

# **60/120 Megabyte Magnetic Tape Cartridge Streamer Installation Guide**

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***MAI BasicFour®***



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## PREFACE

This manual provides information for installing the 60/120 Megabyte 1/4-Inch Magnetic Tape Cartridge Streamer (MTCS) drive into MAI Basic Four computer systems. Service information on the MTCS drive is provided in the OEM service manual. Testing and fault isolation procedures for tape drives are provided in the computer system service manuals.

The MAI Basic Four computer systems addressed in this manual are:

|           |                                   |
|-----------|-----------------------------------|
| Section 1 | MAI 1500/1800                     |
| Section 2 | MAI 2000                          |
| Section 3 | MAI 3000                          |
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## WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures that may be required to correct the interference.

MAI Basic Four equipment is designed to meet the safety requirements of Underwriters Laboratories (UL) and the emission requirements of the Federal Communications Commission (FCC) and Verbandes Deutscher Elektrotechniker (VDE), as well as certain other applicable safety or regulatory agencies. Compliance requires the use of specific interconnecting cables which have been determined to meet the applicable criteria. Use of cables not meeting these requirements could result in violation of local Building Codes and regulations and possible damages.

MAI Basic Four shall have no responsibility for any results whatsoever which flow from any use of any cable other than those supplied or installed by MAI Basic Four or our authorized representative.

The use of shielded I/O cables is required when connecting unit to any and all optional peripheral or host devices. Failure to do so may violate FCC rules.



## SECTION 1

### MAI 1500/1800

#### 1.1 INTERNAL MTCS

The following procedure assumes that no device is present where the 60/120 MB MTCS is to be installed. If a device is present, refer to the MAI 1500(/1800) service manual (M8105), Section V, for removal instructions (and for testing and fault isolation procedures for tape drives).

To install the 60/120 MB MTCS into the MAI 1500 or MAI 1800 system, verify that the operating system and diagnostic level are 6.X or higher for the MAI 1500 system or 7.XN or higher for the MAI 1800 system, and proceed as follows:

1. Turn off power at the front panel power on/off switch, and remove the power cord from the ac outlet.
2. Remove the cable guard from the rear of the computer by pressing the guard in on each side and tilting it up and out (see Figure 1-1).
3. Power down all peripherals connected to the computer.
4. Unlock the front panel keylock, if it is in the locked position.
5. At the rear of the computer, remove the five screws that secure the cover (see Figure 1-2). Note that the sixth screw (at the bottom center of the rear panel) need not be removed.

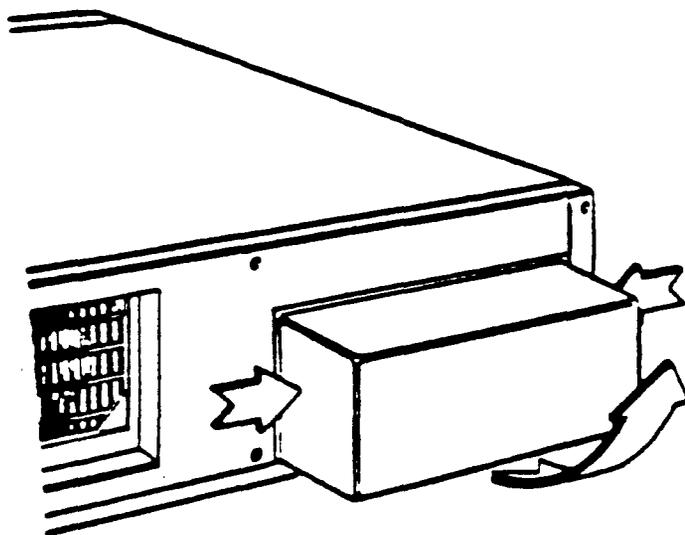
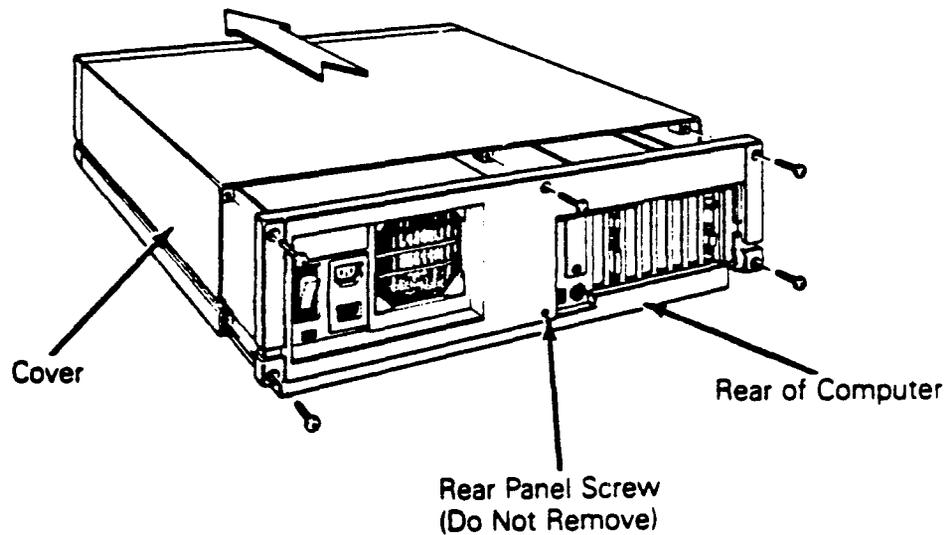


Figure 1-1. Cable Guard Removal/Replacement



**Figure 1-2. Computer Cover Removal/Replacement**

6. Grasp the cover by both sides, and pull it toward the front of the computer until it is free of the computer chassis.
7. Set the switches on the 400655-002 MCS controller as shown in Table 1-1 (MAI 1500) or in Table 1-2 (MAI 1800).
8. Install the MCS controller into the CCA (Central Cabinet Assembly) chassis (refer to Figure 1-3). The controller may reside in any back-plane location.

