



# Maintenance Information

<b>MI</b> MAPs START EXIT 00-02  VOL 01	<b>MI</b> MAPs 04-0E 2X-4X  VOL 02	<b>MI</b> MAPs 80-84  VOL 03	<b>MI</b> MAPs 88 89  VOL 04	<b>MI</b> MAPs AX  VOL 05	<b>MI</b> MAPs AX  VOL 06	<b>MI</b> MAPs CX DX EX F1-F5  VOL 07	<b>MI</b> MAPs F7 00-69  VOL 08	<b>MI</b> MAPs F7 6A-B5  VOL 09	<b>MI</b> MAPs F7 B6-FF  VOL 10	<b>MI</b> MAPs F8 FC FD FE INDEX  VOL 11
<b>MI</b> STM LOC REM ADJ DIAGN 53 FD CONFIG  VOL 13	<b>MI</b> STM FEAT CA 5424  VOL 14	<b>MI</b> STM FEAT LA OP GUIDE PDG DIAGN CONFIG  VOL 15	<b>MI</b> POWER INTROD. PRINCIP. DETAILS REP INFO REF INFO  VOL 16	<b>MI</b> GSI INTRO MAINT DIAGN TOOLS FRIEND  VOL 17	<b>MI</b> INSTALL. MANUAL PARTS CAT. OP GUIDE PACK. INSTR.  VOL 18					

## IBM 4321/4331 Processors Installation Manual

**INST**

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PC, OP Guide  
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B/M Number 4331-2: 5683368  
B/M Number 4331-11: 4687146

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## Safety Guidelines

If you are aware of the guidelines for working with electrical and mechanical equipment and practice these guidelines, you can work safely with this equipment.

*You need not fear electricity, but you must respect it.*

You should take every safety precaution possible and observe the following safety practices while maintaining IBM equipment.

1. You should not work alone under hazardous conditions or around equipment with dangerous voltage. Always advise your manager if this is a potential problem.
2. Remove all power before removing or assembling major components, working in the immediate area of power supplies, performing mechanical inspection of power supplies, or installing changes in machine circuitry.
3. Power supplies, pumps, blowers, motor generators, and other units with voltages which exceed 30V ac or 42.4V dc must not be serviced with power on when the unit is removed from its normal installed position within the machine, unless maintenance documentation clearly states otherwise. (This is done to ensure that proper grounding is maintained.)
4. Unplug the power supply cord whenever possible before working on the machine. The wall box switch when turned off should be locked in the off position or tagged with a DO NOT OPERATE tag (form Z229-0237). Be aware that a non-IBM attachment to an IBM machine may be powered from another source and be controlled by a different disconnect or circuit breaker.
5. When it is absolutely necessary to work on equipment having exposed live electrical circuitry, observe the following precautions:
  - a. Another person familiar with power off controls must be in immediate vicinity. (Someone must be there to turn off power if it should become necessary.)
  - b. Do not wear any jewelry, chains, metallic frame eyeglasses, or metal cuff links. (In the event of contact, there will be more current flowing because of the greater contact area afforded by the metal.)
  - c. Use only insulated pliers, screwdrivers, and appropriate probe tibs/ extenders. (Remember, worn or cracked insulation is unsafe.)
6. Follow special safety instructions when working with extremely high voltages. These instructions are outlined in CEMs and the safety portion of maintenance documentation. Use extreme care when checking high voltage.
7. Avoid use of tools and test equipment that have not been approved by IBM. (Electrical hand tools [wire wrap guns, drills, etc.] should be inspected periodically.)
8. Replace worn or broken tools and test equipment.
9. After maintenance, restore all safety devices, such as guards, shields, signs, and ground leads. Replace any safety device that is worn or defective. (These safety devices are there to protect you from a hazard. Don't defeat their purpose by not replacing them at the completion of the service call.)
10. Safety glasses must be worn when:
  - Using a hammer to drive pins, etc.
  - Power hand drilling.
  - Using spring hooks, attaching springs.
  - Soldering, wire cutting, removing steel bands.
  - Parts cleaning, using solvents, chemicals, and cleaners.
  - All other conditions which might be hazardous to your eyes.
11. Never assume that a circuit is deenergized. (Check it first.)
12. Always be alert to potential hazards in your working environment (i.e., damp floors, nongrounded extension cords, power surges, missing safety grounds, etc.)
13. Do not touch live electrical circuits with the surface of the plastic dental mirrors. The surface of the dental mirror is conductive and can result in machine damage and personal injury.
14. Four steps that should be taken in the event of an electrical accident:
  - a. **USE CAUTION - DON'T BE A VICTIM YOURSELF.**
  - b. **TURN POWER OFF.**
  - c. **HAVE SOMEONE ELSE GET MEDICAL HELP.**
  - d. **ADMINISTER RESCUE BREATHING IF VICTIM IS NOT BREATHING.**
15. Do not use solvents, cleaners, or oils that have not been approved by IBM.
16. Lift by standing or pushing up with stronger leg muscles. This takes strain off back muscles. Do not lift any equipment or parts which you feel uncomfortable with.
17. Each customer engineer is responsible to be certain that no action on his/her part renders the product unsafe or exposes hazards to customer personnel.
18. Place removed machine covers in a safe out-of-the-way location while servicing the machine. These covers must be in place on the machine before the machine is returned to the customer.
19. Always place CE tool kit away from walk areas where no one can trip over it (i.e., under desk to table.)
20. Avoid wearing loose clothing that may be caught in machinery. Shirt sleeves must be left buttoned or rolled up above the elbow. Long hair and scarves must be secured.
21. Ties must be tucked in shirt or have a tie clasp (preferably non-conductive) approximately three inches from the end when servicing a machine.
22. Before starting equipment, make sure that fellow CEs and customer personnel are not in a hazardous position.
23. Maintain good housekeeping in the area of the machines while performing and after completing maintenance.
24. Avoid touching moving mechanical parts when lubricating, checking for play, etc.

*Prevention* is the key to electrical safety. You should always be conscious of electrical safety. Follow the Safety Guidelines and practice good habits such as:

- Making certain that the customer's power receptacle meets IBM equipment requirements.
- Inspect line cords and plugs. Check for loose, damaged or worn parts.
- Before removing a component which can retain a charge from the machine, review the procedure in the maintenance documentation. **CAREFULLY** discharge the necessary component exactly as directed by the service procedure.
- Do not use an ordinary lamp as an extension trouble light.

## Safety Guidelines (continued)

Never assume anything about a machine or circuit. No machine is completely safe all the time. The exact condition of a machine may be unknown. Here are some of the reasons why:

- The power receptacle could be incorrectly wired.
- Safety devices or features could be missing or defective.
- The maintenance and/or modification history may be uncertain or unclear.
- A possible design deficiency could exist.
- The machine may have suffered transportation damage.
- The machine might have an unsafe alteration or attachment.
- An EC or sales change may have been improperly installed.
- The machine may have deteriorated due to age or environmental extremes.
- A component could be defective, creating a hazard.
- Some component of the machine may have been incorrectly assembled.

Relating to safety, these are some of the ways the condition of the machine can be affected. Before you begin a service call or procedure, exercise good judgment and proceed with caution.

### Electrical Accidents

#### Administering First Aid

In implementing rescue procedures in an electrical accident, one must:

- **Use Caution** - If the victim is still in contact with the electrical current source, it may be necessary to use the room EPO (Emergency Power Off) or disconnect switch to remove the electrical current. If the EPO or disconnect switch cannot be located, use a dry stick or another nonconducting object to pull or push the victim away from contact with the electrical equipment.
- **Act Quickly** - If the victim is unconscious, he/she may need rescue breathing and possibly external cardiac compression if the heart is not beating.
- **Call Fire Rescue** (Rescue Squad, Emergency, Ambulance, Hospital, etc.) - Have someone summon medical aid.

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ANC0130

Determine if the victim needs rescue breathing.

1. Make certain that the victim's airway is open and that it is not obstructed. Check the mouth for objects that may be blocking the airway such as gum, food, dentures or even the tongue. Position the victim on his back and place one hand beneath the victim's neck and the other hand on his forehead. Then lift the neck with one hand and tilt the head backward with pressure on the forehead from the other hand as shown in Figure 1.
2. Now you must *look, listen, and feel* to determine if the victim is breathing freely. Place your cheek close to the victim's mouth and nose to listen and feel for the exhaling of air.



Figure 1

At the same time, look at the chest and upper abdomen to see if they rise and fall. If the victim is not breathing properly, you should:

- a. With the head in a backward tilt as shown in Figure 1, continue to exert pressure on the victim's forehead with your hand while rotating this same hand so that you can pinch the victim's nostrils together with the thumb and index finger (Figure 2).

**CAUTION:** Use extreme care when administering rescue breathing to a victim that may have breathed in toxic fumes. **DO NOT INHALE AIR EXHAUSTED BY THE VICTIM.**



Figure 2

- b. Open your mouth and take a deep breath. Make a tight seal with your mouth around the victim's mouth and blow into the victim's mouth (Figure 3).



Figure 3

- c. Remove your mouth and allow the victim to exhale while watching for the victim's chest to fall (Figure 4).



Figure 4

- d. Repeat this cycle once every five seconds until the victim breathes for himself or medical help arrives.

### Reporting Accidents

It is a CE's responsibility to report all electrical accidents, potential hazards, and "near miss" accidents to your field manager. Remember, a near miss accident might be the result of a design deficiency and prompt reporting will assure that the situation will be resolved quickly.

It's important to report even a minor shock since the conditions which caused it need only be varied slightly to cause serious injury.

# Installation Manual

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# Installation Manual

## Before Installation

### Machine Type

#### IBM 4321/4331 Processors

#### Introduction

This Installation Instruction provides the information needed to install the IBM 4321/4331 Processors. The CE must follow the instructions step by step. Check off each completed step in the square box in front of the step number.

Some pages in this manual or some steps called out in the installation procedure may be for features that are not installed on your machine. Where this occurs, skip the corresponding installation steps. The plant may attach a 'Note To CE' in front of this manual in order to pick up last minute changes.

When installation is completed, keep this installation instruction with the machine for possible reinstallation of the machine.

**Note:** Metric tools are required for metric screws (blue screws and nuts).

#### Pre-Installation Checks

- 1. Use the planning documents that have been drawn by the installation planner and check that all planning requirements, including wall outlets with Emergency Power off (EPO) control, are met.
- 2. If the machine is not already at its final location, monitor transportation of the machine and ensure that it is properly positioned according to the physical planning documents.
- 3. Supervise the removal of the machine from the palette (if applicable) and unpack the machine according to the unpacking instructions delivered with machine (usually taped on the top or cover of the machine).
- 4. Remove packing material and adhesive tape (if applicable).

- 5. Make a visual inspection for damage resulting from shipment. Report any serious damage immediately to your branch office.

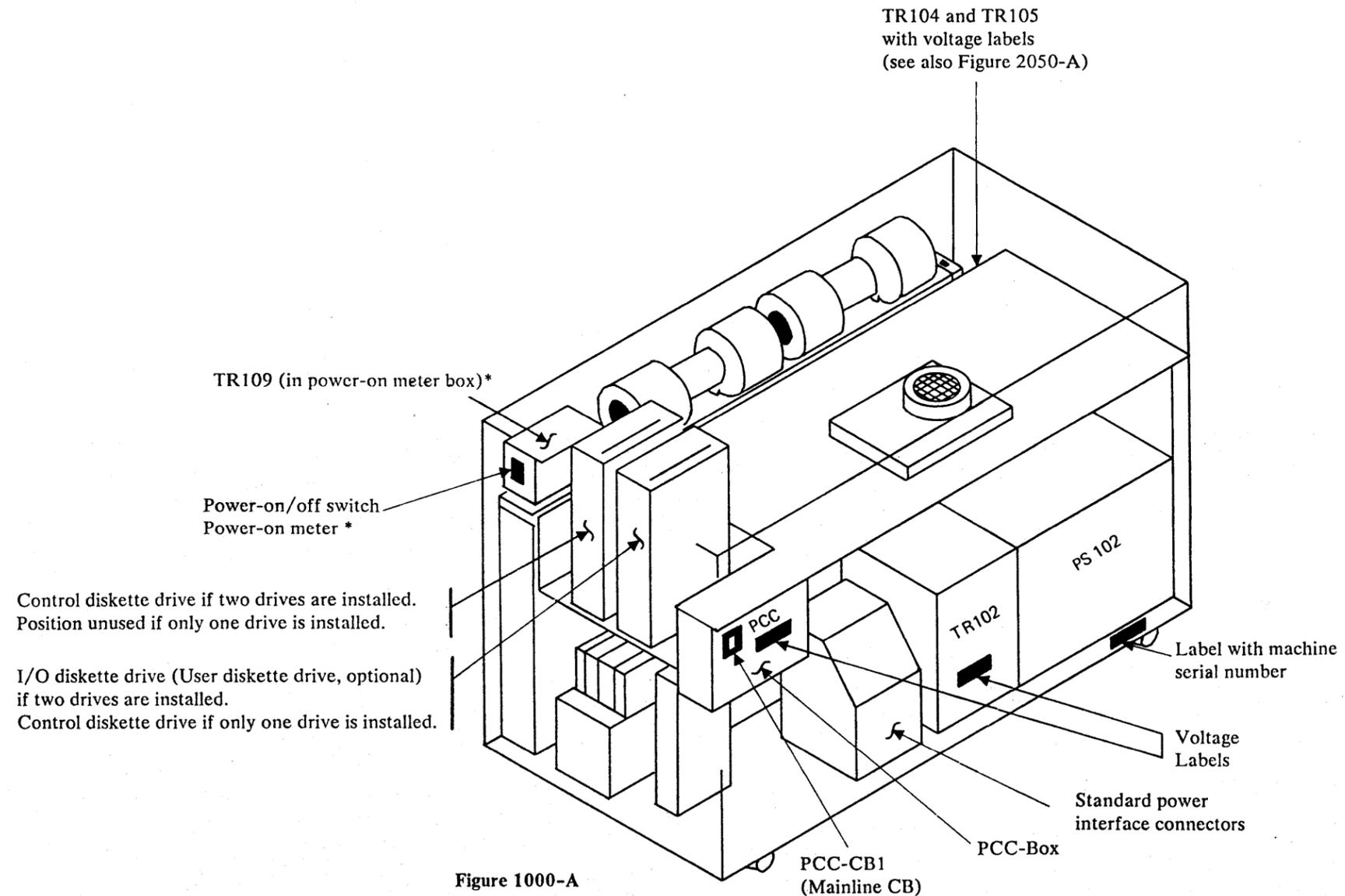


Figure 1000-A

\* The power-on meter is not installed in all machines

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## Installation Manual

### Before Installation

#### *Pre-Installation Checks (continued)*

- 6. Lift off the machine covers and store them in a safe place. Compare the machine serial number with the shipping documents (see Figure 1000-A). Report any difference to your branch office.
- 7. Remove the fastening bars located under the machine if the machine was shipped on a pallette. (Figure 1005-A, **7** )
- 8. Remove tape and seal that is securing the main line cord in the machine. (Figure 1005-A, **8** )
- 9. Pull the line cord through the bottom opening of the machine.
- 10. Close the opening at the bottom of the frame by turning the plate and refasten the screw. (Figure 1005-A, **10** ).
- 11. Remove the 'shipping protecting' of the sliding cover (if present). (Figure 1005-A, **11** ).

