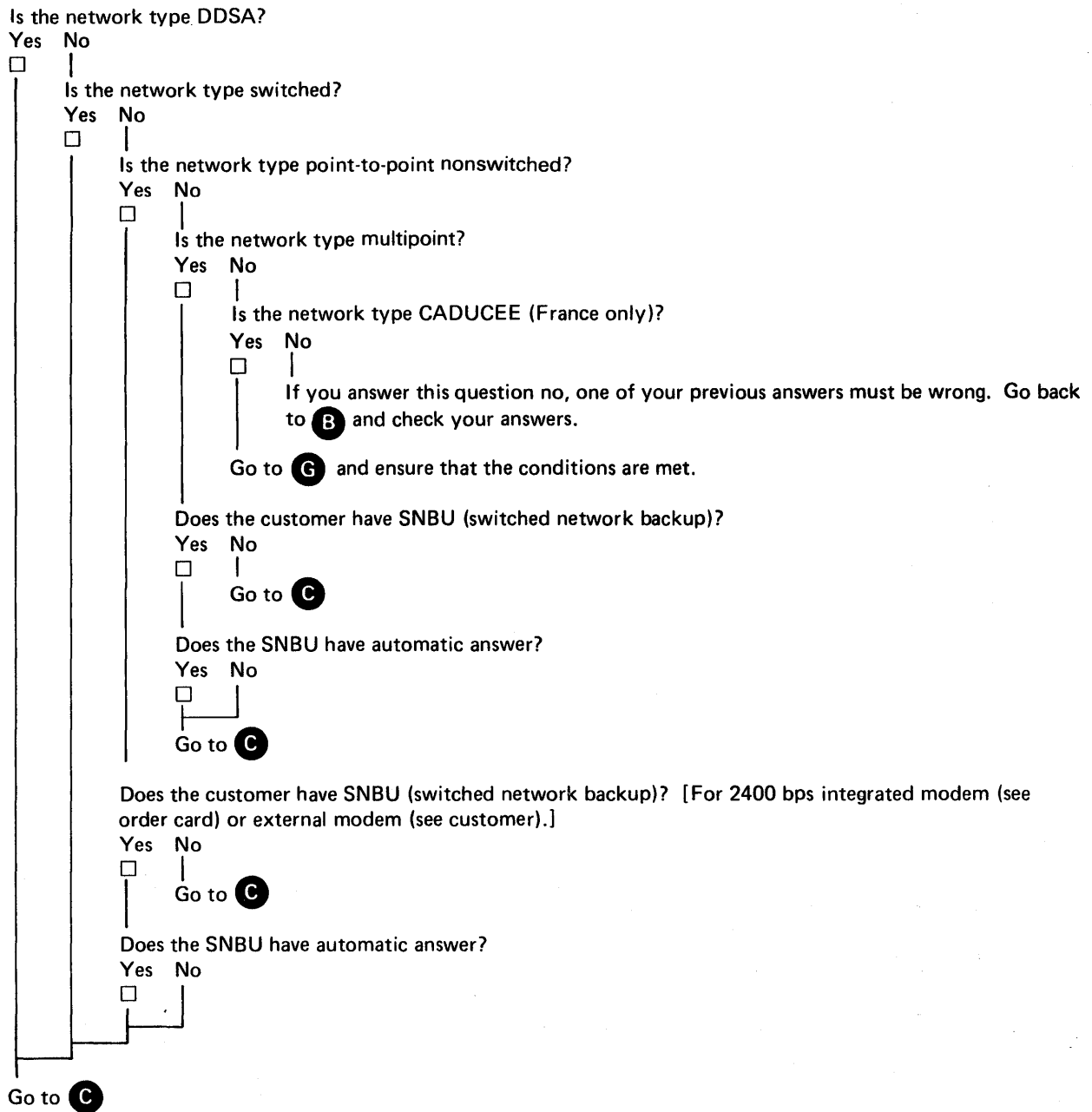


Figure 45-15 (Part 2 of 8). Line 1 Data Communications Installation Data Table (First Communications Adapter)

## **C** HARDWARE INSTALLED

The machine history located in Volume D (*Field Service Logics*) specifies the type of hardware installed.

The modem that is attached to the system that you are installing must be compatible with the modem used at the remote location.

Does the system you are installing have EIA/CCITT (interface to external modem)?

Yes No

Does the system you are installing have a 1200 bps integrated modem?

*Note:* The internal clock feature is automatically installed with a 1200 bps integrated modem.

Yes No

Does the system you are installing have a 2400 bps integrated modem?

Yes No

Does the system you are installing have a Digital Data Service Adapter?

Yes No

If you answer this question no, one of your previous answers must be wrong. Go back to **C** and check your answers.

Go to **D**

Go to **E**

Go to **F**

Does the system you are installing have the internal clock feature installed?