**Table 1-1. 400655-002 MCS Controller Switch Settings for MAI 1500**

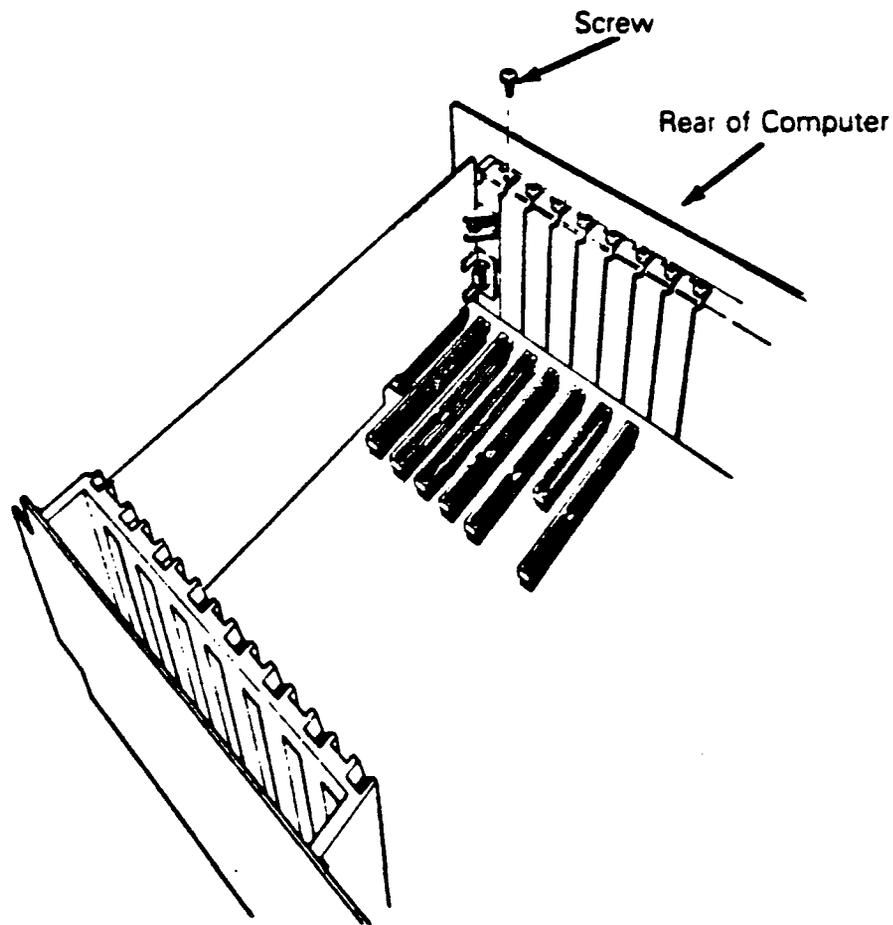
| SW-1 | SW-2 | SW-3 | SW-4 | SW-5 | SW-6 | SW-7 | SW-8 | SW-9 | SW-10 |
|------|------|------|------|------|------|------|------|------|-------|
| ON   | OFF  | OFF   |

Select DA, Jumper 1  
 Select DR, Jumper 3  
 Select IRQSL Jumper 7  
 Leave DR3EN Jumper OFF

**Table 1-2. 400655-002 MCS Controller Switch Settings for MAI 1800**

| SW-1 | SW-2 | SW-3 | SW-4 | SW-5 | SW-6 | SW-7 | SW-8 | SW-9 | SW-10 |
|------|------|------|------|------|------|------|------|------|-------|
| ON   | ON   | ON   | ON   | ON   | OFF  | OFF  | OFF  | OFF  | OFF   |

Select DA, Jumper 3  
 Select DR, Jumper 3  
 Select IRQSL Jumper 5  
 Leave DR3EN Jumper OFF



**Figure 1-3. CCA Chassis**

9. Mount guide rails to the MTCS on both sides (refer to Figure 1-4).
10. Install the 907612-001 Y-breakout dc power cable to the MTCS.
11. Remove the cover plate mounted under the floppy disk drive on the right side of the CCA chassis (refer to Figure 1-5).
12. Remove the double mounting clip located between the right and left drive mounting locations (refer to Figure 1-6).
13. Slide the MTCS into the chassis guide slots underneath the floppy disk drive.
14. Install and route the 916125-001 data bus cable between the MCS and the MTCS.
15. Connect a dc power cable from the power supply to the in-line connector of the Y-breakout cable.
16. Retain the MCS drive by reinstalling the double mounting clip.
17. Replace the cover and the cable guard by reversing steps 2 through 6.
18. Reconfigure the computer by running the Setup program in Section II of the MAI 1500(/1800) service manual (M8105).