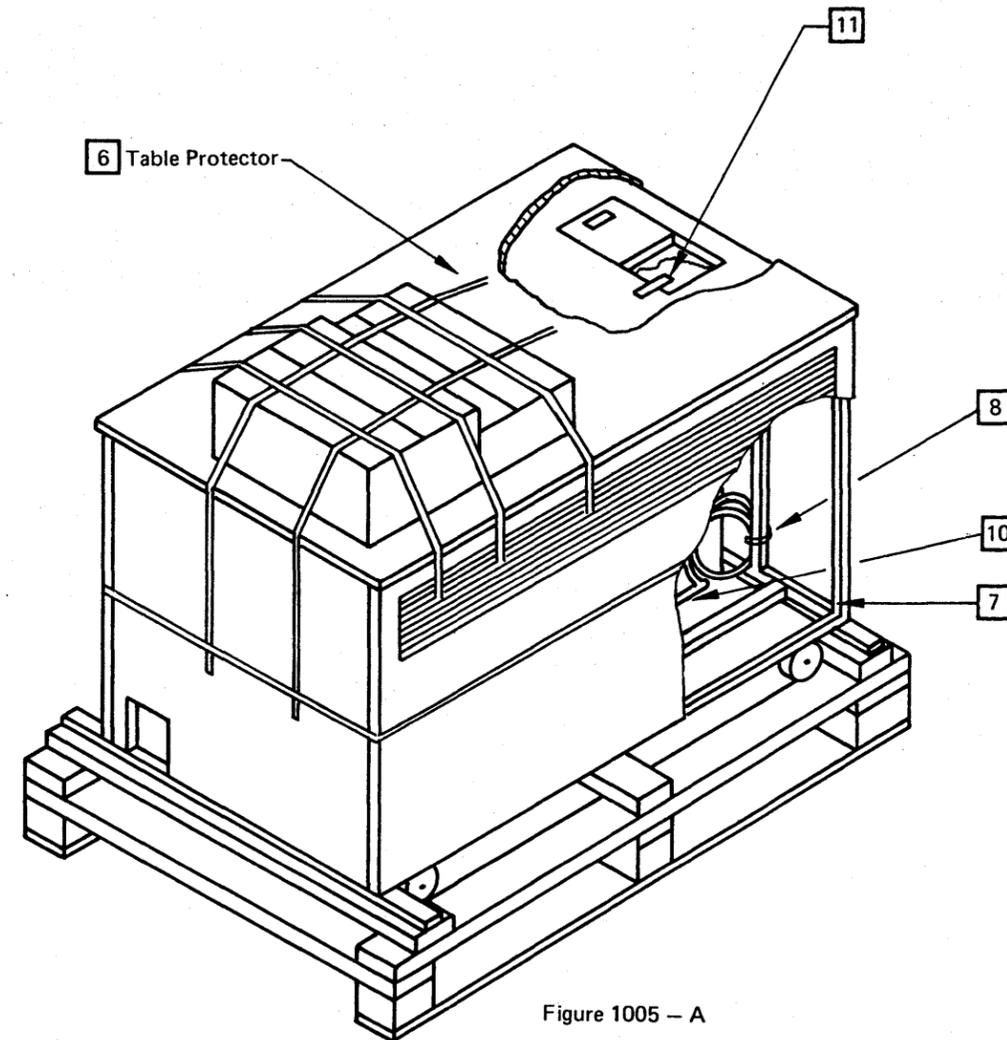


Figure 1005 - A

## Installation Manual

### Before Installation

#### Check Cables

1. Sort cables by cable group numbers and ensure that the necessary cables have been received (see installation plan and page 2045) and that all cables and connectors are undamaged. Ensure that cables have the correct length according to the physical planning documents. Report any discrepancy to your branch office. Installation cannot be completed unless all cables are present and undamaged.  
**Note:** The maximum cable length for 3310 is 100 feet.

##### Onfloor cables:

Installation of onfloor cables proceeds as the system is installed.

##### Underfloor cables:

Underfloor cables may have been installed before system was delivered.

2. **Interface Cables**  
To prevent mistakes in connecting the interface cables, mark both ends of each cable with the same label, either 'BUS' or 'TAG', depending on usage. The machine type should also be added to the labels. Do this prior to cable installation if the labels are not already present. Attach a label to that side of the interface cable connector where pin rows B and G are located (see Figure 1010-A).

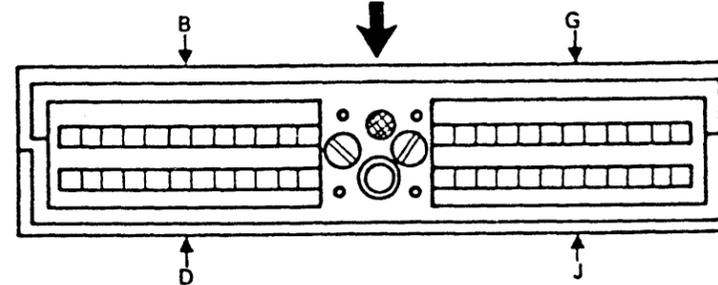
Interface cable part numbers are shown under item 'External I/O Cables' in this manual.

##### Caution:

The dark grey plug must be plugged into the machine and the light grey plug into the I/O unit.

**General rule:** Dark grey plugs are always connected to light grey plugs and vice versa.

Attach label to this side of connector



Interface connector

Figure 1010-A.

#### Remove Shipping Hardware

1. Locate both orange shipping braces at lock side of gate 01A, loosen the screws and turn the upper brace downwards and slide the lower one upwards. Tighten the screws so that the gate can be opened.
2. Check that the gate 01A slides easily (but with a noticeable resistance) into the locking mechanism. If necessary, adjust upper hinge of gate.

#### Check Line Voltage/Voltage Conversion

##### Caution:

Do not connect the machine to the wall outlet at this time.

1. Determine from the customer the line voltage provided by him. The AC voltage requirements of the machine are shown on the labels located at the PCC cover.  
If the customer voltage does not match the machine voltage indicated on the above mentioned label, change the AC input lines to the machine transformers according to the table on ALD page YA021. Physical locations of transformers are shown on pages 1000 and 2050.

After changing the machine voltages, also change the voltage labels on the transformers and PCC box.

The line voltage is present at the terminals of PCC-CB01 (main line CB). PCC-CB01 is shown on ALD page YA-321.

Voltage conversions to 200V or 208V on machines with PS105 installed and MS-size greater than 2 MB require a Reactive Power Compensator (RPC). The RPC is a set of capacitors installed below the PCC-box. If the RPC is not present, the B/Ms 8481709, 1598079, and for Canadian-French language group B/M 1598078 must be ordered and installed.

A missing RPC on machines to which the above conditions apply may cause the main CB in the PCC-box (PCC-CB01) to trip.

**Note:** World Trade Corporation machines are designed to be connected to IT nets (nets with unearthed or impedance grounded neutral; IT = Impedance Terminated).

## Installation Manual

### Before Installation

#### *Check Grounding*

**Caution:**

Do not touch the metal shell of the customer's power connector until the following tests are complete. Improper wiring can cause the receptacle shell to be at line potential.

1. Ask the customer to turn off the wall circuit breaker or disconnect feeding power to the power receptacle.
2. Using the CE meter on the RX1 resistance scale, check for continuity between the ground pin of the connector, the connector shell and building ground. If there is no convenient ground available under the raised floor, an adjacent grounded IBM machine frame or electrical conduit may be used. If you fail to read continuity between any of these points, there is a problem and power must not be turned on. Notify the customer and have a qualified electrician correct the problem.
3. If a satisfactory condition is found in step 2, switch the meter to the 500 volt AC scale.
4. Ask the customer to turn on the wall circuit breaker or reconnect feeding power to the receptacle.
5. Do not touch the shell of the receptacle! Any potential in excess of zero volts between the shell of the receptacle and any of the following grounded surfaces (metal conduit, the metallic structure of the customer's raised floor, or another grounded IBM machine frame) indicates the possibility of an improperly wired receptacle.
6. Ask the customer to turn off the wall circuit breaker or disconnect and leave it turned off.
7. If a voltage is detected in step 5, the receptacle must be checked by a qualified electrician.
8. If any electrical work is performed by an electrician as a result of the preceding steps the above checks must be repeated.

# Installation Manual

## Installation

### Check Received Parts and Assemble Machine

- 1. Unpack the Shipping Group No. 8481002 (mechanical parts) and check it for completeness. The maintenance package has to be checked using the Maintenance Package Check List in the center column of this page.
- 2. Check MI, Volume 30, for additional RPQ documents. If RPQ documents are present, proceed according to the RPQ installation instruction in Volume 30.
- 3. Check the link list (see Note 1) received with the maintenance package. Starting on page 3 of Section A you will find important information about the purpose of the EC and of the handling of last minute changes incorporated.
- 4. Pull out the diskette drive(s) and loosen the screws of the upper orange shipping braces. Turn the braces 90 degrees and tighten the screws. The lower orange shipping brace(s) must be removed and must be reversed installed in the same place.
- 5. Remove dummy diskettes (if present) from diskette drive(s). The dummy diskette(s) should be stored with the diagnostic and control diskettes in a pocket of the machine cover next to the diskette drives. The dummy diskette, if available, should be installed for reshipment.

**Caution:**

Store diskettes in a protected area during system installation time so that they will not be damaged. Diskettes may also be damaged if exposed to a magnetic field, for example a magnetized screwdriver.

**Note 1:**

**WT only:** Vol. 50 contains the link list and may be packed separately.

**US only:** Vol. 50 is not used in US. Vol. 30 contains the link list.

### Maintenance Package Check List

<input type="checkbox"/> B/M 8481420 for 4321	<input type="checkbox"/> PDL4 or			
<input type="checkbox"/> B/M 8481421 for 4321	<input type="checkbox"/> PDL5 or			
<input type="checkbox"/> B/M 8481003 for 4331-1	<input type="checkbox"/> PDL4 or			
<input type="checkbox"/> B/M 8481313 for 4331-1	<input type="checkbox"/> PDL5 or			
<input type="checkbox"/> B/M 8481120 for 4331-2	<input type="checkbox"/> PDL4 or			
<input type="checkbox"/> B/M 8481314 for 4331-2	<input type="checkbox"/> PDL5 or			
<input type="checkbox"/> B/M 8481426 for 4331-11	<input type="checkbox"/> PDL4 or			
<input type="checkbox"/> B/M 8481427 for 4331-11	<input type="checkbox"/> PDL5			
<input type="checkbox"/> Vol.01	<input type="checkbox"/> Vol.09	<input type="checkbox"/> Vol.17	Note 2	
<input type="checkbox"/> Vol.02	<input type="checkbox"/> Vol.10	<input type="checkbox"/> Vol.18		
<input type="checkbox"/> Vol.03	<input type="checkbox"/> Vol.11	<input type="checkbox"/> Vol.30		
<input type="checkbox"/> Vol.07	<input type="checkbox"/> Vol.13	<input type="checkbox"/> Vol.40		
<input type="checkbox"/> Vol.08	<input type="checkbox"/> Vol.16	<input type="checkbox"/> Vol.50 (WT only)		
Features (installed if ordered)				
CA and or 5424, Vol.14				Note 2
<input type="checkbox"/> B/M 8481365 for 4331-1				
<input type="checkbox"/> B/M 8481398 for 4331-2				
CA (MAPs, STM - Vol.04/14)			Note 2	
<input type="checkbox"/> B/M 8481363 for 4331-1				
<input type="checkbox"/> B/M 8481396 for 4331-2				
5424 (MAPs, STM - Vol.05/14)				
<input type="checkbox"/> B/M 8481437 for 4321				
<input type="checkbox"/> B/M 8481364 for 4331-1				
<input type="checkbox"/> B/M 8481397 for 4331-2				
<input type="checkbox"/> B/M 8481436 for 4331-11				
LA (MAPs, STM - Vol. 06/15)				
<input type="checkbox"/> B/M 8481435 for 4321				
<input type="checkbox"/> B/M 8481347 for 4331-1				
<input type="checkbox"/> B/M 8481348 for 4331-2				
<input type="checkbox"/> B/M 8481434 for 4331-11				

**Note 2:** CA documents (Vol. 4 and 14) are shipped with all 4321 and 4331-11 processors. The feature B/M's shipped with your machine are also listed in ITC, Vol. 30.

### Check Card and Connector Seating

- 1. Ensure that the connectors of all power supplies are correctly seated (see Figure 2000-A). For this action the cover of the PS must be removed. Physical locations of the power supplies are shown in Figures 1000-A and 2050-A.
- 2. Remove the gate cover. Check that all cards, cable connectors and top connectors of the cards are seated correctly. Check also the connectors on the pinside of the boards.
- 3. Ensure that all connectors at the power control compartment (PCC box) are seated correctly (see Figure 1000-A).
- 4. Open the PCC box and check that the ground wires are tightened to the back of the PCC box housing (inside).
- 5. Check that the diskette drives can easily be loaded. Check only the mechanical function of the load mechanism: Depress the head mechanism to insure no binds.
- 6. Ensure that the ground strap between gate 01A hinge side and frame ground is fastened (see Figure 2010-B 7).

PS/No.	Number of Connectors			
	4321, 4331-1		4331-2, 4331-11	
	PDL4	PDL5	PDL4	PDL5
102	6	6	8	8
103	5	-	5	-
104	6	8	6	8
105	6	6	6	6

**Note 3:** On PDL5 machines there is no PS103 installed (PDL = Power Design Level).

Figure 2000-A

INST

# Installation Manual

## Installation

### Install Table for Operator Console

1. The table for the operator console may be provided by the customer or by IBM. Table installation has to be done according to local practice.