Yes No

The data table is complete.

| Figure 45-15 (Part 3 of 8). Line 1 Data Communications Installation Data Table (First Communications Adapter)

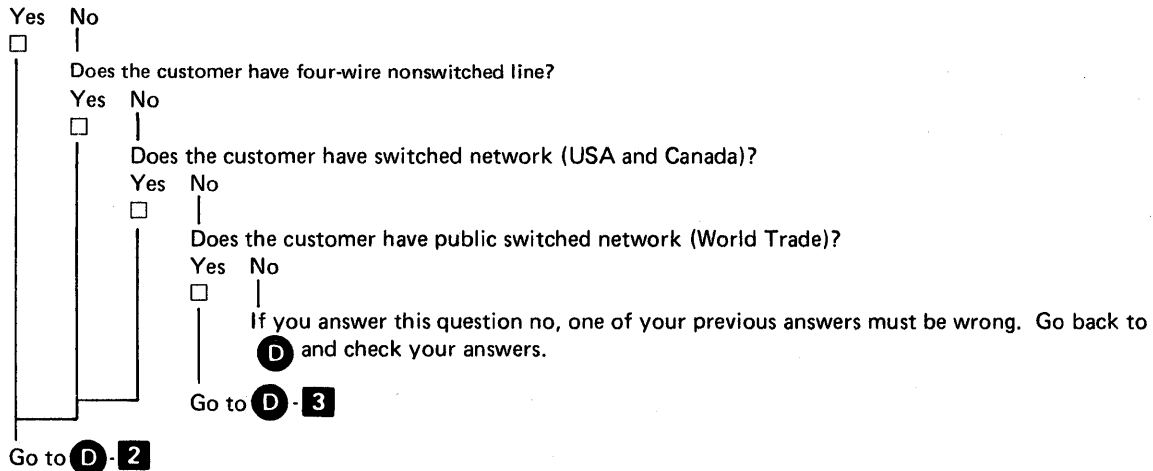
## D 1200 BPS INTEGRATED MODEM (A-A2H2)

For more information on the 1200 bps integrated modem, see paragraph 31-310.

### D-1 Communications Facilities

*Note:* The internal clock feature is automatically installed with a 1200 bps integrated modem.

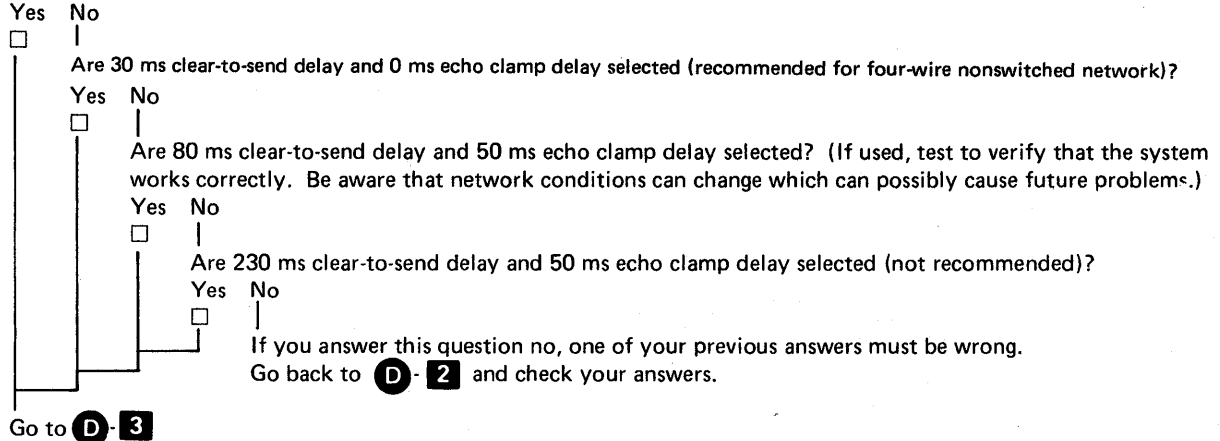
Does the customer have two-wire nonswitched line?



### D-2 Clear-to-Send Delay and Echo Clamp Delay

When used, clear-to-send delay must be longer than the echo clamp delay. The 0 ms echo clamp delay is automatically selected if the 30 ms clear-to-send delay is selected.

Are 230 ms clear-to-send delay and 150 ms echo clamp delay selected (recommended for switched network and two-wire nonswitched line)?



### D-3 Transmit Level

Transmit level is specified (for a switched line network) by the common carrier, and should be marked on the line coupler box. Enter the transmit level in the space provided.

\_\_\_\_ dB is the setting of the transmit level switches.

The data table is complete.

Figure 45-15 (Part 4 of 8). Line 1 Data Communications Installation Data Table (First Communications Adapter)

**E-1 2400 BPS INTEGRATED MODEM (B-A1)**

For more information on the 2400 bps modem, see paragraphs 31-460 and 31-470.

**E-1-1 Receiver Sensitivity**

Is the receiver sensitivity set to -27 dB (for nonswitched line without SNBU)?

Yes No

Is the receiver sensitivity set to -40 dB (for switched network or nonswitched line with SNBU)?

Yes No

If you answer this question no, one of your previous answers must be wrong. Go back to **E-1-1** and check your answers.

Go to **E-2**

**E-2 Communications Facilities**

Does the customer have two-wire with echo suppressors on a nonswitched line without SNBU?

Yes No

Does the customer have two-wire nonswitched line?

Yes No

Does the customer have four-wire nonswitched line?

Yes No

Does the customer have switched network (USA and Canada)?

Yes No

If you answer this question no, one of your previous answers must be wrong. Go back to **E-2** and check your answers.

Go to **E-3**

Figure 45-15 (Part 5 of 8). Line 1 Data Communications Installation Data Table (First Communications Adapter)

**E-3 Transmit Level**

Transmit level is specified (for a switched line network) by the common carrier, and should be marked on the line coupler box.

For a nonswitched line with SNBU, there are two transmit level attenuation settings. (See paragraphs 31-471 and 31-474 for information on these settings.)

Enter the transmit level, that you set with the jumpers, in the space provided.

Does the customer have nonswitched line? 0 db (USA and Canada) \_\_\_\_\_ db.

Yes No

Does the customer have switched network? 0 dB to -15 dB \_\_\_\_ dB.

Yes No

If you answer this question no, one of your previous answers must be wrong. Go back to **E-3** and check your answers.