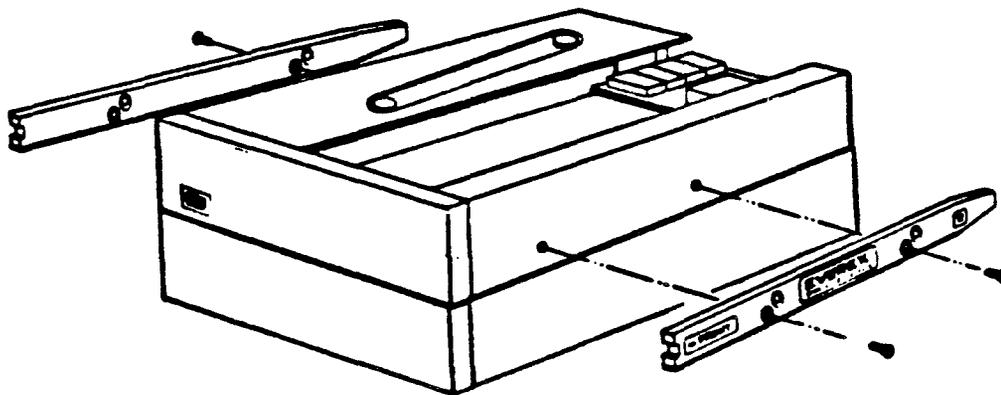


Figure 1-4. Location of Guide Rails

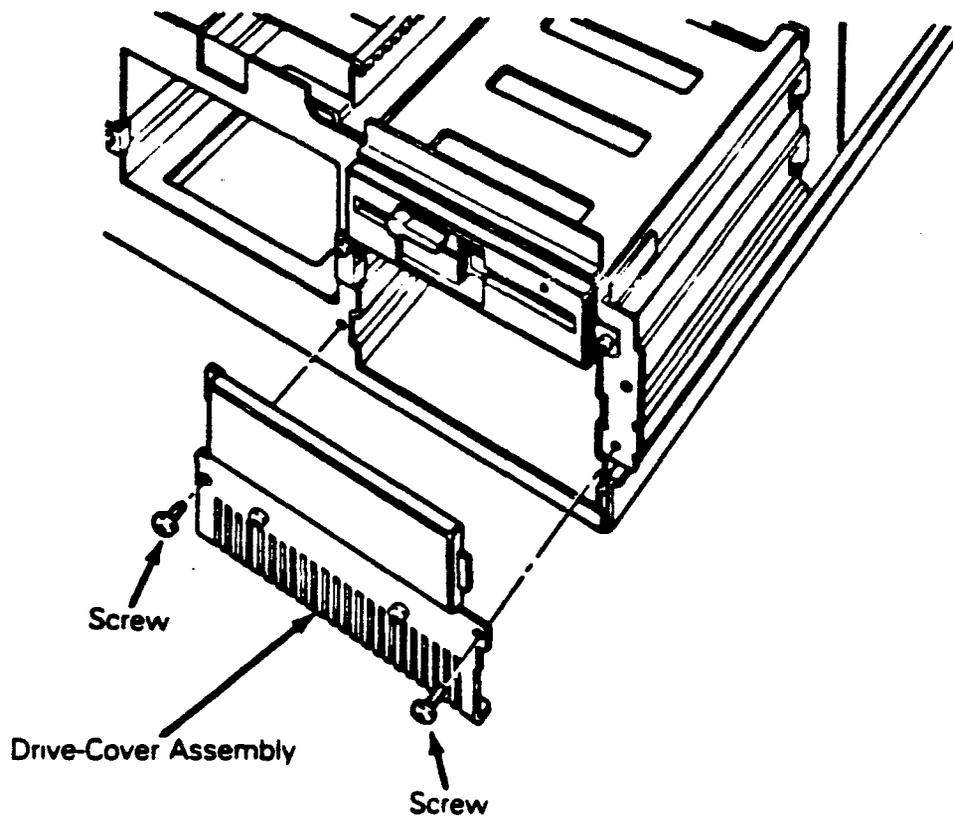


Figure 1-5. Cover Plate Removal

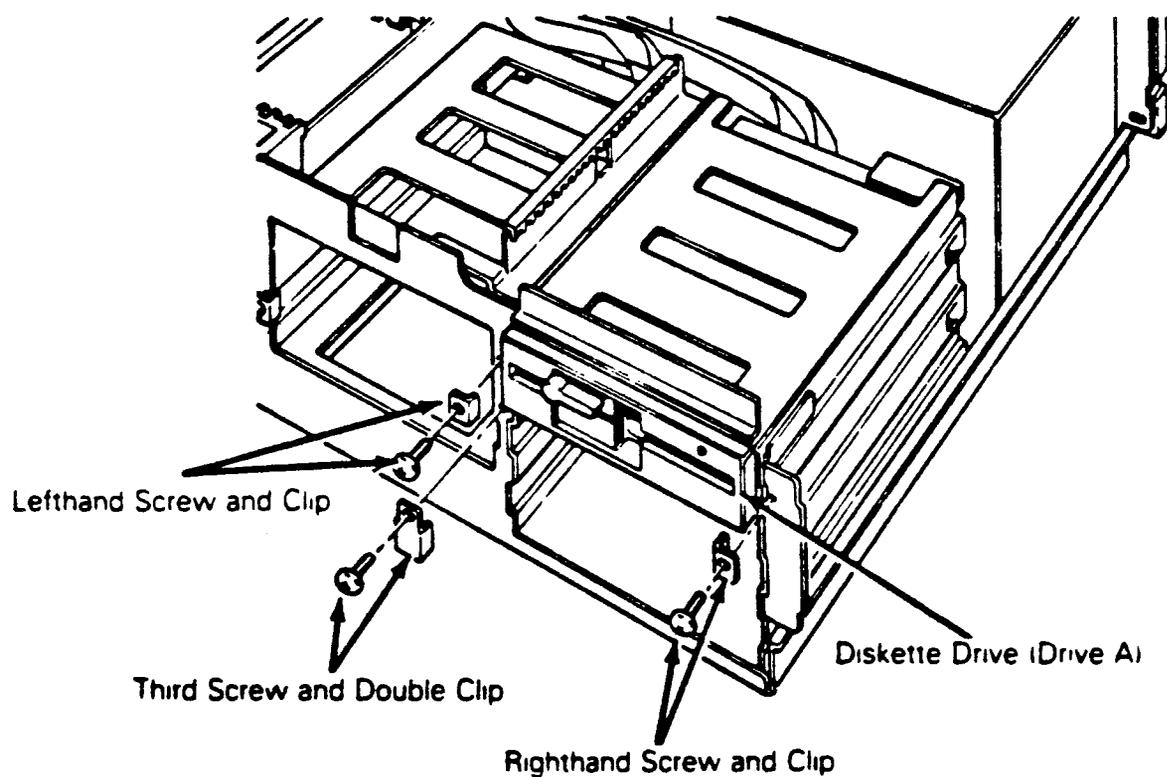


Figure 1-6. Mounting Hardware

## 1.2 EXTERNAL MTCS

The MTCS in its own separate enclosure is MBF model number 514406. It may be connected to the system as an external unit. The 514406 MTCS connects to the CCA via cable assembly 916031-001. The switch settings on the MCS Controller for the external unit are the same as those for the internal unit. To install the MCS Controller, perform steps 1 through 8 and steps 17 and 18 in paragraph 1.1 of this section.

**NOTES**

## SECTION 2

### MAI 2000

#### 2.1 INTERNAL MICS

The following procedure assumes that no device is present where the 60/120 MB MICS is to be installed. If a device is present, refer to the MAI 2000 service manual (M8079), Section V, for removal instructions (and for testing and fault isolation procedures for tape drives).