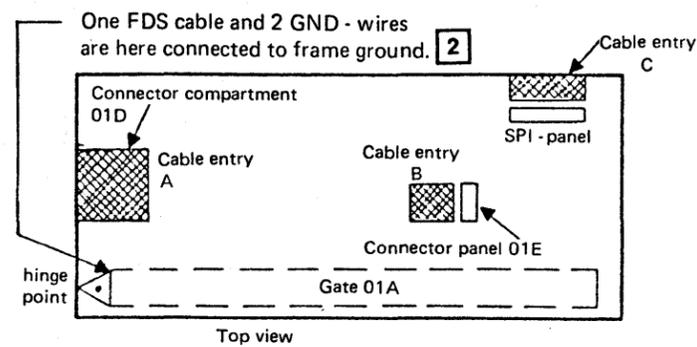


Figure 2010 - A

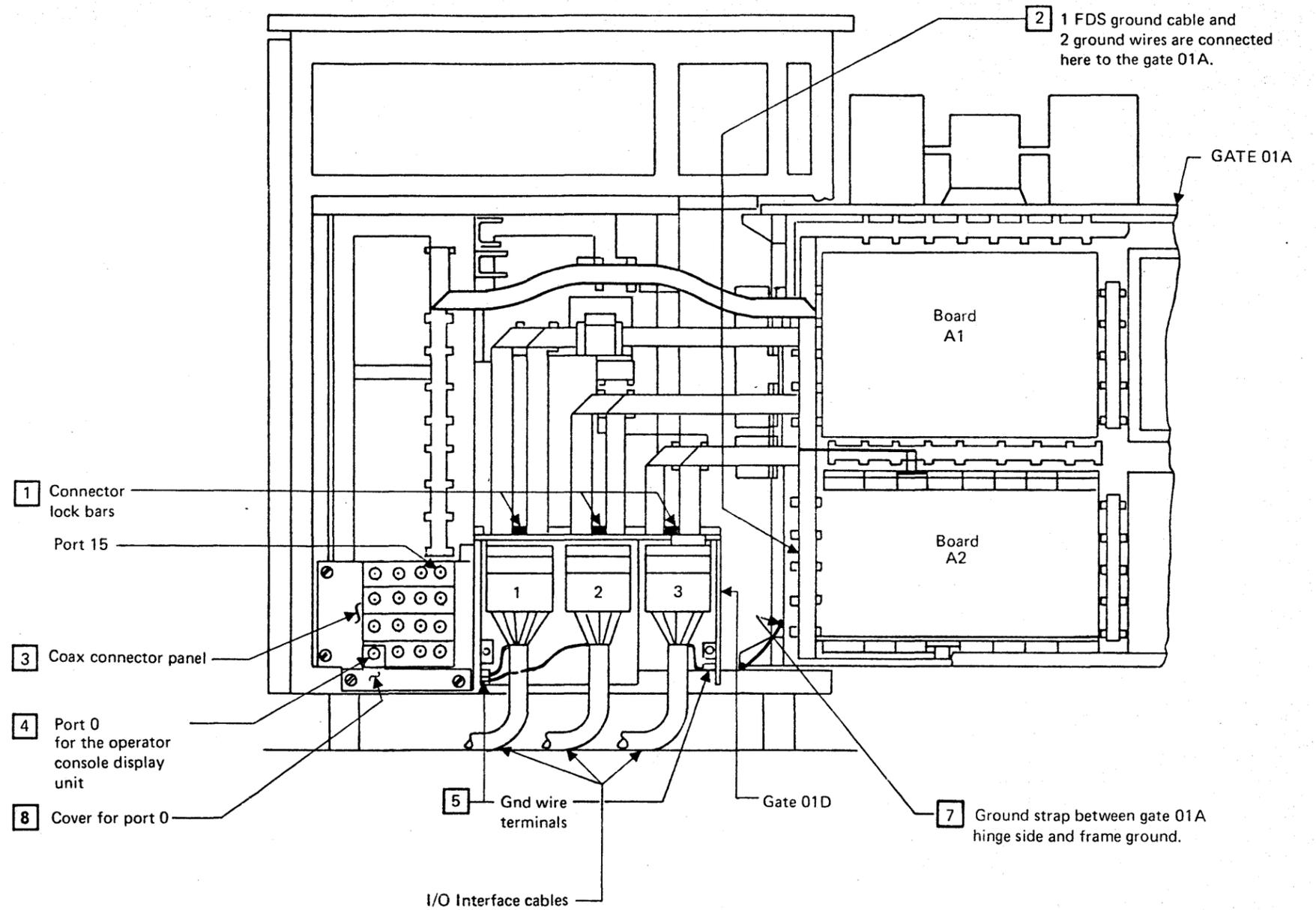


Figure 2010 - B

# Installation Manual

## Installation

### Install Operator Console

1. The operator console consists of a keyboard and a CRT display unit 3278-2A or 3279-2C. Both units are to be placed on the operator console table.
2. Install the 3278-2A or 3279-2C Display Console according to the installation instruction of that unit (if present).
3. Connect the coaxial cable P/N 5578477 to the Display Console and route the cable from the Display Console to the machine coax connector plate and connect the cable to Port 0 (see Figure 2010-B **4**).  
The cover for Port 0 must be removed before connecting the cable and must be put into its original position after the cable is connected to Port 0 (see Figure 2010-B **8**).
4. Connect both cables from the keyboard and the OCP interface cable (P/N 5578498) to the connectors at the display unit (see Figure 2013-A).
5. Route the OCP interface cable for the operator console panel (OCP) from the display unit to the cable entry B (see Figure 2010-A).
- 5.1 Remove the cover from cable entry B (see Figure 2010-A).
- 5.2 Connect the cable from the operator console to connector OCP01 and connect the ground wire to the machine frame next to the cable connector (see Figure 2013-B).

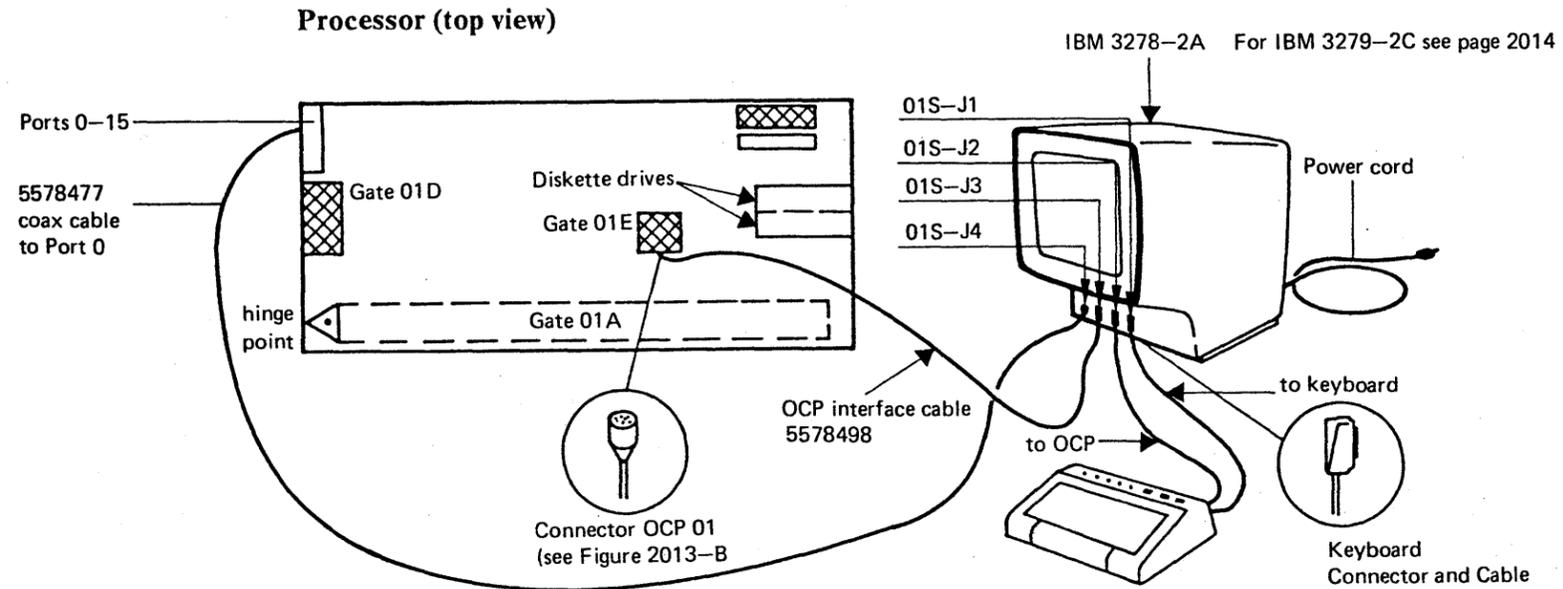


Figure 2013-A

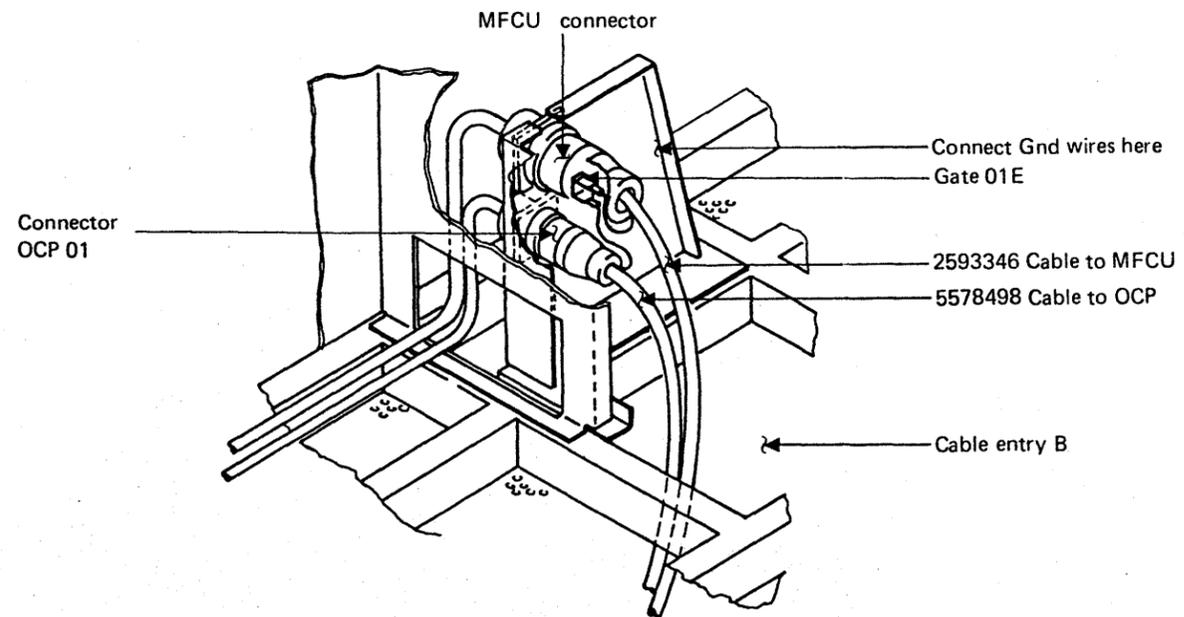
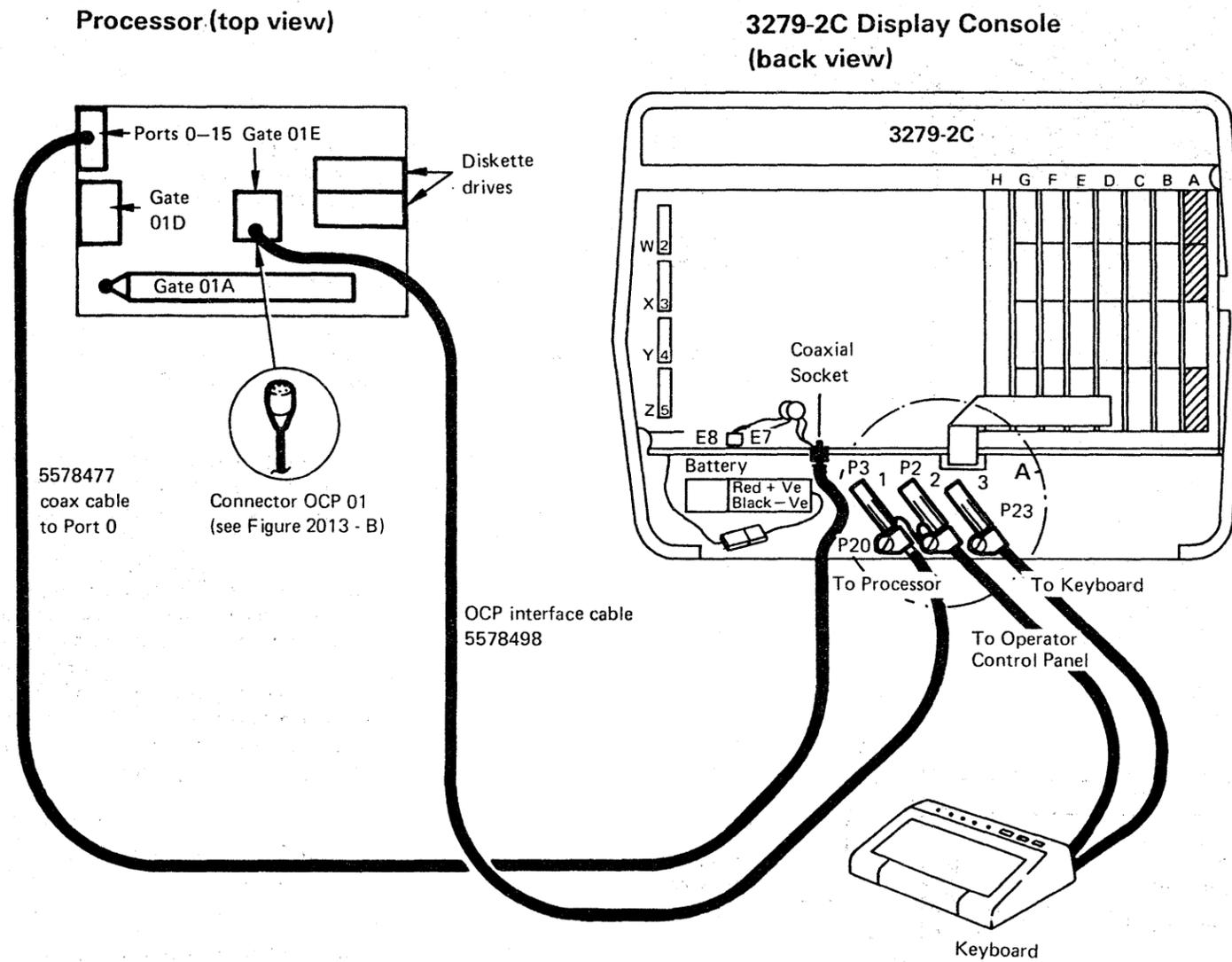


Figure 2013-B

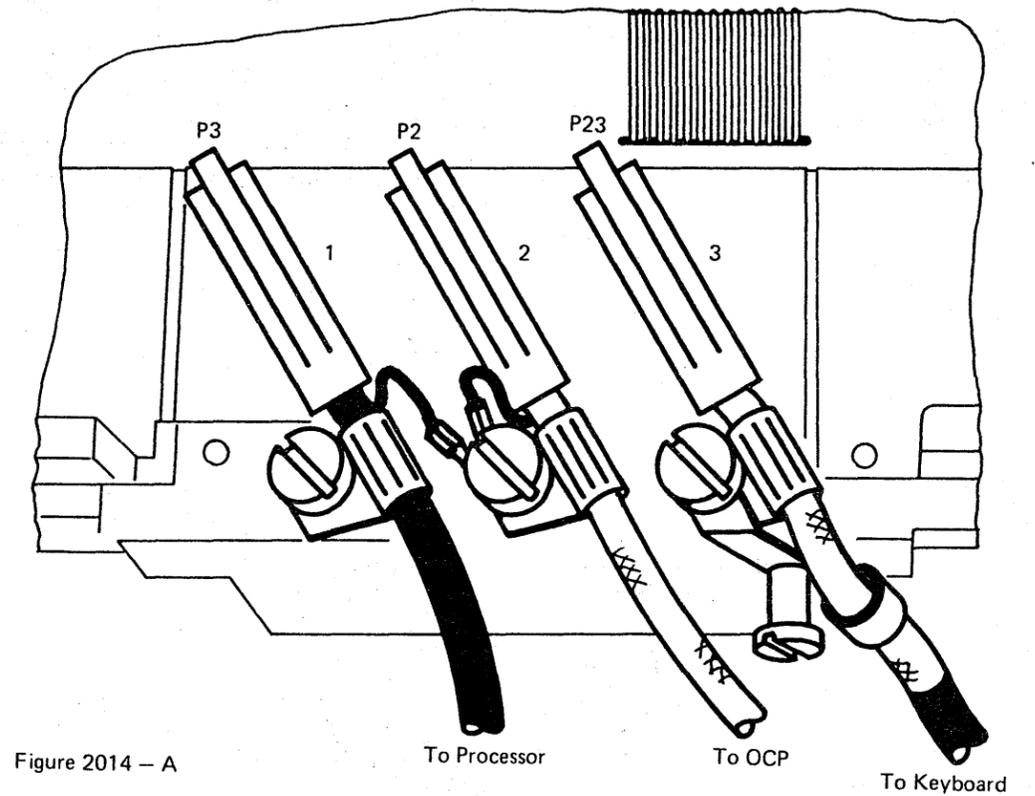
# Installation Manual

## Installation

### Install Operator Console (continued)



Detail A



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EC 366516 05 Feb 82	EC 366582 13 Sep 82		P/N 5684091 Page 3 of 4	2 015 F
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**INST**

## Installation Manual

### Installation

#### Check Warning Labels (WT except Canada)

In the processor box you will find a number of warning labels. Most of them use graphic symbols instead of text. In countries where warning symbols are not allowed to be used at certain machine locations, you will find warning labels in English or in the national language according to the national requirements.