Enter the auto answer tone \_\_\_\_\_ dB. 0 dB to -15 dB (same as switched network transmit level). Go to **E-4**

Does the customer have switched network backup (SNBU)? 0 dB to -15 dB \_\_\_\_ dB.

Yes No

Go to **E-4**

Enter the auto answer tone \_\_\_\_\_ dB. 0 dB to -15 dB [same as switched network (SNBU) transmit level]. Go to **E-4**

Figure 45-15 (Part 6 of 8). Line 1 Data Communications Installation Data Table (First Communications Adapter)

**E-4 Clear-to-Send Delay and Echo Clamp Delay**

Is the network type nonswitched?

Yes No

Is the network type switched?

Yes No

If you answer this question no, one of your previous answers must be wrong. Go back to **E-4** and check your answers.

Check the clear-to-send delay and the echo clamp delay that apply to the system that you are installing and go to **E-6**

Clear-to-Send Delay

- 75 ms
- 147 ms

Echo Clamp Delay

- 0 ms
- 50 ms
- 100 ms

Check the clear-to-send delay that applies to the system that you are installing. (There is no echo clamp delay on a nonswitched line.)

- 8.5 ms
- 25.0 ms
- 75.0 ms
- 147.0 ms

If the customer has SNBU, check the clear-to-send delay and the echo clamp delay that apply to the system that you are installing. Go to **E-5**

Clear-to-Send Delay

- 75 ms
- 147 ms

Echo Clamp Delay

- 0 ms
- 50 ms
- 100 ms

**E-5 Continuous Carrier**

Does the modem use continuous carrier?

Yes No

Go to **E-6**

Is the continuous carrier unconditional (data terminal equipment does not control request to send)?

Yes No

Is SNBU installed and is the continuous carrier controlled by auto request to send (data terminal equipment controls request to send)?

Yes No

If you answer this question no, one of your previous answers must be wrong. Go back to **E-5** and check your answers.

**E-6 The data table is complete.**

Figure 45-15 (Part 7 of 8). Line 1 Data Communications Installation Data Table (First Communications Adapter)

**F** DIGITAL DATA SERVICE ADAPTER (A-A2H2)

Is the network speed 2400 bps?

Yes No

Is the network speed 4800 bps?

Yes No

Is the network speed 9600 bps?

Yes No

If you answer this question no, one of your previous answers must be wrong. Go back to **F** and check your answers.

Is the disable remote loop-back function jumper installed? (This jumper must be installed for multipoint operation.)

Yes No

The data table is complete.

**G** CADUCEE (France)

With CADUCEE the following are needed:

- 2400 bps integrated modem
- Receiver sensitivity setting of -27 dB
- Four-wire nonswitched line
- Nonswitched line with a clear-to-send delay of 25 ms
- Transmit level setting of -6 dB
- Unconditional continuous carrier (DTE does not control request to send)

*Note:* Do not connect the signal and frame ground in the coffret on the modem if the signal and frame ground are connected at another point in the system.

Figure 45-15 (Part 8 of 8). Line 1 Data Communications Installation Data Table (First Communications Adapter)

**LINE 2 DATA COMMUNICATIONS INSTALLATION DATA TABLE (SECOND COMMUNICATIONS ADAPTER)**

Installation Date \_\_\_\_\_

Installing CE \_\_\_\_\_

The following information is needed to install data communications and to answer configuration questions correctly. It is important that you fill out this table because the MAPs contain reference to it. Some of the answers will depend on the communications configuration at the remote location.

To answer **A** and **B**, you will need information from the customer or the marketing representative. If necessary, get in touch with the customer or marketing representative at the central site where the order was made.

Enter a check (✓) in the box under your answers to the questions in **A**. In sections **B** through **F**, check only the boxes under the questions to which you answer yes.

**A COMMUNICATIONS ADAPTER (A-A2K2)**

Set the switches on the data communications adapter card in A-A2K2 as instructed in paragraph 31-200; then reinstall the adapter card.

The device address is hex 80  or hex 20 .

Does the modem need NRZI?

Yes No *Note: NRZI can be used only in conjunction with SDLC. If the customer runs only BSC, select No. All data terminal equipment communicating with each other must select the same coding option (NRZI or not NRZI). Get in touch with your IBM marketing representative to identify those modems that have pattern sensitive synchronization problems and to determine which coding is to be used.*

Does the modem use continuous carrier? (This option applies only to point-to-point nonswitched line.)

Yes No

Does the modem use half-rate speed? (Even if the system that you are installing is to use half-rate speed, select full-rate speed during the system configuration.)

