

**UNISYS** BT 3200 Series  
324X/326X/328X  
Magnetic Tape Subsystem

**Installation  
Manual**

**Class B Document**  
Customer Services Engineering  
Restricted/Proprietary Data

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04

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5-3, 5-18 revised.





Model Number Cross Reference Table

UNISYS Model No.	Description Model No.
3241	F617A1
3242	F617A2
3244	F617B
3243	F617E
3261	F618A1
3262	F618A2
3266	F618B
3265	F618E
3281	M2436--1
3282	M2436--2
3288	M2436--8



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## PREFACE

This manual contains installation instructions and requirements for all configurations of the Magnetic Tape Unit (MTU) Magnetic Tape Controller (MTC), and field tester. An MTU master unit consists of one tape drive and either one controller (MTC #0) or two controllers (MTC #0 and MTC #1). A Magnetic Tape Subsystem (MTS) may include up to seven additional MTU slave units.

The instructions provide step-by-step procedures for initial inspection and placement of equipment; selecting input voltage, frequency, and cabling; cleaning, checking and adjusting the MTU; and performing a self-test internal diagnostic routine on the MTC. The last chapter provides a final check list of all required tasks and a listing of the locations within the Installation Instructions where pertinent information can be found. A glossary of commonly used terms and acronyms is provided in Appendix A. The location of printed circuit assemblies (PCAs) is contained in Appendix B. A list of optional shorting plugs is given in Appendix C.



## CHAPTER 1 EQUIPMENT INSPECTION AND PLACEMENT

### 1.1 Introduction

Installation instructions and requirements in this chapter include:

- (1) Receiving and inspection procedures
- (2) Preparing for physical placement
- (3) Special and common tools and test equipment
- (4) Physical installation procedures.

### 1.2 Receiving and Inspection Procedures

The MTU and MTC are shipped via commercial carrier. Each device is packed and crated in compliance with industrial standards and recommendations of the carrier.

Condensation may occur when the cabinet is transferred from a cold to a warm environment. To avoid condensation, the cabinet should remain in an environment at the ambient temperature for at least three hours before unpacking.

Visually inspect the shipping container for external damage. Remove the shipping container and visually inspect the front, rear, and sides of each unit for shipping damage. Ensure that frames are not bent or damaged. Do not remove supporting blocks until each unit has been moved to its assigned location.

Check received equipment against the packing list.

### 1.3 Preparing for Physical Placement

Exercise caution when moving heavy equipment to its assigned location. A forklift or its equivalent will be required. Dimensions and weight of the units are shown in Table 1.1.

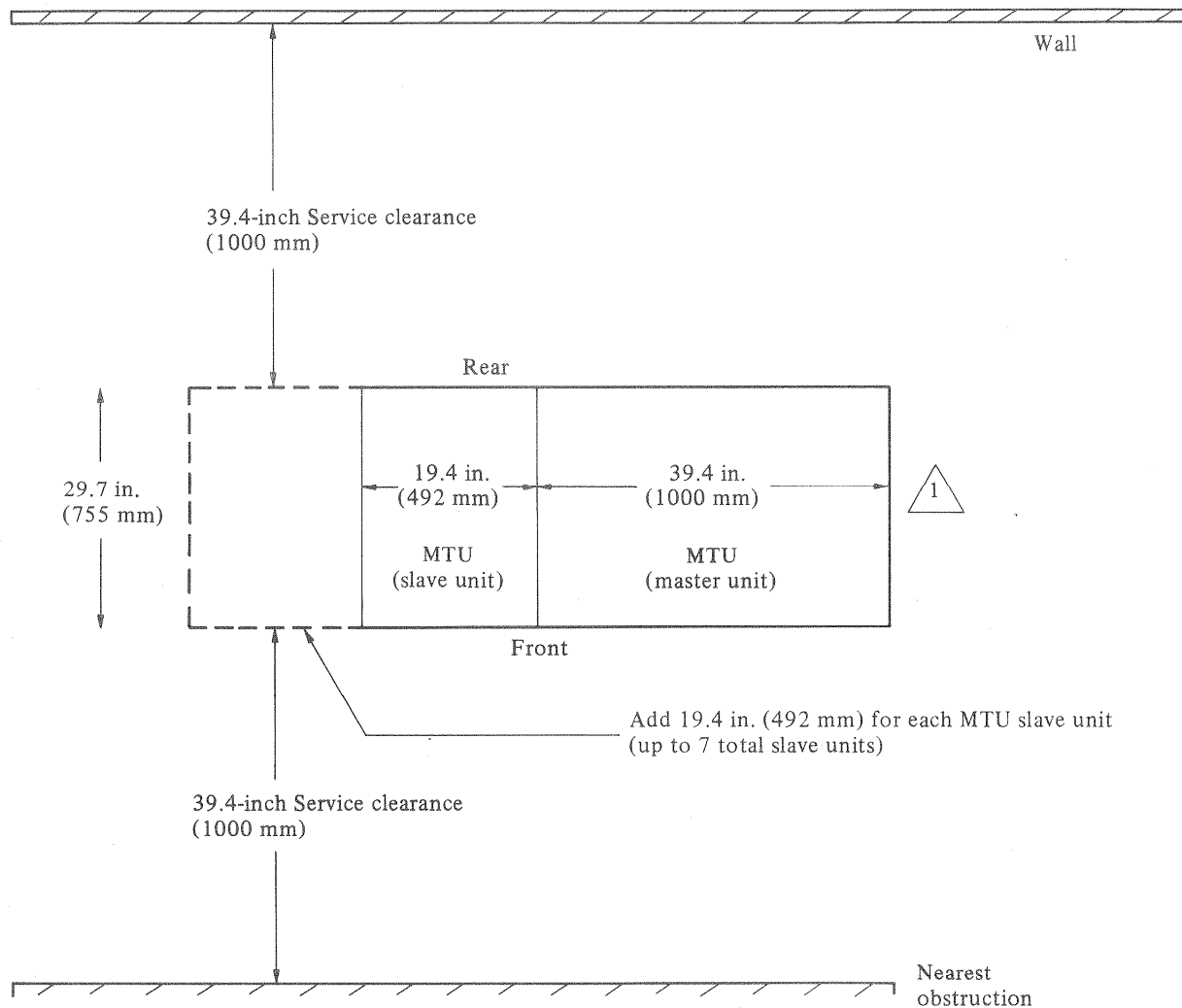
Table 1.1 External dimensions and weights

Unit	Height	Width	Depth	Weight
Master Unit	1400 mm	1000 mm	755 mm	390 kg with 1 MTC (860 lbs)
	55.1 in	39.4 in	29.7 in	430 kg with 2 MTCs (948 lbs)
Slave Unit	1400 mm	492 mm	755 mm	250 kg (552 lbs)
	55.1 in	19.4 in	29.7 in	

Complete the following steps before final placement of equipment:

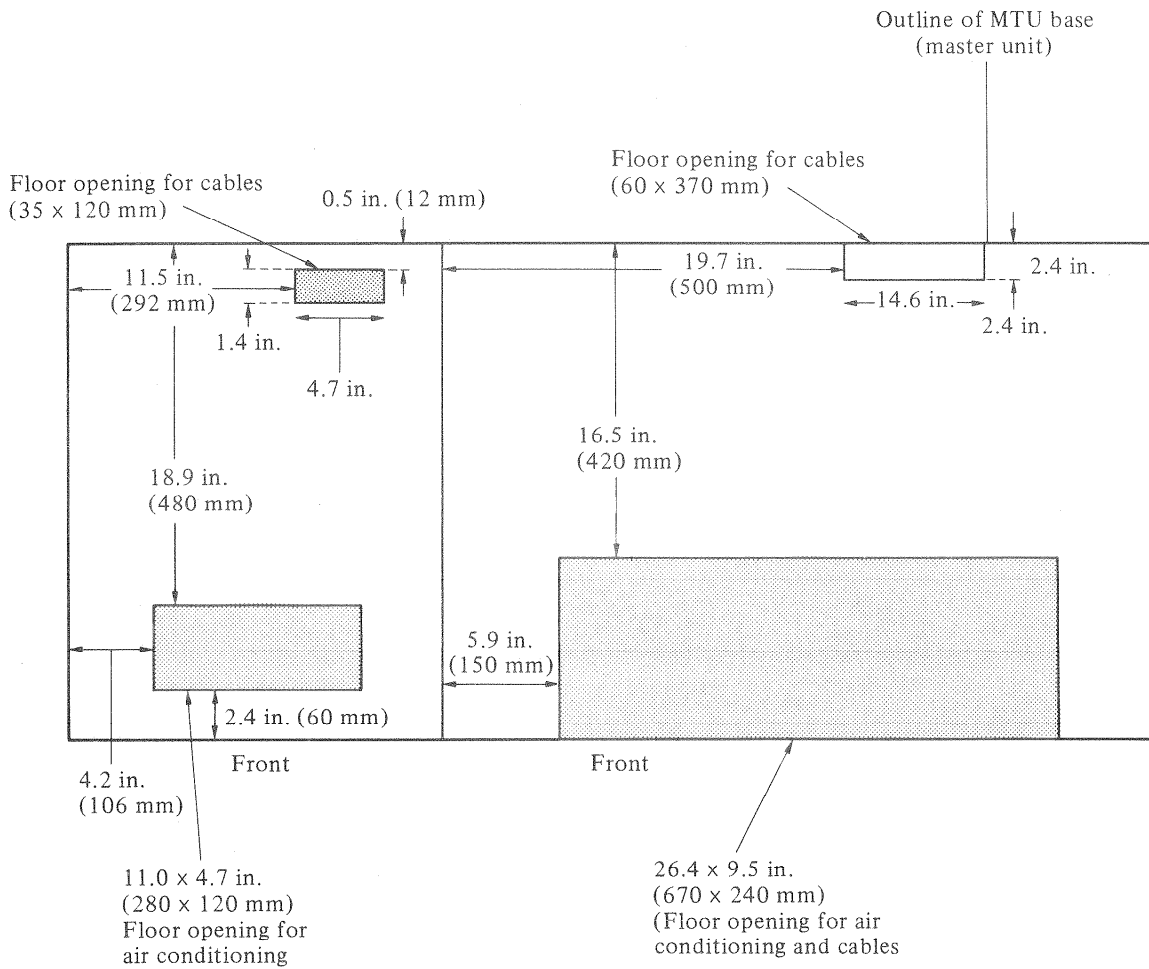
- (1) Ensure that the designated space is sufficient to meet installation clearances shown in Figure 1.1.
- (2) Ensure that the cable length from the host controller is sufficient to reach the connecting point(s) on the MTC.
- (3) Verify that the size and position of floor openings are in accordance with dimensions shown in Figure 1.2 when using under-floor wiring.
- (4) Open the rear door of the unit(s) with a flat-head screwdriver. Perform a final check of all received equipment for damage, dents, deformation, corrosion, condensation, and other abnormalities.
- (5) Visually inspect the air hoses and tubes within the MTU. Ensure that there are no cracks and that joints and hose bands are tight.





1 No side clearances required except for installation and maintenance access to rear of unit(s).

Figure 1.1 Installation clearances



**Figure 1.2 Floor openings for MTUs**

#### 1.4 Special Test Equipment and Tools

Special test equipment, common test equipment, and common tools required for installation, power-on, and initial checkout are listed below. Specifications and descriptions of test equipment are also provided. When ordering Fujitsu or equivalent test equipment, verify that items received conform to the following specifications:

##### Special Tools and Test Equipment

##### Specification

o	Restraint pressure tool*	B960-0110-T026A
o	Pressure gauge	B91L-0020-0001A
		4000 mm H <sub>2</sub> O full scale (157.5 in.)
o	Vacuum gauge	BMz 198a
		1000 mm H <sub>2</sub> O full scale (39.37 in.)
o	Field tester*	B13B-0110-B101A
o	Master skew tape	BM. Bv Mt 351d
o	Good quality tape	SRM3200 or equivalent
o	Tension meter	B96L-0110-0004A
o	Reel adjustment tool*	B960-0110-T015A
o	PCA removal tool*	C960-0300-T001
o	Cleaner kit*	B960-0110-T016A

##### Common Test Equipment

o	Digital voltmeter	30 V DC voltage range (minimum)
o	Oscilloscope	50 MHz frequency range (minimum)

##### Common Tools

o	Adjustable wrench	30 mm width (1.18 in.) minimum
o	Hexagonal wrench key	8 mm width (0.32 in.) minimum

\* Equipment designated with an asterik must be ordered from Fujitsu.

## 1.5 Physical Installation Procedures

When two or more MTUs are installed side by side, remove covers from the sides that will be adjacent to one another. Only the end units require side covers. Refer to Figures 1.3 through 1.6, and follow these steps:

- (1) Remove the two screws shown in Figure 1.3 to loosen side cover from top of frame.
- (2) Lift side cover to detach from bottom of frame.
- (3) Remove the mounting plate from the master unit and attach it to the end unit.
- (4) Place the MTU(s) in the installation position.
- (5) Level each unit by adjusting the four leveling pads.
- (6) Ensure that the distance between the floor and the bottom of the MTU(s) is 50 mm (approximately 2 inches).
- (7) Continue leveling until bolt holes are aligned on adjacent MTUs.
- (8) Bolt two MTUs together using two bolts in holes shown in Figures 1.3 through 1.5.
- (9) Ensure that all units are stable, level, and free of vibration after bolting.
- (10) Refer to Figure 1.6 for final configuration of up to eight units.

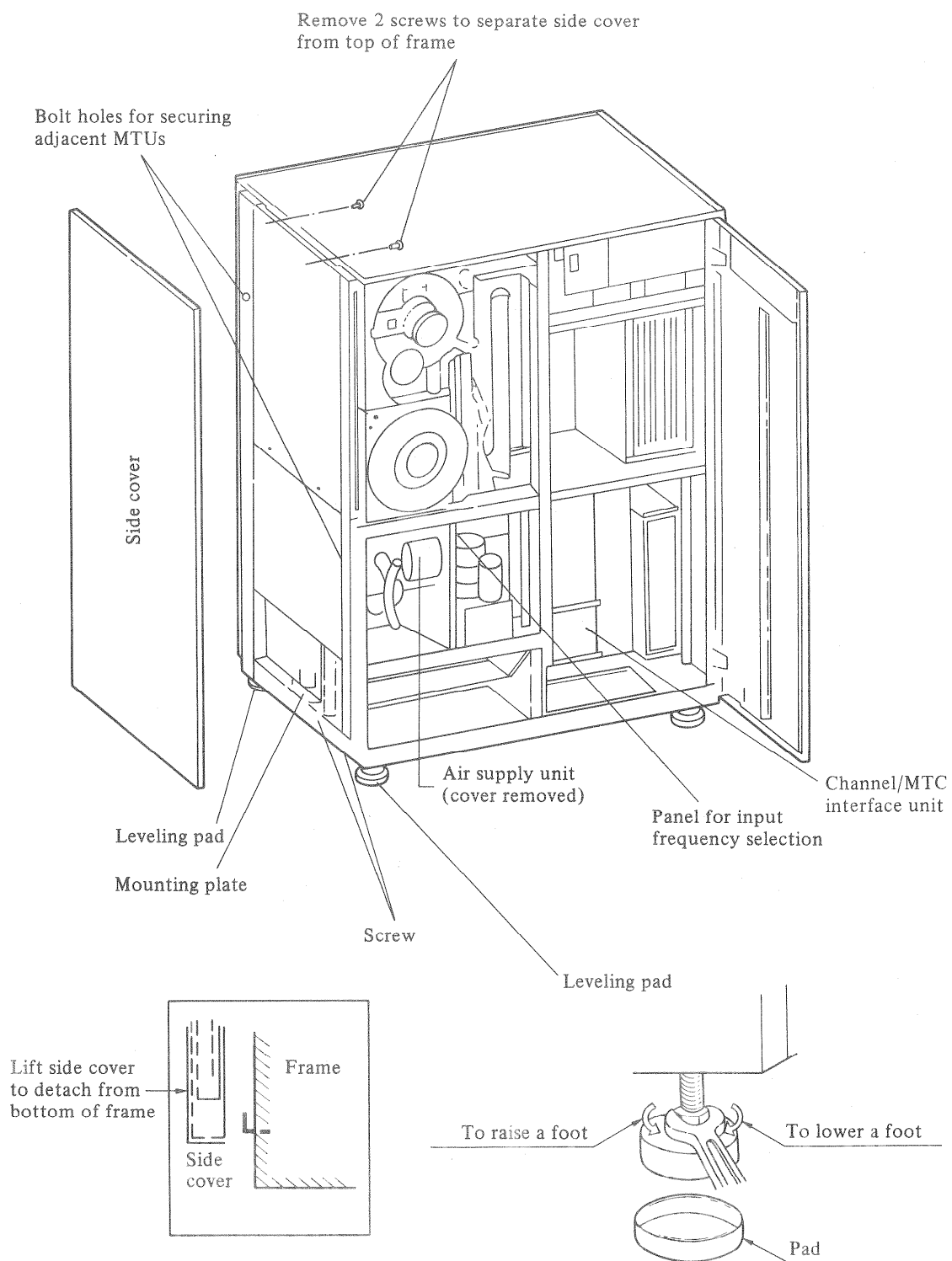
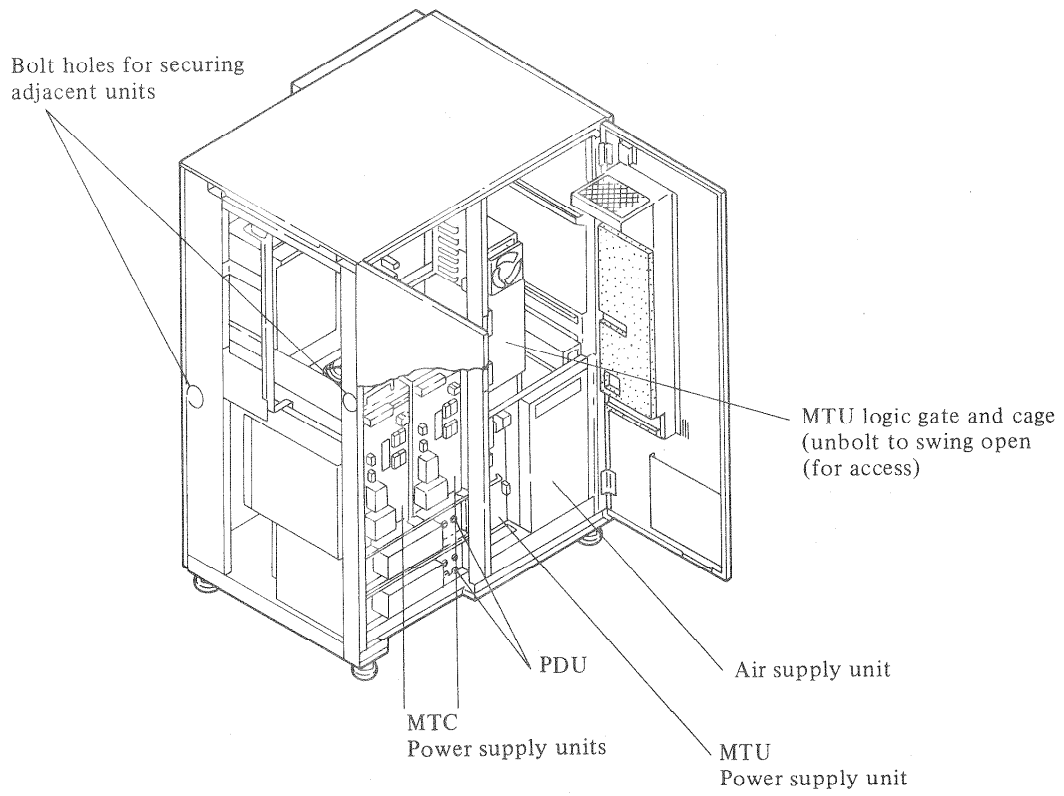