To install the 60/120 MB MICS into the MAI 2000 system, verify that the operating system and diagnostic level are 7.2D or higher, and proceed as follows:

1. Shut down the system, and turn the Base Unit power off.
2. Insert a screw driver, or similar device, into the slot at the bottom right-hand side of the Base Unit cover, and push in to disengage the plastic latch. Repeat with the left-hand side, and remove the cover.
3. Unplug all connections to the CMB, including all attached peripherals.
4. Unplug the WDC PCBA from the top of the "stack." (This step may not be necessary; when more than one device controller board is present, the entire stack may be removed as a single unit, and the MICS PCBA then may be removed from the stack while the stack is outside the CMB.)
5. Unplug from the stack any other controller PCBAs that might be present (after first disconnecting their cables) until the Magnetic Tape Cartridge Streamer Controller PCBA, if present, is accessible. (Note: if an MICS Controller PCBA is present, verify that it is P/N 903406-002; if it is not, be sure to upgrade.) Record the order of board removal.
6. Set the appropriate switches (SW1) on the 903406-002 MICS Controller PCBA for the correct bus arbitration number and mode according to Table 2-1.
7. Plug the MICS Controller PCBA into the CMB (or into the PCBA from which the original MICS Controller PCBA was removed) at the rear right-hand corner of the CMB.

**Table 2-1. 903406-002 MICS Controller Switch Settings**

| SW-1 | SW-2 | SW-3 | SW-4 | SW-5 | SW-6 | SW-7 | SW-8 |
|------|------|------|------|------|------|------|------|
| ON   | ON   | ON   | ON   | OFF  | OFF  | X    | ON   |

SW1-8 is ON for normal operation and OFF for drive burn-in mode  
X = DON'T CARE

8. Mount the MICS to the 907422-001 bracket (refer to Figure 2-1).

9. Snap the bracket of the MTCS into the left-hand side of the chassis (refer to Figure 2-1).
10. Install and route the 907797-002 bus cable assembly between the MTCS and the MTCS Controller PCBA (refer to Figure 2-2).
11. Install the 907612-001 Y-breakout cable between a power supply dc cable and the MTCS, with the Y-breakout cable connecting to the MTCS in two places.
12. Replace any other PCBAs that were removed in steps 4 and 5 of this procedure, in the order recorded in those steps, and plug the WDC PCBA into the PCBA at the top of the stack.
13. Replace the Base Unit cover by lowering the cover onto the Base Unit and allowing it to "snap" into place.
14. Plug in all connections to the Base Unit, including all previously attached peripherals.

## 2.2 EXTERNAL MTCS

The MTCS in its own separate enclosure is MBF model number 514406. It may be connected to the system as an external unit. The 514406 MTCS connects to the Base Unit via cable assembly 907506-001. The switch settings on the MCS Controller for the external unit are the same as those for the internal unit. To install the MCS Controller, perform steps 1 through 7 and steps 12 through 14 in paragraph 2.1 of this section.