Yes No

**Figure 45-16 (Part 1 of 8). Line 2 Data Communications Installation Data Table (Second Communications Adapter)**



**B NETWORK TYPE**

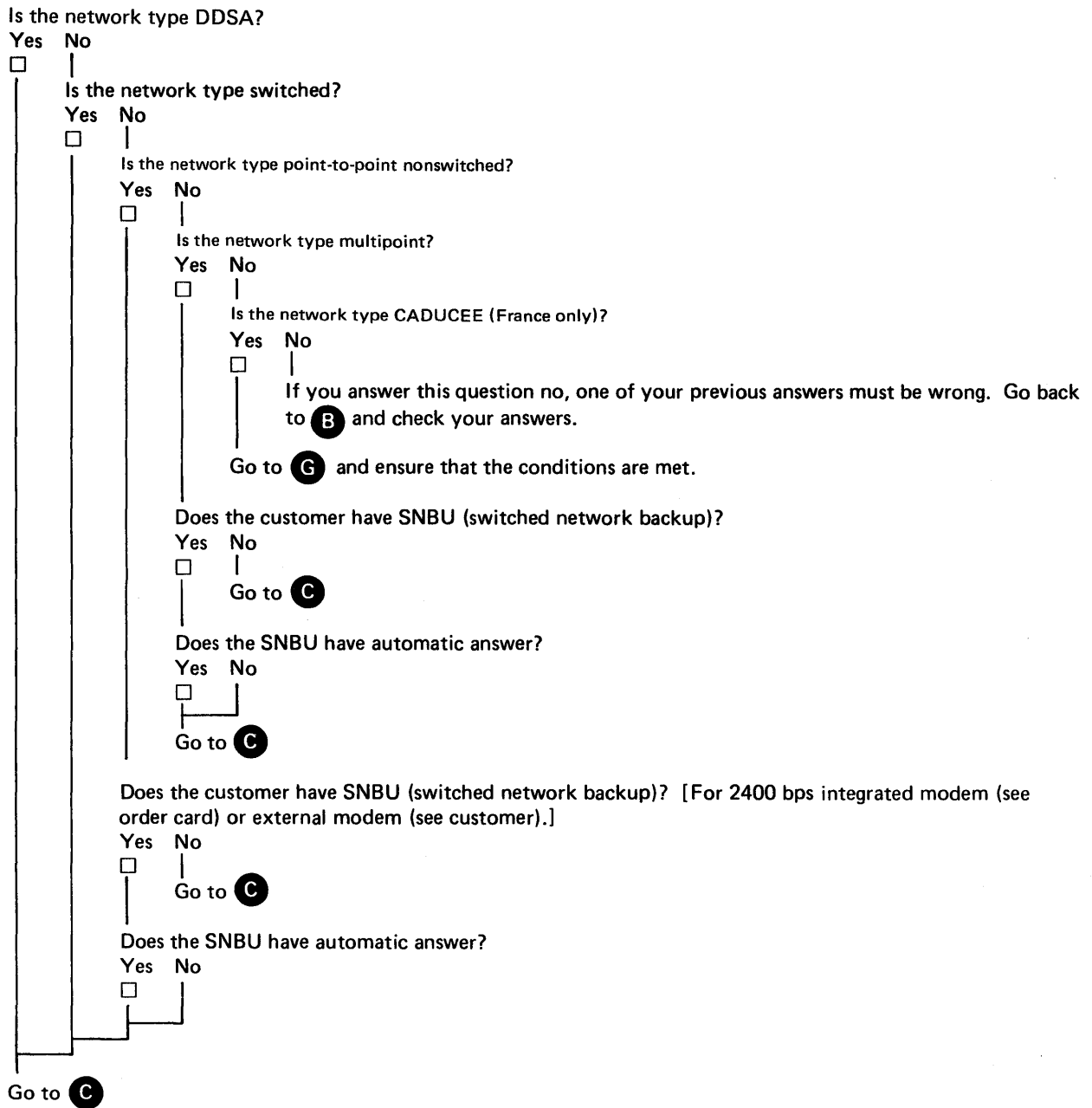


Figure 45-16 (Part 2 of 8). Line 2 Data Communications Installation Data Table (Second Communications Adapter)

### **C** HARDWARE INSTALLED

The machine history located in Volume D (*Field Service Logics*) specifies the type of hardware installed.

The modem that is attached to the system that you are installing must be compatible with the modem used at the remote location.

Does the system you are installing have EIA/CCITT (interface to external modem)?

Yes No

Does the system you are installing have a 1200 bps integrated modem?

*Note:* The internal clock feature is automatically installed with a 1200 bps integrated modem.

Yes No

Does the system you are installing have a 2400 bps integrated modem?

Yes No

Does the system you are installing have a DDSA?

Yes No

If you answer this question no, one of your previous answers must be wrong. Go back to **C** and check your answers.

Go to **D**

Go to **E**

Go to **F**

Does the system you are installing have the internal clock feature installed?

Yes No

The data table is complete.

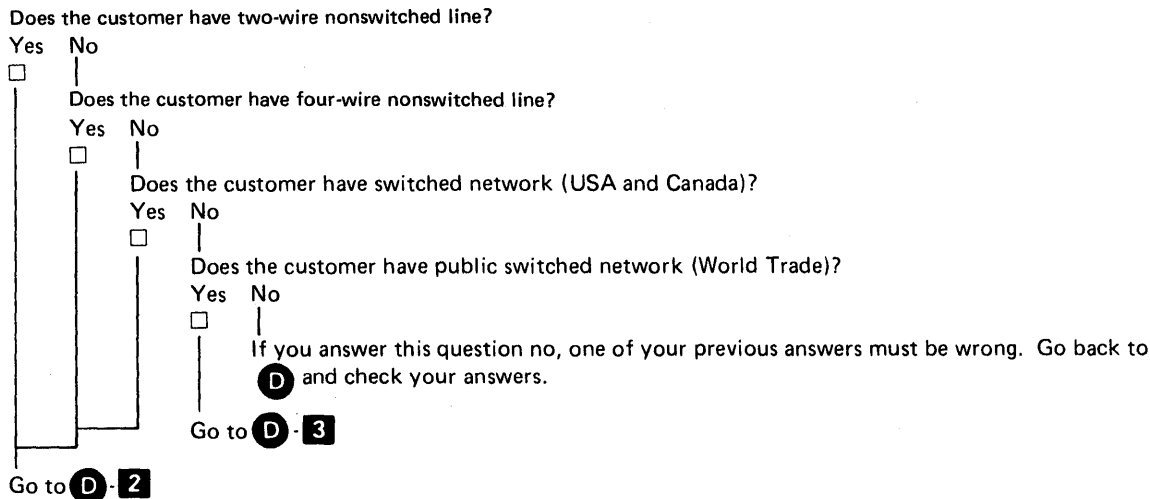
Figure 45-16 (Part 3 of 8). Line 2 Data Communications Installation Data Table (Second Communications Adapter)

## D 1200 BPS INTEGRATED MODEM (A-A2H4)

For more information on the 1200 bps integrated modem, see paragraph 31-310.