Figure 1.3 Master unit (front view)



**Figure 1.4 Master unit (rear view)**

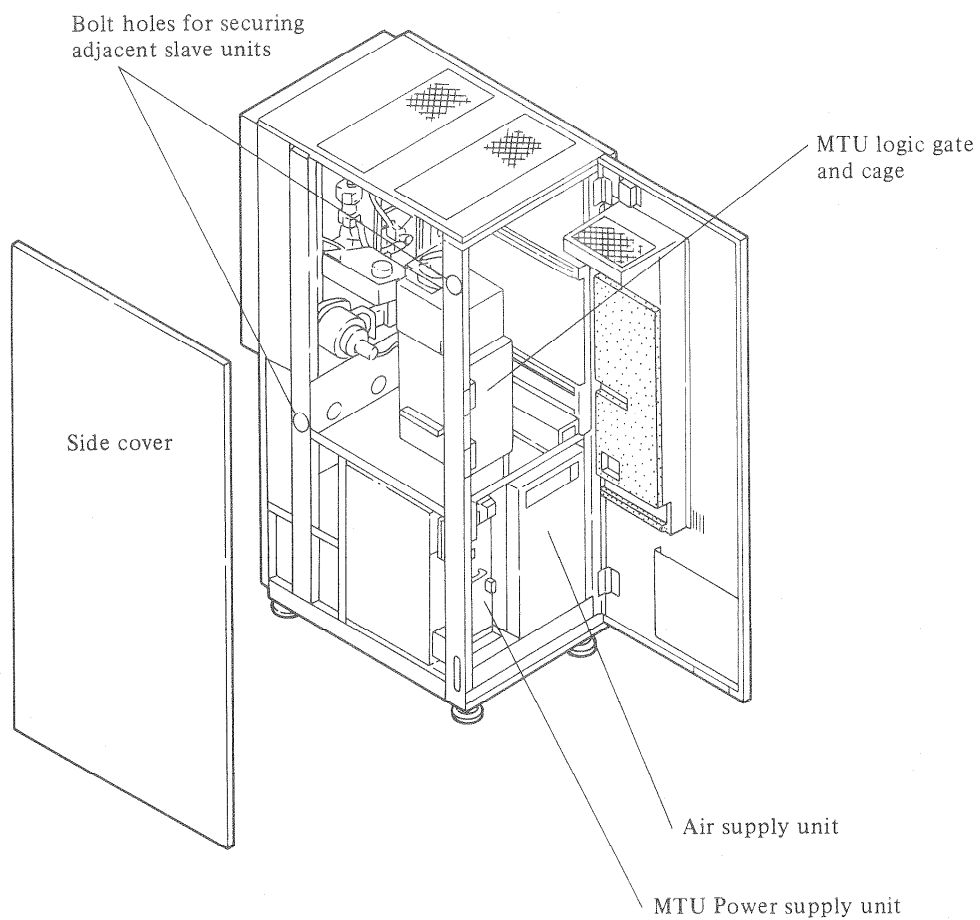


Figure 1.5 Slave unit (rear view)

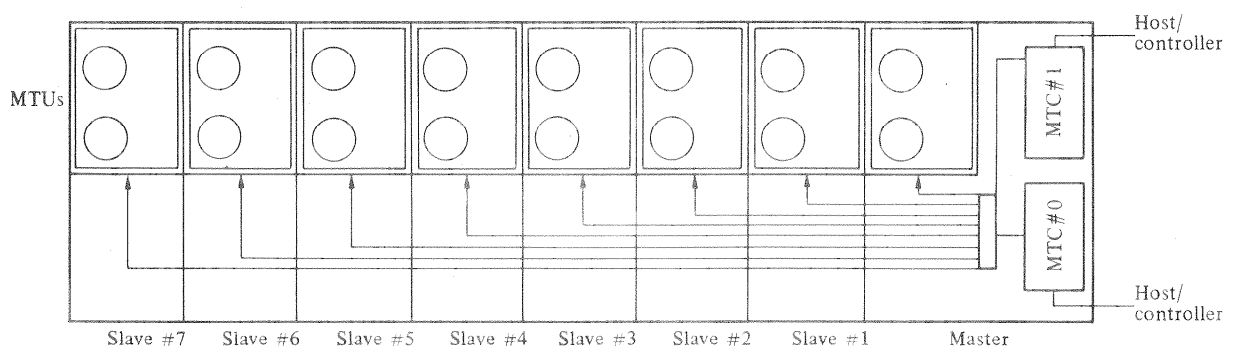


Figure 1.6 Maximum configuration





## CHAPTER 2 VOLTAGE SELECTION, FREQUENCY SELECTION, AND CABLING

### 2.1 Introduction

This chapter contains instructions and facility requirements leading to equipment power-on. The following topics are described:

- (1) Input voltage selection
- (2) Frequency selection
  - Air supply unit adjustment
- (3) Altitude adjustment
- (4) Interface cabling
  - Channel/MTC
  - MTC/MTU
- (5) Power control cabling
- (6) Input power cabling.

### 2.2 Input Voltage Selection

This Magnetic Tape System (MTS) can operate from 200 to 240 and 380 to 415 VAC input. Do not connect the main input power cable to facility power until instructed to do so by the procedures in Chapter 4. Select the input voltage as follows:

#### Warning:

Dangerous voltage is present on the input voltage selector terminals after facility power has been connected to the MTU. Be certain the main input power cable is disconnected.

#### 2.2.1 Input voltage selection of PDU

- (1) Pull the PDU to the side and remove the rear cover (Figure 2.1). The location of the PDU is shown in Figure 1.4. The PDUs are delivered inside A overhead package (new equipment only.)
- (2) Change the tap according to the input voltage conversion label which is pit on the cover (Figure 2.2).
- (3) Mount the cover and the PDU in place.

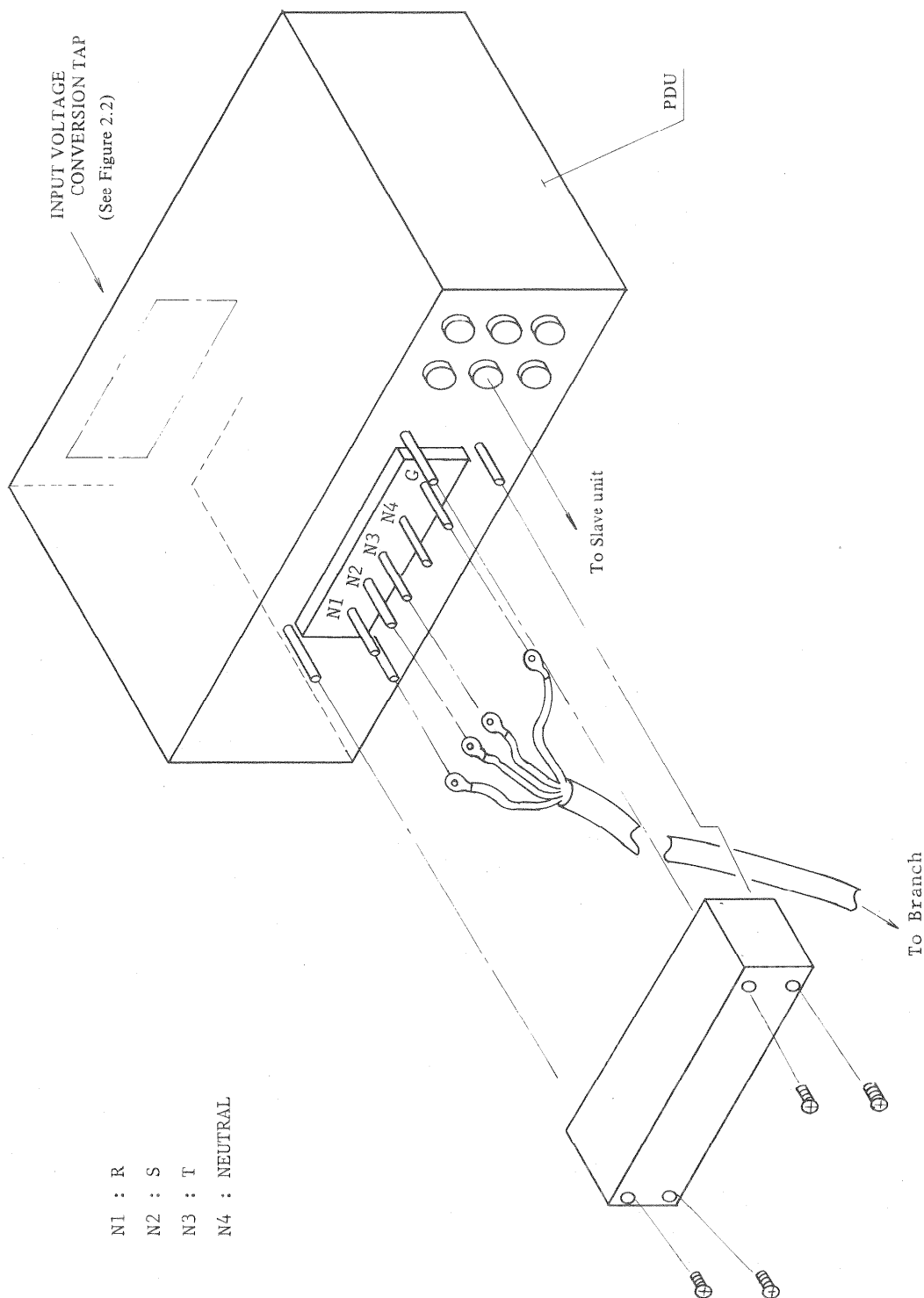


Figure 2.1 PDU connection

# INPUT VOLTAGE CONVERSION

CONNECT BETWEEN THE TERMINALS FOR  
EACH PHASE ACCORDING TO THE FOLLOWING  
FIG.

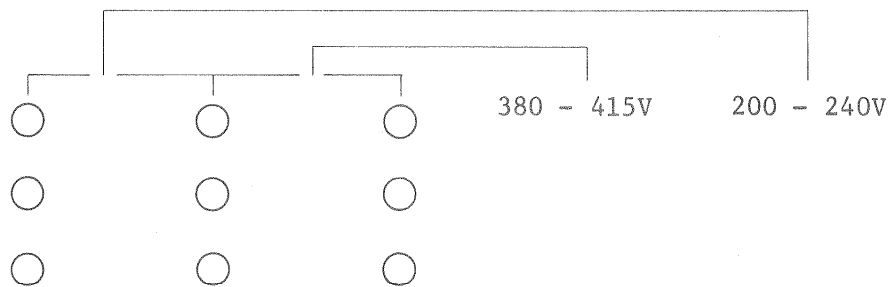


Figure 2.2 PDU voltage selection tap

## 2.2.2 Input voltage selection of power supply

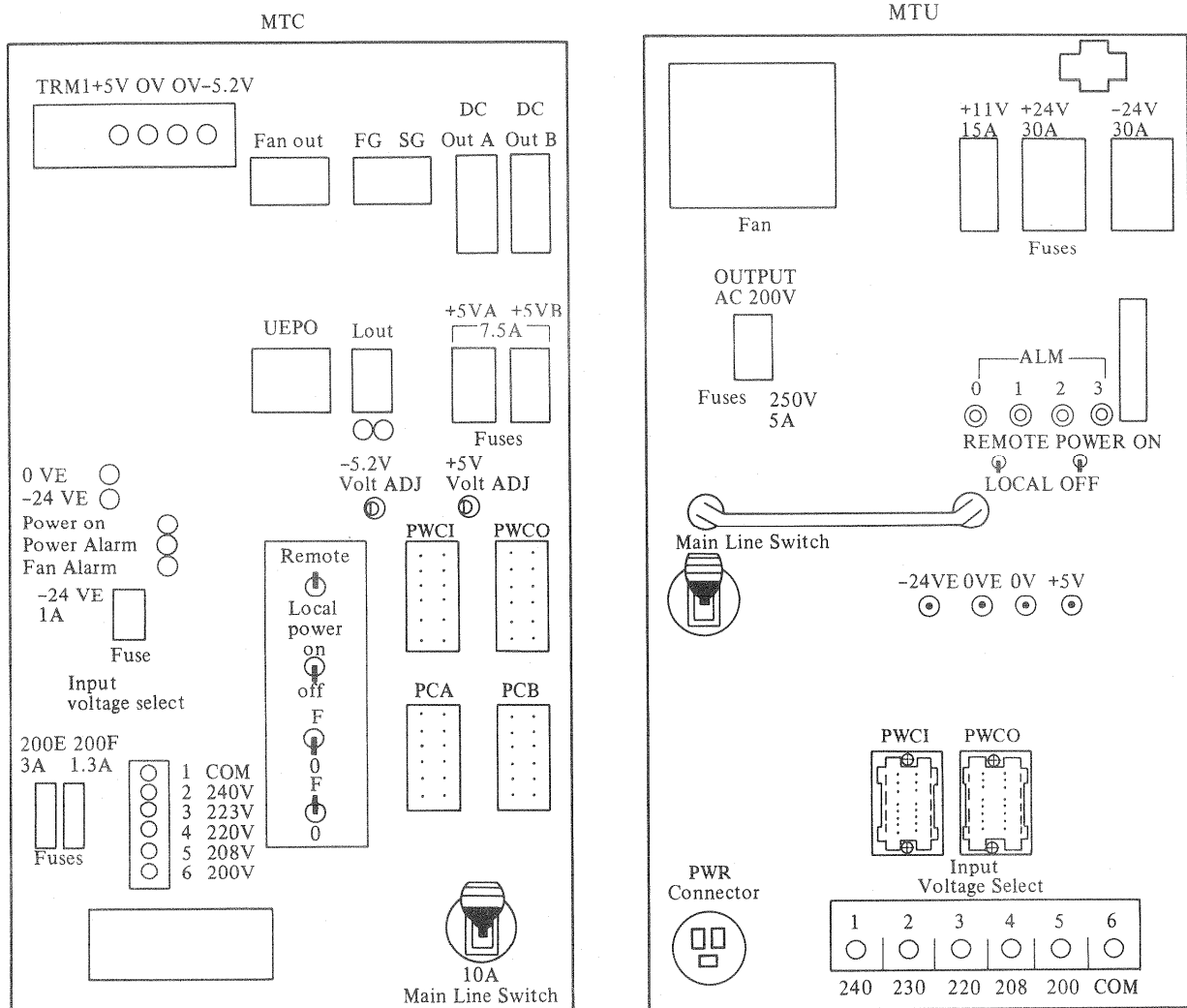


Figure 2.3 MTC and MTU power supply units

- (1) Remove the covers of the input selection terminals of the MTC and MTU power supplies. The location of MTU and MTC power supply units are shown in Figure 1.4. These covers are located at the rear of the MTU and MTC and are labeled INPUT VOLTAGE SELECTION.
- (2) Select the MTC terminal that corresponds to the voltage label, and connect a jumper between that terminal and COM.
- (3) Select the MTU terminal that corresponds to the voltage label, and connect the red lead to that terminal and the black lead to COM.
- (4) Reinstall the covers on the MTC and MTU power supplies.

### 2.3 Input Power Frequency Selection

- (1) Confirm whether facility input frequency is 50 or 60 Hz.
- (2) Remove the cover of the air supply unit. This cover is located on the front of the MTU, as shown in Figure 1.3. The label on the cover specifies whether the unit is set for 50 or 60 Hz input.
- (3) For 60-Hz input, verify that CNP66 is connected to CNJ66B and that CNP66C is connected to CNJ66A. These connections are shown in Figure 2.4.

For 50-Hz input, verify that CNP66 is connected to CNJ66A and that CNP66C is connected to CNJ66B. These connections are also shown in Figure 2.4.

- (4) Do not reattach the cover of the air supply unit until the remaining frequency and altitude checks are completed. These checks are described in the next paragraph.

