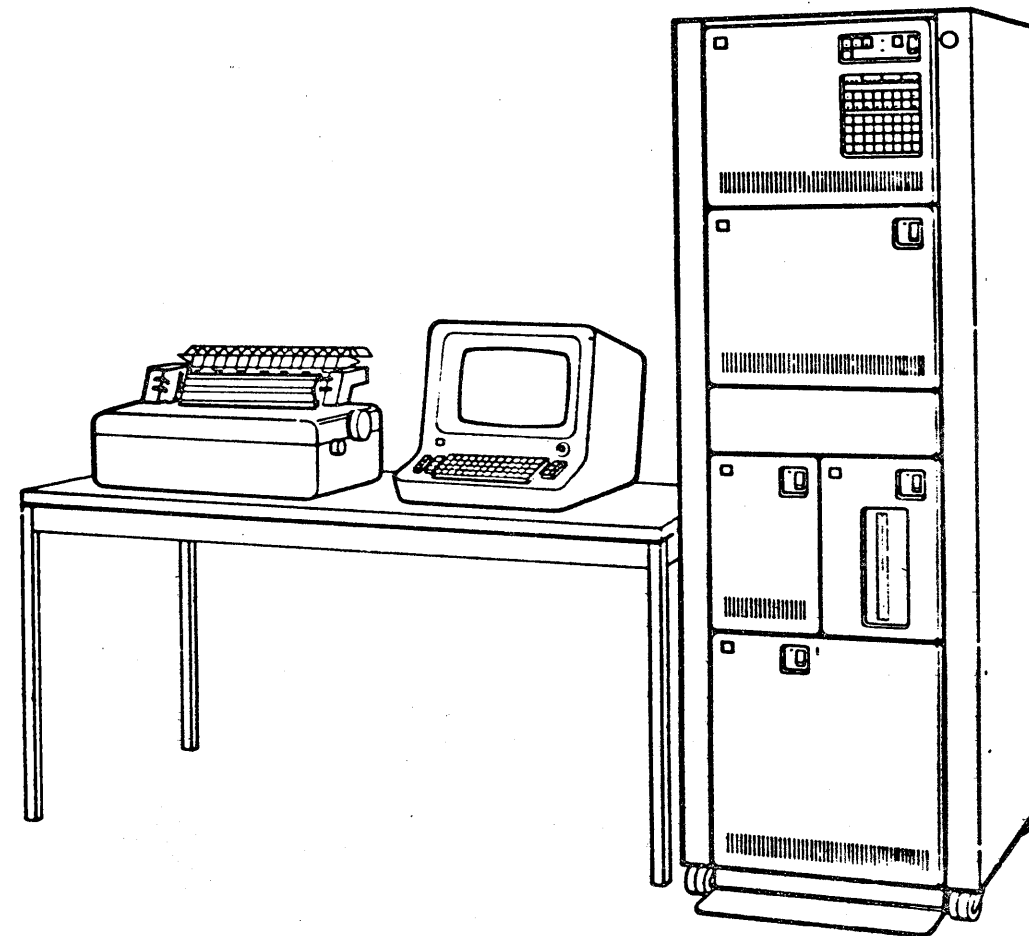




**Series/1**

**IBM Series/1  
INSTALLATION PROCEDURES**



**COPYRIGHT: IBM 1977**

<b>Series/1</b>	<b>Seq No</b>	<b>Part No</b>	<b>EC No</b>	<b>755020</b>			
		<b>8326725</b>	<b>Date</b>	<b>2 Nov 77</b>			

# INSTALLATION PROCEDURES

## CONTENTS

<b>GLOSSARY</b>	<b>2</b>
<b>SAFETY</b>	
GENERAL	3
PERSONAL SAFETY	3
EQUIPMENT PRECAUTIONS	3
<b>BEFORE INSTALLATION</b>	
MACHINE TYPE	4
INTRODUCTION	4
PRE-INSTALLATION CHECK	4
PREPARATION	5
INSTALLATION TIME	5
SPECIAL TOOLS/ TEST EQUIPMENT	5
USER'S RESPONSIBILITY	6
<b>INSTALLATION</b>	
BEGIN INSTALLATION	7
REMOVE INTERNAL PACKING MATERIALS	7
4997 Enclosure	7
4953 A and C Processor Units	7
4953 B and D and 4955 Processor Units	7
4955 Input/Output Expansion Unit	7
4962 Disk Storage Unit	8
4964 Diskette Unit	9
4982 Sensor Input/ Output Unit	9
MULTIPLE 1.8 METER RACK ENCLOSURE INSTALLATION	10
MULTIPLE 1 METER RACK ENCLOSURE INSTALLATION	11
RACK TO RACK CABLE INSTALLATION	12
CONNECTING EXTERNAL UNITS TO RACK	14
INSTALLING EXTERNAL I/O UNITS	15
4973 PRINTER	15