To meet the national requirements the CE must ensure that those labels are present in the required language (see table 1 on this page). Some countries allow an English label to be used at certain points in the machine while a label in national language is required at another point in the same machine.

1. Ensure that the warning label ▼ next to power on switch at the Customer Control Panel (CCP) is present in the required language (see table on this page).

- If the label is present in the required language, proceed with the first paragraph on the next page.
- If the label next to the power on switch does not meet the national requirements, the labels ● and ▼ must be replaced according to table 1.

The labels are provided by the shipping group P/N 8481297. If the shipping group is not available, B/M number 8481297 must be ordered.

The shipping group contains a full set of labels for all countries. Select from this group the required label according to table 1.

System 4331 is installed in: (country)	LANGUAGE TO BE USED ON LABEL							
	ENGLISH	GERMAN	FRENCH	FRENCH/DUTCH	FINNISH	ITALIAN	NOR- WEGIAN	SWEDISH
Belgium				●* / ▼*				
Finland					● / ▼			
France			●* / ▼					
Germany		●* / ▼						
Italy						● / ▼		
Norway	●						▼	
Sweden								● / ▼
Others	● / ▼							

Table 1: NATIONAL LANGUAGE REQUIREMENTS

\* Label is bilingual.

● = Label on the PCC-box only.

English text:

HAZARDOUS AREA TRAINED SERVICE PERSONNEL ONLY
--

▼ = Label on the CCP (next to PWR-On switch) and on the PCC-box.

English text:

LINE VOLTAGE PRESENT WITH MACHINE POWER OFF
--

# Installation Manual

## Installation

### Connect Power Cable and Power On

**Note:** The customer must ensure proper continuity between the ground connector for the processor, the ground connector for the operator console display unit, and the ground connectors for all separately powered I/O units. The resistance between all ground connections must be zero ohm.

The customer must ensure that line voltage is present at the customer's wall outlet and that the system can be switched off by the customer's room IPO or EPO switch (if present).

IPO = Instant Power off  
EPO = Emergency Power off

- 1. WT only:  
An electrician must connect the machine line cord to customer's power source. If the customer wants a plugable connection, (see country-dependent information below) he must provide the wall plug and attach it to the line cord.  
Line cord size: Outer diameter 13.51 mm (.532 inch).  
Do not coil the cable and do not cut off the line cord if it is too long.  
  
Country-dependent information:  
FINLAND: Country requirements specify a permanent power connection.
- 2.1 Not applicable for WT:  
Ask the customer to turn off the circuit that feeds the receptacle for the processor.
- 2.2 Not applicable for WT:  
Route and plug the machine line cord to the customer's wall outlet (if applicable).  
Do not coil the cable, and do not cut off the line cord if it is too long.
- 3.1 Ensure that PCC-CB01 (main line CB) is turned off.

- 3.2 **Danger:**  
Line voltage may be present at the power input terminals of PCC-CB01.  
Open the PCC box.
- 3.3 Request the customer to turn on the wall circuit breaker or otherwise provide power.
- 3.4 Set the CE-meter to 500 VAC and measure the line voltage at the power input terminals of PCC-CB01.

If the line voltage does not match the voltage labels on the PCC-box cover, follow the procedure described on page 1010.

- 3.5 Close the PCC box and switch PCC-CB01 on.
- 4. Ensure that all CPs, located in the power supplies are switched on. The physical locations of the power supplies are shown on page 1000 and 2050. The number of available CPs is listed below.

PS No.	Number of CPs			
	4321, 4331-1		4331-2, 4331-11	
	PDL4	PDL5	PDL4	PDL5
102	1	1	8	8
103	1	-	1	-
104	6	7	6	7
105	6	6	6	6

- 5. Insert the control diskette FU1, SEQ. 1 (see diskette label) into the diskette drive. If two diskette drives are installed, use drive 1 (see Figure 2050-A).  
  
**Caution:**  
Diskettes may be damaged if exposed to a magnetic field, for example, a magnetized screwdriver.
- 6.1 If your machine has a 5424 attachment installed, jumper 01A-A2D2-D09 and 01A-A2C2-D03.

- 6.2 If your machine has a Standard Power Interface (SPI) panel installed, make sure that the SPI dummy plug (see connector 98, Figure 2030-A) is installed in the first SPI connector position (upper panel, left position).
- 7. Switch operator console display unit power on and press the power-on switch (see Figure 1000-A). The system should power up and the power complete indicator should be turned on after a successful power-on sequence.

The power complete indicator at the OCP is not turned on if any reference code beginning with F7 is displayed.

If the basic check indicator is on and no reference code is displayed, press the cancel key for reference code generation and go to Start MAP 0000.

If any other power-on problem occurs, go to MAP 0000 (Start MAP).

- 8. Press the lamp test key at the OCP and ensure that all indicators at the OCP are on. If any of the following listed indicators are not on, go to MAP 0200, Main Entry:  
Basic check indicator  
Power incomplete indicator  
Power complete indicator  
  
If the 'SYS' or 'WAIT' indicator is not on, go to MAP 0000, Entry Point A.
- 9. Wait approximately three minutes and press the power-off switch or the power-off key at the OCP. The machine should be powered down without any reference code displayed on the screen. If any reference code is displayed, go to corresponding MAP. If any other power off problem exists, go to MAP 0201, Entry Point B.
- 10. Remove the jumpers installed in step 6.1.

# Installation Manual

## Installation

### Configuration of System and Diagnostic Diskettes

- 1. If you do not have the customer device address assignments, ask the customer to list them for you on the 'System Chart' in STM Configure Section 6. You will need information from the 'System Chart' before you can do the initial testing.

You will need the following documentation for the next step:

- a. For all Systems STM and MAP FE90.
- b. If CA is installed, also STM Features (CA) and MAP 88FF.
- c. If the loop adapter feature is installed also Vol. 15, STM Features (LA) 'Loop Adapter Configurator Tool'.

It is important that the configure procedure be completed at this time, so that time is not wasted later on, trying to diagnose apparent machine failures caused by incorrect system configuration.

The functional microcode can be on one or two diskettes labelled as FU1 and FU2. The processor can be shipped with one or two sets of functional micro code (control diskettes) and one or two diagnostic diskettes. Therefore, you will receive either one (FU1, Seq.1), two (FU1, Seq.1 and FU2, Seq.1) or (FU1, Seq.1 and FU1, Seq.2) or four (FU1, Seq.1 and FU2, Seq.1 and FU1, Seq.2 and FU2, Seq.2) control diskettes and one or two diagnostic diskettes (DD1, Seq.1 and DD2, Seq.1). One additional diagnostic diskette for ST4300 (labelled DIAG 5) may be shipped. (See also 'Configuration MAP' FE90.)

STM Configure Section 6 will guide you completely through the configure process, including the copy configuration.

- 2. Configure a control diskette and copy the configuration to the other diskettes. See 'Diskette Configuration' in STM Section 6.

### Initial Testing

- 1. Make sure that IML has been performed with the diagnostic diskette during the copy configure process. Insert diagnostic diskette; switch power on (if not already done). Run the following diagnostic tests in sequence listed below (if applicable for your system configuration). Hints for proper application and test results are given in the documentation listed in the following table.

If any reference code or symptom code is displayed, go to corresponding MAP. If a hang-up condition is suspected, go to Start MAP 0000, Entry Point A.

- 2. If the previous test sequence has been successfully completed, switch system power off and switch off the main line CB for the customer's wall outlet or the PCC-CB01 (see Figure 1000-A).
- 3. Add microprogram updates to the control diskette(s) and to the diagnostic diskette(s). Use the MCTF (Microcode Temporary Fix) diskette as described in STM, Vol. 13, Section 4 under topic 'MCTF Update via MCTF Diskette'. If MCTF diskette is not available, invoke your support structure.

Ref.	TEST					Tested Functions / Remarks
	Vol.	4321	4331 -1	4331 -2	4331 -11	
16	X	X	X	X	Voltage measurement	Processor voltages are measured and displayed (see hints in book MI POWER, Vol. 16)
13	X	X	X	X	Test chain	(see STM, Section 4)
13	X	X	X	X	I/O diskette test (53FD)	(only if I/O diskette installed)
13	X	X	X	X	MPX standard interface test	Install wrap connectors in 01D-D3 (BUS*) and 01D-E3 (TAG*)
13	X	X	X	X	BMPX1 standard interface test	Install wrap connectors in 01D-F3 (BUS*) and 01D-G3 (TAG*)
13			X		BMPX2 standard interface test	Install wrap connectors in 01D-C2 (BUS*) and 01D-D2 (TAG*)
13	X	X	X	X	Control interface test (CTLI)	WRAP connectors P/N 8483860 must be installed (see STM, Section 4).
13			X		HSC test	Install wrap connectors in 01D-E2 (BUS*) and 01D-F2 (TAG*)
13	X	X	X	X	Array Tool	Use Parameters DM and IM and CT
13	X	X	X	X	PU/BSM test	Use Parameters DM and IM and CT

#### Abbreviations:

- BMPX = Block Multiplexer Channel
- CA = Communications Adapter
- FTA = File Tape Adapter
- HSC = High Speed Channel
- MPX = Multiplexer Channel
- CTLI = Control Interface
- LA = Loop Adapter

\* Wrap connector part numbers are:  
 BUS P/N 8483772  
 TAG P/N 8483773

# Installation Manual

## Installation

The steps shown on this and on the next page are applicable only for those machines which have a Remote Support Facility (RSF) and/or Remote Operator Console Facility (ROCF) installed.

The RSF/ROCF, and in some countries also the adapter cards, must be ordered by a specify code (sales code). For details refer to Sales Manual and TSI/TSL.

## RSF/ROCF Jumpering

- 1. Check and modify (if necessary) the RSF/ROCF jumpers. The jumpering is different for each line type. The transmit level switch setting and jumper options are shown in the Supplement to MAPs, Vol. 13, Section 4. See 'RSF Adapter Interface Cards' and 'Transmit Level Set-Up'.

## RSF/ROCF Cables - Routing and Plugging

- 1. The cable for the RSF/ROCF has to be plugged into position 01E-A1BD (see Figures 2050-B and 2054-A). Depending on line type and feature B/M, different external cables are available (see following table).

## RSF/ROCF Functional Check

- 1.1 US only:  
Invoke your support structure.
- 1.2 Switch machine power on and check the RSF/ROCF for correct operation (see STM, Vol.13 'RSF/ROCF Facility').

## Notes:

1. Cable P/N 1853134 must be connected to cable P/N 8482931 if required.
2. Only for those WTC countries where under-cover-modems are allowed.
3. Assembly part number: Includes two cables and the line plate. For line plate adjustments see Supplement to MAPs (STM), Section 4 (Vol. 13).

Type of Line	Cable Part No.	Location see 2050-B	Feature B/M	Country	Cable Routing (see Figure )
CCA with clock 38LS SNMA (Note 1)	8 482 931 1 853 134	①	8 481 033	US and Canada	2054-A, 2024-A
CCA with clock 38LS SNMA (Note 2)	8 482 934 (Note 3)	①	8 481 034	EMEA	2056-A, 2024-B
CCA with clock 38LS LL	8 482 932	①	8 481 358	Japan only	2054-A, 2024-D
CCA with clock 38LS SNMA	8 482 934	①	8 481 360	AFE w/o Japan and Canada	2056-A, 2024-B
CCA EIA	8 482 930	①	8 481 035	EMEA US	2054-A, 2024-C
CCA EIA	8 482 930	①	8 481 361	AFE w/o Canada no UK PTT modem	2054-A, 2024-C
CCA EIA	8 482 933 and 1 727 744	①	8 481 368	UK PTT modem	2054-A, 2024-C

Figure 2023-A

## Legend:

38LS = Integrated Modem  
 AFE = America (w/o US), Far East  
 AA = Auto Answer  
 CCA = Common Communications Adapter (with clock)  
 DAA = Data Access Arrangement (provided by Telephone Company)  
 EIA = Interface for External Modems according to standards  
 of Electronic Industries Association  
 EMEA = Europe, Middle East, Africa  
 MA = Manual Answer  
 NTT = Nippon Telephone and Telegraph  
 PSN = Public Switched Network  
 PTT = Post Telephone and Telegraph Administration  
 ROCF = Remote Operator Console Facility  
 RSF = Remote Support Facility  
 SN = Switched Network  
 TSI = Technical Service Information  
 TSL = Technical Service Letter  
 UK = United Kingdom  
 US = United States of America