### D-1 Communications Facilities

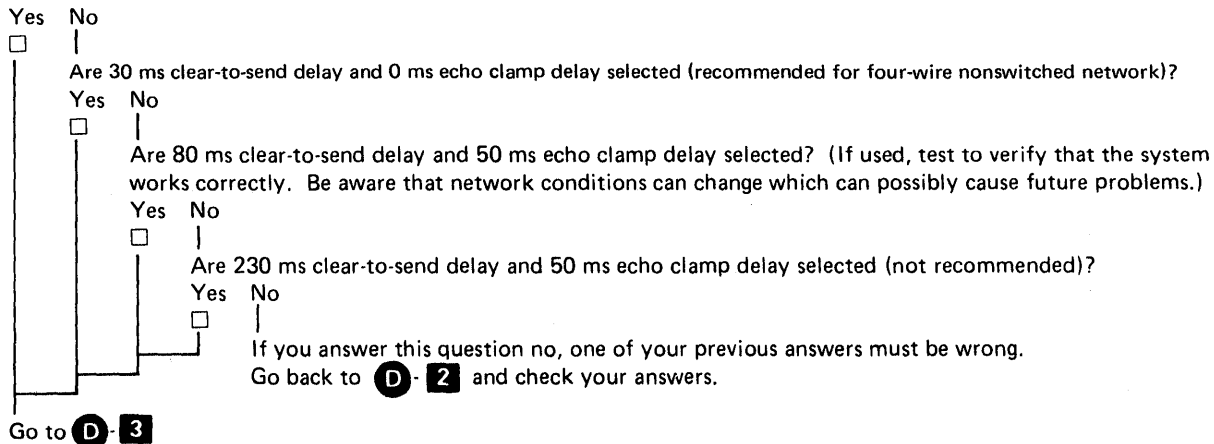
*Note:* The internal clock feature is automatically installed with a 1200 bps integrated modem.



### D-2 Clear-to-Send Delay and Echo Clamp Delay

When used, clear-to-send delay must be longer than the echo clamp delay. The 0 ms echo clamp delay is automatically selected if the 30 ms clear-to-send delay is selected.

Are 230 ms clear-to-send delay and 150 ms echo clamp delay selected (recommended for switched network and two-wire nonswitched line)?



### D-3 Transmit Level

Transmit level is specified (for a switched line network) by the common carrier, and should be marked on the line coupler box. Enter the transmit level in the space provided.

\_\_\_\_\_ dB is the setting of the transmit level switches.

The data table is complete.

Figure 45-16 (Part 4 of 8). Line 2 Data Communications Installation Data Table (Second Communications Adapter)

**E - 2400 BPS INTEGRATED MODEM (B-A2)**

For more information on the 2400 bps modem, see paragraphs 31-460 and 31-470.

**E - 1 Receiver Sensitivity**

Is the receiver sensitivity set to -27 dB (for nonswitched line without SNBU)?

Yes No

Is the receiver sensitivity set to -40 db (for switched network or nonswitched line with SNBU)?

Yes No

If you answer this question no, one of your previous answers must be wrong. Go back to **E - 1** and check your answers.

Go to **E - 2**

**E - 2 Communications Facilities**

Does the customer have two-wire with echo suppressors on a nonswitched line without SNBU?

Yes No

Does the customer have two-wire nonswitched line?

Yes No

Does the customer have four-wire leased line?

Yes No

Does the customer have switched network (USA and Canada)?

Yes No

If you answer this question no, one of your previous answers must be wrong. Go back to **E - 2** and check your answers.

Go to **E - 3**

Figure 45-16 (Part 5 of 8). Line 2 Data Communications Installation Data Table (Second Communications Adapter)

**E-3 Transmit Level**

Transmit level is specified (for a switched line network) by the common carrier, and should be marked on the line coupler box.

For a nonswitched line with SNBU, there are two transmit level attenuation settings. (See paragraphs 31-471 and 31-474 for information on these settings.)

Enter the transmit level, that you set with the jumpers, in the space provided.

Does the customer have nonswitched line? 0 dB (USA and Canada) \_\_\_\_\_ dB.

Yes No

Does the customer have switched network? 0 dB to -15 dB \_\_\_\_ dB.

Yes No

If you answer this question no, one of your previous answers must be wrong. Go back to **E-3** and check your answers.

Enter the auto answer tone \_\_\_\_\_ dB. 0 dB to -15 dB (same as switched network transmit level). Go to **E-4**

Does the customer have switched network backup (SNBU)? 0 dB to -15 dB \_\_\_\_ dB.

Yes No

Go to **E-4**

Enter the auto answer tone \_\_\_\_\_ dB. 0 dB to -15 dB [same as switched network (SNBU) transmit level]. Go to **E-4**

Figure 45-16 (Part 6 of 8). Line 2 Data Communications Installation Data Table (Second Communications Adapter)

**E-4 Clear-to-Send Delay and Echo Clamp Delay**

Is the network type nonswitched?

Yes No

Is the network type switched?

Yes No

If you answer this question no, one of your previous answers must be wrong. Go back to **E-4** and check your answers.