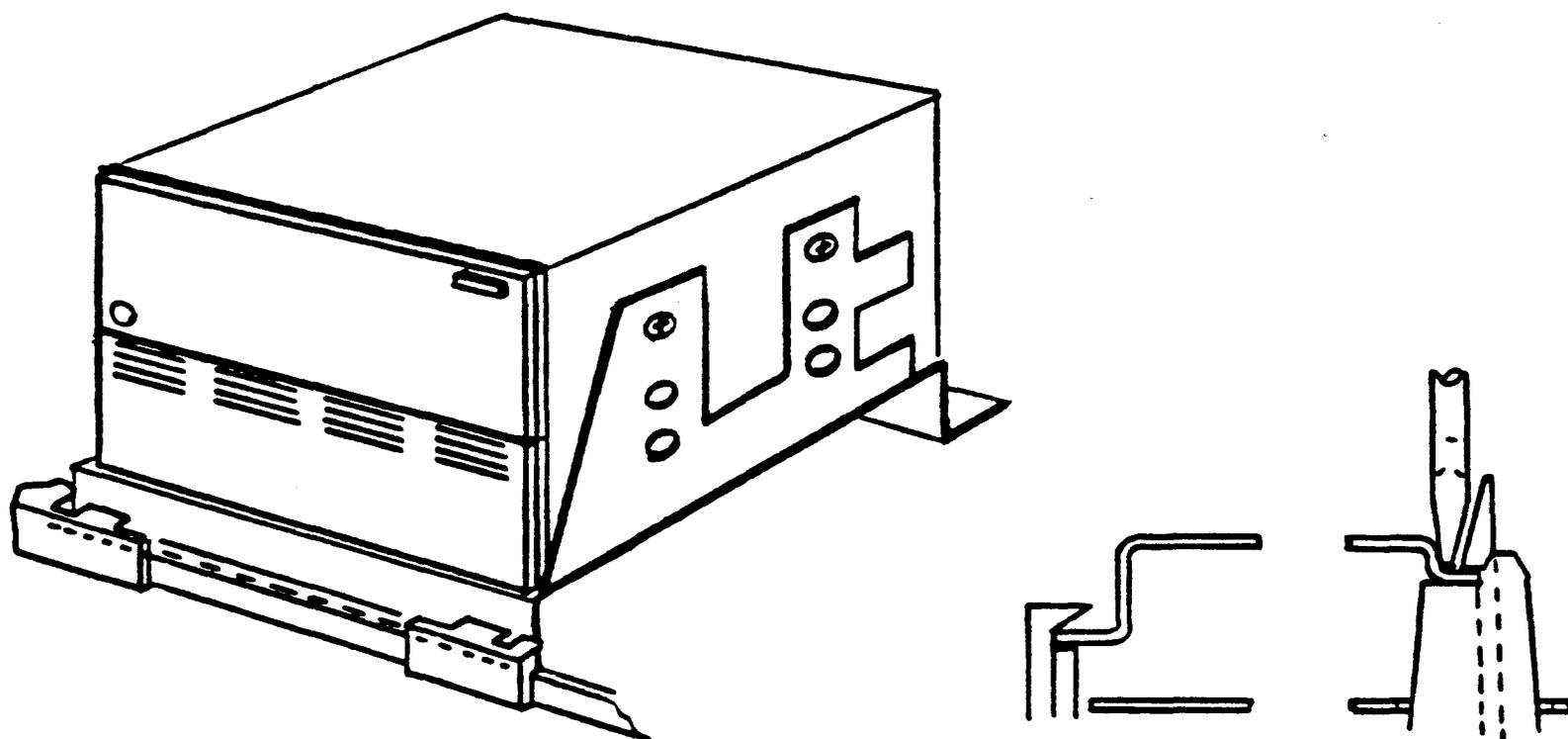


Figure 2-1. MTCS Mounting Bracket

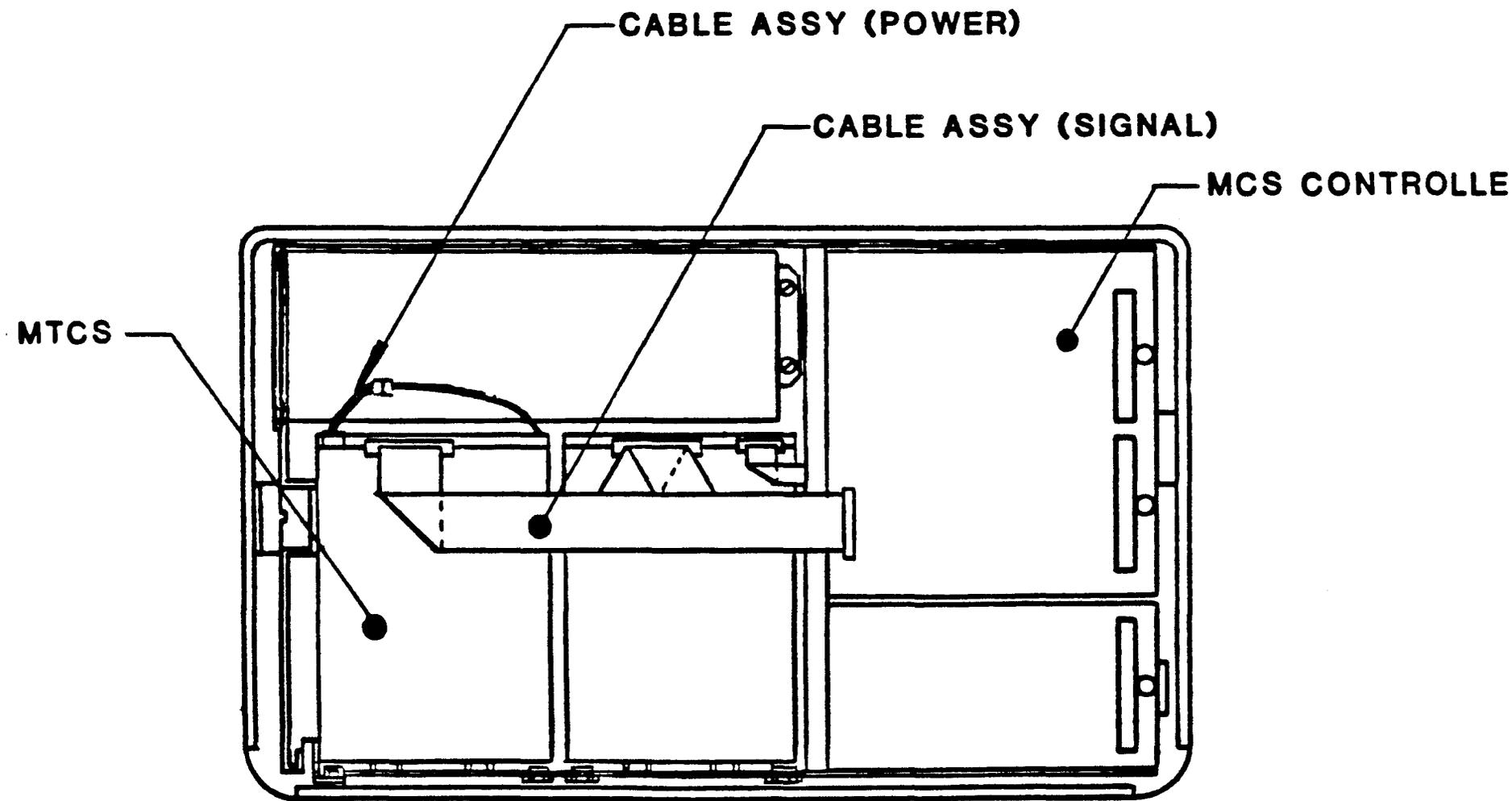


Figure 2-2. Cable Assembly Routing

**NOTES**

## SECTION 3

### MAI 3000

#### 3.1 INTERNAL MICS

The following procedure assumes that no device is present where the 60/120 MB MICS is to be installed. If a device is present, refer to the MAI 3000 service manual (M8108), Section V, for removal instructions (and for testing and fault isolation procedures for tape drives).

To install the 60/120 MB MICS into the MAI 3000 system, verify that the operating system and diagnostic level are 7.2D or higher, and proceed as follows:

1. Shut down the system as follows:

- a. Enter CTRL D.

- b. Type:

powerdown

and wait for the prompt.

#### CAUTION

**An incorrect shutdown procedure will corrupt the file system.**

2. Turn OFF the CCA by operating the rear panel power switch to the OFF position, and unplug the power cable.

#### CAUTION

**The rear panel rocker switch DOES NOT turn off ac power into the CCA. AC is removed only by unplugging the CCA power cord.**

3. Remove the CCA front panel by using a screwdriver to disengage two captive screws at the bottom and then pulling from the bottom.
4. Remove the right-hand side panel. The side panels slide forward for easy removal. It may be helpful to insert the tip of a flat-blade screwdriver between the front flange of the panel and the frame, about midway down the panel; carefully twist the blade to disengage the panel from the frame.