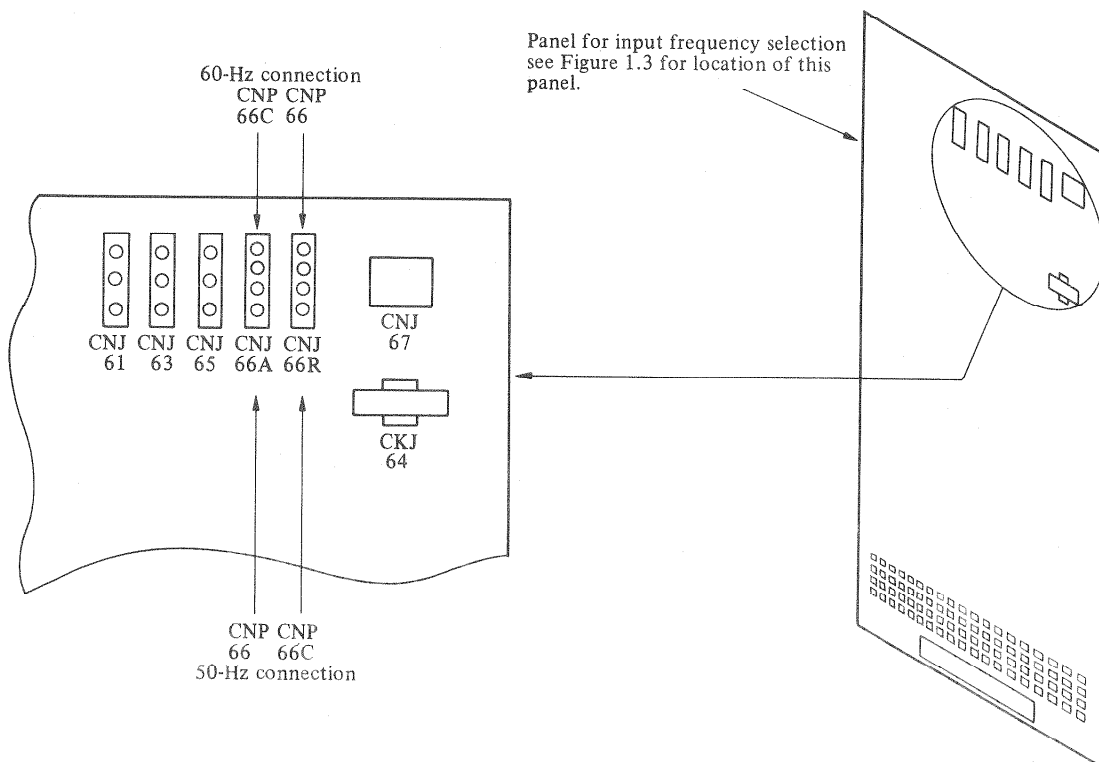


Figure 2.4 Input power frequency setting

## 2.4 Air Supply Unit Frequency Selection and Altitude Adjustment

Figure 2.5 (a through c) shows the location of pulleys for the vacuum blower and the air-pressure pump on the air supply unit. These pulleys are dependent on input-power frequency (50 or 60 Hz). The vacuum blower pulley is also dependent on altitude.

### Caution:

Do not remove or install belts by prying with shop tools. Use the adjustment screws on the air supply unit to loosen pulleys and belts. Use tension tool (B96L-0110-0004A) to adjust belt tension.  
(See Section 2.8)

### 2.4.1 Vacuum blower pulley (accessible without removal of air supply unit)

- (1) Verify that the correct frequency-dependent pulley has been installed in accordance with Table 2.1. When delivered, the device is pre-set for either 50 Hz or 60 Hz input. For 50-Hz input, use P/N B30L-1940-0101A; for 60-Hz input, use P/N B30L-1940-0102A.
- (2) Verify that the correct altitude-dependent pulley has been installed. If the unit operates at an altitude above 3000 feet, install the vacuum blower pulley in accordance with Figure 2.5 (e) and Table 2.1. Remove the pulley and reverse its orientation.

Table 2.1 Input-frequency and altitude adjustment

Installation condition	Vacuum blower pulley	Motor pulley
50 Hz input frequency	Use P/N B30L-1940-0101A	Large-diam. pulley
60 Hz input frequency	Use P/N B30L-1940-0102A	Small-diam. pulley
Low altitude (<3000 ft)	Large-diam. pulley	No adjustment
High altitude (>3000 ft)	Small-diam. pulley	No adjustment

(See Section K of Maintenance Manual.)

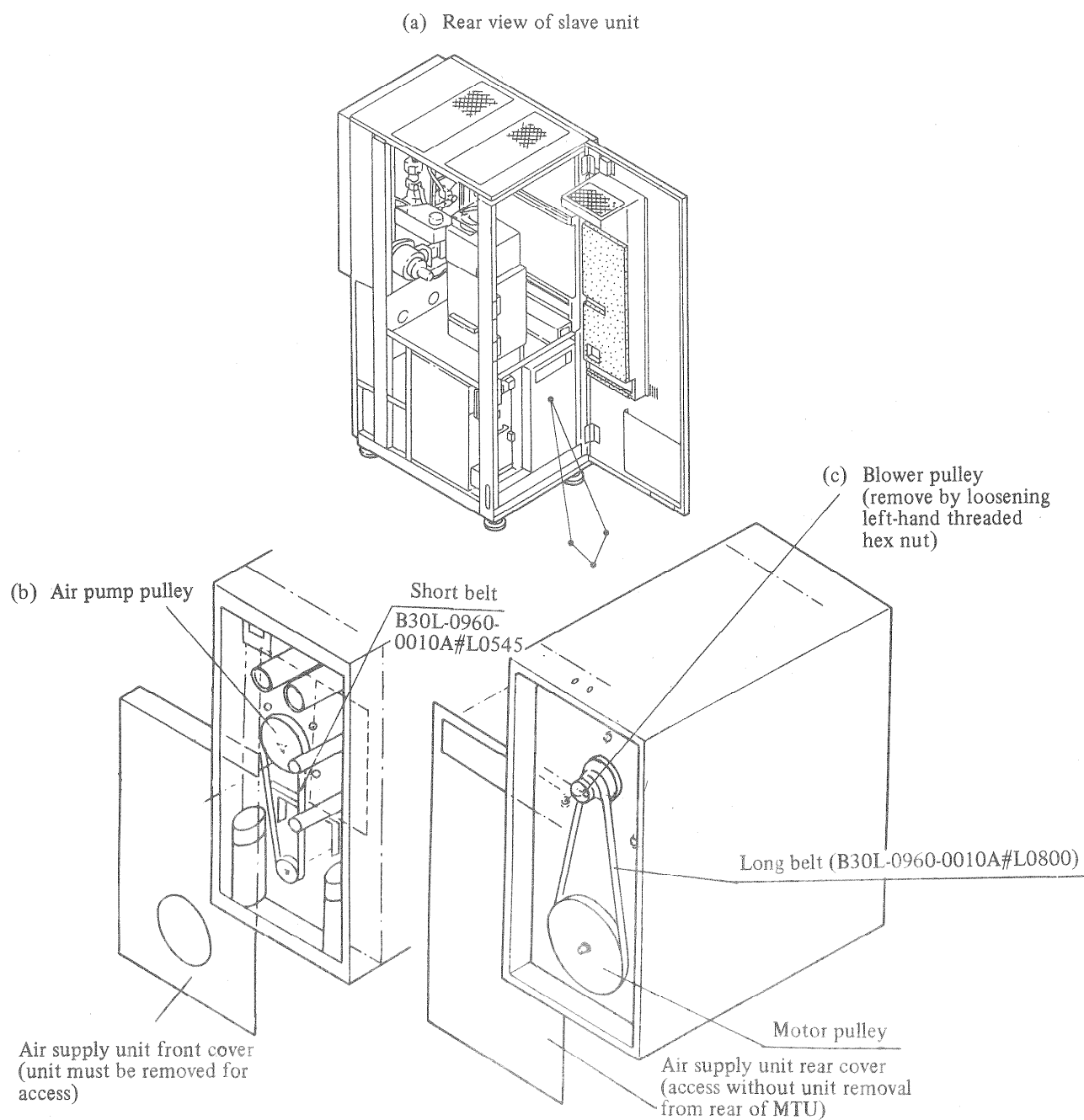


Figure 2.5 Air supply unit: vacuum blower and motor pulleys (1/2)

#### 2.4.2 Motor pulley

The motor pulley driving the air pump can be oriented for operation at either 50 or 60 Hz, as shown in Figure 2.5 (d) and Table 2.1. The air supply unit must be removed (subsection 2.4.3) for access to the motor pulley. If the MTU operates on 50 Hz, connect the belt to the large diameter pulley. If the MTU operates on 60 Hz, connect the belt to the small diameter pulley.

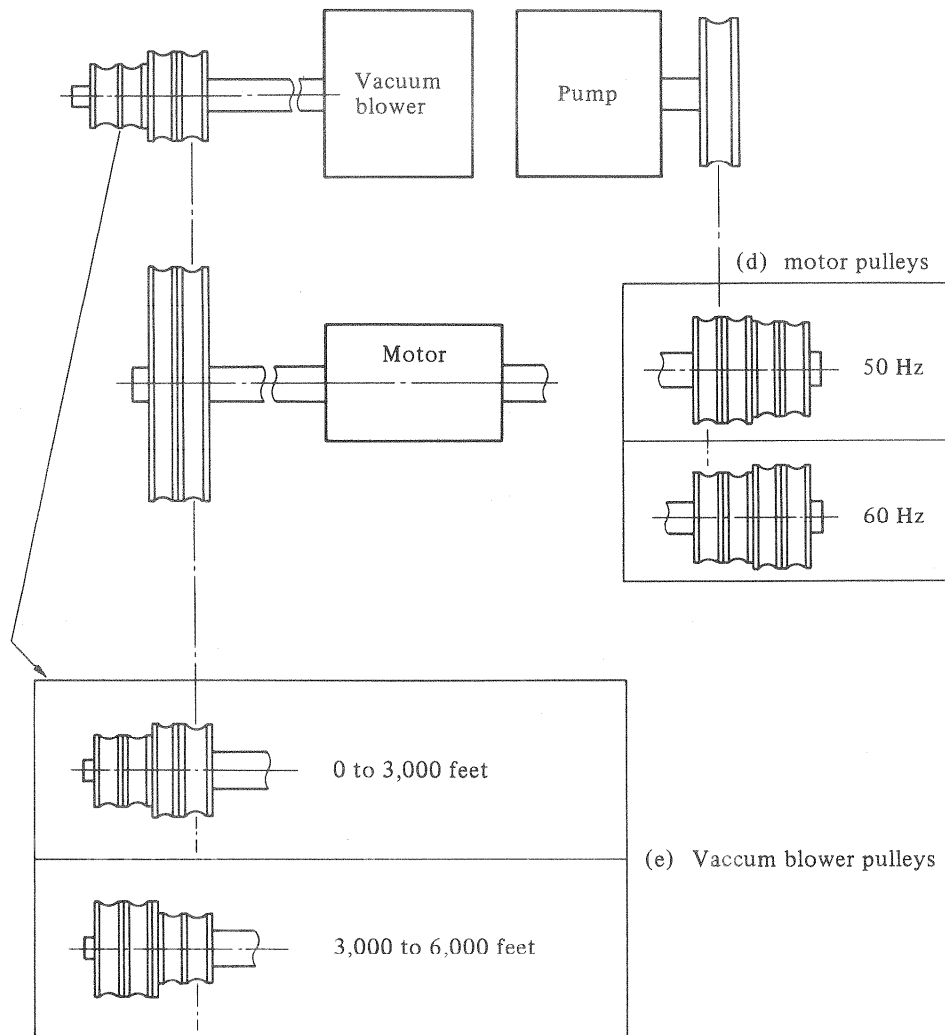


Figure 2.5 Air supply unit: vacuum blower and motor pulleys (2/2)



### 2.4.3 Air supply unit removal and installation

#### (1) Removal

- (a) Open the MTU lower left-hand door. Remove six screws and remove the plate to gain access to the front of the air supply unit.
- (b) Disconnect the hose from the blower air inlet and blower air outlet, shown in Figure 2.6.
- (c) Disconnect the tube at the pump outlet.
- (d) Disconnect power connector CNP44 of air supply.
- (e) Remove two screws 1 at the front of the air supply unit.
- (f) Open the MTU rear door and remove four screws 2 and remove the air supply unit mounting bracket.
- (g) Remove the air supply unit.

#### (2) Installation

- (a) Install the air supply unit by reversing the steps, above, for removal.
- (b) Ensure the pressure check described in chapter 4 are performed prior to operating the MTU.

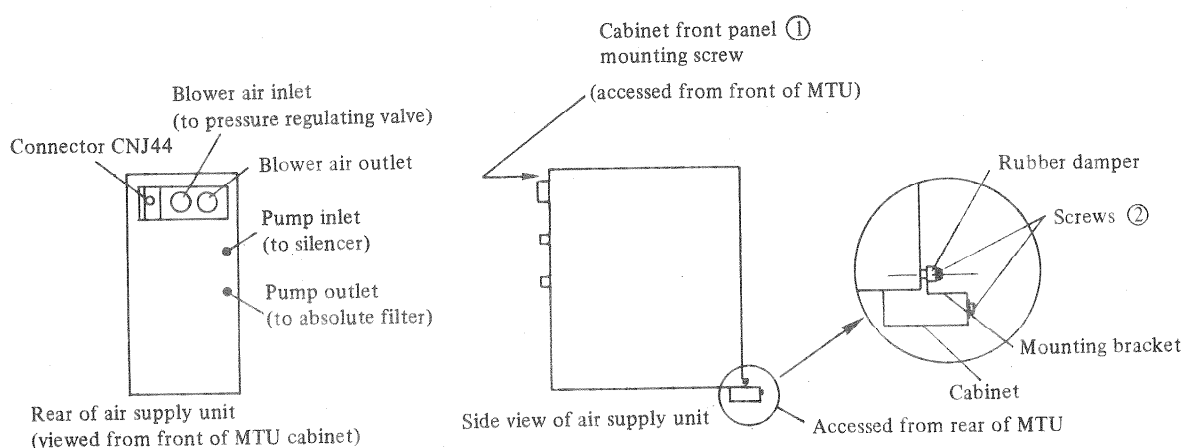


Figure 2.6 Air supply unit removal

## 2.5 Interface cabling

### 2.5.1 Channel/MTC interface cabling

The connections of the channel/MTC interface cables to the channel/MTC interface unit. The location of the channel/MTC interface unit is shown in Figure 1.3. Figure 2.7 shows the connection. The channel B side is of a two channel switch feature. The MTC of 3241, 3261, and 3281 is mounted only in the MTC#0 side. Perform the channel/MTC interface cabling as follows:

- (1) Confirm that the MTC is not connected to facility power.
- (2) Verify the connector arrangement for MTC#0, MTC#1, channel A, and channel B. Signals from the channel or from the previous unit are sent to the TAGI and BUSI connectors, and are sent to next unit through the TAGO and BUSO connectors. If the unit is the last unit on this channel, terminators must be attached.
- (3) Route the channel/MTC interface cables through the opening in the bottom of the MTU.
- (4) Connect the black connector (TAGI or BUSI) to the brown cable connector, and the brown connector (TAGO or BUSO) to the black cable connector. When attaching the terminators, connect the TBWA (C16B-9901-0300) to the TAGO (brown) connector and the TBWB (C16B-9901-0310) to the BUSO (brown) connector.

**Note:** The TAG and BUS cable pairs must be equal length. Paired cables of unequal length cause hard-to diagnose timing errors and exclusive subsystem problems.

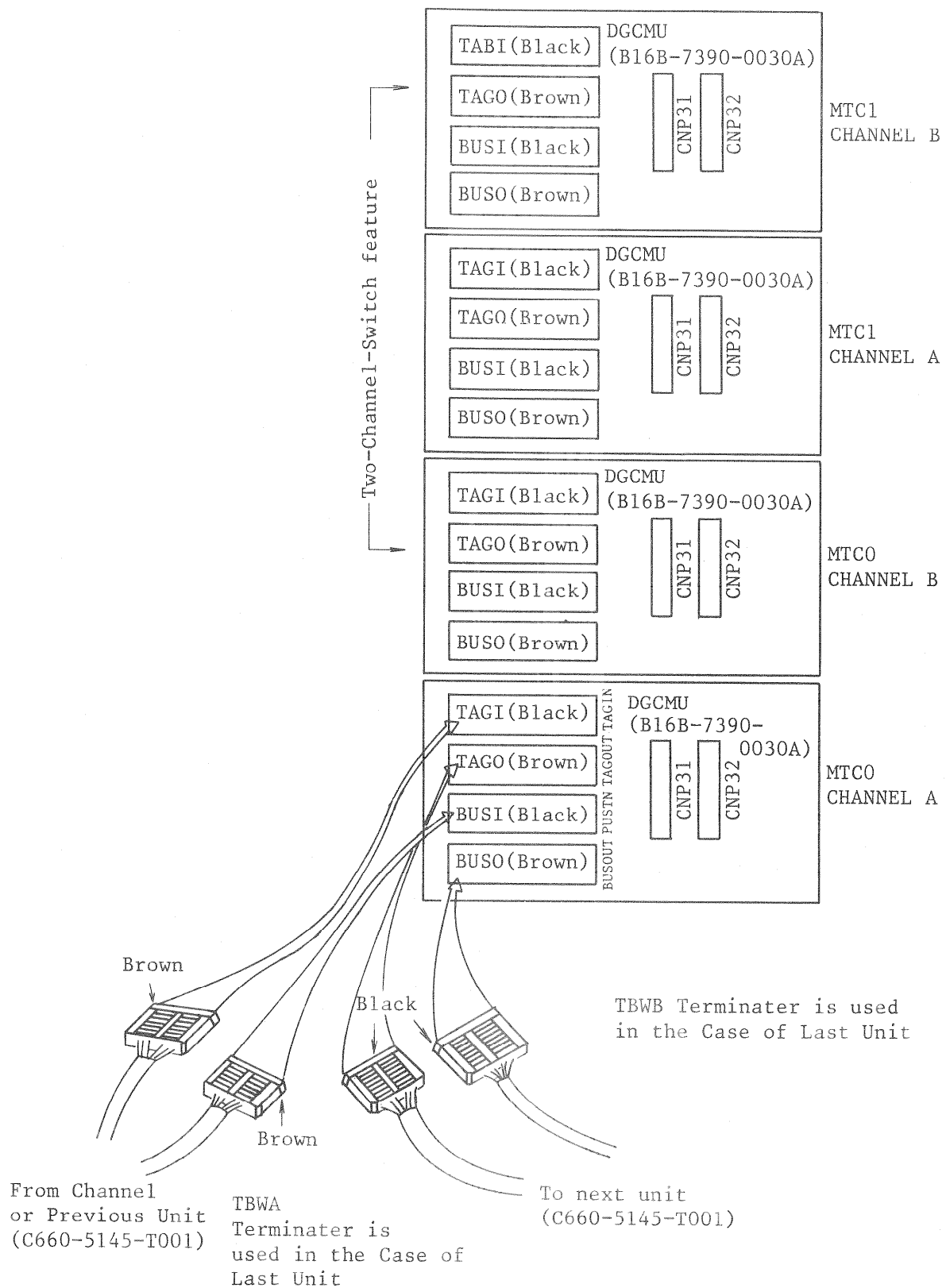


Figure 2.7 Channel/MTC interface cabling

## 2.5.2 MTC/MTU interface cabling

Part numbers for the cable connecting the MTC to the MTU(s) are as follows:

- o Master MTC to MTU #0 B03B-5280-0912A/#T05
- o Master MTC to slave MTU #1 thru #7 B03B-5280-0913A/#T07

The physical connection is between the MTC distribution board shown in Figure 2.8 and the MTU 1C06 shown in Figure 2.9.