# Installation Manual

## Installation

### Remote Support Cable - Routing and Plugging (continued)

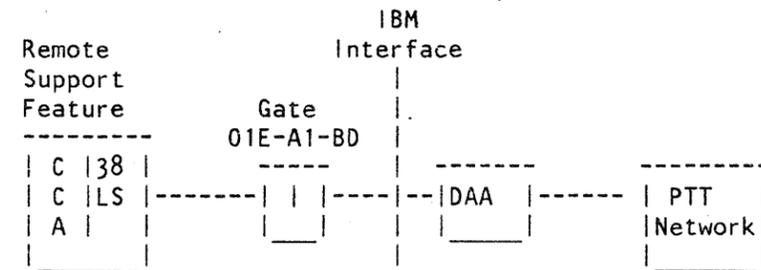


Figure 2024-A

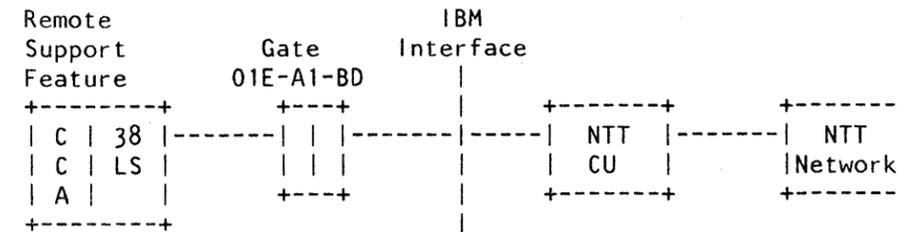


Figure 2024-D

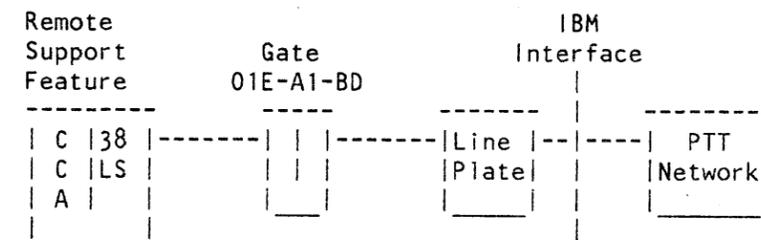


Figure 2024-B

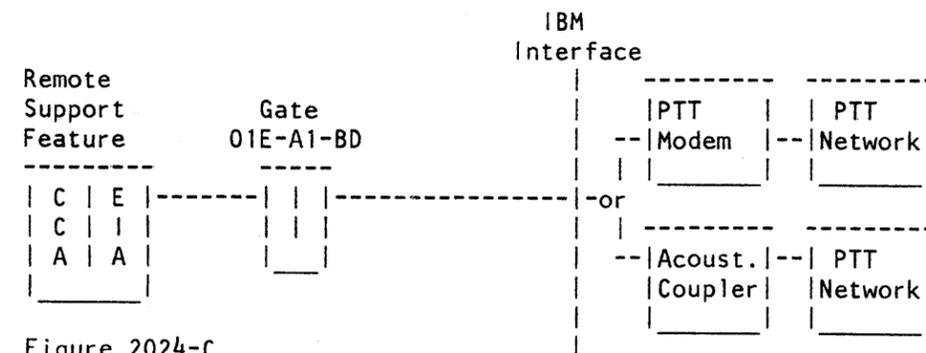


Figure 2024-C

# Installation Manual

## Installation

### Install I/O Units

- 1. Install all I/O units according to the installation instructions of those units.

It is recommended to connect buffered I/O devices to the Block Multiplexer (BMPX). If those devices are attached to the Byte Multiplexer (MPX), the device should be switched to burst mode or at least to multi-byte mode.  
Unbuffered I/O units connected to the MPX or BMPX must have higher priority than buffered I/Os.

Note: Max. cable length is 200 feet.

### Route and Plug I/O Cables

The processor and I/O are interconnected by I/O cables. The key symbols 1 through 12 of the I/O cables, shown in Figure 2040-A, relate to the table on the page 2045.

Note: Before routing interface cables to the processor, label them with I/O unit, and BUS or TAG, for identification.

- 1. Route the signal cables of all I/O units, except TP cables, to Cable Entry A (see Figure 2040-B).

Note: The dark grey plug of the standard interface cable must be located at the processor side.

3310 only: The maximum cable length is 100 feet.

- 2. For machines with Standard Power Interface (SPI) only:  
Remove the cover of the standard power interface (SPI) panel and route the SPI cables of all I/O units to SPI panel(s) next to Cable Entry C (see Figure 2040-B).

3340 only:

When SPI is installed, plug 3340 cable in first unused position from left at the SPI panel. If SPI is not installed, plug 3340 Dummy plug into the 3340 SPI connector position.

- 3. For MFCU only  
Route the MFCU-DC-ground cable to Cable Entry B (see Figure 2040-B) and connect the MFCU-DC-ground cable to its connector next to Cable Entry B and connect the shielding to the frame (see Figure 2013-B).

- 4. For TP and Remote Support equipment only:  
Route all teleprocessing and Remote Support cables to Cable Entry B and fasten the strain reliefs of the cables to the bolts next to Cable Entry B and connect all cables to their connectors on panel 01E according to Figures on pages 2054 and 2056.  
Connect the cable shields to the slip on connectors.

- 5. Connect the I/O cables to the connectors in connector compartment 01D at Cable Entry A.  
Apply the following procedure:

- 5.1 Remove the connector lock bars on top of connector compartment 01D if applicable (see Figure 2010-B 1).

- 5.2 Disconnect all flat cables from connector blocks (if applicable).

- 5.3 Open the front cover of the connector housing.

- 5.4 Slide out all connector blocks from the connector housing. If wrap connectors are installed, remove them.

- 5.5 Fasten the signal cables with screws to the previously removed connector blocks.

#### Caution

Never use connector blocks with red dots for MFCU (5424) cables. Otherwise interface signals will be grounded. The red dots are located on both short sides of the connector blocks or on top of them.

- 5.6 Slide in all connector blocks with connected interface cables in correct sequence. Connector locations within connector compartment 01D are shown in Figure 2045-A. Install a dummy block (filler) for each unused position.

Note: The connector surface has a conductive plating. Ensure that the connectors are exactly parallel installed in order to get a sufficient contact between all connectors.

- 5.7 Connect the ground wires of the interface cables to the ground terminals (located on the right and on the left side of 01D, see Figure 2010-B 5). The cables should be grounded only at the processor side. The ground wires of the cables on the I/O side should be taped back and insulated from I/O frame.

- 5.8 Close the front cover of the connector compartment and connect the internal flat cables from the top side to the connector blocks. The cables are labeled. Do not plug any cable into a wrong position.

- 5.9 Secure the connector blocks with the lock bars.

- 6. Install BUS and TAG terminators in the last control unit on a standard channel or in the last controller on a CTLI (FTA 1 or FTA 3\* see Figure 2040-C). The CTLI of the FTA 2 is already terminated in the IBM 8809 tape unit.  
\* FTA3 not available in 4321, 4331-1 and 4331-11.

## Installation Manual

### Installation

#### *Route and Plug I/O Cables (continued)*

- 7. Route standard-power-interface cables through the bottom opening (Cable Entry C) and connect the cables from the I/O units to the SPI connectors. Connect the cables in the sequence from left to right and use the upper panel first (see Figure 2030-A).
- 8. Plug connector 98 of the SPI end cable to the first unused SPI connector position (see Figure 2030-A). Connector 99 must always be plugged on the last used SPI panel. If eight control units are connected to the last panel, connector 98 stays unused.
- 9. Connect the GND wires of the SPI cables as shown in Figure 2030-A and close the cover of the SPI panel.

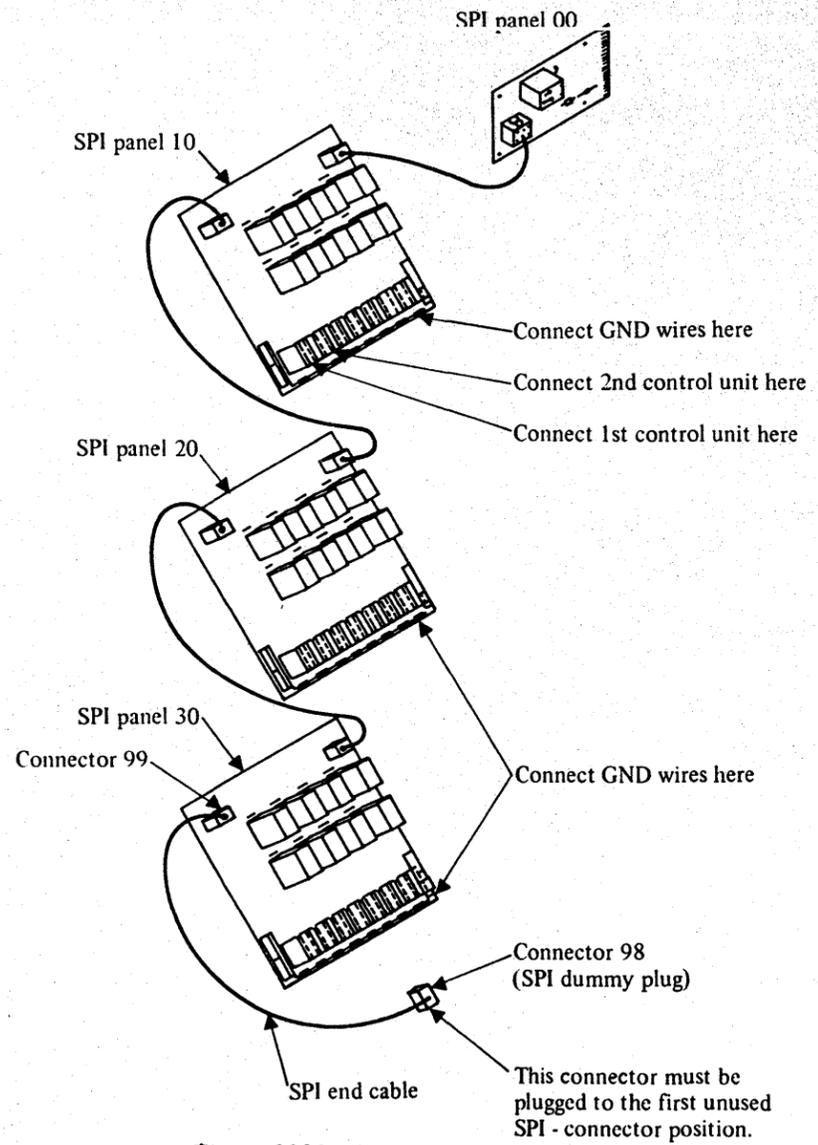


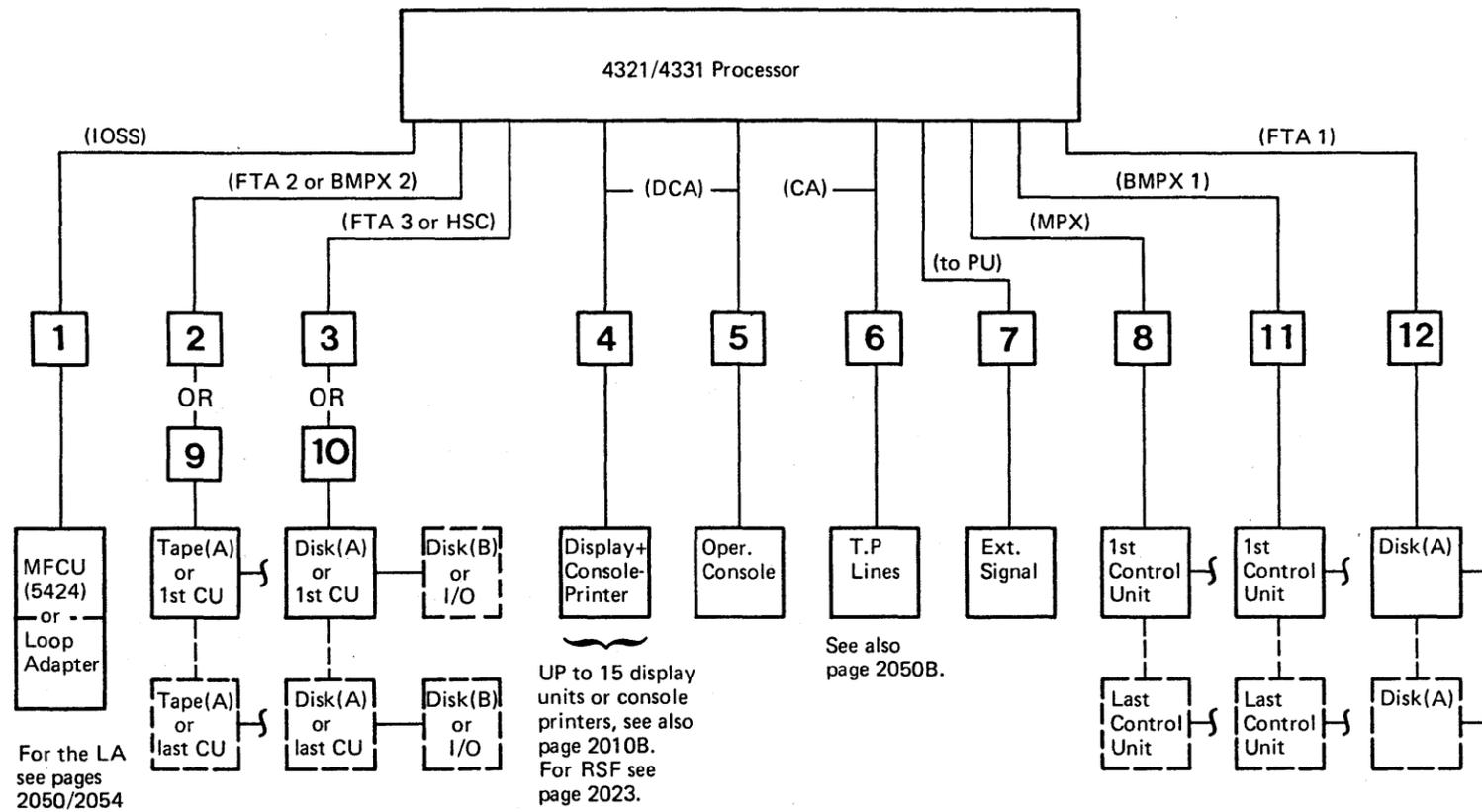
Figure 2030 - A

# Installation Manual

## Installation

### Route and Plug I/O Cables (continued)

The figures and tables on pages 2040 and 2045 show the maximum configuration for all models.



The key symbols 1 to 12 relate to Figure 2045 - A.

Figure 2040 - A

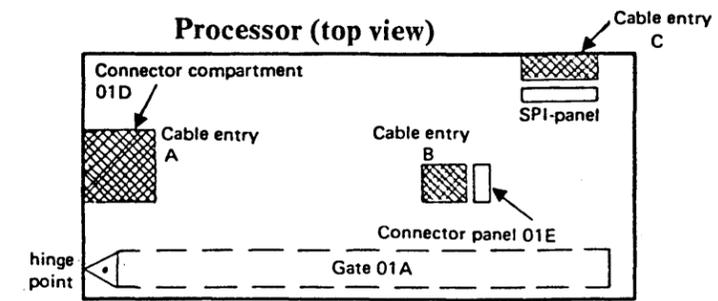
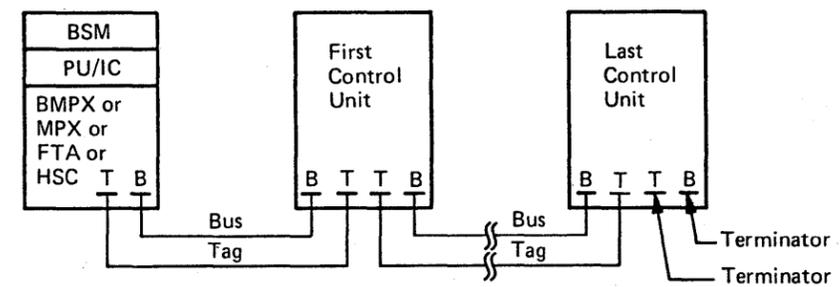


Figure 2040 - B



CTLI and Standard Interface

Use the terminators with the P/N as shown in the following table:

	P/N for BUS	P/N for TAG	REMARKS
FTA 1, 3*	2 282 675	2 282 675	Same P/N for BUS and TAG
MPX	2 282 675	2 282 676	
BMPX 1, 2*	2 282 675	2 282 676	
HSC*	2 282 675	2 282 676	

\* Restrictions:

The FTA 3, BMPX 2, and HSC are not available on 4321, 4331-1 and 4331-11.