4974 PRINTER	19
4979 DISPLAY STATION	20
INSTALLING OTHER I/O DEVICES	21
ADDRESSING/TERMINATION CHECKS	23
Prepower Checks	23
Turn On Power	24
Measure DC Voltages	24
System Checkout	26
EMC TESTING	27
COVERS	27

### AFTER INSTALLATION

RECORD UPDATING	28
DISPOSITION OF SHIPPING MATERIAL	28

### USER'S INSTALLATION PROCEDURES

INSTALLING SENSOR I/O EQUIPMENT	29
4999 BATTERY BACKUP UNIT	30

### APPENDIX A. FEATURE PRIORITY AND ADDRESS ASSIGNMENT

FEATURE ATTACHMENT CARD RULES	31
FEATURE LOCATION PRIORITY ASSIGNMENTS	32
ADDRESS ASSIGNMENT SUMMARY	32
FEATURE CODE IDENTIFICATION	33

### APPENDIX B. INSTALLING RACK MOUNTABLE UNITS

RULES	34
RACK MOUNTING FIXTURE INSTALLATION	35

# INSTALLATION PROCEDURES INST

Uninstalled. Not installed.

## GLOSSARY

**Bustle.** A bustle is an acoustic cover that protrudes from the rear of a 4973 Printer.

**Enclosure.** The enclosure is the 4997 machine type. It provides a rack (see RACK) to contain the processor and other machine types, AC power for those machines, and covers.

**File (Card File).** Units in which I/O attachment cards are installed. The 4953 and 4955 Processors and the 4959 I/O Expansion Unit are card files.

**Foam.** Foam is a packing material.

**Movers.** Movers are businesses and their personnel that the customer uses to move the machines to the location where they are to be installed.

**Mountable, Mounted.** Installable, installed.

**Occurrence.** Something that occurred.

**Planner.** A person who makes plans and schedules.

**Raceway.** A protected area (normally connected to a rail) along which cables can be placed.

**Rack.** The rack is part of a 4997 enclosure. It is the frame in which the machine types are installed.

**Route, Routed.** Installing a cable in a specific path.

**Spindle.** The mechanism to turn the disk in a disk unit.

Series/1

Seq No	Part No	EC No	755020			
	8326725	Date	2 Nov 77			

INSTALLATION PROCEDURES INST 2

INSTALLATION PROCEDURES

**SAFETY**

**GENERAL**

Personal safety cannot be over emphasized. Service Personnel must not work alone with power on. At least two persons should be present when any work is done on a machine with power on. Service Personnel should wear safety glasses while working on the Series/1.

Fire extinguishers should be available in each room where there are system units. Extinguishers should be of the CO2 type, which is recommended for electrical fires.

Any safety covers that have been removed must be reinstalled before going on to another operation. Hazardous voltages are present in this equipment; not being careful could be lethal. Do not use tools or test equipment that are not grounded. They can be lethal.

**PERSONAL SAFETY**

**Contact With Environmental Hazards**

Special attention must be given to the user's I/O cables for they contain voltages. The system can be connected directly to the user's process, and voltages can enter into the system from a number of sources. With power removed from the system, voltages can still be present in the user's terminating area. All conductors may be dangerous and should be regarded as live circuits. When entering any part of the process area, observe all safety precautions and rules. Check the following items with the customer's chief personnel:

1. The need for safety glasses, hard hats, or special clothing.
2. Specific path that must be taken to and from the Series/1. Does a customer representative need to go with you?
3. Smoking restrictions.
4. Restrictions on use of electrical or other arc producing tools.
5. Possibility of contact with high voltages.
6. Possibility of contact with heavy machinery or other equipment.
7. Possibility of contact with acids, molten metal, hot fluids, and similar hazards.
8. Possibility of contact with toxic gases and vapors.
9. Warning alarms and emergency exits.