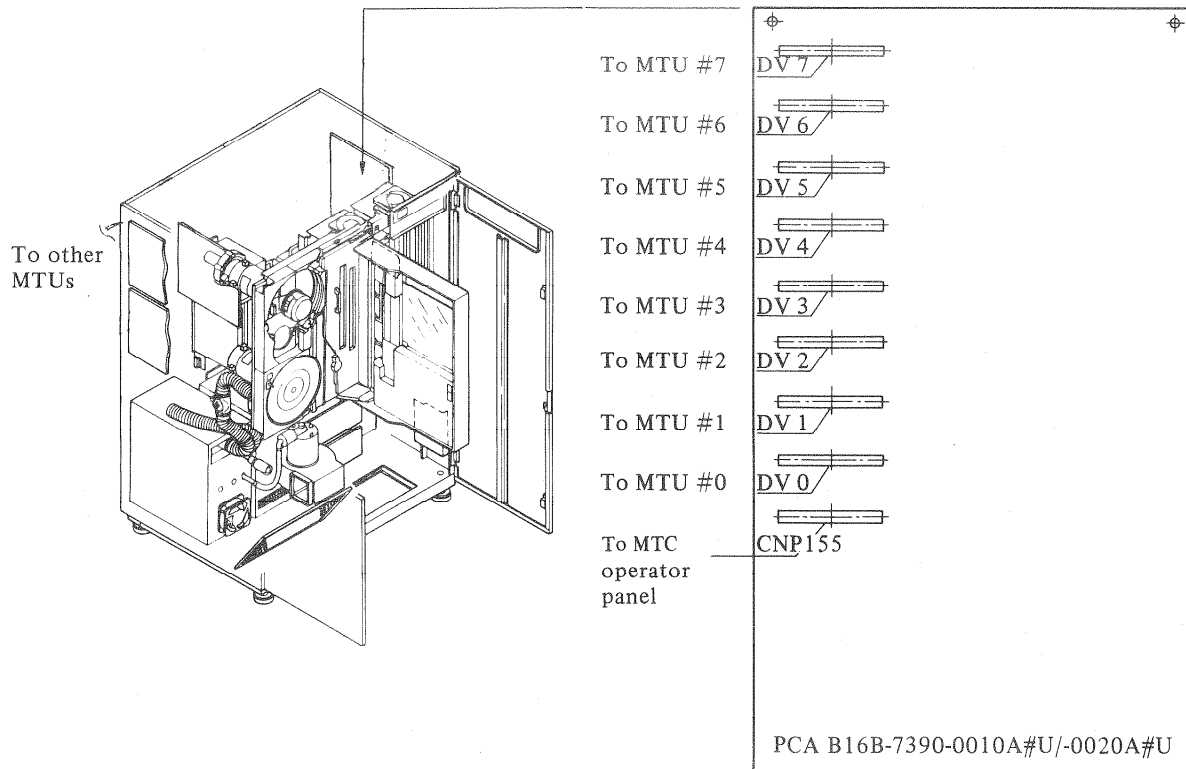


Figure 2.8 MTC/MTU interface cabling

### 2.5.3 MTC/MTU #0 interface cabling

MTC/MTU #0 interface cabling is completed when the unit is delivered. Verify MTC/MTU #0 interface cabling as a guide for performing MTC/MTU slave interface cabling described in Subsection 2.5.4.

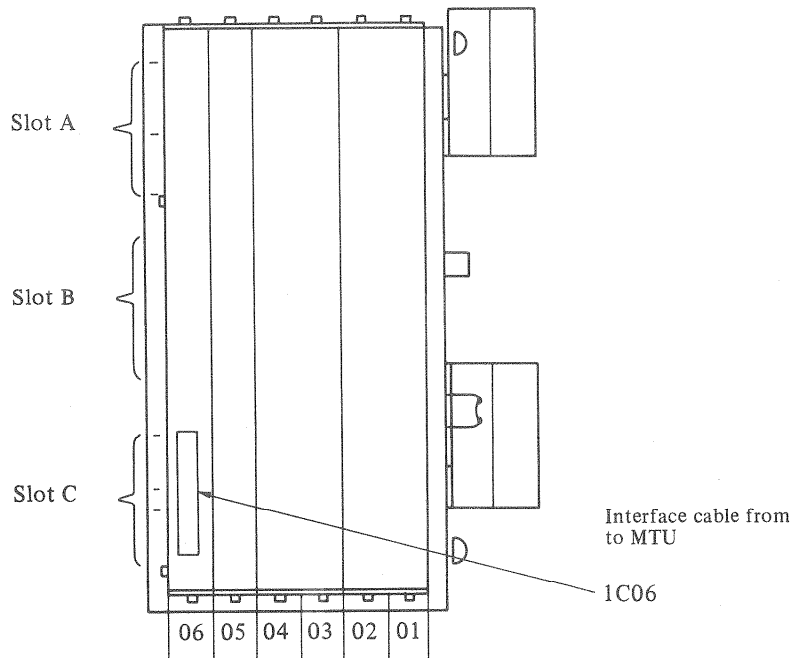


Figure 2.9 MTU PCA location

- (1) Confirm that the MTC and MTU are not connected to facility power.
- (2) Unbolt the MTU logic gate and card cage assembly of MTU #0 as shown in Figure 2.10.
- (3) Locate interface cable (B03B-5280-0912A) at 1C06, as shown in Figure 2.9.
- (4) Locate the route for the cable through attach Points #1 through #3 on the MTU logic gate, through attach Point #4 on the upper channel provided inside the MTU cabinet, and then to the MTC, as shown in Figure 2.10.
- (5) Locate the connection of the cable onto DV #0 on the interface distribution board (B16B-7390-0010A/U) in the MTC, as shown in Figure 2.8.

#### 2.5.4 MTC/MTU #1 through #7 interface cabling

Perform MTC/MTU #1 through #7 interface cabling as follows:

- (1) Confirm that the slave MTU(s) are not connected to facility power.
- (2) Unbolt the card cage of slave MTU #1 and swing open.
- (3) Install cable (B03B-5280-0913A) at 1C06 on slave MTU #1 as shown in Figures 2.9 and 2.10.
- (4) Route cable in the same manner as step 4, above.
- (5) Wind excess cable around the cable hangers located just below the top shelf on the rear of the master MTU, shown in Figure 2.10.
- (6) Install cable onto DV #1 for MTU #1 on the interface distribution board (B16B-7390-0010A/U) of the MTC. This connection is shown in Figure 2.8.
- (7) Repeat steps 1 through 6 to complete MTC/MTU #2 through #7 interface cabling.

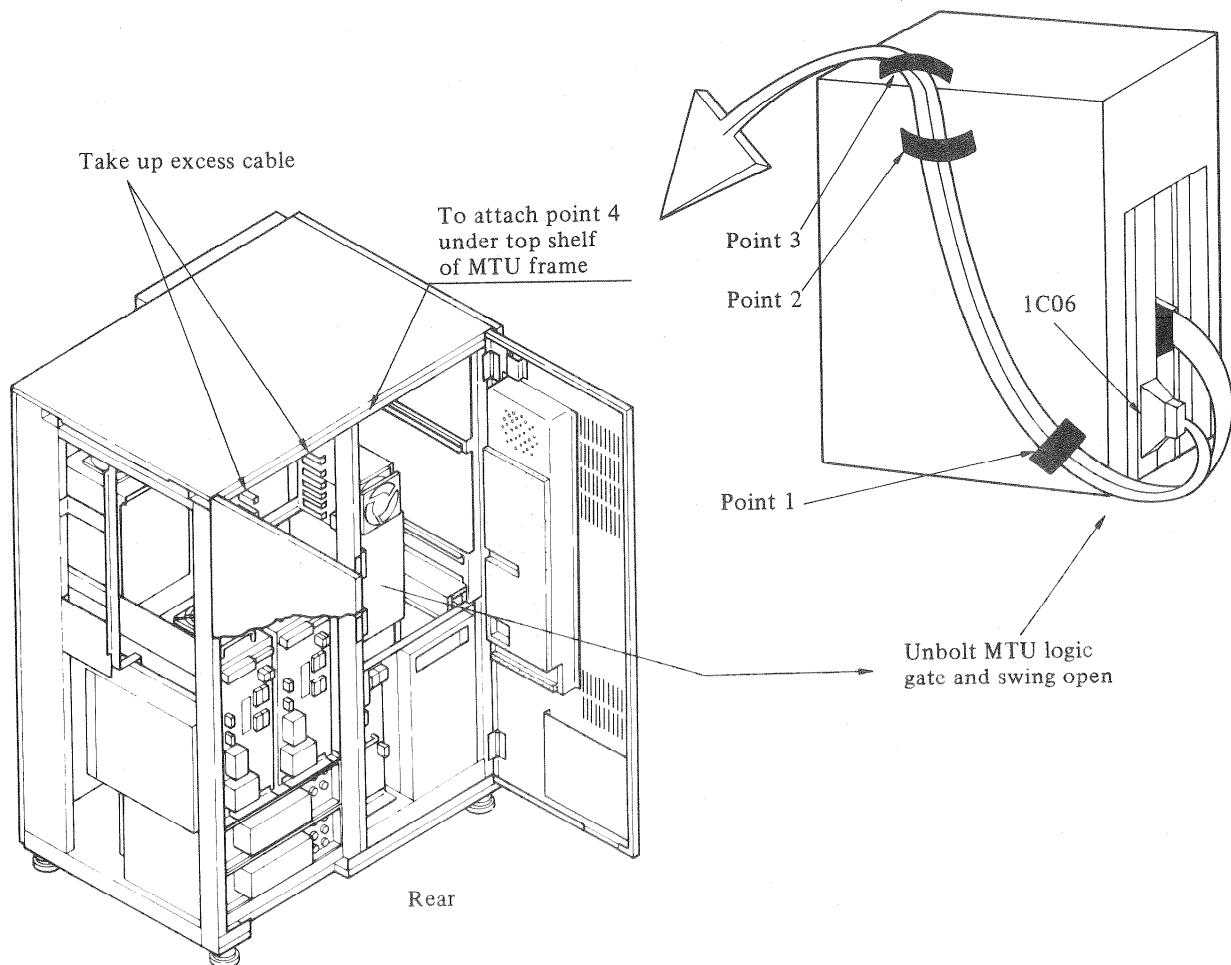


Figure 2.10 MTC/MTU interface cable routing

## 2.6 Power Control Cabling

- (1) For the two MTCs model (3242, 3262, and 3282), ensure that the power control cable C660-9215-T002 interconnects PWCI of the MTC#0 power supply and PWCO of the MTC#1 power supply, and PWCO of the MTC#0 power supply and PWCI of MTU#0 power supply.
- (2) Connect the power control cable C660-5325-T001 MTU#0 and all MTU slave units in accordance with Figure 2.11.
- (3) Attach the terminator CA.DIV184A (accessary of master unit) to PWCO of the last slave unit.
- (4) Connect the sequence & control (EPO) cable C660-5235-T014 from PCA of the MTC power supply to the I/O power sequence (PSP) connector of the CPU (Figure 2.12). The number of cables between PSP and MTC is determined by the number of the control unit. In case of two MTCs model, two cables are required.

Note: If the power switch of the MT subsystem is operated in the LOCAL mode without PSP, pins 1 and 2 of the connector PCA must be shorted together. A 16-pin MB connector C63L-0010-0001 (pins 1 and 2 are shorted) is suitable for the power switch operation without the PSP.

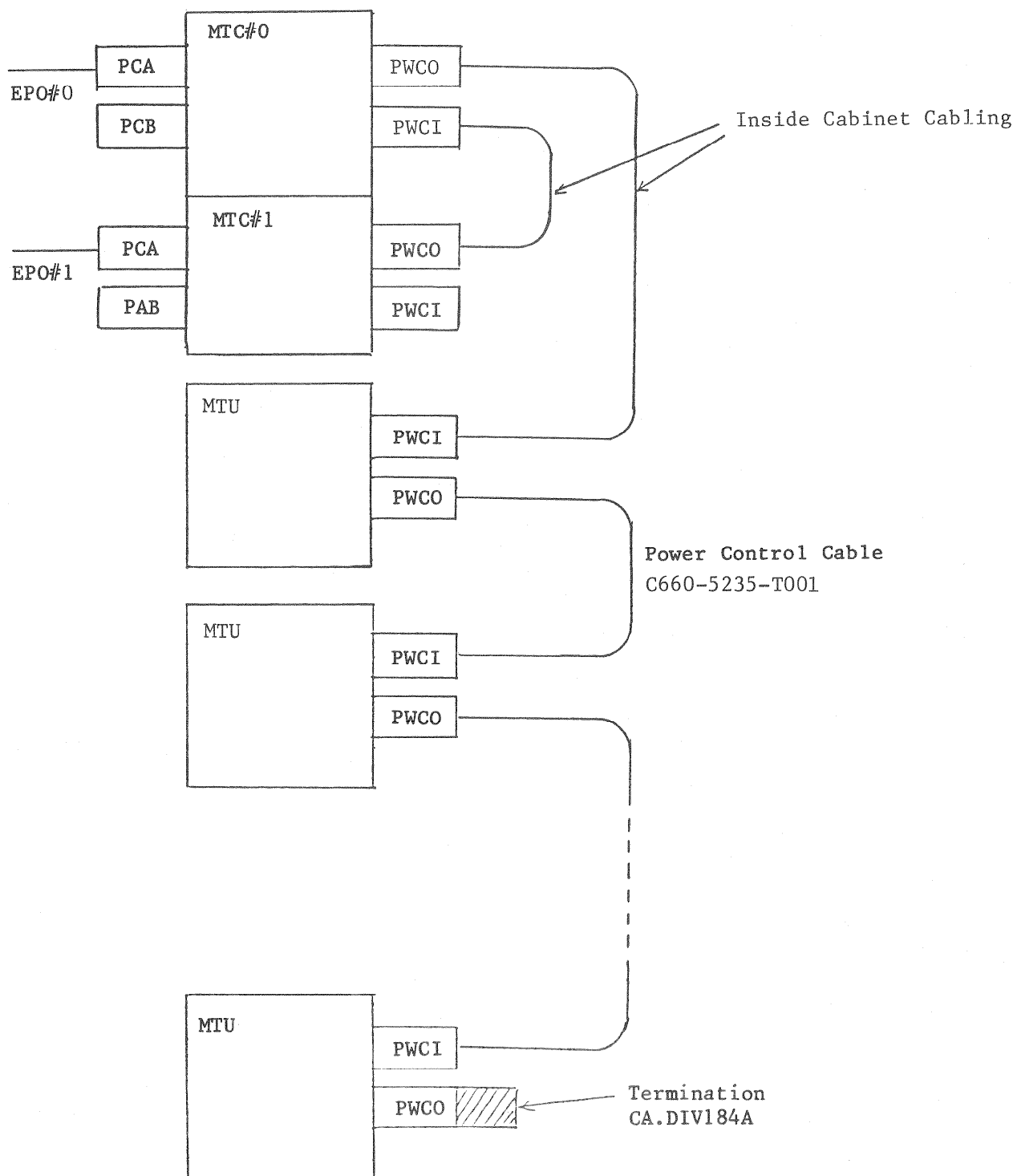
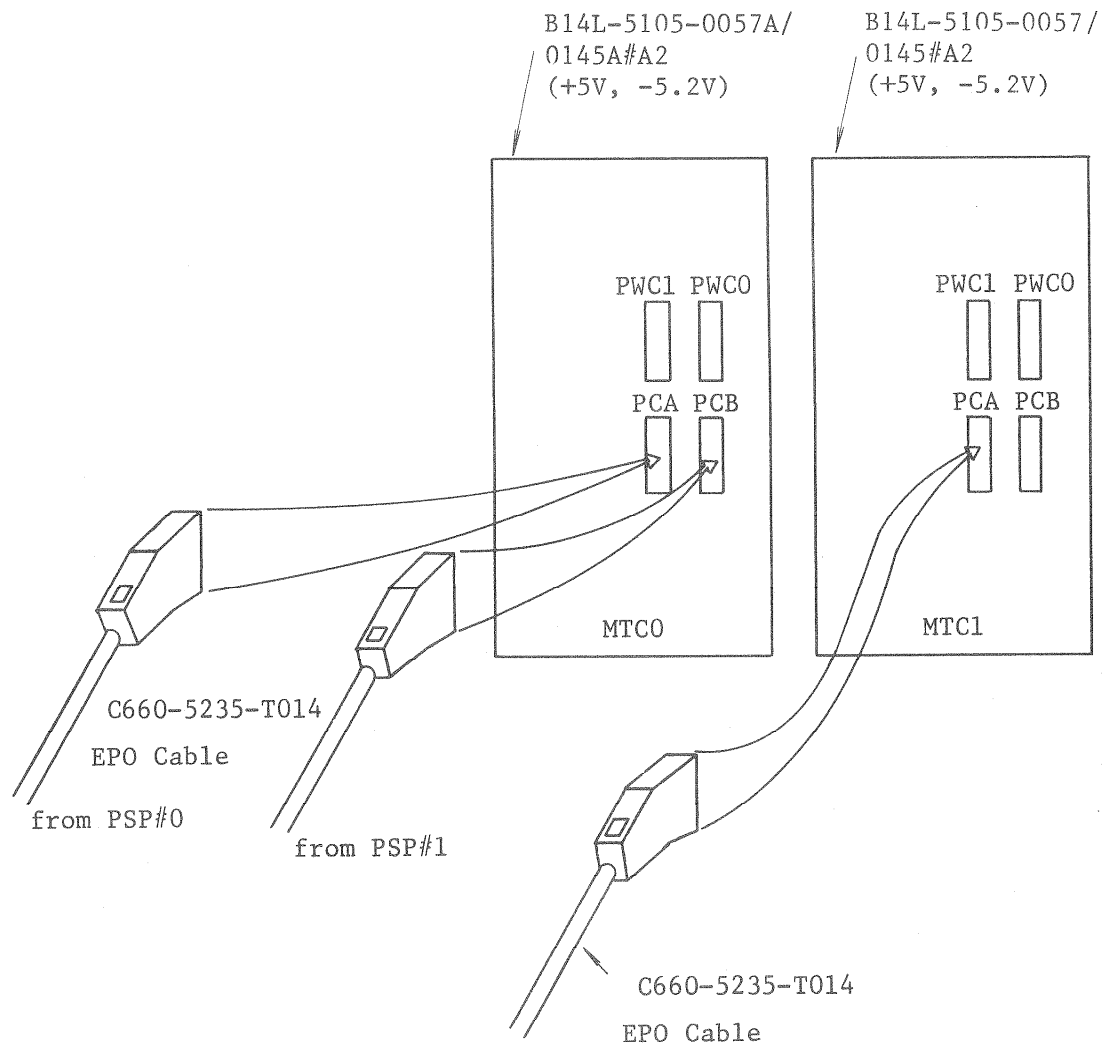


Figure 2.11 Power control cabling (1)





Note: If a tape control with Two-Channel Switch feature is connected to two systems, the EPO cables from both systems (PSP#0, PSP#1) are connected at PCA and PCB, respectively.