Figure 2040-C

The same terminators are used to terminate the standard interface(s) in the processor if no control unit is attached.

Control interfaces need not to be terminated if no control unit is attached.

# Installation Manual

## Installation

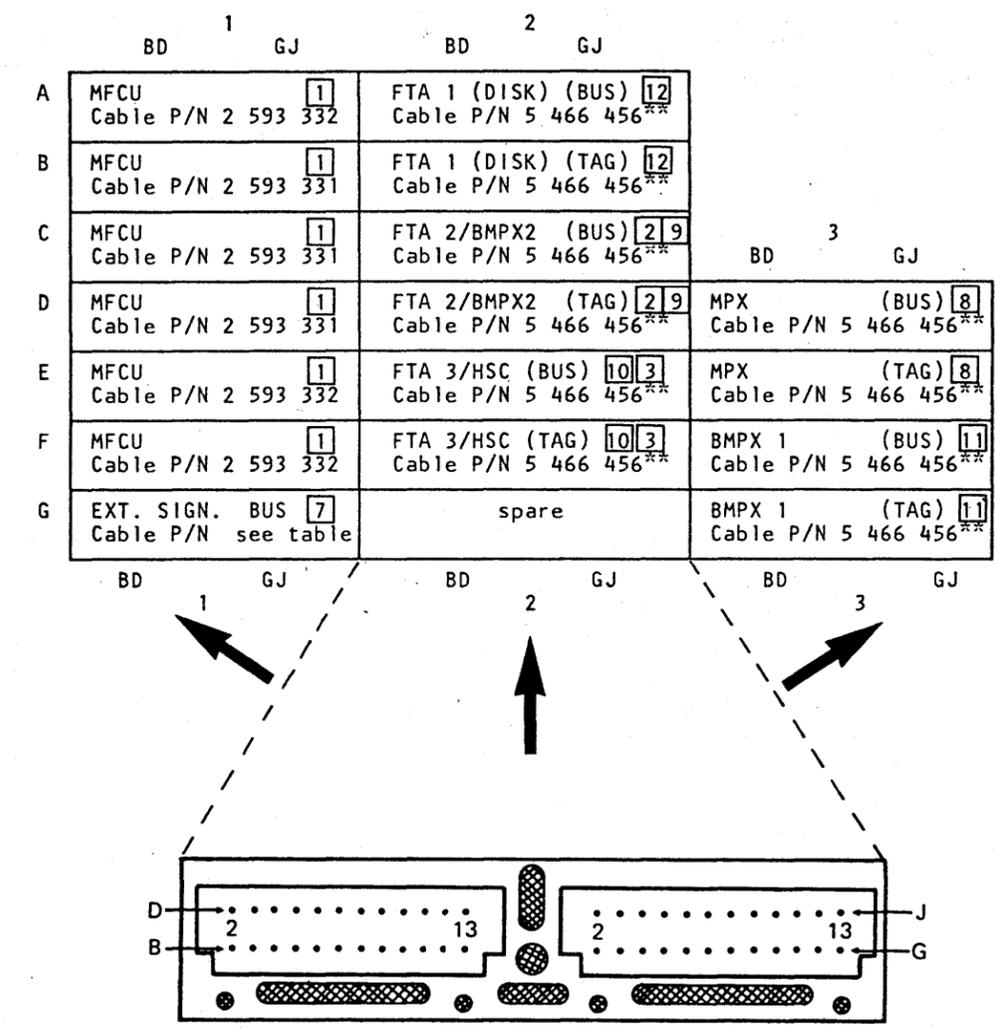
### External I/O Cables

The key symbols 1 to 12 relate to Figures 2040 A and 2045-A.

Key	I/O or Channel	Intf. Cable Part Number	4331 Connector Location
1	MFCU (for LA see page 2050/54)	2 593 332 2 593 331 2 593 346	01D-A1, E1, F1 01D-B1, C1, D1 MFCU DC-GND Conn.
2 or 9	Tape (FTA2) or BMPX 2	5 466 456** 5 466 456** 5 466 456** 5 466 456**	01D-C2 (BUS) 01D-D2 (TAG) 01D-C2 (BUS) 01D-D2 (TAG)
12	Disk (FTA1)	5 466 456** 5 466 456**	01D-A2 (BUS) 01D-B2 (TAG)
4	Displ.(1) or Prtr.(15)	2 577 672	Coax. conn. 1 - 15 to the left of 01D See Figure 2050-A.
5	Op. Cons. Displ.(0)  DCP	5 578 477  5 578 498	Coax. connector 0 See Figure 2050-A. 01E-OCP connector
6	TP-conn. chart. is shown on pages 2050 to 2056		
7	Ext. Sign.	5 372 977 5 404 458	01D-G1 (non IBM devices) 01D-G1 (for IBM devices)
8	MPX	5 466 456** 5 466 456**	01D-D3 (BUS) 01D-E3 (BUS)
11	BMPX 1	5 466 456** 5 466 456**	01D-F3 (BUS) 01D-G3 (TAG)
10 or 3	HSC or FTA 3	5 466 456** 5 466 456** 5 466 456** 5 466 456**	01D-E2 (BUS) 01D-F2 (TAG) 01D-E2 (BUS) 01D-F2 (TAG)

### I/O Connector Arrangement

(Top View of Connector Compartment 01D)



**WARNING:**  
Never use connector blocks with red dots for MFCU. Otherwise, interface signals will be grounded. The red dots are located on top of the connector blocks.

**Note:**  
Disk units must be connected to FTA 1 or FTA 3. Tape units must be connected to FTA 2. See also restrictions on page 2040, Figure A.

**ATTENTION:**  
The connector blocks must be installed as shown.

Figure 2045-A

\*\* Interface cables P/N 5353920 and/or shielded I/O interface cables P/N 2281630, may also be used if already available.

The dark grey plugs of interface cables must be connected to the processor's connector, while the light grey plugs must be connected to the I/O unit.

# Installation Manual

## Installation

### CA Jumpering

- 1. Check and modify (if necessary) the CA jumpers. The CA jumpering is different for each line type. The jumper options and more detailed information is shown in the CA documentation. See 'Adapter Interface Cards' in 'Supplement to MAPs Features, Section CA' (MI Vol. 14). The board jumpering is shown in the tie-down list in the binder MI 30. A plug list is also included in the same binder.

### LA Jumpering

- 1. Check and modify (if necessary) the LA jumpering according to 'Adapter Interface Cards' in Supplement to MAPs Features, Section LA in MI Vol. 15.

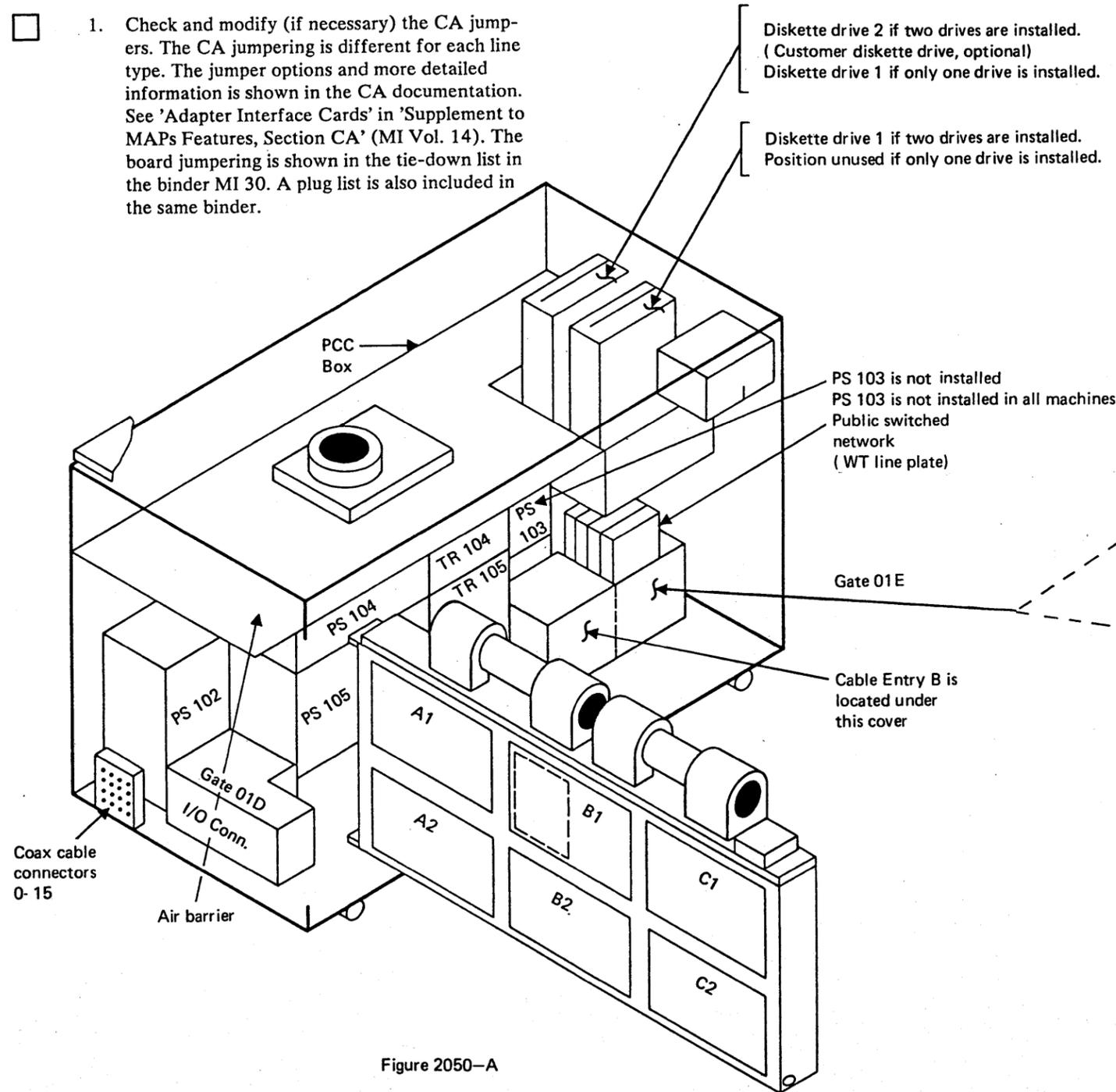


Figure 2050-A

### CA/LA Cables Routing and Plugging

- 1. Route and plug CA/LA cables feature dependent according to table on page 2052. Use Cable Entry B (see Figures 2050-A and 2050-B) and secure cables with strain relief bolt.
- 2. Connect the cable shields to frame ground using the slip-on connectors (see Figures on pages 2054 and 2056).

### CA/LA Line Connector Arrangement and Location

GATE 01E

A1	A2	A3	A4	A5	A6	A7	A8	A9
BD	BD	BD	BD	BD	BD	BD	BD	BD
RSF	31 LN2	33 LN4	35 LN6	37 LN8	ACA 2	DAL2	DLAL 2	spare
1	3	5	7	9	11	13	15	
GJ	GJ	GJ	GJ	GJ	GJ	GJ	GJ	GJ
30 LN1	32 LN3	34 LN5	36 LN7	spare	ACA 1	DAL1	DLAL 1	spare
2	4	6	8		12	14	16	

Figure 2050-B

Gate seen from plugging side of the external cables.

- = The number in the square box is the line address.
- = The number in the circle is used for identification of the physical location (see table on page 2052).
- CA = Communications Adapter
- RSF = Remote Support Facility
- LN = Communications Adapter Line
- ACA = Auto Call Adapter
- LA = Loop Adapter
- DAL = Directly Attached Loop
- DLAL = Data-Link Attached Loop

# Installation Manual

## CCA External Cable Chart

Type of Line	Key	Cable Part No.	Line 1 to 8 Cable Grp.   Key No	Remarks	Connector Location (see Figure 2050-B)	Cable Routing (see Figure)
CCA with clock	38 LS-US SN	8 482 356	4016   4016A	CBS (AA)	(2)(3)(4)(5)(6)(7)(8)(9)	2054-A
	38 LS-US LLSB	8 482 358	4018   4018A		(2)(3)(4)(5)(6)(7)(8)(9)	2054-A
	38 LS-US LLSM or LL	8 482 357 8 482 360	4017   4017A 4019   4019A	LLSM (see Note 1) LL	(2)(3)(4)(5)(6)(7)(8)(9)	2054-A
	38 LS-WT LL	8 482 360 8 482 364 or 1 568 430	4019   4019A 4023   4023A	Japan WT w/o Japan	(2)(3)(4)(5)(6)(7)(8)(9)	2054-A
	38 LS-WT SNAA	8 482 878 or 8 482 934	4021   4021A	Max 3 lines (w. WT Line Plate)	(2)(3)(4)(5)(6)(7)(8)(9)	2056-A
			8 482 351 or 8 482 930	4011   4011A	W/o UK	(2)(3)(4)(5)(6)(7)(8)(9)
CCA without clock	EXTERNAL MODEM I/F	8 482 856 or 8 482 933 and 1 727 744 8 482 935 or 8 482 351 or 8 482 351 and 2 722 052	4039   4039A 4039   4039B 4046   4046A	UK PTT Modem only Japan and non IBM Modem only		
	LOCAL Att. I/F	8 482 352 or 1 568 438 and 8 482 361 and 1 878 529	4012   4012A 4012   4012B 4012   4012C	See Figure 2054-B	(2)(3)(4)(5)(6)(7)(8)(9)	2054-B
	DDS- INTERFACE	8 482 353	4013   4013A	US only	(2)(3)(4)(5)(6)(7)(8)(9)	2054-A
	X21 LL	8 482 876 or 1 568 431	4037   4037A		(2)(3)(4)(5)(6)(7)(8)(9)	2054-A
	V35- MODEM I/F	8 482 354 or 1 568 432 and 1 749 352	4014   4014A 4015   4015A	(see Note 2)	(2) only	2054-A
	ACA-INTERFACE (may be used with each of the 8 lines)	8 482 350 or 1 568 409 8 482 855 or 1 568 439 and 674 570	4010   4010A 4040   4040A 4040   4040B	W/o UK UK only	(12) (11)	2054-A 2056-B
Loop Adapter	DAL 1/2	8 482 849 or 1 568 443	4047   4047A	(see Note 3)	(13) (14)	2054-A
	DLAL 1/2	8 482 351 or 8 482 930	4011   4011A	Not for UK PTT modem	(15) (16)	
		8 482 856 or 8 482 933 and 1 727 744 8 482 935 or 8 482 351 or 8 482 351 and 2 722 052	4039   4039A 4039   4039B 4046   4046A	For UK PTT modem For non-IBM modem with V24/V28 inter- face Japan only		

**Legend:**

- AA = Auto Answer
- ACA = Auto Call Adapter
- ACU = Auto Call Unit
- CA = Communications Adapter
- CBS = Data Coupler with Auto Answer
- CCA = Common Communications Adapter
- CDT = Data Coupler with Manual Answer
- DAL = Directly Attached Loop
- DDS = Dataphone Digital Service
- DLAL = Data-Link Attached Loop
- LL = Leased Line or Direct Attached Loop
- LLSB = Leased Line Switched Network Back-up
- MA = Manual Answer
- SM = Switched Network Manual Answering
- SN = Switched Network
- SNAA = Switched Network Auto Answering
- US = US and Canada only
- V35 = High Speed Interface
- WT = World Trade only w/o Canada
- X21 = General Purpose Data Network Interface
- 38LS = Integrated Modem 134.5 1200 bits/sec

Key \* = The key relates to the corresponding line of the CCA-feature B/M list on page 2053.