5. Unplug all connections to the CCA, including all attached peripherals.
6. Unplug the WDC PCBA from the top of the "stack." (This step may not be necessary; when more than one device controller board is present, the entire stack may be removed as a single unit, and the MTCS Controller PCBA then may be removed from the stack while the stack is outside the CCA.)
7. Unplug from the stack any other controller PCBAs that might be present (after first disconnecting their cables) until the Magnetic Tape Cart-ridge Streamer Controller PCBA, if present, is accessible. (Note: if an MTCS Controller PCBA is present, verify that it is P/N 903406-002; if it is not, be sure to upgrade.) Record the order of board removal.
8. Set the appropriate switches (SW1) on the 903406-002 MCS Controller PCBA for the correct bus arbitration number and mode according to Table 3-1 in this section.
9. Plug the MTCS Controller PCBA into the CMB (or into the PCBA from which the original MTCS Controller PCBA was removed) at the bottom right-hand corner of the CMB.
10. Mount the MTCS to the CCA (Central Cabinet Assembly) chassis (refer to Figure 3-1).
11. Install and route the 916024-001 bus cable assembly between the MTCS and the MCS controller (refer to Figure 3-1).
12. Install the 907612-001 Y-breakout cable in line with the fan assembly dc cable, with the Y-breakout cable connecting to the MTCS drive in two places.
13. Replace any other PCBAs that were removed in steps 6 and 7 of this procedure, in the order recorded in those steps, and plug the WDC PCBA into the PCBA at the top of the stack.
14. Replace the CCA front and side panels.
15. Plug in all connections to the CCA, including all previously attached peripherals.

**Table 3-1. 903406-002 MCS Controller Switch Settings**

| SW-1 | SW-2 | SW-3 | SW-4 | SW-5 | SW-6 | SW-7 | SW-8 |
|------|------|------|------|------|------|------|------|
| ON   | ON   | ON   | ON   | OFF  | OFF  | X    | ON   |

SW1-8 is ON for normal operation and OFF for drive burn-in mode  
 X = DON'T CARE

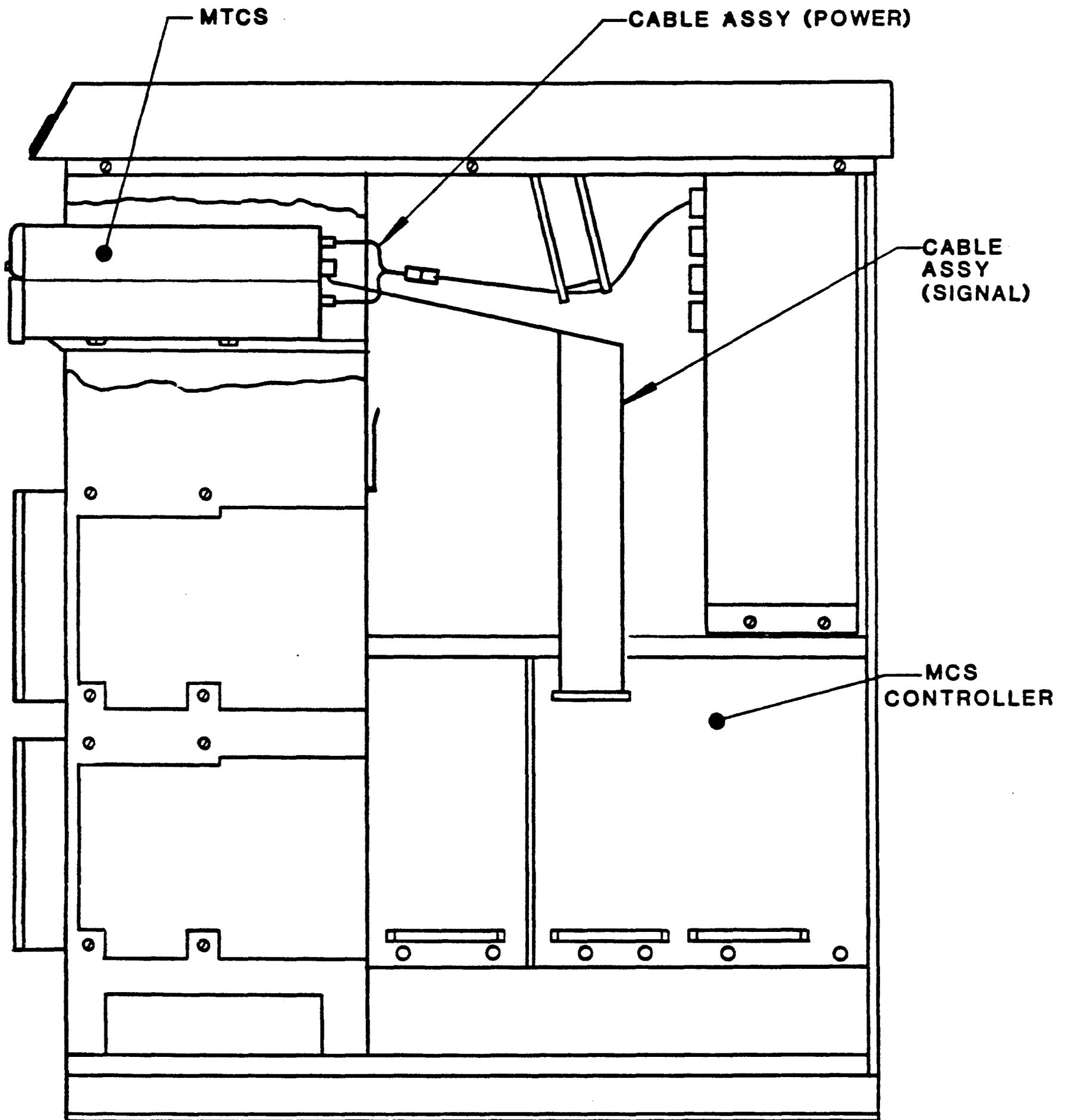


Figure 3-1. MCS Installation into MAI 3000 CCA

## 3.2 EXTERNAL MPCS

The MPCS in its own separate enclosure is MBF model number 514406. It may be connected to the system as an external unit. The 514406 MPCS connects to the CCA via cable assembly 907506-001. The switch settings on the MCS controller for the external unit are the same as those for the internal unit. To install the MCS Controller, perform steps 1 through 9 and steps 13 through 15 in paragraph 3.1 of this section.

**NOTES**

**NOTES**

## SECTION 4

### MPx 7000

#### 4.1 INTERNAL MTCS

The following procedure assumes that no device is present where the 60/120 MB MTCS is to be installed. If a device is present, refer to the MPx 8000 Series service manual (M8075), Section V, for removal instructions, for PCBA access and identification instructions, and for testing and fault isolation procedures for tape drives.