Figure 2.12 Power control cabling (2)

## 2.7 Input Power Cabling

Before connecting the power cables:

- Verify that the voltage and frequency selection procedures described in Sections 2.2 through 2.4, above, have been completed.
  - Ensure that the circuit breakers (MAIN LINE switch) on the MTC power supplies and on the MTU master unit power supply are set to OFF.
  - Ensure that the circuit breakers on the slave unit power supplies are set to OFF.
- (1) Connect the power cable from the slave unit power supply to the PDU in the master unit respectively.
  - (2) Connect the main input power cable of the PDU to the room receptable.

Note: One PDU supplies the power to three slave units. When more than four slave units are connected to the master unit in the MT subsystem, the additional PDU is required in the master unit.

## 2.8 Belt Tension Check and Adjustment

- (1) Remove the MTU air supply unit (See Subsection 2.4.3).
- (2) Remove the air supply unit front and rear covers and refer to Figure 2.5 for location of belts.
- (3) Install the tension meter, as shown in Figure 2.13. Turn the motor pulley 3 to 5 turns by hand before measuring the tension. Push up the lever with a finger as shown in Figure 2.13. Snap the belt. Read the value in pounds when the belt hits the tension meter (at location "A").
- (4) Adjust the belt tension by positioning the vacuum blower or air pump.
  - o If the belt is to be replaced, the new belt must be adjusted so that the tension levels in Table 2.2 are satisfied.
  - o If the old belt is to be used again, measure the tension before removing it, and adjust the belt to that tension when reinstalling it. The direction of rotation of the belt must be the same when reinstalling it.

Table 2.2 Belt tension

Belt	Minimum tension	Adjusted value	
		New belt	Old belt
Belt between motor and vacuum blower (longer belt)	16.5 lbs.	29 to 34 lbs.	Original tension (refer to Note 2)
Belt between motor and air pump (shorter belt)	12.5 lbs.	29 to 34 lbs.	

- Notes: 1. Belt tension rapidly deteriorates in several days or several months. Replace the belt if Table 2.2 requirements are not met.
2. If an old belt has been stretched, its life may be extremely short if its tension is adjusted to the value for a new belt. Replace old belt as soon as possible.

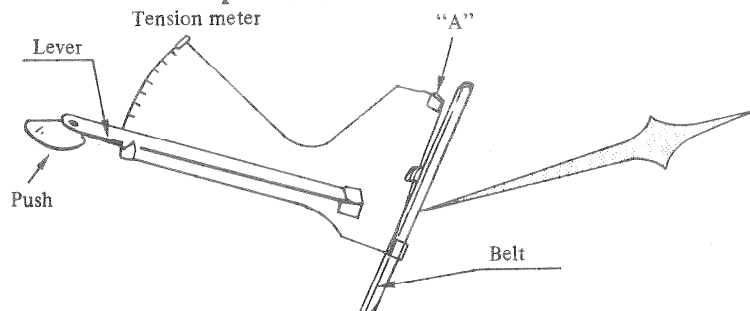


Figure 2.13 Tension meter



## CHAPTER 3    CLEANING

### 3.1    Introduction

This chapter contains instructions for MTU cleaning prior to system checkout. Use the cleaning agent (solvent) that is supplied with the cleaner kit (B960-0110-T016A). In general, never apply rough or abrasive material or hard tools, such as metal bars, when cleaning MTU components. Clean the surfaces shown in Figure 3.1 and listed below with a gauze cloth soaked in solvent.

### 3.2    Read/Write and Erase Heads

To clean Read/Write and Erase heads:

- (1)    Open the front door of the MTU.
- (2)    Lift autocleaner to access the lower part of the read/write head.
- (3)    Use a circular motion while applying a gauze cloth soaked in solvent to the heads.
- (4)    Inspect the heads after cleaning.
- (5)    Remove adhering gauze thread with a cotton swab or clean cloth.

### 3.3    Capstan Roller

To clean the capstan roller:

- (1)    Wear clean gloves or cover hands with a gauze cloth. Do not touch the capstan surface with uncovered hands.
- (2)    Manually turn the capstan and clean carefully with a gauze cloth soaked in solvent.
- (3)    Inspect the capstan for gauze threads and remove with a clean cloth.

### 3.4 Tape Cleaner

Clean the edges of the tape cleaner with a cotton swab or gauze soaked in solvent.

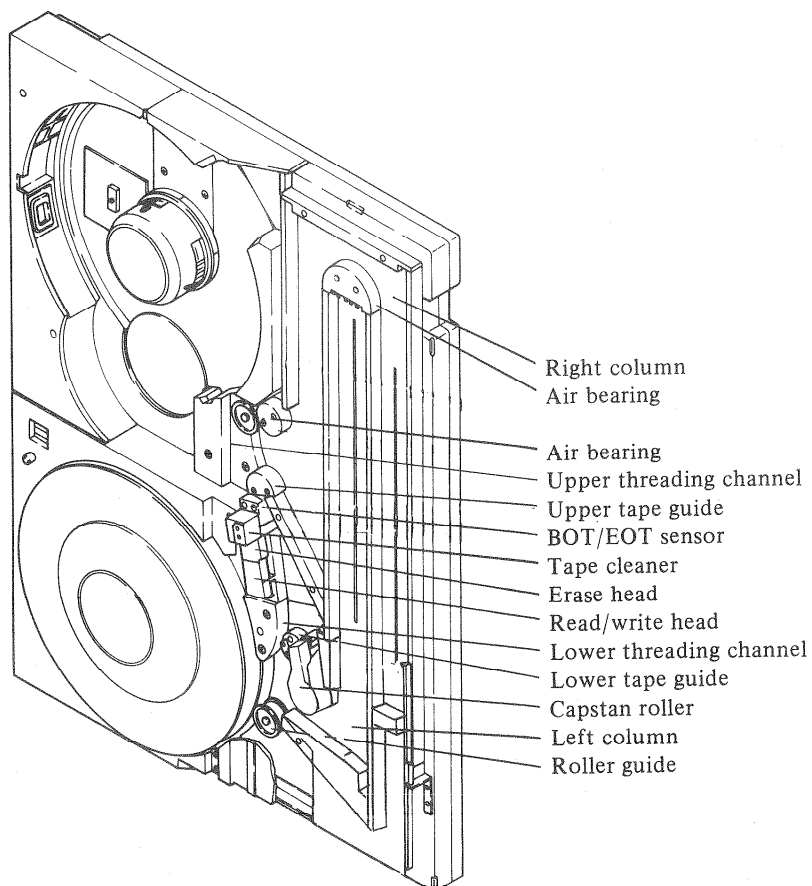


Figure 3.1 MTU components requiring cleaning

### 3.5 Other MTU Components

Clean each of the following items with a gauze cloth or cotton swab containing solvent. To remove dirt from more inaccessible locations, use a brush dipped in solvent. After brushing, apply a gauze cloth or cotton swab soaked in solvent to these surfaces.

- (1) Tape guide (upper and lower)
- (2) Air bearing (see two locations in Figure 3.1)
- (3) Roller guide
- (4) Upper threading channel
- (5) Lower threading channel
- (6) Column interior
- (7) Glass cover
- (8) Photo sensor (beginning of tape and end of tape sensor).

## CHAPTER 4 SUBSYSTEM SETTING

### 4.1 MTC Address

The address of the MTC is determined by plugging pins on the terminal boards (SH09) on a PCA. One MTC has each MTC address for each channel path. Therefore, for example, in the case of 3242, 3262, and 3282, four address must be set for the two control units.

	Route of the Channel Path	
	A	B
PCA name	512184U	512183U
PCA mounting position	1A08	1A09

Tape control and tape unit address byte

	MTC				MTU			
Bit	0	1	2	3	4	5	6	7

MTC Address byte	Terminal Pins to be connected		Terminal board (SH09) location on the PCA	
Bit	"0"	"1"	Route A	Route B
0	03-04	02-03	AG7	AM5
1	06-07	05-06		
2	10-11	09-10		
3	13-14	12-13		
4	03-04	02-03	AG6	AM6

Part No. of shorting plugging C63L-0790-0001

#### 4.2 MTC Selection Priority

Tape control units are factory plugged to respond to a Select Out signal (high priority). If low priority is required, plug pins on the terminal boards (SH09) on a PCA to a Select In signal.

Priority change is made by plugging pins on the terminal boards on a PCA in each Interface Unit.

PCAs name: DGCMU (C16B-7390-0030/U)  
Terminal board (SH09): SW1  
location on the PCA

Terminal pins to be connected	Remarks
03-04 06-07 13-14	Hig priority Select Out fetch
02-03 05-06 12-13	Low priority Select In fetch

#### 4.3 MTC EC Level

The EC level of the MTC is determined by plugging pins on the terminal board (SH09) on a PCA. (See Figure 4.1)

PCA name: 512185U  
PCA mounting location: 1A07

MTC EC level Bit	Terminal Pins to be connected		Terminal board (SH09) location on the PCA
	"0"	"1"	
0	09-10	10-11	BB1
1	12-13	13-14	
2	02-03	03-04	
3	05-06	06-07	



# IC or Terminal Board Location on a PCA

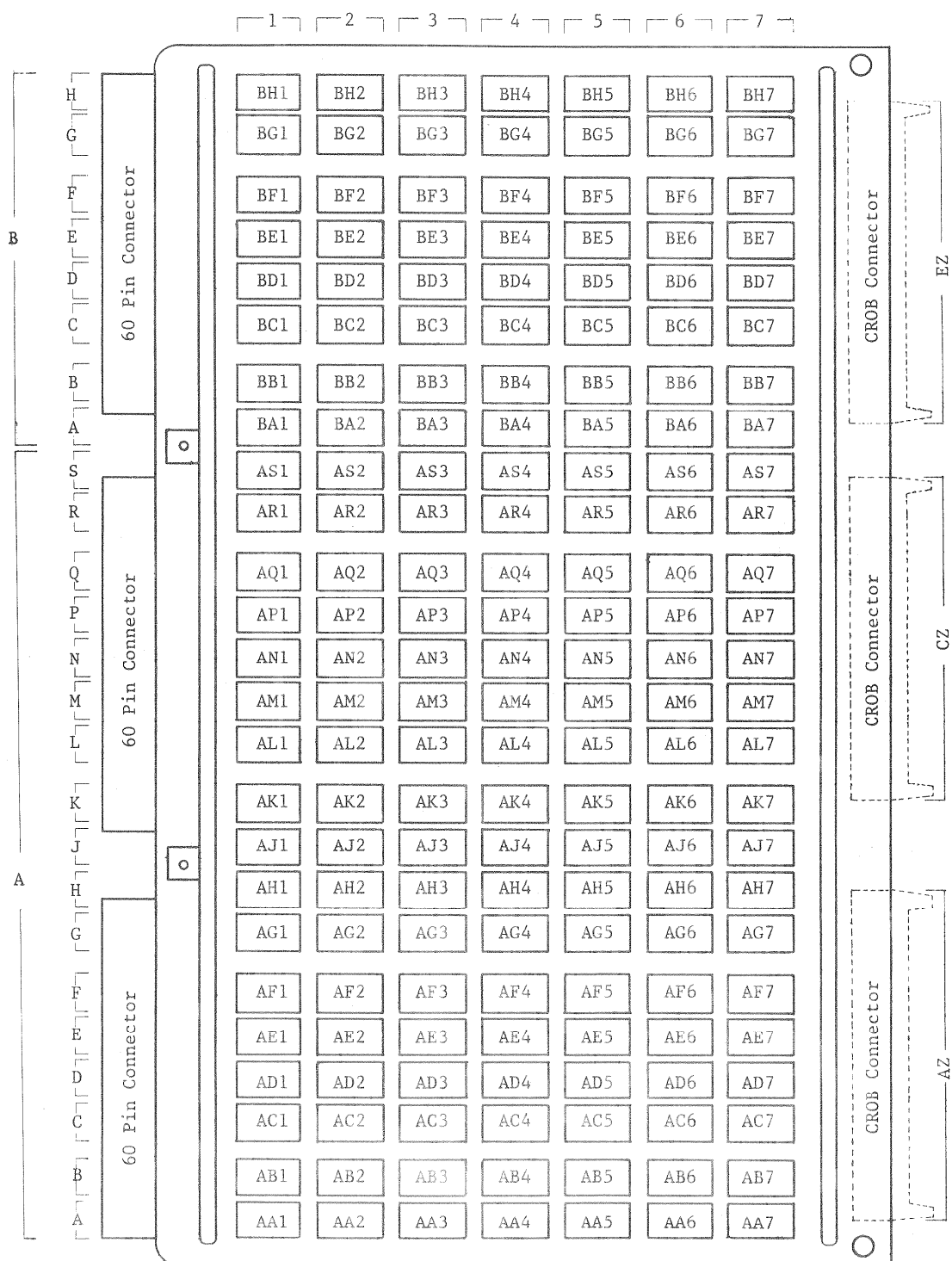


Figure 4.1 View of IC inserting side

#### 4.4 MTC Initial Hardware Setting

Tape Control units are factory plugged pins on the terminal boards (SH09) on PCAs as under table to set the MTC Hardware initial status. (See Figure 4.1).

PCA name	PCA mounting position	Short-circuit mounting position	Terminal pins to be connected
512184U	1A08	AG6	05-06
			09-10
			12-13
512183U	1A09	AM6	06-07
			10-11
			13-14
512185U	1A07	AA7	02-03
			06-07
			10-11*
			13-14
		AA6	03-04
			06-07
			10-11**
			13-14
		BG7	03-04

\* For 324X/6X applications, 10-11 are connected.  
For a 328T application, 09-10 are connected.

\*\* For SPERRY system 80, 09-10 are to be connected at an installation time.

#### 4.5 Channel Extension Feature

Maximum length for channel cable can be increased by channel Extension Feature (Offset interlock mode).

Maximum cable length is 80 m (267 FT) when the switch circuit on the PCA is jumpered as follows:

#### NOTE

Maximum cable length may be extended 107 m (350 ft.) by restricting the channel connections to two control units.

PCA ; C16B-5121-0840/U  
PCA Location ; 1A08  
Switch Location; AG6  
Connected Pins ; From: DC Interlock Mode 12-13  
To: Offset Interlock Mode 13-14

Note) To extend the interface cable, please note the following condition.

- 1) Connected channel should have the following data transfer capability.

More than 2.0 MB/s in 200 IPS  
More than 1.5 MB/s in 125 IPS

If the connected channel doesn't have the above capability, an Overrun Error may often occur.

- 2) Channel Interface Control PCA, 512184U (1A08), should be more than Rev. I.

Such a PCA is furnished to MTC having following ELC level.

Model	ELC
3241	more than 10
3242	"
3261	more than 13
3262	"

If such extension is selected in the older revision unit, ICC (Interface Control Check) may occur.



## CHAPTER 5 MTU CHECKOUT AND ADJUSTMENT

### 5.1 Introduction

This chapter provides detailed instructions for checking and adjusting the MTU prior to data applications. Procedures are given for:

- o Initial MTU installation checkout
- o Powering on the MTS
- o Power supply adjustment
- o Connecting the field tester
- o BOT and EOT checks and adjustments
- o Air system checks and adjustments
  - Column vacuum
  - Air-bearing pressure
  - Restraint pressure
- o Tape-loop position check
- o Azimuth check
- o Read signal check.

It is important to perform the MTU installation checks and adjustments in the sequence given above. If any error codes or malfunctions occur during MTU checks, refer to the Maintenance Manual for corrective action.

### 5.2 Initial MTU Installation Checkout

After physical installation of the MTS has been completed, perform the following initial installation checks:

- (1) Verify that input voltage (see Section 2.2), frequency selection (see Sections 2.3 and 2.4), and cabling (see Sections 2.5 through 2.7) have been completed correctly.
- (2) Ensure that MTU cleaning (see Chapter 3) has been completed.

### 5.3 Powering on the MTS

Perform the following power-on steps:

- (1) Turn the circuit breaker (MAIN LINE switch) of the PDU on and check that no abnormality occurs.
- (2) Set the MTC#0 power supply unit REMOTE/LOCAL switch to LOCAL.  
For a dual-MTC system, set the MTC#1 power supply unit REMOTE/LOCAL switch to LOCAL.
- (3) Turn the MTC#0 power supply unit MAIN LINE switch on. For a dual-MTC system, turn the MTC#1 power supply unit MAIN LINE switch on.
- (4) Set the MTU#0 power supply unit REMOTE/LOCAL switch to LOCAL.
- (5) Turn the MTU#0 power supply unit MAIN LINE switch on.
- (6) Verify that:
  - All blowers and motors operate correctly.
  - Only the PROTECT lamp on the MTU operator panel lights.
  - The window of the front door opens.
  - The air supply motor is stopped.
- (7) Turn the MTU#0 power supply unit MAIN LINE switch off.
- (8) Turn the MTC power supply unit MAIN LINE switch off.
- (9) Set the MTU#0 power supply unit REMOTE/LOCAL switch to REMOTE.
- (10) Turn the MTC power supply unit MAIN LINE switch on.
- (11) Verify that MTU goes on a few seconds after the MTC turns on.
- (12) Turn the MTC power supply unit MAIN LINE switch off.
- (13) Verify that the MTU as well as the MTC goes off at the same time.