Check the clear-to-send delay and the echo clamp delay that apply to the system that you are installing and go to **E-6**

Clear-to-Send Delay

75 ms

147 ms

Echo Clamp Delay

0 ms

50 ms

100 ms

Check the clear-to-send delay that applies to the system that you are installing. (There is no echo clamp delay on a nonswitched line.)

8.5 ms

25.0 ms

75.0 ms

147.0 ms

If the customer has SNBU, check the clear-to-send delay and the echo clamp delay that apply to the system that you are installing. Go to **E-5**

Clear-to-Send Delay

75 ms

147 ms

Echo Clamp Delay

0 ms

50 ms

100 ms

**E-5 Continuous Carrier**

Does the modem use continuous carrier?

Yes No

Go to **E-6**

Is the continuous carrier unconditional (data terminal equipment does not control request to send)?

Yes No

Is SNBU installed and is the continuous carrier controlled by auto request to send (data terminal equipment controls request to send)?

Yes No

If you answer this question no, one of your previous answers must be wrong. Go back to **E-5** and check your answers.

**E-6 The data table is complete.**

Figure 45-16 (Part 7 of 8). Line 2 Data Communications Installation Data Table (Second Communications Adapter)

**F DIGITAL DATA SERVICE ADAPTER (A-A2H4)**

Is the network speed 2400 bps?

Yes No

Is the network speed 4800 bps?

Yes No

Is the network speed 9600 bps?

Yes No

If you answer this question no, one of your previous answers must be wrong. Go back to **F** and check your answers.

Is the disable remote loop-back function jumper installed? (This jumper must be installed for multipoint operation.)

Yes No

The data table is complete.

**G CADUCEE (France)**

With CADUCEE the following are needed:

- 2400 bps integrated modem
- Receiver sensitivity setting of -27 dB
- Four-wire nonswitched line
- Nonswitched line with a clear-to-send delay of 25 ms
- Transmit level setting of -6 dB
- Unconditional continuous carrier (DTE does not control request to send)

*Note:* Do not connect the signal and frame ground in the coffret on the modem if the signal and frame ground are connected at another point in the system.

Figure 45-16 (Part 8 of 8). Line 2 Data Communications Installation Data Table (Second Communications Adapter)

**MLCA INSTALLATION DATA TABLE**

Serial Number \_\_\_\_\_

Installation date and installing CE:

	Date	CE
Line 1	_____	_____
Line 2	_____	_____
Line 3	_____	_____
Line 4	_____	_____

The following information is needed to install MLCA communications and to answer configuration questions. This table is also to be used as a guide for CEs to determine which communication features are installed on the system and which options were taken at installation time.

It is important to fill out and maintain this table because the MAPs contain reference to it.

You will need information from the customer or marketing representative to answer some of the questions. You may have to contact the customer or marketing representative at the central site where the order was placed.

To complete the table, you should mark an X in the suitable column to indicate which features and options are installed.

**Figure 45-17 (Part 1 of 3). MLCA Installation Data Table**



Feature or Option	Line 1	Line 2	Line 3	Line 4
Communications Adapter Options (see 30-200)				
● Device address				
– 10				
– 20				
– 40				
– 80				
● Continuous carrier				
– Used				
– Not used				
● Line speed				
– Medium speed ( $\leq 9600$ bps)				
– High speed ( $> 9600$ bps)				
● Rate select interface line				
– Enable				
– Tie down				
● NRZI encoding				
– Enable				
– Disable				
Network Type				
● Digital data				
● Switched				
● Point-to-point nonswitched				
● Multipoint tributary				
● Multipoint control				
Hardware Installed				
● EIA/CCITT adapter				
● 1200-bps integrated modem				
● Digital data service adapter				
● Analog wideband adapter				
● 4800-bps integrated modem A				
● 4800-bps integrated modem B				
● Autocall adapter				
● Communications line clocking				
– Internal clock card (A-B3U2)				
– Modem clocking				
● Autocall (no clocking required)				
● X.21 Line adapter				

Figure 45-17 (Part 2 of 3). MLCA Installation Data Table

Feature or Option	Line 1	Line 2	Line 3	Line 4
<b>Digital Data Service Adapter (see 30-500)</b> <ul style="list-style-type: none"> <li>● Mode of operation <ul style="list-style-type: none"> <li>– Local direct attach</li> <li>– Point-to-point</li> <li>– Multipoint</li> </ul> </li>   <li>● Line speed <ul style="list-style-type: none"> <li>– 2400 bps</li> <li>– 4800 bps</li> <li>– 9600 bps</li> <li>– 56,000 bps</li> </ul> </li> </ul>				
<b>1200 BPS Integrated Modem (see 30-300)</b> <ul style="list-style-type: none"> <li>● Communications facility <ul style="list-style-type: none"> <li>– 2-wire nonswitched</li> <li>– 4-wire nonswitched</li> <li>– Switched (U.S. and Canada)</li> <li>– Public switched network (World Trade)</li> </ul> </li>   <li>● Clear to send/echo clamp delay <ul style="list-style-type: none"> <li>– 30 ms/0 ms (4-wire nonswitched)</li> <li>– 80 ms/50 ms (must be tested)</li> <li>– 230 ms/50 ms (not recommended)</li> <li>– 230 ms/150 ms (switched or 2-wire nonswitched)</li> </ul> </li>   <li>● Transmit Level (record db level)</li> </ul>				
<b>4800 BPS Integrated Modem (see 30-400)</b> <ul style="list-style-type: none"> <li>● Installed as: <ul style="list-style-type: none"> <li>– Modem A</li> <li>– Modem B</li> </ul> </li>   <li>● Communications facility <ul style="list-style-type: none"> <li>– 4-wire nonswitched</li> <li>– 2-wire switched <ul style="list-style-type: none"> <li>a. Coupler adapter (Canada only)</li> <li>b. Incorporated protective coupler (U.S. only)</li> <li>c. World Trade coupler</li> </ul> </li> </ul> </li>   <li>● First transmission initialization RFS delay <ul style="list-style-type: none"> <li>– Nonswitched <ul style="list-style-type: none"> <li>a. 24 ms (normal)</li> <li>b. 50 ms (long)</li> </ul> </li> <li>– Switched <ul style="list-style-type: none"> <li>a. 923 ms (long/normal)</li> <li>b. 708 ms (short)</li> </ul> </li> </ul> </li>   <li>● Speed control, nonswitched point-to-point (see 30-460): <ul style="list-style-type: none"> <li>– Local (speed control)</li> <li>– Remote (speed control)</li> </ul> </li>   <li>● Transmit level (record db level)</li> </ul>				