Physical location of connector gate 01E is shown in Figures 2050-A and 2050-B.

For more detailed information about adapter interface refer to STM, CA in Vol. 14, pages 2xxx.

**Notes:**

1. Cable P/N 1853134 must be connected to cable P/N 8482357, if required.
2. Cable P/N 1749352 must be connected to cable P/N 8482354 in countries where pin size 20 at the 48K modem is used (France).
3. An unused lobe must terminate in a loop station connector (LSC).

# Installation Manual

## Installation

### CCA Feature B/M Chart

Type of Line	Key *	Feature B/M for the CCA-Lines								OTHERS	
		Line 1	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line 8		
CCA with clock	38 LS-US SN	Ⓐ	8 481 262	8 481 263	8 481 264	8 481 172	8 481 173	8 481 174	8 481 170	8 481 171	--
	38 LS-US LLSB	Ⓑ	8 481 265	8 481 266	8 481 267	8 481 184	8 481 185	8 481 186	8 481 182	8 481 183	--
	38 LS-US LLoL LLSM	Ⓒ	8 481 268	8 481 269	8 481 270	8 481 190	8 481 191	8 481 192	8 481 188	8 481 189	--
	38 LS-WT LL	Ⓓ	8 481 256	8 481 257	8 841 258	8 481 202	8 481 203	8 481 204	8 481 200	8 481 201	--
	38 LS-WT SNAA	Ⓔ	8 481 259	8 481 260	8 481 261	8 481 196	8 481 197	8 481 198	8 481 194	8 481 195	--
EXTERNAL MODEM I/F	Ⓕ	8 481 274	8 481 275	8 481 276	8 481 231	8 481 232	8 481 233	8 481 229	8 481 230		
CCA without clock	LOCAL Att. I/F	Ⓖ	8 481 277	8 481 278	8 481 279	8 481 166	8 481 167	8 481 168	8 481 164	8 481 165	--
	DDS-INTERFACE	Ⓗ	8 481 271	8 481 272	8 481 273	8 481 208	8 481 209	8 481 210	8 481 206	8 481 207	--
	X21 LL	Ⓙ	8 481 213	8 481 214	8 481 215	8 481 216	8 481 217	8 481 218	8 481 219	8 481 220	--
	V35-MODEM I/F	Ⓚ	8 481 280	--	--	--	--	--	--	--	--
ACA INTERFACE	ACA1	Ⓛ	--	--	--	--	--	--	--	--	18 481 211
	ACA2	Ⓛ	--	--	--	--	--	--	--	--	18 481 212
LOOP ADAPTER	DAL 1	Ⓜ	--	--	--	--	--	--	--	--	18 481 070
	DAL 2	Ⓜ	--	--	--	--	--	--	--	--	18 481 071
	DLAL 1	Ⓝ	--	--	--	--	--	--	--	--	18 481 072
	DLAL 2	Ⓝ	--	--	--	--	--	--	--	--	18 481 073

The chart on this page shows the feature B/Ms for the CCA-lines. If you are not sure which features are installed in your machine, refer to the 'Feature Summary List' in the ITC binder of your machine and compare it with the chart on this page.

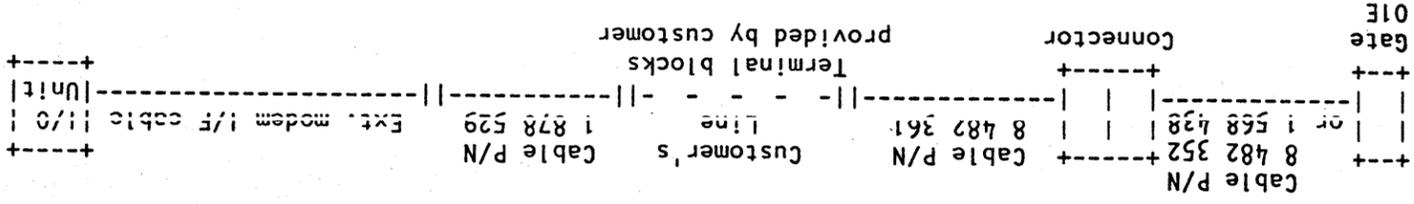
Key \* = The key symbol relates to the corresponding line of the chart on the previous page where the part numbers for the external cables are shown.

Installation

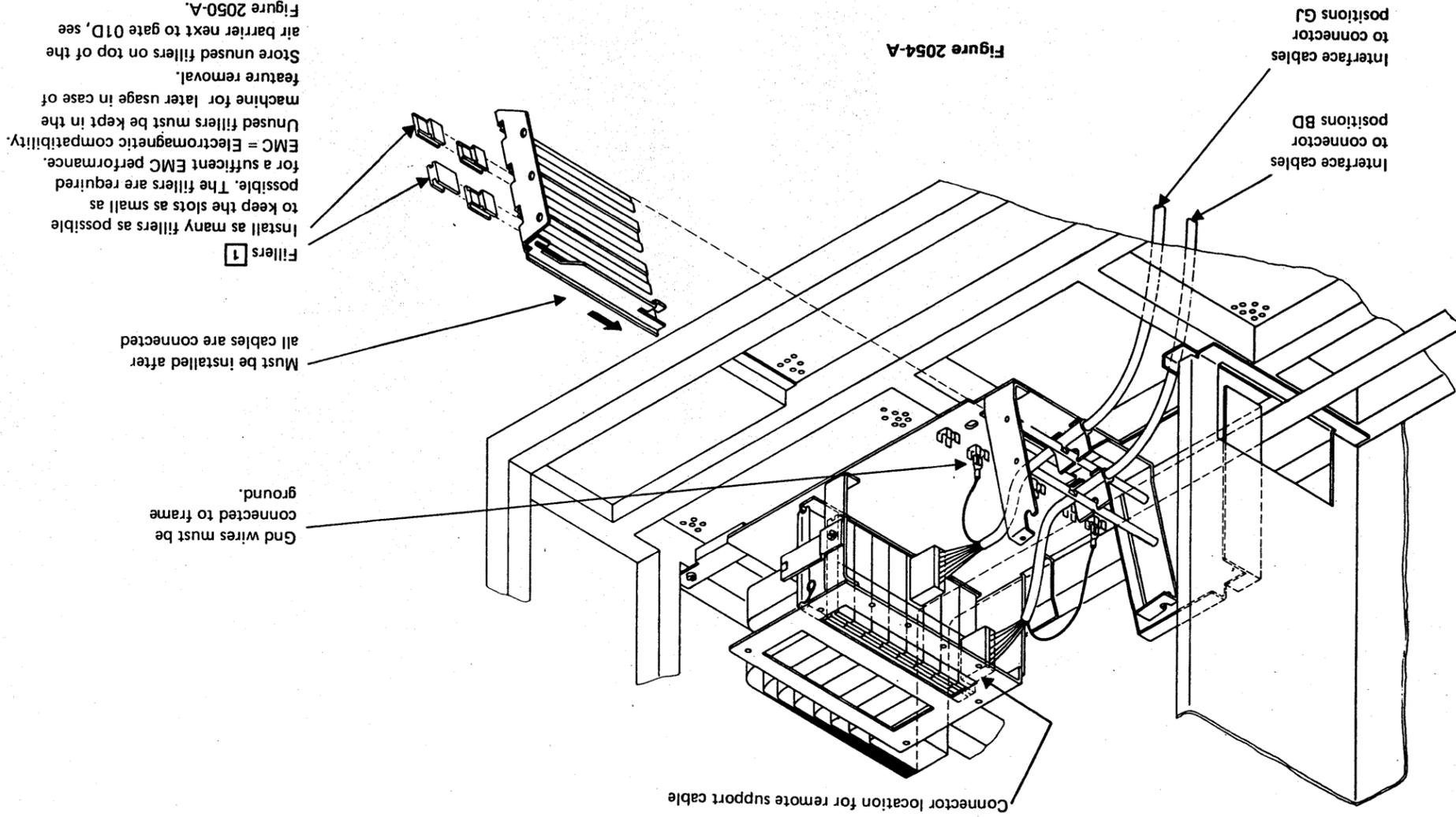
Interface Cable Routing - CA, ACA, RSF, LA

Cable routing for: Communications Adapter (CA), Auto Call Adapter (ACA), Remote Support Facility (RSF), Loop Adapter (LA)

Together with cable P/N 8 482 352 two additional cables are provided, which have to be connected as shown in the following figure:



Connector location for remote support cable



Install as many filters as possible to keep the slots as small as possible. The filters are required for a sufficient EMC performance. EMC = Electromagnetic compatibility. Unused filters must be kept in the machine for later usage in case of feature removal. Store unused filters on top of the air barrier next to gate 01D, see Figure 2050-A.