If the system does not include slave units, go to step 19.

- (14) When the slave units are connected by the power control daisy-chain connection, set all MTU power supply unit REMOTE/LOCAL switches to REMOTE.
- (15) Turn the MTC power supply unit MAIN LINE switch on.
- (16) Verify that the slave units go on sequentially.
- (17) Turn the MTC power supply unit MAIN LINE switch off.
- (18) Verify that all slave units are also turned off.
- (19) Set both MTC and MTU power supply unit REMOTE/LOCAL switches to REMOTE.

- (20) Power on the MT subsystem from the host, and verify that normal power ON occurs.
- (21) Power off the MT subsystem from the host, and verify that normal power OFF occurs.

#### 5.4 Power Supply Checkout and Adjustment

- (1) Use a digital voltmeter to check and adjust the following DC voltage levels on the MTC #0 power supply unit.

Voltage	Range
+5 V	+4.75 to +5.25 V. Adjust the +5 V ADJ on the power supply unit as required.
-5.2 V	-5.46 to -4.94 V. Adjust the -5.2V ADJ on the Power supply unit as required.

- (2) Check MTC #1 power supply unit for a dual-MTC system. Adjust DC voltage levels, if necessary, to the same range as that for MTC #0.
- (3) Use a digital voltmeter to check the following DC voltage levels on the MTU power supply unit(s).

Voltage	Range
+5 V	+ 4.75 to 5.25 V
+20 V	+16 to 24 V
-24 V	-18 to -28.8 V

## 5.5 Connecting the Field Tester

- (1) Set the MTC front panel POWER ON switch(es) to OFF.
- (2) Connect the field tester (B13B-0110-B101A) to slot 1C05 on the MTU logic gate assembly (see Figure 5.1).
- (3) Set the MTC front panel POWER ON switch(es) to ON.

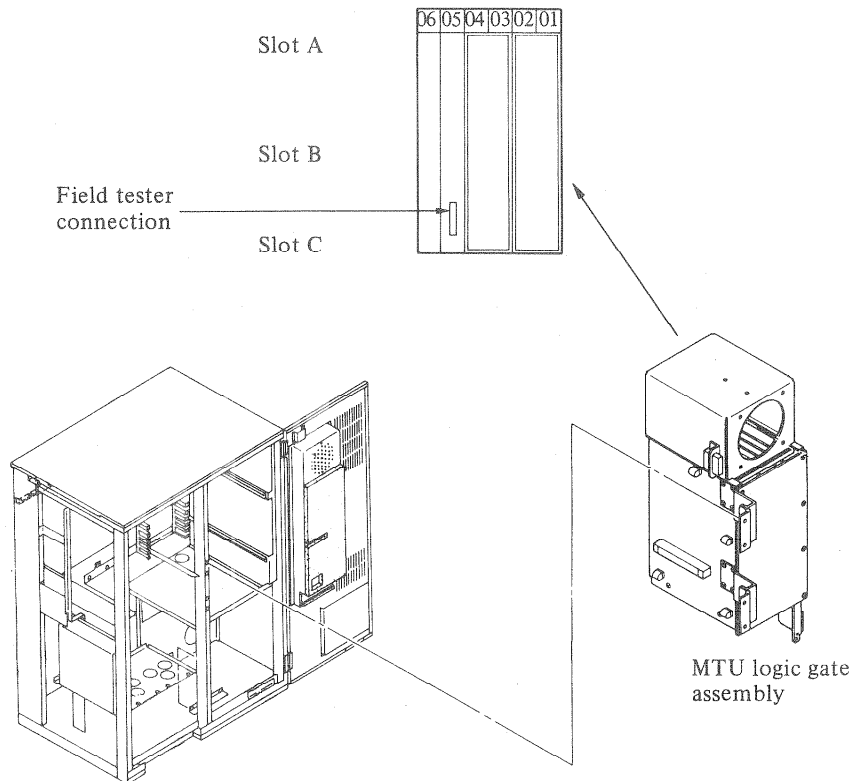


Figure 5.1 Field tester connection to 1C05 on MTU logic gate



## 5.6 BOT and EOT Detection Circuits

- (1) Obtain a magnetic tape and install two new reflective markers as shown in Figure 5.2.

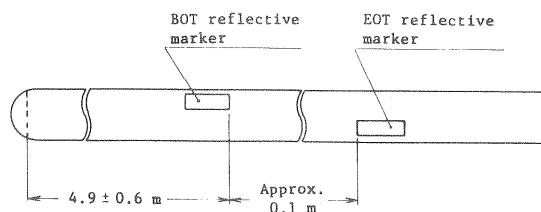


Figure 5.2 Beginning of tape and end of tape reflective markers

- (2) Before loading tape, check the voltage levels at terminals BOT/GND and EOT/GND (See Figure 5.3) with a digital voltmeter. The readings should be +2.0 V.
- (3) If voltage is not +2.0 V, adjust potentiometers for BOT and EOT, respectively, on the MTU PCA. See Figure 5.3 for location of this card and BOT and EOT potentiometers.

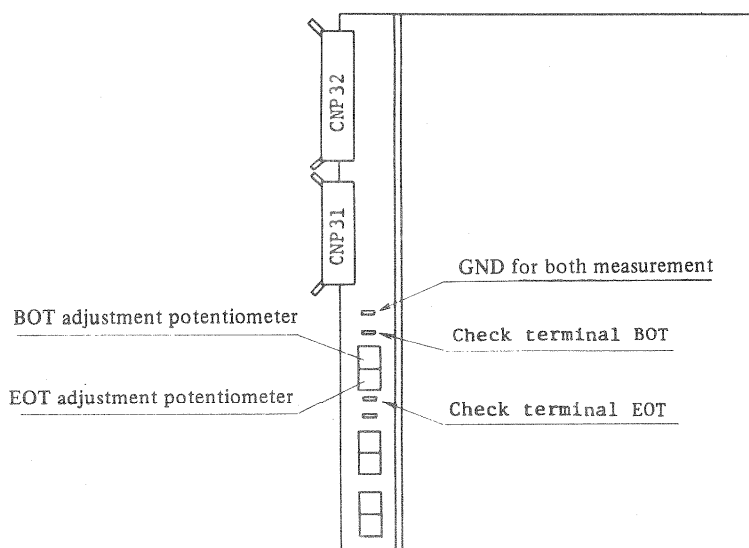


Figure 5.3 PCA 1A04 located in the MTU logic gate assembly

- (4) Mount the tape and press LOAD/REWIND on the MTU front panel.
- (5) After the tape automatically stops at BOT, measure the voltage at the BOT terminal.
- (6) If the level is lower than +2.0 V, adjust the level to +2.0 V using BOT potentiometer.

- (7) Set the field tester switch to \$01, and set the OFL/ONL switch to OFL.

\$01	Switch number	0	1	2	3	4	5	6	7
	Switch setting	dn	dn	dn	dn	dn	dn	dn	up

- (8) Toggle the SSS switch to run the tape forward. Tape automatically stops at EOT.
- (9) Measure the voltage level at the BOT terminal and adjust voltage to lower than +0.3 V.
- (10) Measure the EOT level.
- (11) If EOT level is lower than +2.0 V, adjust the level to +2.0 V using potentiometer EOT.
- (12) Set the field tester switches to \$41.

\$41	Switch number	0	1	2	3	4	5	6	7
	Switch setting	dn	up	dn	dn	dn	dn	dn	up

- (13) After the tape automatically stops at BOT, check that the EOT level is lower than +0.3 V.
- (14) Repeat these steps for each MTU in the system.

## 5.7 Air System

Load an SRM3200 tape or a tape of equivalent quality as follows:

- (1) Install the reel of tape on the file (upper) reel.
- (2) Position the tape leader between the two white scribe marks on the upper restraint. (For a cartridge, omit this step.)
- (3) Close the door.
- (4) Press the LOAD/REWIND button on the MTU front panel.

The air system (pneumatics) should now come on, the window will close, and the file reel will rotate clockwise (CW) to feed the tape. Tape will load into columns, search forward, search backward, and stop at beginning of tape (BOT). If the 2-digit display on the MTU operator panel is other than 00, refer to the error codes in the Maintenance Manual.

To allow for thermal stabilization, the pneumatics assembly must operate for at least 30 minutes before adjustment. Use pressure gauge B91L-0020-0001A and vacuum gauge BMz 198a for the following checks. Repeat the procedures in the following sequence for each MTU and whenever vacuum/pressure adjustment is made.

### 5.7.1 Column vacuum

The air-bearing pressure check requires tape to be fully loaded into columns. The column vacuum check requires tape to be fully loaded into columns.

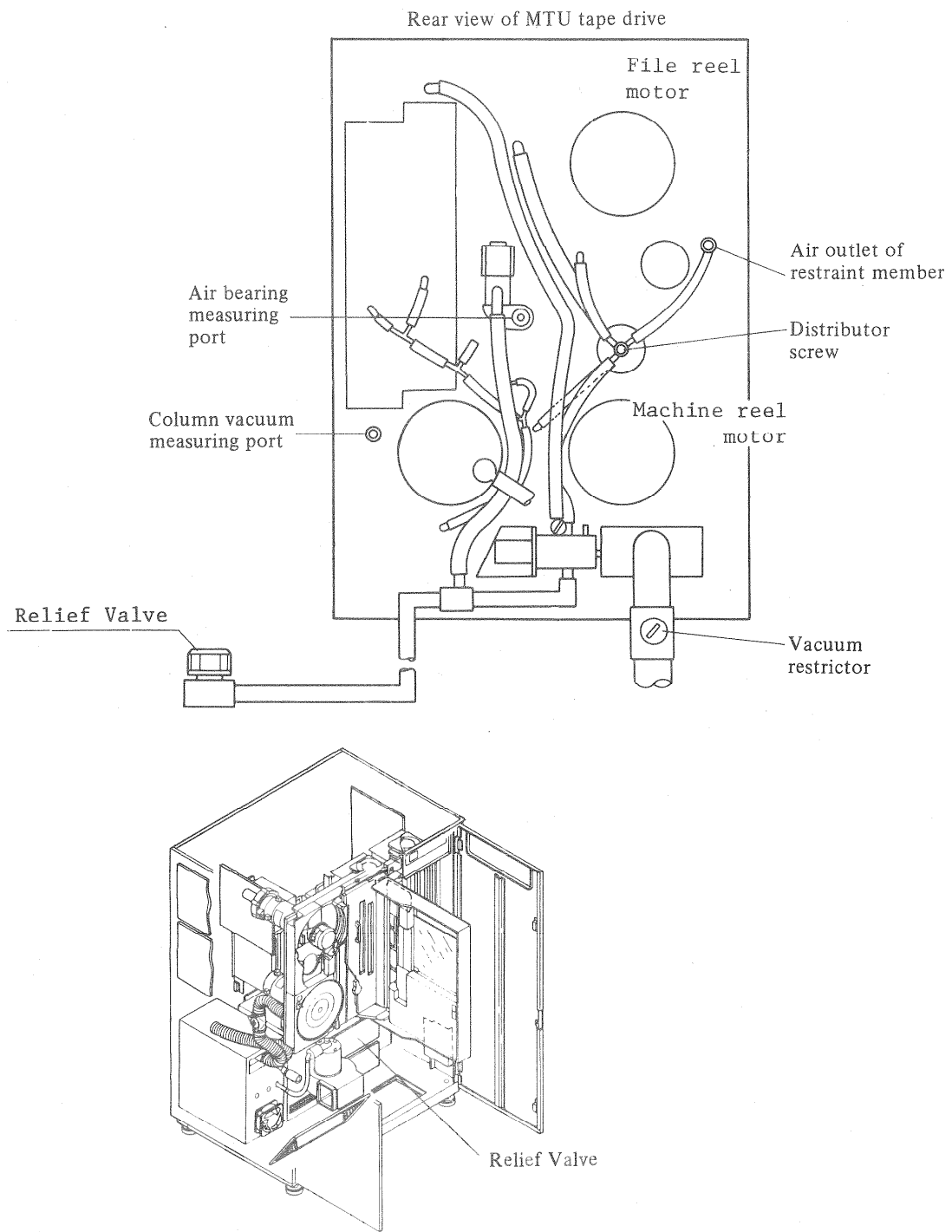
- (1) Remove the white nylon screw from the column vacuum measuring port shown in Figure 5.4.
- (2) Connect the vacuum gauge to the column vacuum measuring port.
- (3) Refer to the pressure check level in Table 5.1 for column vacuum.
- (4) If necessary, adjust the vacuum restrictor so that vacuum pressure is within air pressure adjustment level listed.

Table 5.1 Air pressure specifications

Check point	Air pressure check levels (mm H <sub>2</sub> O)	Air pressure adjustment levels (mm H <sub>2</sub> O)
Column vacuum	950 ± 100	950 ± 50
Air bearing pressure	2600 ± 100	2600 ± 50
Restraint pressure	450 ± 50	450 ± 20

### 5.7.2 Air-bearing pressure

- (1) Remove the white nylon fitting and connect the pressure gauge to the air-bearing measuring port.
- (2) Refer to the pressure check specification in Table 5.1 for air bearing pressure.
- (3) If necessary, adjust the pressure-relief valve shown in Figure 5.4 until the pressure is within the air bearing pressure adjustment level listed.



Front view of MTU

**Figure 5.4 Pressure check and adjustment points**

### 5.7.3 Restraint pressure

- (1) Press the UNLOAD button on the MTU front panel.
- (2) When unloading is complete, remove the tape from the file reel hub.
- (3) Mount the pressure-adjustment tool (B960-0110-T026A) on the air outlet of restraint member.
- (4) Connect pressure gauge (B91L-0020-0001A) to the restraint member pressure port E.
- (5) Set field tester switches to \$A5 and toggle the SSS switch.

\$A5	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	dn	up	dn	dn	up	dn	up

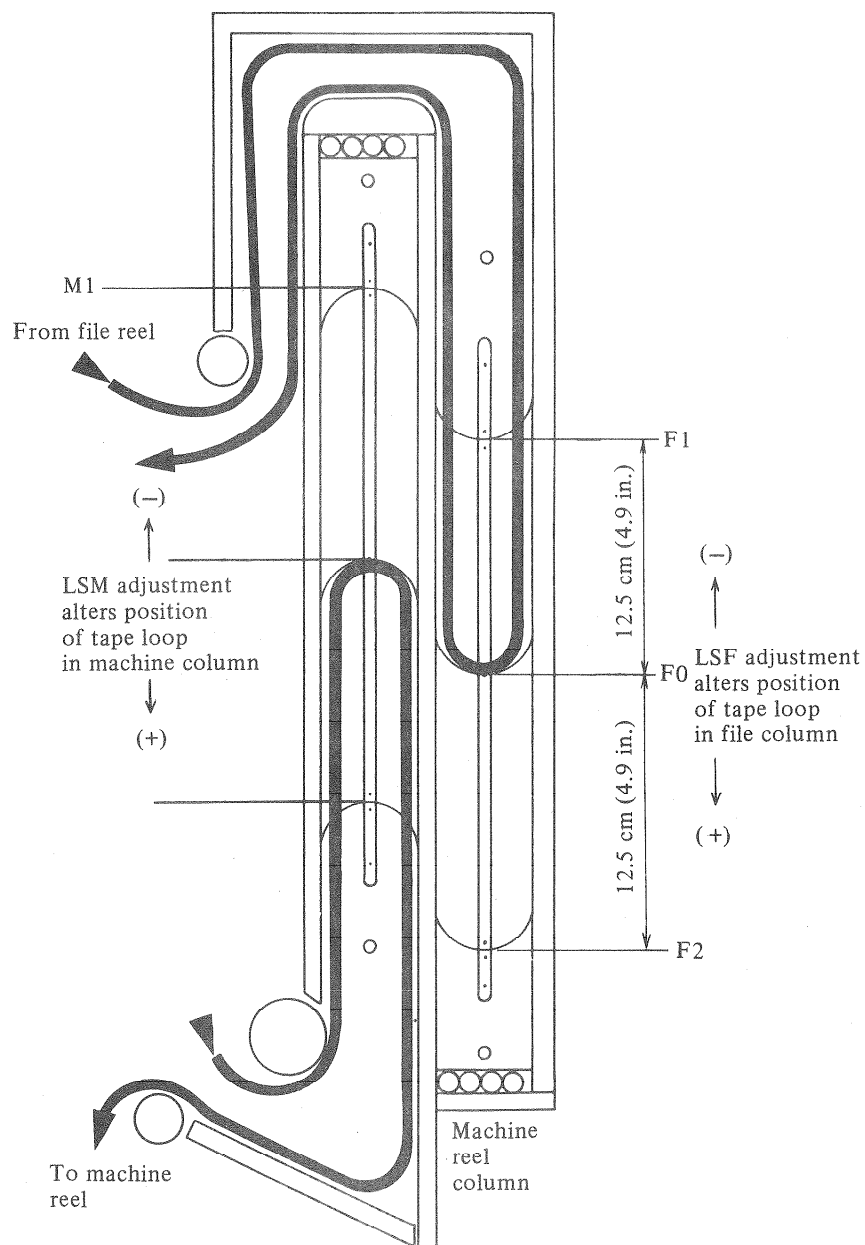
- (6) Refer to the pressure check specification in Table 5.1.
- (7) If necessary, adjust the distribution screw until pressure is within restraint pressure adjustment specification.
- (8) Toggle the SSS switch on the field tester to turn the air system off.

## 5.8 Tape-Loop-Position Detection Circuits

- (1) If tape is loaded, press the UNLOAD button on the MTU front panel.
- (2) As the tape loop starts to appear in the columns, press the RESET switch on the MTU front panel.
- (3) Set field tester switches S0 through S7 to \$A8 and the OFL/ONL switch to OFL. Toggle the SSS switch. This turns on the air pressure.

\$A8	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	dn	up	dn	up	dn	dn	dn

- (4) Manually position the tape reels so that the tape loop is located at positions F0 and M0 as shown in Figure 5.5. Hold the file reel in place by taping the reel to the column door.