Figure 45-17 (Part 3 of 3). MLCA Installation Data Table

#### 45-710 External Modem EIA/CCITT Connection

If the system that you are installing does not have a medium-speed external modem ( $\leq 9600$  bps), go to paragraph 45-720.

1. Check the EIA/CCITT interface card(s) (see Note 1) to see that no jumpers are installed. (There are jumper locations, but no jumpers are needed.)
2. Reinstall the card(s) that were removed in step 1.
3. Attach the cable(s) to the modem(s). (See Note 2.)
4. Go to paragraph 45-790 if no other communications lines are to be installed.

#### 45-720 Digital Data Service Adapter

If the system that you are installing does not have a DDSA (digital data service adapter), go to paragraph 45-730.

1. Install the jumpers on the DDSA card(s) (see Note 1), as instructed in paragraph 31-500, for the first or second communications adapter or paragraph 30-550 for MLCA.
2. Reinstall the card(s) that were removed in step 1.
3. Attach the cable(s) to the channel service units, or the local attach accessory cable adapter (IBM part number 4236967) available for direct attach.
4. Go to paragraph 45-790 if no other communications lines are to be installed.

#### Notes:

1. The cards to be removed in paragraphs 45-710, 45-720, and 45-730 are located as follows:

For first or second communications adapter:

- Line 1 A-A2H2
- Line 2 A-A2H4

For MLCA:

- Line 1 A-B3L2
- Line 2 A-B3M2
- Line 3 A-B3L4
- Line 4 A-B3M4

2. The customer must have the external communications equipment.

#### 45-730 IBM 1200 BPS Integrated Modem

If the system that you are installing does not have a 1200-bps integrated modem, go to paragraph 45-740.

1. Set the switches on the 1200-bps integrated modem card(s) (see Note 1) as instructed in paragraph 31-310 (first or second communications adapter) or 30-350 (MLCA).
2. Reinstall the card(s) that were removed in step 1.
3. Attach the communications cable from the system to the common-carrier equipment. The customer must do this. See paragraph 31-130 (first or second communications adapter) or paragraph 30-300 (MLCA).
4. If your system is connected to a World Trade public switched network, perform the line plate adjustment. See paragraph 31-320 (first or second communications adapter) or paragraph 30-360 (MLCA).
5. Go to paragraph 45-790 if no other communications lines are to be installed.

#### 45-740 IBM 2400 BPS Integrated Modem

If the system you are installing does not have a 2400-bps integrated modem, go to paragraph 45-750.

1. Perform the 2400-bps integrated modem card(s) and jumper(s) check. See paragraphs 31-460 and 31-470. Also perform the signal quality meter adjustment (see paragraph 31-430).

Note: The modem card part numbers and locations are on FSL (*Field Service Logics*) page AC390. The modem board feature wiring is on FSL page AC395. You need not change any of the feature wiring on this board because this wiring was installed at the factory for your system.

2. The customer must connect the external communications line cable(s) to the common-carrier equipment. See paragraph 31-120.

3. If the installation will use nonswitched lines, do the following procedure. Because the customer must perform this procedure after the installation is complete, show the customer how to do it now. This procedure needs customer or CE aid at the remote location. For *Point-to-Point*:
  - a. Set the Test/Operate switch on the local modem to the T3 position and the Test/Operate switch on the remote modem to the T4 position. Set the Receive Equalizer switch on the remote modem so that the signal quality meter of the remote modem indicates the minimum signal level obtainable.
  - b. Set the Test/Operate switch on the local modem to the T4 position and the Test/Operate switch on the remote modem to the T3 position. Set the Receive Equalizer switch on the local modem so that the signal quality meter of the local modem indicates the minimum signal level obtainable.
  - c. Leave the equalizer switches on both modems set so that each signal quality meter continues to indicate the minimum signal level obtainable. Return both Test/Operate switches to Operate.

*For Multipoint Tributary or Control Station:*

- a. Set the Test/Operate switch on the tributary stations modem to the T3 position and the Test/Operate switch on the control stations modem to T4. Set the Transmit Equalizer switch on the tributary stations modem so that the signal quality meter of the control stations modem indicates the minimum signal level obtainable.
- b. Set the Test/Operate switch on the tributary stations modem to the T4 position and the Test/Operate switch on the control stations modem to the T3 position. Set the Receive Equalizer switch on the tributary stations modem so that the signal quality meter of the tributary stations modem indicates the minimum signal level obtainable.
- c. Leave the equalizer switches on both modems set so that each signal quality meter continues to indicate the minimum signal level obtainable. Return both Test/Operate switches to Operate.

## **45-750 IBM 4800 BPS Integrated Modem**

If the system that you are installing does not have a 4800-bps integrated modem, go to paragraph 45-760.