# Installation Manual

## Installation

### CA Cable Routing (continued)

Cable Routing for Public Switched Network Interface

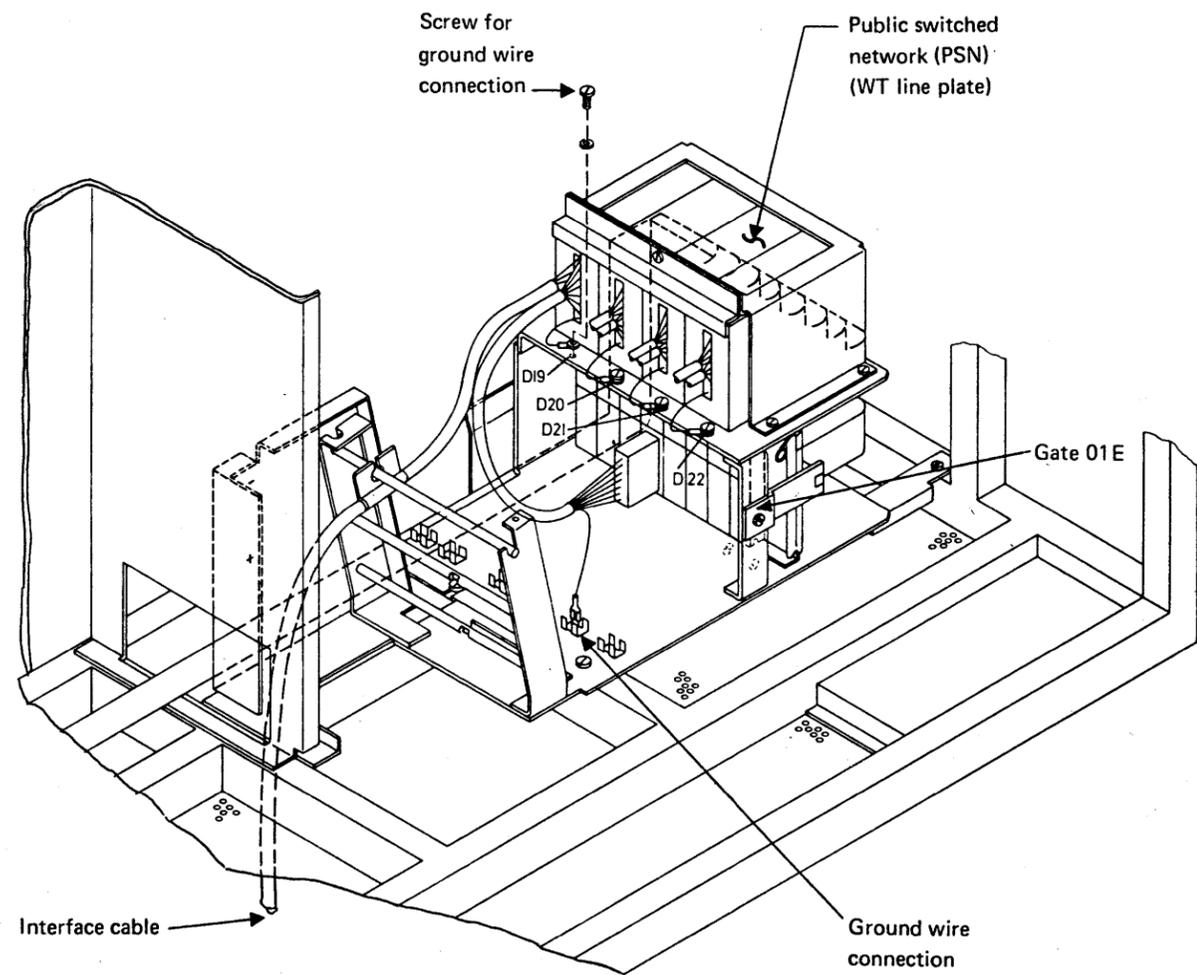


Figure 2056 - A

Cable Routing for UK PTT Modem Interface and UK ACU Interface

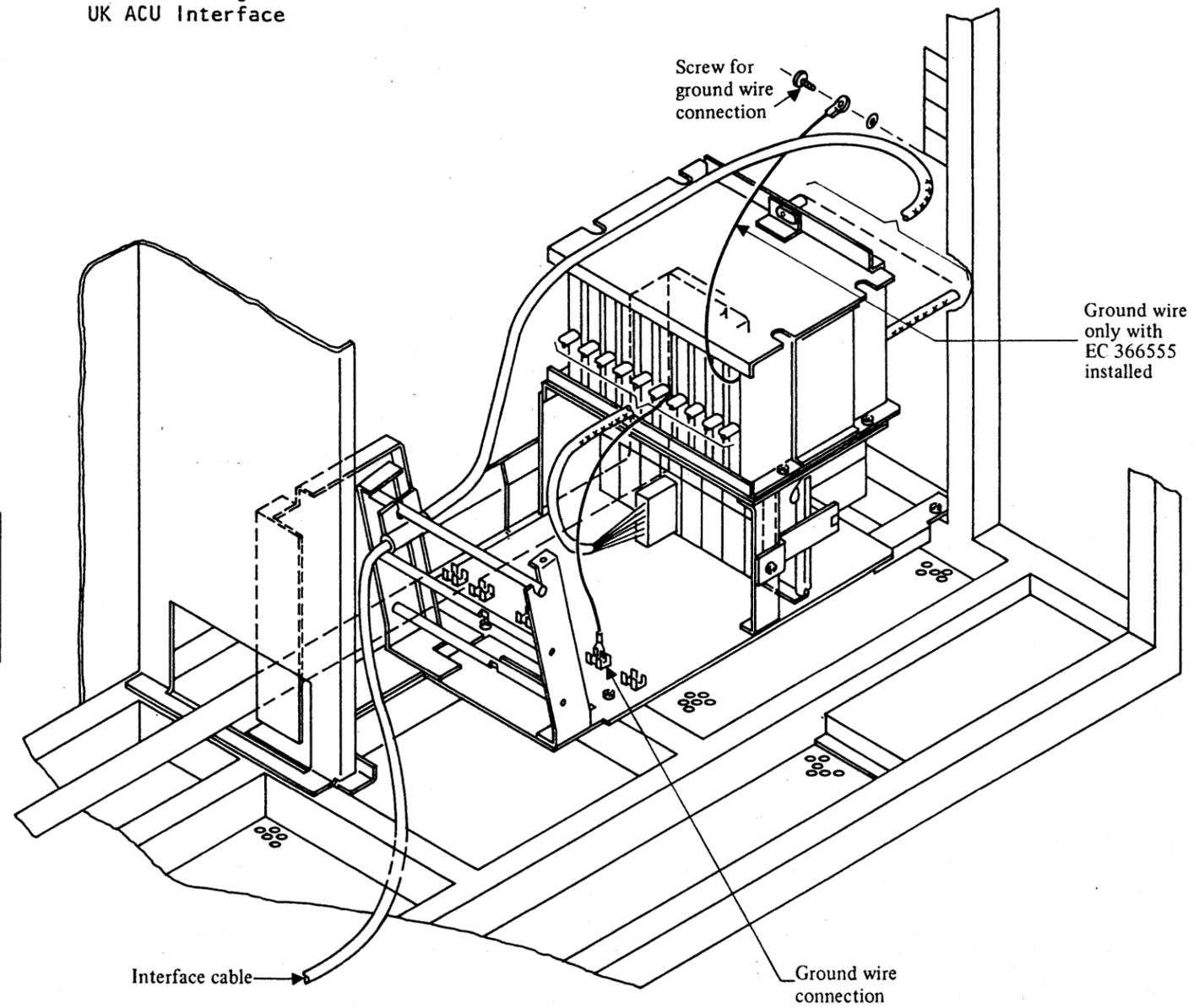


Figure 2056 - B

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AAJ2056

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# Installation Manual

## Installation

### Power on for Final System Test

- 1. 5424 only:  
The 5424 attachment is wired for a 5424 model A1. If another 5424 model is connected, the tie down connections must be modified according to the tie down list in the binder MI 30.
- 2. Ensure that all I/O units and the display terminals are connected to the line voltage according to the installation instructions of those units.
- 3. Close the gate cover.
- 4. Take the four caster locks from the shipping group and put them into the positions shown in Figure 2080-A.
- 5. Ensure that line voltage is present at the customer's wall outlet. If necessary switch customer's mainline CB on.
- 6. Switch PCC-CB1 on (see Figure 1000-A).
- 7. Ensure that all CPs located in the power supplies are switched on. The physical locations of the power supplies are shown on pages 1000 and 2050. The number of available CPs is listed below.

PS No.	Number of CPs			
	4321, 4331-1		4331-2, 4331-11	
	PDL4	PDL5	PDL4	PDL5
102	1	1	8	8
103	1	-	1	-
104	6	7	6	7
105	6	6	6	6

- 8. Insert the control diskette into the diskette drive (see Figure 1000-A).
- 9. Switch operator console display unit power on and press the power on switch. The system should power up and the power complete indicator should turn on if the power-on sequence is successfully completed. The power-on sequence takes approximately one minute. If any power problem or IML problem exists, go to MAP for displayed reference code. If any power-on problem appears without any display on the screen go to MAP 0200, Entry Point A.  
If the basic check indicator is on and no reference code is displayed, press the cancel key to start the reference code generation.
- 10. For 3279-2C only:  
If a color display unit (3279-2C) is attached as operator console, wait at least 10 minutes to allow the 3279-2C to warm up and check for correct convergence. If convergence is wrong, you can see traces of each primary color (red, green, blue) at the edges of a white character. For convergence adjustment procedure refer to 3279-2C MIM SY33-0090 (Part 1), Chapter 5, 'Display Setup'.
- 11. Press the lamp test key at the OCP and ensure that all indicators at the OCP are on.
- 12. For Remote Support Facility (RSF) only:  
Check the Remote Support Facility for correct operation.
- 13. For Remote Operator Console Facility (ROCF) only:  
Refer to Operator's Library Manual (Form No. GA33-1545) 'Remote Operator Console Facility', Chapter 3, and proceed as described under topic 'Service Representative Operations' and 'System Installation'.
- 14. Press power off key.  
Insert the second control diskette into the diskette drive and power up the system (including IML) to check the second diskette for correct operation. This will ensure that there is an operational back-up diskette.

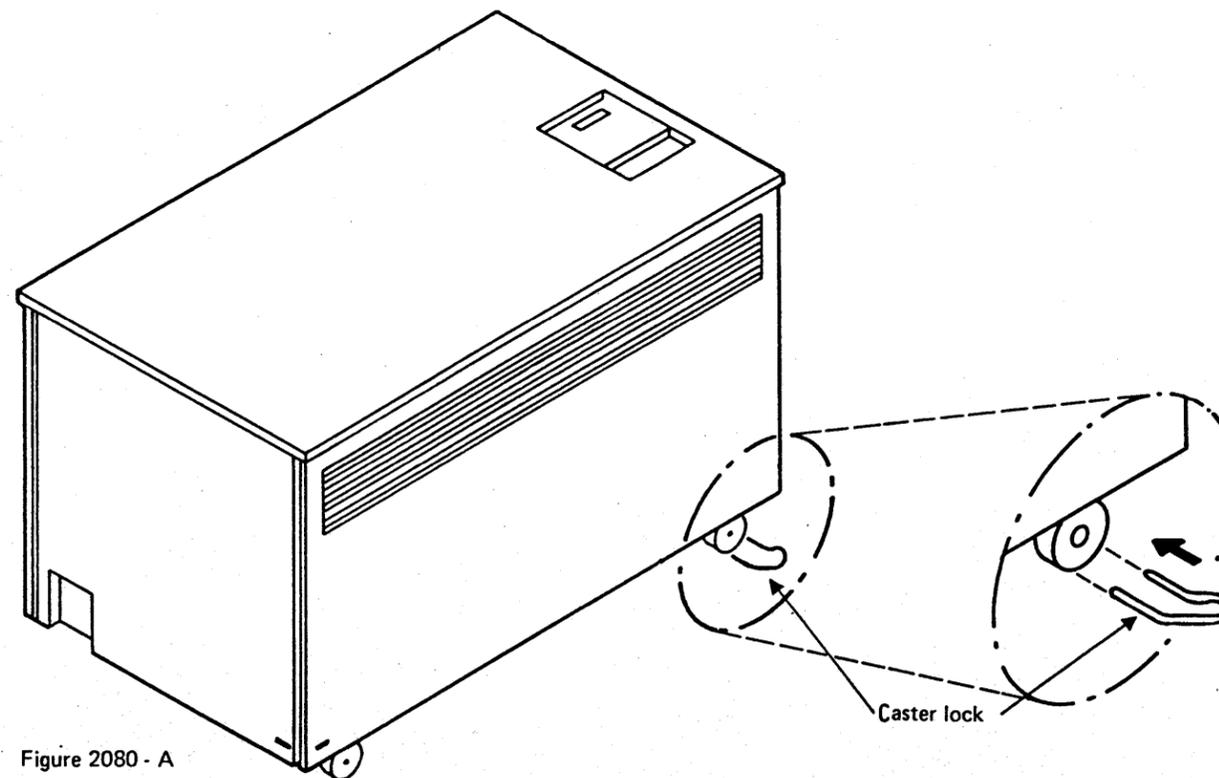


Figure 2080 - A

## Installation Manual

### Installation

#### Final System Test

1. Insert diagnostic or control diskette according to table below, switch system power on and run 4300 FRIEND or ST4300 and use the configure options to display the SYS configuration. The results should agree with the information you have entered into the SYS Chart in STM Section 6.
2. Run the diagnostic tests shown in the table below in sequence as shown. Details for proper application and test results are given in the Supplement to MAPs, Vol. 13, Section 4.
3. After system testing has been successfully performed, erase the log area on the control diskette.
4. Press the power-off key and check that the system including all I/O units are powered down. If any power-off problems appear, go to MAP for displayed reference code. If a power-off problem exists and no reference code is displayed, go to MAP 0200, Entry Point AA.

**Note:** If problems occur, which may be caused by a processor problem, return to the initial system tests (see page 2019) and repeat the listed tests. If intermittent problems occur, perform the ground check procedure (see page 3000 of this manual) and all steps listed in the EMC check list in book MI Vol.16 'Processor Power'. Before running the OLTs insert the control diskette and erase the log area.

Ref. Vol.	Test OK	Test	Diskette	Tested Functions / Remarks
13		Disk/Tape inline tests	C	Page 0004 in Vol. 15 contains the latest software requirements. Page 0004 in Vol. 15 contains the latest software requirements. Run a short routine to any I/O device (printer) to ensure that FRIEND is OK. Channel attached I/O units are tested by OLTs as defined for those units. All OLTs run under control of OLTSEP. For OLT generation or OLT update, the system should be in /370 and 1052 mode. Verify all I/O addresses for CDS generation.
14		5424 tests	C	
14		CA inline tests	C	
15		LA offline test	D	
15		LA inline wrap tests	D	
17		FRIEND	D	
—		OLTs (erase log area before)		
13		ST4300 (if available)	D5	
13		Log display program	C	

Diskette:  
 C = Control diskette  
 D = Diagnostic diskette  
 D5 = Diagnostic diskette labeled Diag. 5

## Installation Manual

### After Installation

#### Hand over Machine to Customer

- 1. Ensure that covers for connector panels, 01D and 01E and SPI panel are installed and that screws are tight.
- 2. Ensure that the gate cover is closed.
- 3. Switch CE mode to normal and the display switch at the CE-panel off (if applicable).
- 4. Close gate 01A and install all machine covers. If the hinge brackets of the machine were removed for transportation, the hinge brackets for the side covers must be adjusted according to Figure 3000-A.
- 4.a Remove table protector (see Figure 1005-A) 6.
- 5. Ensure that the cover gaskets make continuous contact to frame ground without any slot.
- 6. Store tools and machine documentation locally.
- 7. Clean up installation area and clean machine if necessary.
- 8. Hand over machine to customer, verify with him the initial power-on-meter readings and let customer sign the installation report.

Germany only:  
Hand over the registration papers for PTT notification. Advise the customer to fill in the form sheet and send it to the PTT office.

- 9. WT only:  
Complete Installation Report (IR) and Technical Activity Report (TAR).
- 9.1 US only:  
Complete the Installation Activity Document (IAD).
- 10. Prepare machine log-book.

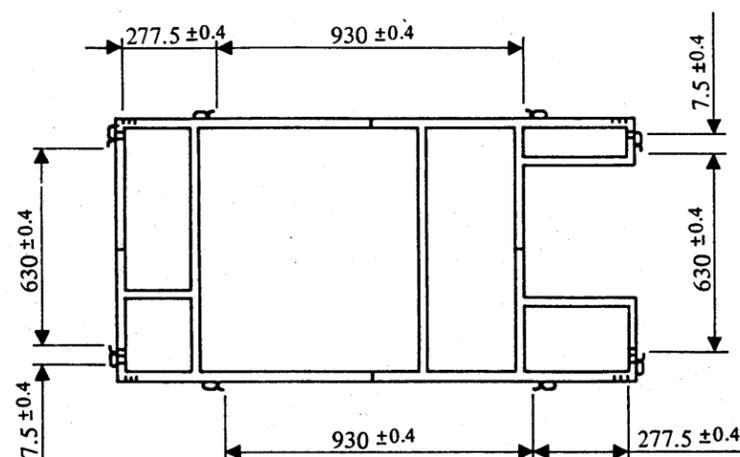


Figure 3000 - A

#### Ground Check

This procedure must not be performed during normal installation time. Only if intermittent errors occur which cannot be detected by applying the maintenance procedures, the following check should be done to ensure that no additional connection between DC-GND and frame ground exists.

- 1. Switch power off and remove the three connector lock bars on top of gate 01D and disconnect all flat cables from the connector blocks in gate 01D (see Figures 2010-A and 2010-B **1**). Disconnect all coax cables from ports 0-15.
- 2. Disconnect one FDS cable (FDS = Flexible Distribution System) and the two ground wires from gate 01A hinge side (see Figure 2010-B **2**).
- 3. Remove the coax connector plate from the machine frame and ensure that no electrical connection exists between plate and frame (see Figure 2010-B **3**).
- 4. Connect ohmmeter (Range x1k) between the FDS cable (which was disconnected in step 2) and frame ground. The meter reading should be higher than 100k ohm. If the meter reading is below 100k ohm check for any damaged DC cable or FDS cable.  
A grounding fault must be repaired before proceeding with the next step.
- 5. Reconnect the FDS cable and the two ground wires to gate 01A hinge side **2**. If screw holes have been damaged, use the spare holes in 6mm distance from original holes (if present).
- 6. Fasten the previously removed coax connector plate to the machine frame **3**.
- 7. Reconnect all external I/O cables to connectors in gate 01A-D, 01A-E and all coax cables to ports 0-15.

**Prepare Machine for Reshipment**

**General**

- 1. Make sure that all cables, components, applicable manuals, and paperwork are shipped. Use envelopes for small items such as screws, nuts, and washers. Ensure that all parts have their part numbers attached so that they can be identified on subsequent reassembly.

**Disconnect Cables**

- 1. Switch off the main line CB for customer's wall outlet. Disconnect line cord.
- 2. Verify that all I/O cables are legibly labeled with part number.
- 3. Disconnect operator console cables and pack operator console.
- 4. Disconnect I/O cables and fit protective covers (if present) to connectors.
- 5. Coil line cord into machine. Use Cable Entry B (see Figures 2040-B and 1005-A).

**Disassemble I/O Units**

- 1. Disconnect all cables from I/O units. Prepare machines for reshipment as described in the instructions for those units.

**Disassemble Machine**

- 1. The machine should be disassembled in reversed sequence as described in this instruction.
- 2. Ensure that both shipping brackets for gate 01A and the two or three shipping braces for each diskette drive and the dummy diskettes (if available) are installed for shipment.
- 3. Secure all machine covers by adhesive tapes to prevent damage during transportation.

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