To install the 60/120 MB MTCS into the MPx 7000 system, verify that the operating system and diagnostic level are 8.6A or higher, and proceed as follows:

1. On MPC controllers 903500-001 and 903546-001, remove Jumper JMP3, if present, and set the switches as shown in Table 4-1.
2. Install the MPC controller into the card chassis.
3. Verify that the ACS PCBA is 903379-003. If the ACS PCBA is a -002, upgrade it with a 916127-001 kit. If the ACS PCBA is a -001, replace it with a -003 PCBA.
4. Mount the MTCS to the chassis (refer to Figure 4-1), and install and route the 907174-029 bus cable assembly from the MPC controller to the MTCS.
5. Install the 907612-001 Y-breakout cable assembly in line with the power cable from the power adapter (on the rear of the mainframe card chassis) to two places on the MTCS.
6. The 907600-04 front panel must be revision F or higher, i.e., the top corners of the cutout for the MTCS must be square.

#### 4.2 EXTERNAL MTCS

The MTCS in its own separate enclosure is MBF model number 514406. It may be connected to the system as an external MTCS for program exchange. The MTCS is connected to a BMTC PCBA via cable assembly 907567-001. Refer to the MPx 8000 Series service manual (M8075) for PCBA access and identification instructions, for switch settings for 1/4-inch tape units, and for testing and fault isolation procedures for the drive. Conditions for an internal drive do not apply.

**Table 4-1. 903500-001/903546-001 MPC Controller Switch Settings**

| 903500-001 |       | 903546-001 |       |
|------------|-------|------------|-------|
| SW2-1      | SW2-4 | SW2-1      | SW2-2 |
| OFF        | OFF   | OFF        | OFF   |

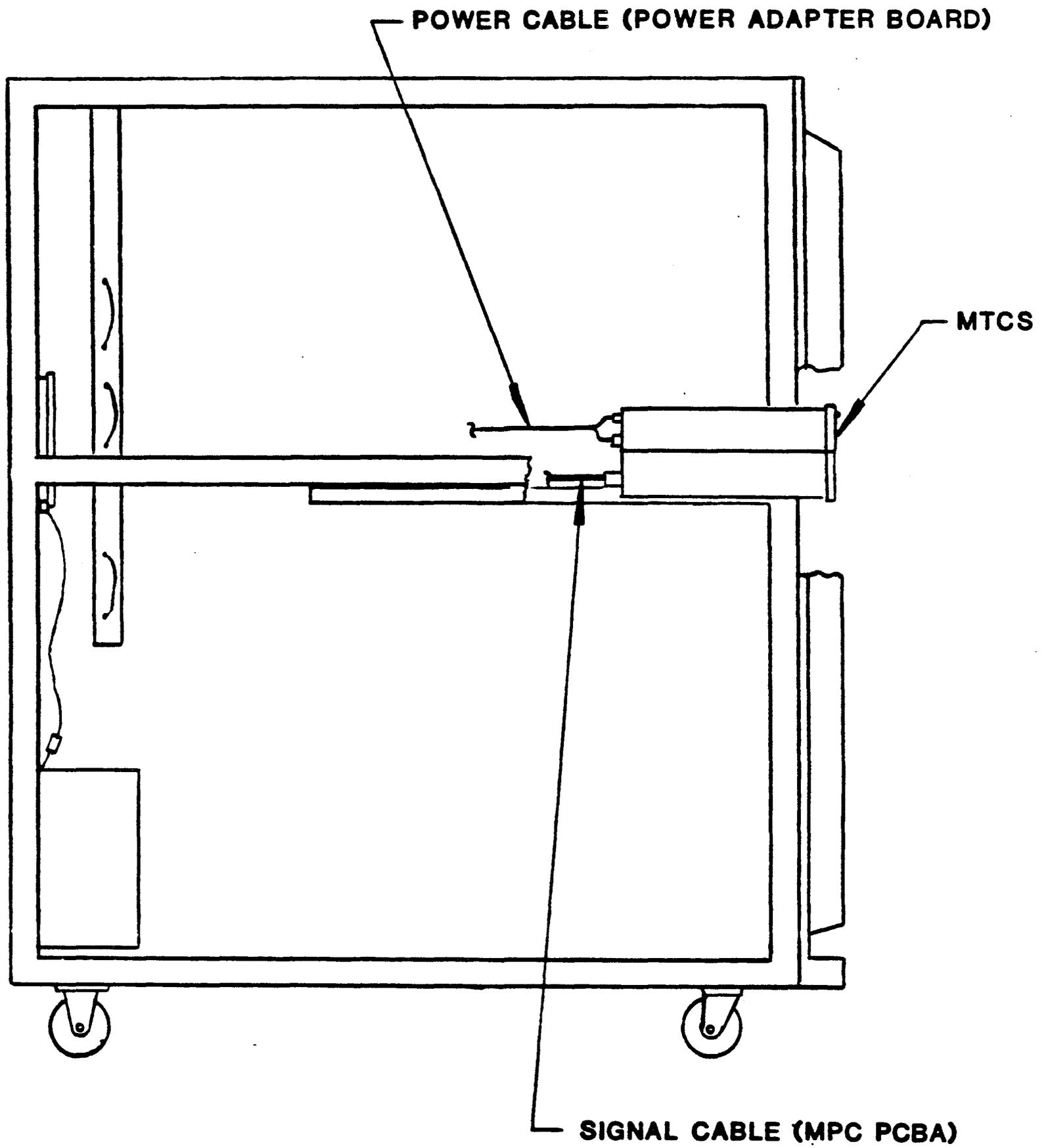


Figure 4-1. MTCS Cable Routing

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## SECTION 5

### MPx 7100

#### 5.1 INTERNAL MTCS

The following procedure assumes that no device is present where the 60/120 MB MTCS is to be installed. If a device is present, refer to the MPx 7100 Series service manual (M8111), Section V, for removal instructions and for PCBA access and identification instructions.