**Machine Warning Labels**

Take notice of the warning labels placed in hazardous areas of the machine. They are placed there for your protection.

**Power Supplies**

Before working on any power supply, remove power from the unit and wait at least one minute for capacitors to discharge to a safe voltage.

**Power Cables**

Check power cables for safe condition and correct third-wire ground connection. Check with a meter from ground on the plug to frame and ensure that there is a zero ohm reading. If not, use the MAPS to locate the trouble.

**Line Powered Equipment**

Oscilloscopes and other equipment that use voltages from service outlets must always be grounded through the third-wire grounding conductor in the power cable.

**EQUIPMENT PRECAUTIONS**

**User's Interface**

The System may become (because of a combination of products) an integral part of the user's operation. Do not, under any conditions, work on any part of the system without the knowledge and approval of the user before you start.

**Product Hardware**

Use caution when working around computer products. Do not leave front covers off when power is on.

**Logic Assemblies**

Electrical overloads for periods as short as a few microseconds can damage modules. You must be careful when grounding signals, because using a voltage instead of a ground or grounding the output of current drivers, emitter followers, and similar circuits, will destroy modules.

**Logic Cards**

You must be careful when removing and inserting I/O cards. Fingerprints, pencil marks, and other contaminants decrease the leakage resistance of these cards. Do not use cleaning fluids or card lubricants, and do not permit the plastic film on the card to become damaged. Do not insert or remove logic cards while power is applied to the system.

Series/1

Seq No	Part No.	EC No.	755020			
	8326725	Date	2 Nov 77			

INSTALLATION PROCEDURES

BEFORE INSTALLATION

MACHINE TYPE

Series/1

INTRODUCTION

This manual contains information necessary for the installation of the IBM Series/1. The information is in a step-by-step format. The sections and the steps in the sections are put in sequence so that you can go step by step through all of the installation for any configuration of the system. If a procedure is not suitable for your configuration, continue to the next procedure. If you have more than one unit of a given type, repeat the procedures until you have completed the installation of those units.

As you complete each step of a procedure, make a check in the space provided in front of the step. This will help you remember what you have done and lead you to the next step.

This installation procedure is written for separate machines in a rack system assembled at the IBM factory before being shipped.

Rack mountable units such as the Sensor Input/Output, Diskette, Disk Storage, and Battery Backup Units are IBM factory installed.

Non-rack installed I/O Units are to be installed as shown in the unit installation instructions for each unit.

It is assumed that you have the knowledge and abilities required to make this installation.

The following publications are available for each machine and should be read for unit maintenance, testing, and theory of operation:

Machine Type	Theory Diagram	Maintenance Information	Parts Catalog
4953	SY34-0042	SY34-0051	S134-0024 or S134-0028
4955	SY34-0041	SY34-0050	S134-0024 or S134-0028
4962	SY34-0045	SY34-0054	S131-0602
4964	SY34-0044	SY34-0053	S131-0601
4973	SY34-0077	SY34-0078	S134-0027
4974	SY34-0046	SY34-0055	S134-0025
4979	SY34-0047	SY34-0056	S134-0026
4982	SY34-0048	SY34-0057	S134-0029
4999	N/A	N/A	S134-0030

Specific Theory Diagrams and Maintenance Information for the products listed below are found in the Processor Unit (4953 or 4955) Manual(s):

- 4999 Battery Backup Unit
- 4959 Input/Output Expansion Unit
- Teletypewriter Adapter, Feature #785
- Integrated Digital Input/Output Non-Isolated, Feature #156
- Timer, Feature #784

PRE-INSTALLATION CHECK

Check with the user's site planner to ensure that site preparation (service outlets, voltage, phase, rotation,

grounding, and similar conditions) has been done as required.