Tape is shown at positions F0 and M0

Figure 5.5 Tape loop positions

- (5) Measure the voltage between LSF (Figure 5.6) and ground. Adjust potentiometer RV1F so that the voltage is  $0 \pm 0.2$  vdc.



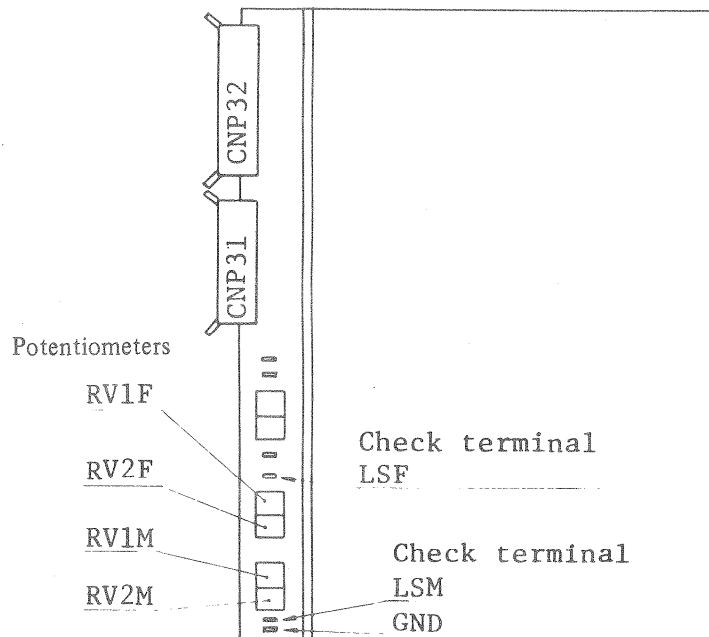


Figure 5.6 PCA 1A04 located in the MTU logic gate assembly

- (6) Measure the voltage between LSM and ground. Adjust potentiometer RV1M so that the voltage is  $0 \pm 0.2$  Vdc.
- (7) Set the field tester switches S0 through S7 to \$AA. This will cause the capstan to move and reposition the tape loop to positions M1 and F1 as shown in Figure 5.5.
- (8) Measure the voltage between LSF and ground. Adjust potentiometer RV2F so that voltage is  $6.5 \pm 0.2$  Vdc.
- (9) Measure the voltage between LSM and ground. Adjust potentiometer RV2M so that the voltage is  $6.5 \pm 0.2$  Vdc.
- (10) Set the field tester switches S0 through S7 to \$AB. This will cause the capstan to move and reposition the tape loop to positions M2 and F2 as shown in Figure 5.5.

\$AB	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	dn	up	dn	up	dn	up	up

- (11) Measure the voltage between LSF and ground. Adjust potentiometer RV2F so that the voltage is no lower than 6.5 Vdc and no higher than 8.5 Vdc.
- (12) Measure the voltage between LSM and ground. Adjust potentiometer RV2M so that the voltage is no lower than 6.5 Vdc and no higher than 8.5 Vdc.

- (13) Toggle the SSS switch on the field tester to terminate the test.

Toggle the SSS switch to start the capstan moving backward. Toggle the SSS switch when the tape is at positions F2 and M2 in Figure 5.5. The tape will stop.

#### 5.9 Azimuth Checkout

- (1) Press the UNLOAD/REWIND button on the MTU front panel and remove the tape from the reel.
- (2) Install master skew tape (P/N BM.BvMt 351d) and press LOAD/REWIND on the MTU control panel.
- (3) Connect a dual-trace oscilloscope to the Write/Read amplifier PCA, tracks 1 and 9, as shown in Figure 5.7. The designations on the write/read amplifier PCA for tracks 1 through 9 are shown in Figure 5.8. Five pins are associated with each track on the PCA. Connect the oscilloscope to pin #5 as shown in Figure 5.9.
- (4) Set the field tester ONL/OFL switch to OFL. Set the field tester switches S0 through S7 to \$E2 for 6250/1600 bpi;  
(or)  
Set the field tester switches to \$E0 for 1600/800 bpi. After setting switches, toggle the SSS switch.
- (5) Using the Phase Encoded (PE) mode (1600 bpi), set the field tester switches for forward (FWD) read using command code \$01. Toggle the SSS switch.

\$01	Switch number	0	1	2	3	4	5	6	7
	Switch setting	dn	dn	dn	dn	dn	dn	dn	up

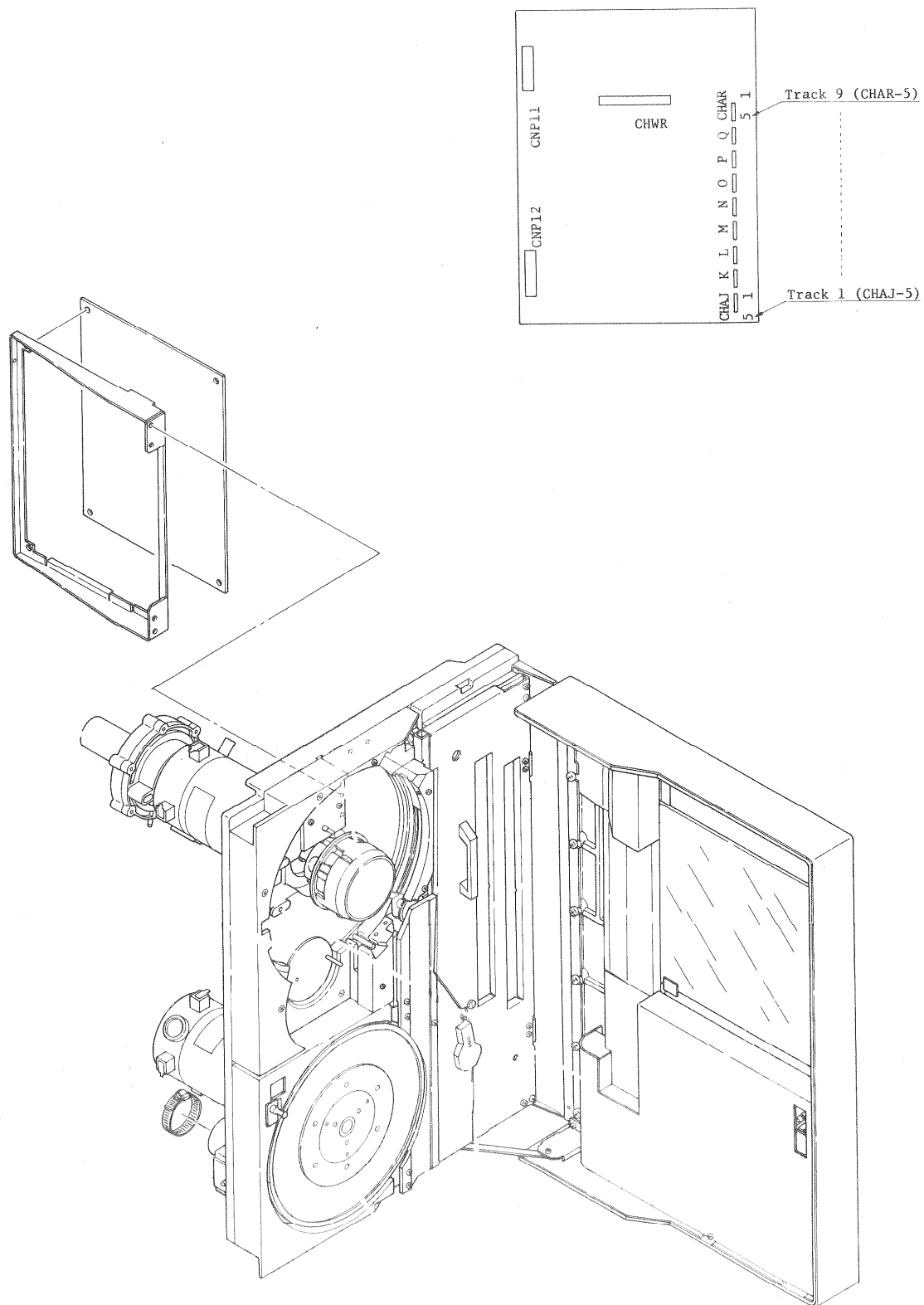


Figure 5.7 Read/Write amplifier PCA

- (6) Check that the phase difference with the read output of tracks 1 and 9 shown in Figure 5.8 satisfies the requirements of FWD skew in Table 5.1.



Track Number	Designation on write/read amplifier PCA
1	CHAJ
2	CHAK
3	CHAL
4	CHAM
5	CHAN
6	CHAO
7	CHAP
8	CHAQ
9	CHAR

Figure 5.8 Phase difference of tracks 1 and 9

Table 5.2 FWD and BWD skew requirements

To use this table, verify model number of unit to be tested. Use skew requirement for FWD and BWD directions (shown in right-hand column) for that model.

Model Number	Specification (write/read PCA)	Check between	Requirement: skew must be within	
3241/42/44	125 ips 6250/1600 bpi (WRHMu)	Track 1 versus 2 through 9	FWD	0.6 $\mu$ s
			BWD	1.0 $\mu$ s
3261/62/66	75 ips 6250/1600 bpi (WRIMU)	Track 1 versus 2 through 9	FWD	1.0 $\mu$ s
			BWD	1.6 $\mu$ s
3265	125 ips 1600/800 bpi (WRJMu)	Track 1 versus 2 through 9	FWD	0.4 $\mu$ s
			BWD	0.4 $\mu$ s
3243	75 ips 1600/800 bpi (WRKMu)	Track 1 versus 2 through 9	FWD	0.7 $\mu$ s
			BWD	0.7 $\mu$ s
328T	200 ips 6250/1600 bpi (WRHMu)	Track 1 versus 2 through 9	FWD	0.4 $\mu$ s
			BWD	0.6 $\mu$ s

- (7) Initiate the backward (BWD) operation by setting field tester switches to \$41.

\$41	Switch number	0	1	2	3	4	5	6	7
	Switch setting	dn	up	dn	dn	dn	dn	dn	up

- (8) Verify that skew is within the values shown in Table 5.2 for BWD operation. Check the BWD skew of tracks 2 through 9 against track 1.
- (9) If either FWD or BWD operations do not satisfy the requirements in Table 5.2, adjust the azimuth according to instructions in the Maintenance Manual.

## 5.10 Read-Signal Checkout

This section provides instructions for checking and adjusting the read-signal levels for the following modes:

- o Low-speed phase encode
- o High-speed phase encode
- o Low-speed group code recording (GCR)
- o High-speed GCR.

Ensure that the conditions listed below have been satisfied before initiating read-signal checkout:

- (1) Clean the read/write and erase heads.
- (2) Verify that the column vacuum level is adjusted to Table 5.1 specifications.
- (3) Ensure that capstan alignment is normal.
- (4) Install an SRM3200 tape or a tape of equivalent quality. Push the LOAD/REWIND button on the MTU front panel. After tape is loaded, push ONL switch.
- (5) Connect the field tester to 1A05 of the MTC.
- (6) Set the field tester switch to \$B2 and toggle the CNT switch.  
Set the field tester switch to \$17 and toggle the SSS switch.  
Set the field tester switch to \$3D and toggle the SSS switch.  
Set the field tester switch to \$B2 and toggle the CNT switch.  
Set the field tester switch to \$01 and toggle the SSS switch.  
Set the field tester switch to \$38 and toggle the SSS switch.  
Set the field tester switch to \$B2 and toggle the CNT switch.  
Set the field tester switch to \$83 and toggle the SSS switch.  
Set the field tester switch to \$39 and toggle the SSS switch.

Toggle SSS switch. Test will last approximately 4 to 7 seconds.

If this procedure is successful, proceed to Chapter 6. If it terminates with the error code 83XX (Routine 83, error code XX), perform the read level adjustments.

### 5.10.1 Low-speed PE checkout

- (1) Set field tester switches S0 through S7 to \$1E, and toggle the CNT switch to select the register address.

\$1E	Switch number	0	1	2	3	4	5	6	7
	Switch setting	dn	dn	dn	up	up	up	up	dn

- (2) Set the field tester switches S0 through S7 to \$EA, and toggle the SSS switch to set the read mode, tape speed, and density. (For models 3244 and 3266, use \$E8 setting.)

\$EA	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	dn	up	dn	up	dn

- (3) Set the field tester switches S0 through S7 to \$FA, and toggle the SSS switch to set the slice level to 100%.

\$FA	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	up	up	dn	up	dn

- (4) Set the field tester switches S0 through S7 to \$89, and toggle the SSS switch to set the write, low-speed, phase encode mode.

\$89	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	dn	dn	dn	up	dn	dn	up

Lamps 0 through 8 will come on and should be semi-luminous (barely glowing).

- (5) Adjust the corresponding potentiometers (RV1R through RV1J) in Figure 5.9, if necessary, to obtain semi-luminous status for lamps 0 through 8. Toggle the SSS switch to stop the tape.

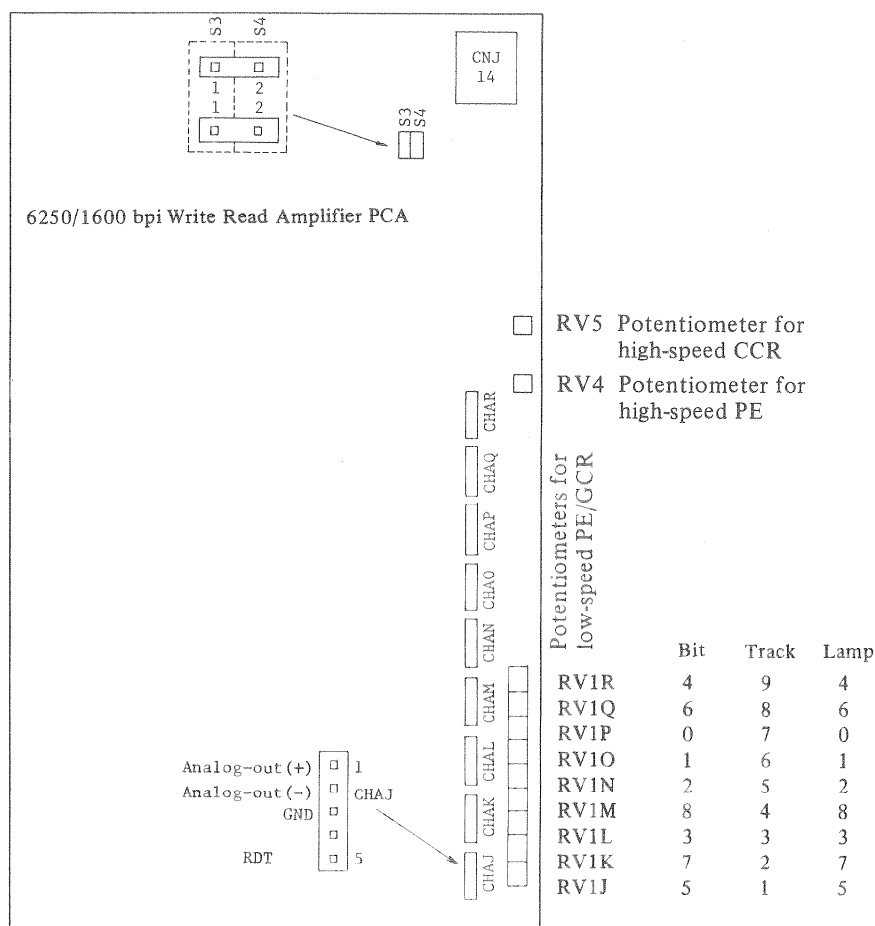


Figure 5.9 Potentiometers and check terminals for lamps 0 through 8 on write/read amplifier PCA



- (6) Set the field tester switches S0 through S7 to \$F9, and toggle the SSS switch to set the slice level to 90%.

\$F9	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	up	up	dn	dn	up

- (7) Set the field tester switches S0 through S7 to \$89, and toggle the SSS switch to set the write, low-speed, phase encode mode.

\$89	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	dn	dn	dn	up	dn	dn	up

Lamps 0 through 8 should be brightly lit.

- (8) Adjust the corresponding potentiometers shown in Figure 5.9, if necessary. Toggle the SSS switch to stop the tape.
- (9) Set the field tester switches S0 through S7 to \$FB, and toggle the SSS switch to set the slice level to 110%.

\$FB	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	up	up	dn	up	up

- (10) Set the field tester switches S0 through S7 to \$89, and toggle the SSS switch.

\$89	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	dn	dn	dn	up	dn	dn	up

Lamps 0 through 8 should be off.

- (11) Adjust the corresponding potentiometers shown in Figure 5.9, if necessary. Toggle the SSS switch to stop the tape.

#### 5.10.2 High-speed PE checkout

- (1) Set the field tester switches S0 through S7 to \$1E, and toggle the CNT switch to select the register address.

\$1E	Switch number	0	1	2	3	4	5	6	7
	Switch setting	dn	dn	dn	up	up	up	up	dn

- (2) Set the field tester switches S0 through S7 to \$ED, and toggle the SSS switch to set the tape to the high-speed mode.

\$ED	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	dn	up	up	dn	dn

- (3) Set the field tester switches S0 through S7 to \$FA, and toggle the SSS switch to set the slice level to 100%.

\$FA	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	up	up	dn	up	dn

- (4) Set the field tester switches S0 through S7 to \$89, and toggle the SSS switch for write, high-speed, phase encode mode.

\$89	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	dn	dn	dn	up	dn	dn	up

- (5) Adjust potentiometer RV4 shown in Figure 5.9 so that four or more of lamps 0 through 8 are lit. After adjustment, toggle the SSS switch to stop the tape.

- (6) Set the field tester switches S0 through S7 to \$F5, and toggle the SSS switch to set the slice level to 80%.

\$F5	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	up	dn	up	dn	up

- (7) Set the field tester switches S0 through S7 to \$89, and toggle the SSS switch for write, high-speed, phase encode mode.

\$89	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	dn	dn	dn	up	dn	dn	up

Lamps 0 through 8 should be lit.

- (8) Adjust potentiometer RV4 if necessary. Toggle the SSS switch to stop the tape.
- (9) Set the field tester switches S0 through S7 to \$F7, and toggle the SSS switch to set the slice level to 125%.