1. For multipoint networks, set the modem address switches on the modem operator panel (see paragraph 30-440).
2. For nonswitched networks, the modem is always shipped from the factory with the jumpers installed that make it a multipoint control station. If the modem is not to be used as a control station, add or remove jumpers as needed. See Table 30-2 in paragraph 30-460 for the jumpers needed for Model 1 options.
3. For switched networks, see Table 30-3 for the jumpers needed for Model 2 options.
4. The customer must connect the modem's external communications line cable(s) to the common carrier equipment.
5. Set the transmit level switches on the modem cards (see paragraph 30-450) for switched networks. For the U.S. and Canada, perform the *Coupler Transmit Level Adjustment* (see 30-480). For World Trade, perform the *Line Plate Adjustment* (see 30-470).
6. Go to paragraph 45-790 if no other communications lines are to be installed.

#### 45-760 Analog Wideband Adapter

If the system that you are installing does not have an analog wideband adapter, go to paragraph 45-770.

1. Remove the analog wideband adapter card, and check that the jumpers are installed as instructed in paragraph 30-750.
2. Reinstall the card removed in step 1.
3. Attach the cable to the external modem. (The customer must have the external communications equipment available to connect to the system.)
4. The customer must connect the external modem communications line cable to the common carrier equipment.
5. Go to paragraph 45-790 if no other communications lines are to be installed.

#### 45-770 Autocall Adapter

If the system that you are installing does not have an external autocall unit, go to paragraph 45-780.

1. Check the autocall adapter card to see that no jumpers are installed. (The card has jumper locations, but no jumpers are needed.)
2. Reinstall the card(s) that was removed in step 1.
3. Attach the system autocall cable to the external autocall unit or to the external modem that has an integrated autocall unit.
4. Ensure that the board jumper for digit signal is installed (see 30-850).
5. The customer must connect the external modem cable to the common carrier equipment. Also, the customer must connect the autocall unit to the external modem if they are separate units.
6. Go to paragraph 45-790.

#### 45-780 X.21 Line Adapter

If the system that you are installing does not have an X.21 line adapter, go to paragraph 45-790.

1. Remove the X.21 line adapter card(s), and check that the jumpers are installed as instructed in paragraph 30-950.
2. Reinstall the X.21 line adapter card(s) removed in step 1.
3. Attach the cable(s) to the DCE(s).
4. Go to paragraph 45-790 if no other communications lines are to be installed.

#### 45-790 Communications Testing

1. Turn the system power on at the operator panel.
2. Perform an initial program load operation from diagnostic diskette DIAGB1 with all four Address/Data switches set to 0000. (See paragraph 45-620 if necessary.) If there are any check conditions or control storage IPL wrap errors, verify that the communications configuration (and the communications controller, if MLCA) is correct and check the switch settings on the adapter cards (see note) before going to step 3.

Line configuration and adapter switch settings should match the installation data table (Figure 45-15 and Figure 45-16 for the first and second communications adapters or Figure 45-17 for MLCA).

Communications wrap errors are in the format 80XXYYZZ for the first or second communications adapter. XX is the device address, YY is the failing communications line number, and ZZ is wrap module 01. For the MLCA line, wrap errors use the format 828ZXXYY. Z is the line adapter address from the MLCA controller, XX is the line number (01, 02, 03 or 04), and YY is the number of the failing diagnostic test unit. Check the failing lines first. Adapter cards for each communication line should not be swapped, because the switch settings on the cards are different for each communication line.

If you have communication line wrap errors, go to step 3 and run MDI tests on those failing lines first.

If a processor check condition or an MLCA controller wrap error (1080XXYY) occurs (XX = not defined; YY = failing diagnostic test unit), correct the problem before continuing.

Note: Locations of the adapter cards are:

For first and second communications adapter:

Line 1	A-A2J2
Line 2	A-A2K2

For MLCA:

Line 1	A-B3F2
Line 2	A-B3G2
Line 3	A-B3H2
Line 4	A-B3J2

3. Select the MDI TEST option from the main menu. Verify that the MDI tests for each communications line installed run without error.
4. For a 1200-bps switched integrated modem, perform the transmit level limiting check in paragraph 31-340 (first or second communications adapter) or paragraph 30-350 (MLCA).
5. If the IBM System Support Program Product (or a similar program product) is installed and a suitable remote station is available, run the communications online test for each communications line installed. See paragraph 99-074 or 99-075 for a description of the online tests. If MLCA is installed, also run diagnostic program COMMTST for data communications line wrap test and MLCA controller wrap test (see paragraph 99-076).

## 45-800 COMPLETING THE SYSTEM INSTALLATION

1. Ensure that all CE panel switches are in their normal position for the customer to operate the system. The correct switch settings are:
  - Data switches set to 0000.
  - CSIPL and MSIPL switches set to Disk.
  - Mode Selector switch set to Proc Run.
  - All other switches down.
2. If the IBM SSP is not installed, the system cannot perform an MSIPL from disk nor can SYSTST or ERAP procedures be executed. If you are installing the IBM SSP (system support program product), it should be done at this time. See the *IBM System/34 Installation and Modification Reference Manual: Program Products and Physical Setup*, SC21-7689.

Note: The customer will receive a bill if you perform this service.

3. Fill out any system installation logs used at the site.
4. If communications features are installed and a remote station is available, it is important that you run the communications online test for each communications line installed if the tests have not been run already. To run the online test, see paragraph 99-074 or 99-075.
5. Complete the *Installation Activity Document*.
6. Inform the customer that the system is available for use.
7. Inform the branch office that the installation is complete.