Prerequisites

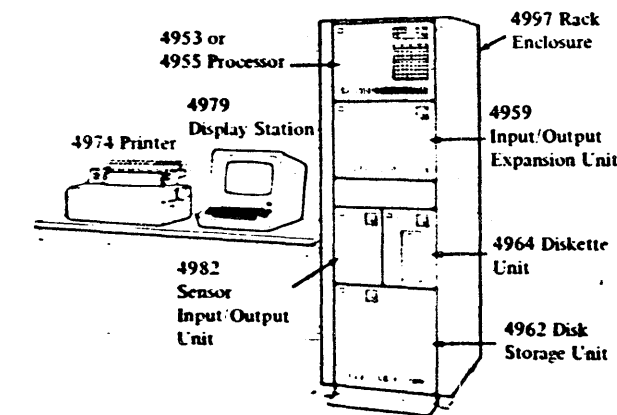
None

CONCURRENT

None

COMPANION

None



Series/1	Seq No	Part No	EC No	755020			
		8326725	Date	2 Nov 77			

INSTALLATION PROCEDURES

PREPARATION

Read these installation procedures so that you understand the sequence of installation. Ensure that you have all of the tools and test equipment that you will need to complete the installation. In addition to your standard hand tools, you will need:

Tool	Part Number
Meter	
Digitec or	453046
Weston	460879
Communications indicator panel	*1635513
Diskette maintenance program load device	*1635514
CE Console (equivalent to programmers console)	*1635512
*Needed only if not provided as a feature.	

For normal machine maintenance, the following tools and test equipment may be required.

Tool	Part Number
General logic probe	453212
454 oscilloscope (or similar)	453550
Fluke meter (or similar)	453191
Signal tracing and record device	163808C
db meter	453545
MU data tester (Model 921-S)	453637

PROGRAMMING

None

INSTALLATION TIME

Installation time is variable with the configuration of the Series/1.

SPECIAL TOOLS/TEST EQUIPMENT

The following list of tools will be shipped with the system/machine if the feature using these tools is ordered. They are to remain with the customer as part of the customer owned equipment.

Tool	Part Number
4982 Only	
Card Extender	1537826
Cable Extender	1637824
4982 001 Test Connectors	
DI/PI (isolated)	4412726
DI/PI (non-isolated)	4412728
DO	4411660
AI	4410181
Integrated DI/DO	1633813
Wrap Connector	
Timer (FC7040)	1633835
Wrap Cable	
4964 Timing Pins	1633834
TTY Attachment	1633834
Wrap Cable	
Customer Access Panel	
Wrap Connectors	
Timer	1632917
TTY	1632918
Integrated DI/DO	1637676
Communications Wrap Connectors	
S/S Direct	1633811
BSCA High Speed	1633810
S/S EIA	2704136
BSCA EIA	2704136
SDLC EIA	2740136
EIA Cable Jumper	4413770
4974-ship group tools	1637990
4979 Video adjusting tool	1634878

4999

Load-110 Volt Jumper

1637844  
1632914

Series/1	Seq No	Part No	EC No	755020			
		8326725	Date	2 Nov 77			

**INSTALLATION PROCEDURES**

**USER'S RESPONSIBILITY**

The user's representative must inventory the containers, remove the external shipping materials from the machines, and do the initial setup of machines. Ensure that those steps have been correctly performed before starting to install the Series/1.

**Inventory of Containers**

An inventory of containers must be made against the order invoice. This inventory should be done to ensure that all units and boxes were received and that no visible damage is present.

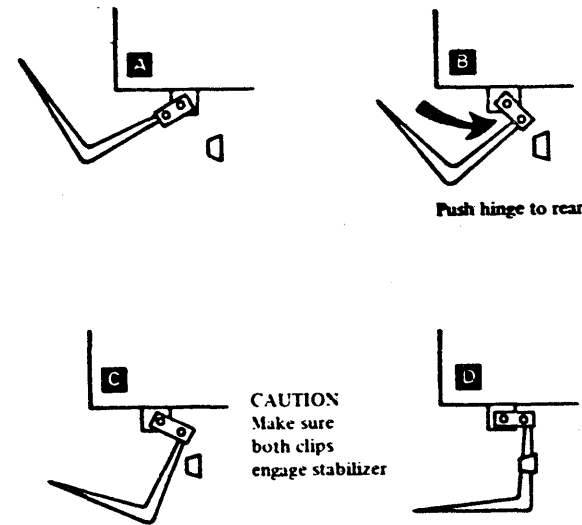
External packing materials must be removed from machines as shown in the unpacking instructions and the units must be inspected for physical damage.

**Initial Setup**

The movers should place non-rack installed devices near the place where the rack will be installed.

The movers should place the system rack enclosure in the place where it will be installed.

The rack stabilizer must be set and locked as shown in the following sequence:



Push hinge to rear

CAUTION  
Make sure  
both clips  
engage stabilizer

The unit must be aligned with the rear leveling pads.