\$F7	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	up	dn	up	up	up

- (10) Set the field tester switches S0 through S7 to \$89, and toggle the SSS switch for write, high-speed, phase encode mode.

\$89	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	dn	dn	dn	up	dn	dn	up

Lamps 0 through 8 should be off.

- (11) Adjust potentiometer RV4 if necessary. Toggle the SSS switch to stop the tape.

### 5.10.3 Low-speed GCR checkout

- (1) Set the field tester switches S0 through S7 to \$1E, and toggle the CNT switch to set the register address.

\$1E	Switch number	0	1	2	3	4	5	6	7
	Switch setting	dn	dn	dn	up	up	up	up	dn

- (2) Set the field tester switches S0 through S7 to \$EA, and toggle the SSS switch to set the tape to the low-speed mode.

\$EA	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	dn	up	dn	up	dn

- (3) Set the field tester switches S0 through S7 to \$F3, and toggle the SSS switch to set the slice level to 51%.

\$F3	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	up	dn	dn	up	up

- (4) Set the field tester switches S0 through S7 to \$C6, and toggle the SSS switch to set the DGC amplifier.

\$C6	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	dn	dn	dn	up	up	dn

Toggle the SSS switch again to stop the tape.

- (5) Set the field tester switches S0 through S7 to \$8B, and toggle the SSS switch for write, low-speed GCR mode.

\$8B	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	dn	dn	dn	up	dn	up	up

Lamps 0 through 8 should be on.

- (6) If the lamps are not on, refer to the Maintenance Manual. Toggle the SSS switch to stop the mode.
- (7) Set the field tester switches S0 through S7 to \$F5, and toggle the SSS switch to set the slice level to 80%.

\$F5	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	up	dn	up	dn	up

- (8) Set the field tester switches S0 through S7 to \$8F, and toggle the SSS switch to perform SAGC operation in write, low-speed, GCR mode.

\$8F	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	dn	dn	dn	up	up	up	up

Lamps 0 through 8 should be on.

- (9) If lamps are not on, refer to the Maintenance Manual. Toggle the SSS switch.
- (10) Set the field tester switches S0 through S7 to \$F7, and toggle the SSS switch to set the slice level to 125%.

\$F7	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	up	dn	up	up	up

- (11) Set the field tester switches S0 through S7 to \$8B, and toggle the SSS switch for write, low-speed, GCR mode.

\$8B	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	up	dn	up	up	up

Lamps 0 through 8 should be off.

- (12) If lamps are not off, refer to the Maintenance Manual. Toggle the SSS switch.
- (13) Set the field tester switches S0 through S7 to \$F3, and toggle the SSS switch to set the slice level to 51%.

\$F3	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	up	dn	dn	up	up

- (14) Set the field tester switches S0 through S7 to \$41, and toggle the SSS switch for read backward in the low-speed, GCR mode.

\$41	Switch number	0	1	2	3	4	5	6	7
	Switch setting	dn	up	dn	dn	dn	dn	dn	up

Lamps 0 through 8 should be on.

- (15) Toggle the SSS switch.

#### 5.10.4 High-speed GCR checkout

- (1) Set the field tester switches S0 through S7 to \$1E, and toggle the CNT switch to set the register address.

\$1E	Switch number	0	1	2	3	4	5	6	7
	Switch setting	dn	dn	dn	up	up	up	up	dn

- (2) Set the field tester switches S0 through S7 to \$EA, and toggle the SSS switch to set the tape to the low-speed mode.

\$EA	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	dn	up	dn	up	dn

- (3) Set the field tester switches S0 through S7 to \$8F, and toggle the SSS switch for write, low-speed GCR mode.

\$8F	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	dn	dn	dn	up	up	up	up

After a few seconds, toggle the SSS switch again to stop the tape.

- (4) Set the field tester switches S0 through S7 to \$EE, and toggle the SSS switch to set the tape to high-speed mode.

\$EE	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	dn	up	up	up	dn



- (5) Set the field tester switches S0 through S7 to \$FA, and toggle the SSS switch to set the slice level to 100%.

\$FA	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	up	up	dn	up	dn

- (6) Set the field tester switches S0 through S7 to \$8B, and toggle the SSS switch for write, high-speed GCR mode.

\$8B	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	dn	dn	dn	up	dn	up	up

- (7) Adjust potentiometer RV5 in Figure 5.9 so that four or more of lamps 0 through 8 are on. Toggle the SSS switch after adjustment to stop the tape.

- (8) Set the field tester switches S0 through S7 to \$F4, and toggle the SSS switch to set the slice level to 64%.

\$F4	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	up	dn	up	dn	dn

- (9) Set the field tester switches S0 through S7 to \$8B, and toggle the SSS switch for write, high-speed, GCR mode.

\$8B	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	dn	dn	dn	up	dn	up	up

Lamps 0 through 8 should be lit.

- (10) Adjust potentiometer RV5, if necessary, so that lamps 0 through 8 are lit. Toggle the SSS switch to stop the tape.
- (11) Set the field tester switches S0 through S7 to \$F7, and toggle the SSS switch to set the slice level to 125%.

\$F7	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	up	dn	up	up	up

- (12) Set the field tester switches S0 through S7 to \$8B, and toggle the SSS switch for write, high-speed, GCR mode.

\$8B	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	dn	dn	dn	up	dn	up	up

Lamps 0 through 8 should be off.

- (13) Adjust potentiometer RV5, if necessary, so that lamps 0 through 8 are off, and then toggle the SSS switch to stop the tape.

- (14) Set the field tester switches S0 through S7 to \$F3, and toggle the SSS switch to set the slice level to 51%.

\$F3	Switch number	0	1	2	3	4	5	6	7
	Switch setting	up	up	up	up	dn	dn	up	up

- (15) Set the field tester switches S0 through S7 to \$42, and toggle the SSS switch to read backward, high-speed, GCR mode.

\$42	Switch number	0	1	2	3	4	5	6	7
	Switch setting	dn	up	dn	dn	dn	dn	up	dn

Lamps 0 through 8 should be off.

- (16) Adjust potentiometer RV5, if necessary, until lamps 0 through 8 are off.
- (17) When read-signal checks and adjustment are completed, toggle the SSS switch to off.
- (18) Press the LOAD/REWIND button on MTU front panel to rewind the tape.



## CHAPTER 6    RUNNING ONLINE TEST PROGRAM

### 6.1    Channel and MTC Check

- (1)    Check that the BMC which is connected to the MTC is set in the SLC or the shared mode.
- (2)    Check that the MTC logical address number is correctly set (refer to Section 4.1).

### 6.2    Switch Setting

- (1)    If the MTC includes 2 channel switch feature, set the CHANNEL ENABLE/DISABLE switches on the operator panel to the upper position to route running the online test program.
- (2)    If there are TAPE UNIT ENABLE/DISABLE switches on the operator panel, set them to the upper position.

### 6.3    Online Test Program Running

Execute the online test program (OLTE) JYOMT6. For the operation and the analysis for the OLTE, refer to the OLTE User's Guide. For the test explanation of EMOS, refer to the EMOS User's Guide.



## CHAPTER 7    INSTALLATION CHECK LIST

Installation of the MTS is complete when the tasks listed below have been successfully performed. Ensure that individual adjustments conform to the requirements provided in each section of the Installation Instructions.

Task	Refer to
o Visual inspection for damage is complete.	Chapter        1
o Equipment received conforms with packing list.	Chapter        1
o Installation clearances and floor openings are adequate.	Figures 1.1 and 1.2
o Special equipment and tools are available.	Section       1.4
o Side covers on adjacent MTUs are removed.	Figure        1.3
o MTS is set for correct input voltage.	Figure        2.1
o MTS is set for correct input frequency.	Figure        2.2
o Air supply unit (pulleys) are adjusted for input frequency and altitude.	Table         2.1
o Controller-to-FMT interface cabling is complete.	Subsection 2.5.1
o FMT-to-MTU interface cabling for all MTU(s) is complete.	Subsection 2.5.2
o Power control cable interconnections are complete.	Figures 2.11 and 2.12
o Input power cable is attached and secure.	Section       2.7
o MTU cleaning is accomplished.	Chapter        3
o DC voltage levels on the MTC(s) meet specifications.	Section       5.4
o DC voltage levels on the MTU meet specifications.	Section       5.4
o Vacuum, air-bearing, and restraint pressure meet specifications.	Table         5.1
o BOT and EOT detection circuits have been checked.	Section       5.6
o Tape loop position detection circuits have been checked.	Section       5.8
o Azimuth check meets specification.	Table         5.2
o Read signal is checked.	Section       5.10





## APPENDIX A GLOSSARY

ADJ	DC voltage adjustment control on FMT power supply unit.
BOT	Beginning of tape.
bpi	Bits per inch.
BWD	Backward. Refers to direction of magnetic tape.
CNT	Switch on the field tester used to set modes and to display contents of the internal register.
CW	Clockwise. Refers to rotation of tape reel.
DV	Device.
Error code	Two-digit error code indicating a malfunction (01-99) or normal operation.
EOT	End of tape.
FWD	Forward. Refers to direction of magnetic tape.
GCR	Group code recording.
Master Unit	MTU and MTC(s).
MTC	Magnetic tape controller.
MTS	Magnetic tape subsystem. Includes MTU, MTC(s), and slave units.
MTU	Magnetic tape unit.
ONL	Online.
OFL	Offline.
PCA	Printed circuit assembly.
PE	Phase encode.
P/N	Part number. Fujitsu specification.
PWCI	Power control cable input.
PWCO	Power control cable output.
REW	Rewind.
R/W	Read/write head.
Slave unit	Tape drives #1 through #7 associated with an MTS.
SSS	Toggle switch on field tester used to set data necessary to control the internal register, to start a command execution, and to step the microprogram for various control functions.

TB           Terminal block.  
TRM          Terminal.

\$            Hex code notation for field tester switches S0 through S7.

## APPENDIX B PCA LOCATION

Throughout the Installation Instructions, printed circuit assemblies are identified by slot number in the MTU or MTC logic gates or by their common names, such as write/read PCA. Use Figure B.1 and Table B.1 to locate PCAs in the MTU. First, identify in the left-hand column of Table B.1 the correct model number of the unit to be installed. For example, in model 3241 (master unit), slot 1A05 of the MTU logic gate contains the PCA identified as:

- o 512648U
- or
- o P/N C16B-5126-0480/U

This PCA is referred to as "1A05 in the MTU" throughout the Installation Instructions. Similarly, use Figure B.2 and Table B.2 to locate PCAs in the MTC.

When removing a PCA from logic gate, do not use shop tools. Always use the PCA removal tool (P/N C960-0300-T001).

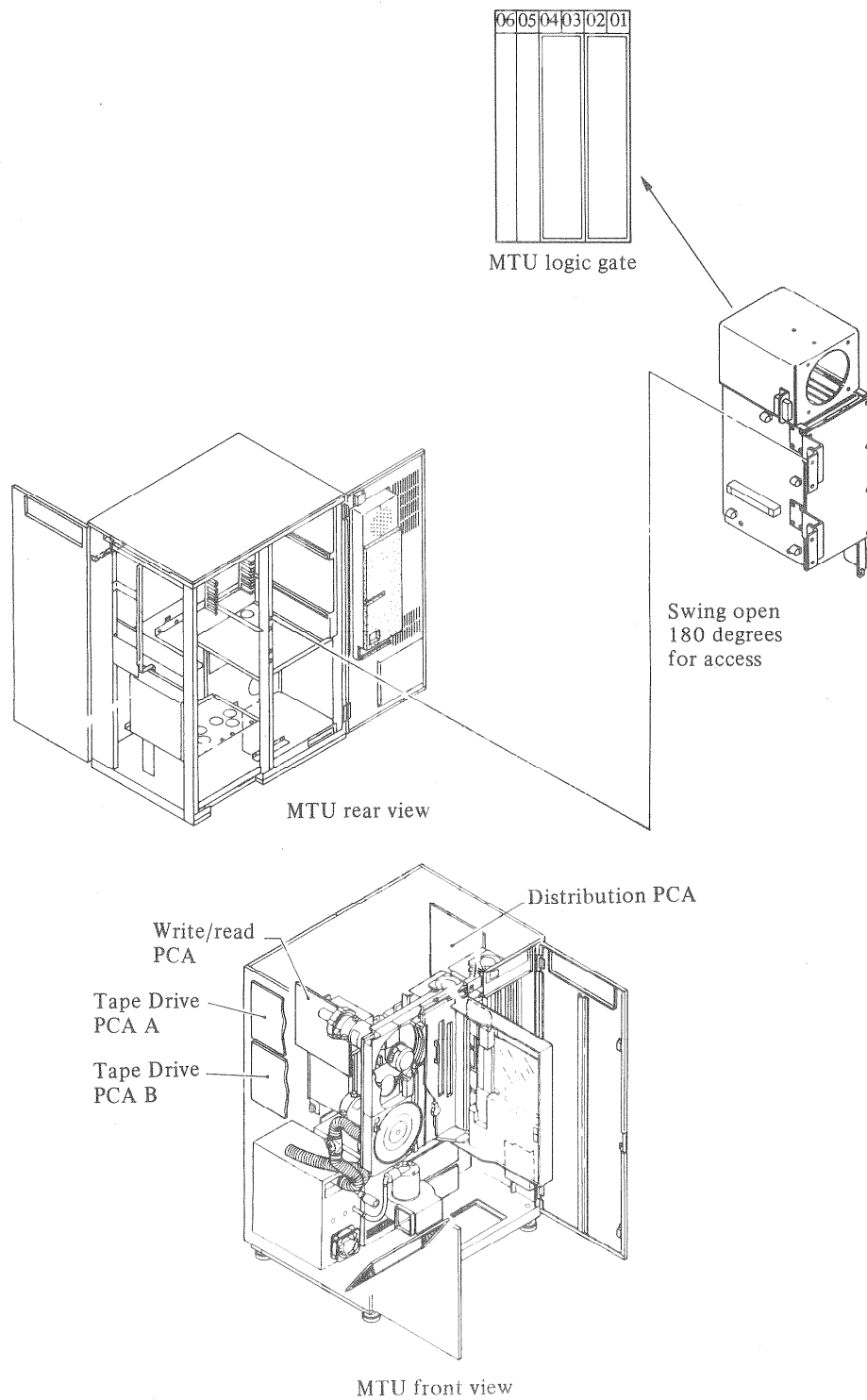
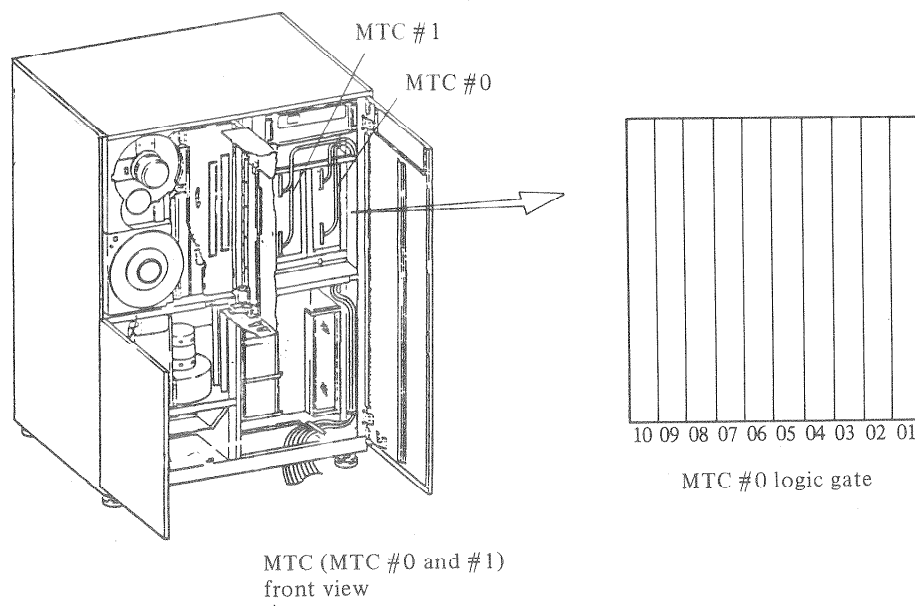


Figure B.1 MTU PCA location diagram

Table B.1 MTU PCA location

Model number	MTU PCA logic gate				Tape drive	Tape drive	Write/read
	1A01/1A02	1A03/1A04	1A05	1A06	A PCA	B PCA	PCA
3244	P/N B16B-7220-0020A#U Power unit VQJMU  Power stabilizing circuit	P/N B16B-7190-0020A#U TKBMU  Tape drive circuit	P/N C16B-5126-0480#U 512648U  Micro-program control section	P/N C16B-5126-0490#U 512649U  Interface control section	P/N B16B-7200-0200A#U Tape drive TVAMU  Power amplifier	P/N B16B-7210-0200A#U Tape drive TVBMU  Power amplifier	P/N B16B-7240-0030A#U WRIMU
3243							P/N B16B-7260-0020A#U WRKMU
3266							P/N B16B-7230-0030A#U WRHMU
3265							P/N B16B-7250-0020A#U WRUMU
3241							P/N B16B-7240-0030A#U WRIMU
3242							
3261							P/N B16B-7230-0030A#U WRHMU
3262							
3281							
3282							
3288							



**Figure B.2 FMT PCA location diagram**

Table B.2 MTC PCA location

Model number	MTC PCA logic gate									
	1A01	1A02	1A03	1A04	1A05	1A06	1A07	1A08	1A09	1A10
3244	None	None	None	None	None	None	None	None	None	None
3243										
3266										
3265										
3241	P/N C16B-5121-0890 #U 512189U (read) (800 bpi)	P/N C16B-5121-0880 #U 512188U (read)	P/N C16B-5500-0880 #U 550088U (VFO)	P/N C16B-5121-0870 #U 512187U	P/N C16B-5126-0360 #U 512186U (DV INT)	None	P/N C16B-5121-0850 #U 512185U	P/N C16B-5121-0840 #U 512184U	P/N C16B-5121-0830 #U 512183U (2CH SW)	None
3242			P/N C16B-5500-0870 #U 550087U (VFO)	or						
3261										
3262										
3281										
3282										
3288	None	None	None	None	None	None	None	None	None	None





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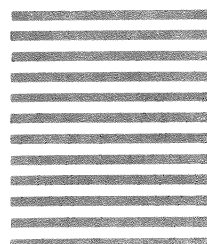
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