To install the 60/120 MB MTCS into the MPx 7100 system, verify that the operating system and diagnostic level are 8.6A or higher, and proceed as follows:

1. On MPC controllers 903500-001 and 903546-001, remove Jumper JMP3, if present, and set the switches as shown in Table 5-1.
2. Install the MPC controller into the card chassis.
3. Verify that the ACS PCBA is 903379-003. If the ACS PCBA is a -002, upgrade it with a 916127-001 kit. If the ACS PCBA is a -001, replace it with a -003 PCBA.
4. Mount the MTCS to the chassis (refer to Figure 5-1), and install and route the 907174-029 bus cable assembly from the MPC controller to the MTCS.
5. Install the 916116-001 Y-breakout cable assembly from the power adapter (on the rear of the mainframe card chassis) to two places on the MTCS (refer to figure 5-1).
6. The front panel assembly must be 916089-003, i.e., it must have the proper cutout for the MTCS.

#### 5.2 EXTERNAL MTCS

The MTCS in its own separate enclosure is MBF model number 514406. It may be connected to the MPx 7100 system as an external MTCS for program exchange. In such a case, the MTCS would be connected to a BMTC PCBA via cable assembly 907567-001. Refer to the MPx 7100 Series service manual for PCBA access and identification instructions, for switch settings for 1/4-inch tape units, and for testing and fault isolation procedures for tape drives. Other conditions for an internal MTCS do not apply.

**Table 5-1. 903500-001/903546-001 MPC Controller Switch Settings**

| <u>903500-001</u> |       | <u>903546-001</u> |       |
|-------------------|-------|-------------------|-------|
| SW2-1             | SW2-4 | SW2-1             | SW2-2 |
| OFF               | OFF   | OFF               | OFF   |

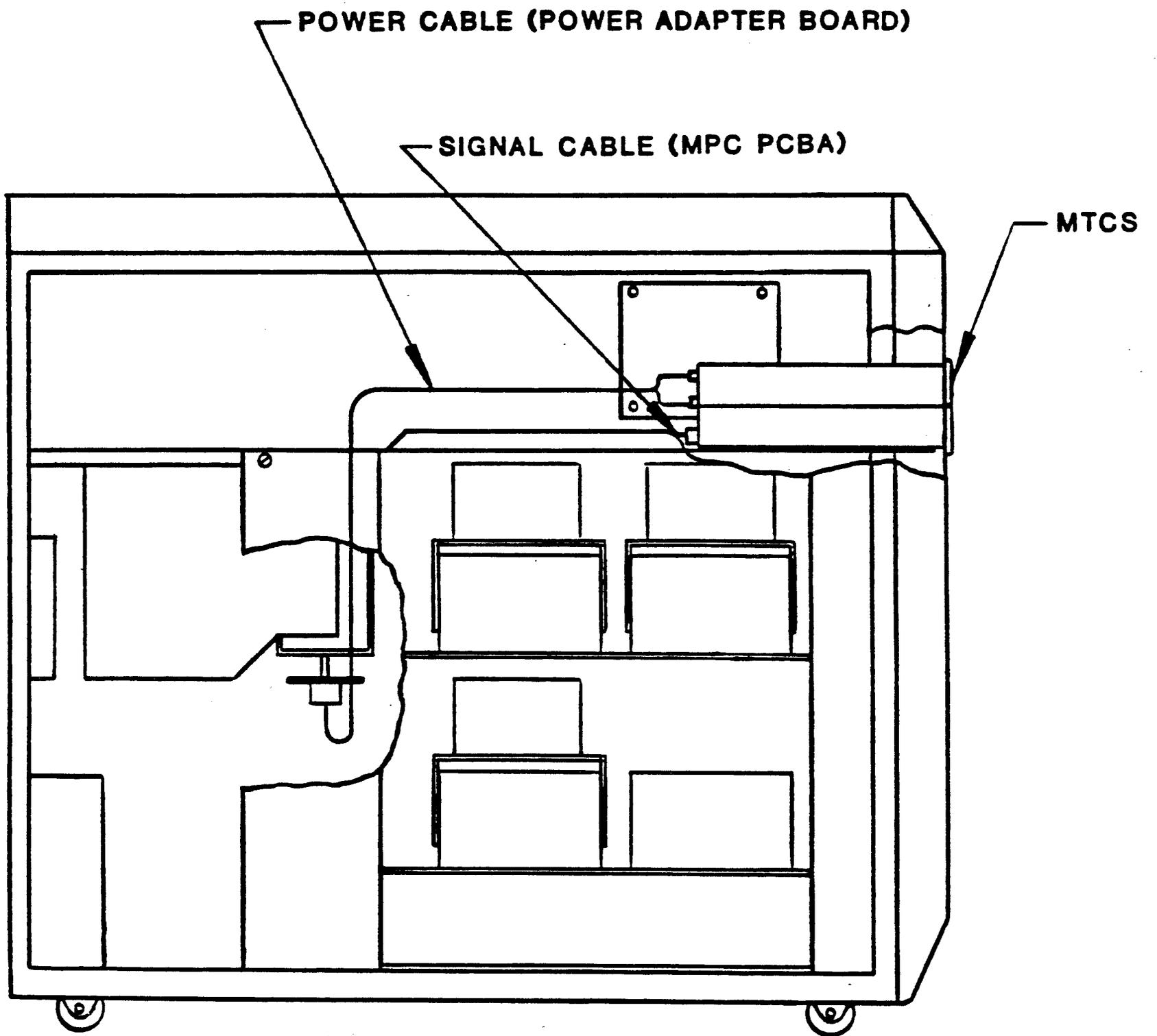


Figure 5-1. MICS Cable Routing

**NOTES**

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## SECTION 6

**MPx 8000**  
**MPx 9000/9100**  
**MPx 9500**

The 60/120 MB Magnetic Tape Cartridge Streamer (MTCS) in its own separate enclosure is MBF model number 514406. It must be connected to the system as an external MTCS for program exchange. The MTCS is connected to a BMTC PCBA via cable assembly 907567-001. Refer to the appropriate service manual for PCBA access and identification instructions, for switch settings for 1/4-inch tape units, and for testing and fault isolation procedures for tape drives. Other conditions for an internal MTCS do not apply.

**NOTES**