Series/1

Seq No	Part No	EC No	755020			
	8326725	Date	2 Nov 77			

## INSTALLATION PROCEDURES

### INSTALLATION

#### BEGIN INSTALLATION

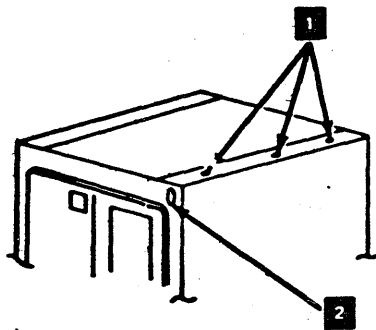
The IBM CE will begin the installation by opening and making an inventory of the contents of the boxes that were shipped with the machines.

1. Check each item as boxes are opened to ensure that all parts have been received.
2. Check the equipment and the cables for identification as well as part numbers and quantities.
3. Check for customized diskette taped to the enclosure.

#### REMOVE INTERNAL PACKING MATERIALS

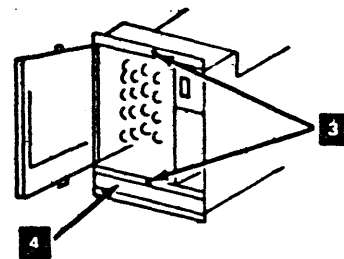
The Customer Engineer must remove all packing materials that are under the covers of the units. Using the following procedures, finish unpacking each unit and make it ready for testing.

#### 4997 Enclosure



- ( ) If the right side cover is shipped uninstalled (and the 4997 is not part of a multiple rack), remove three screws from unit frame top [1]. Take side cover out of shipping tube and install on rack. Reinstall the three screws.
- ( ) Open rear door of unit. Remove tape holding IPO (Instant Power Off) knob to circuit breaker panel. If this enclosure is not part of a multiple enclosure configuration, install the IPO knob [2]. If it is part of a multiple enclosure configuration, do not install the knob until instructed in a later step.
- ( ) Remove all tape holding cables at rear of unit.

#### 4953-A and C Processor Units

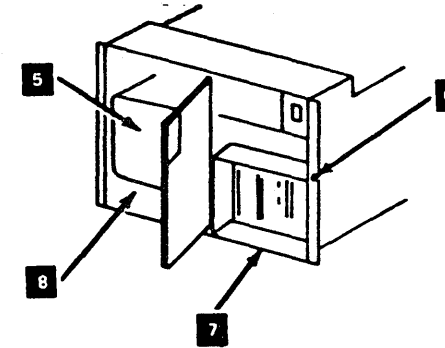


- ( ) Remove front cover by pulling straight out from unit. Open console frame by loosening two screws [3]. Remove pads [4]. Close console and tighten screws. Reinstall front cover.

CE NOTE: If your system has a 4962 installed, its ship group will be located here [4]. Remove it.

## INSTALLATION PROCEDURES INST

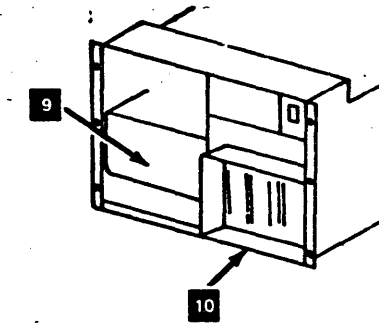
#### 4953-B and D, and 4955 Processor Units



- ( ) Remove front cover by pulling straight out from unit. Remove foam pad [5]. If the unit has a full console, loosen screw [6] and open front. Remove taped tube [7]. Close front, tighten screw, and reinstall front cover.

CE NOTE: If your system has a 4962 installed, its ship group will be in this location [8]. Remove it.

#### 4959 Input/Output Expansion Unit



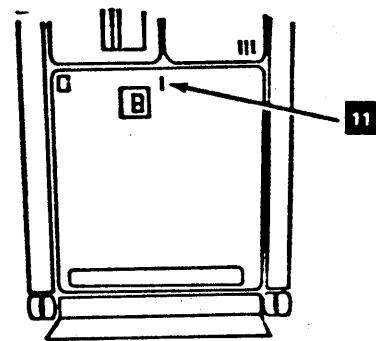
- ( ) Remove front cover by releasing the latch with a screwdriver and pulling straight out from unit. Remove foam pad [9] and taped tube [10]. Reinstall front cover.

Series/1

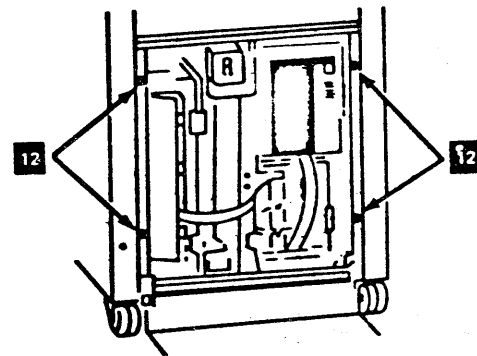
Seq No	Part No	EC No	755020			
	8326725	Date	2 Nov 77			

# INSTALLATION PROCEDURES

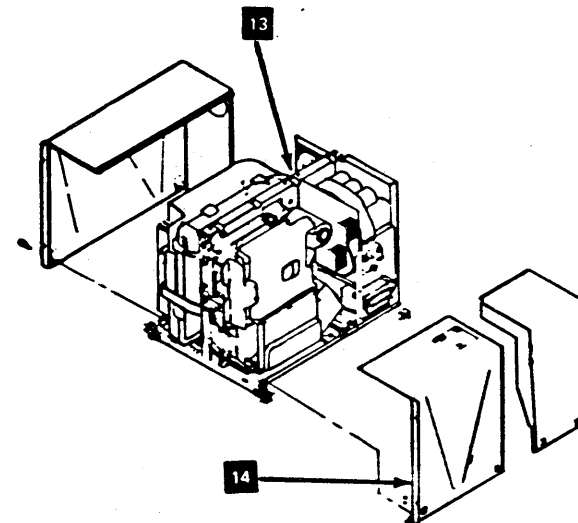
## 4962 Disk Storage Unit



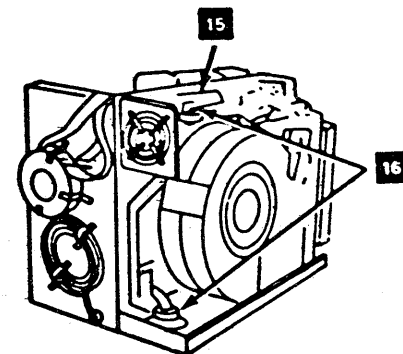
- ( ) Remove front cover by inserting screwdriver or similar device in opening [11] and pulling out at top of cover.



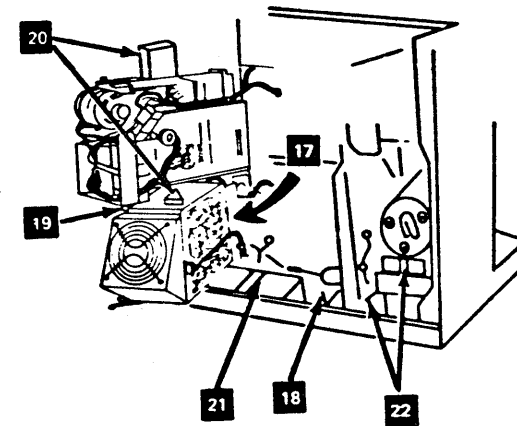
- ( ) Remove unit mounting screws [12], be certain that the stabilizer is attached, and slide unit forward.



- ( ) Loosen four washer nuts [13].
- ( ) Loosen six screws holding the side covers [14]. Remove left cover, right front cover, and right rear cover in that order.



- ( ) Remove one locking bolt [15].
- ( ) Remove shims from 3 shock mounts [16].
- ( ) Remove tape from the line cable, signal cables and motor. Ensure that the belt on motor remains in place.



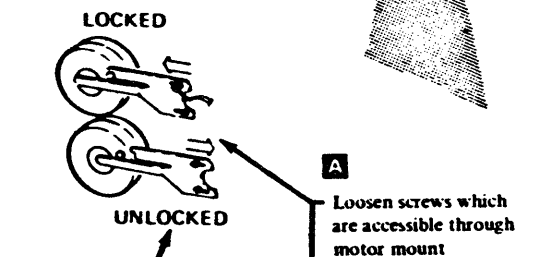
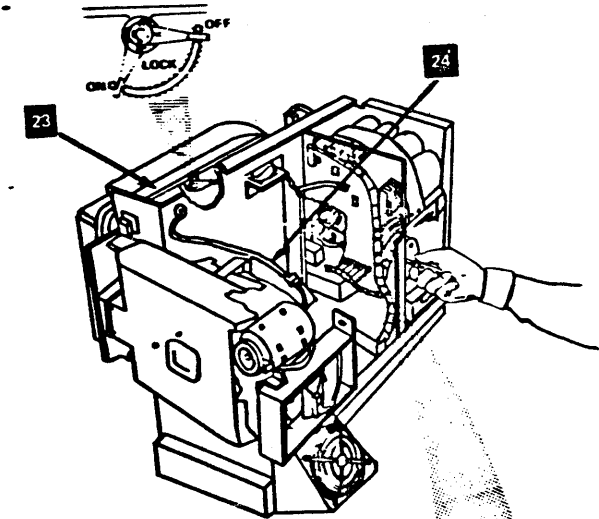
- ( ) Open gate [17] by loosening screw [18] and removing screw [19]. Carefully separate and open gates cut. NOTE: Models without diskette units, only the lower gate need be opened by loosening screw [18].

- ( ) Remove foam blocks [20] protecting the diskette unit (models 002, C2F only). Remove foam block [21] and wooden blocks [22].

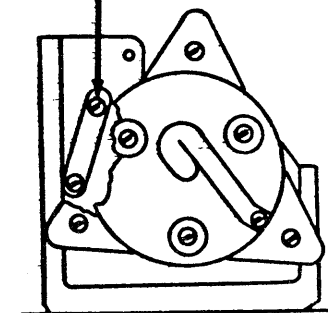
- ( ) Locate the actuator locking arm [23] unlock the actuator as shown.

- ( ) Next, locate the spindle lock [24] move to the unlocked position as shown. Ensure the spindle locking arm's long finger is correctly positioned as it is now the spindle ground.

# INSTALLATION PROCEDURES INST



- B Move spindle lock to the unlocked position and tighten screws



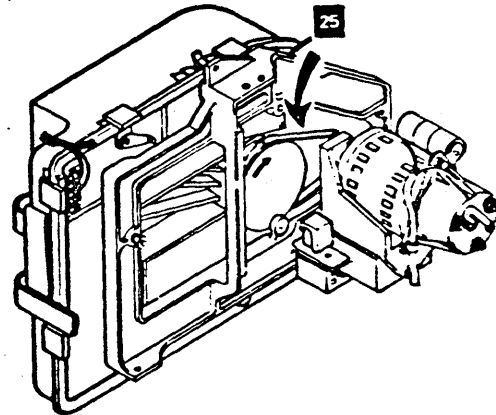
Series/1

Seq No	Part No	EC No	755020			
	8326725	Date	2 Nov 77			

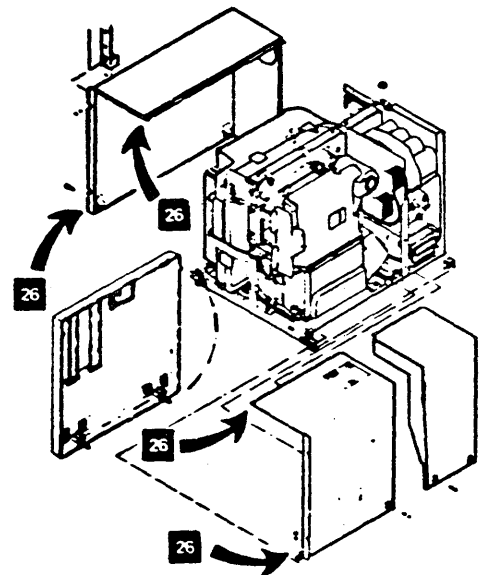


## INSTALLATION PROCEDURES

- ( ) Check to ensure drive belt [25] is properly located on the disk drive.

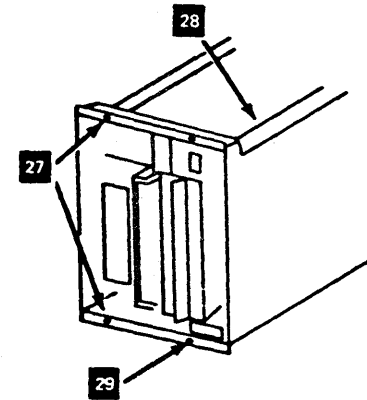


- ( ) Check all cards and connectors for correct seating.
- ( ) Close gate (or gates) and reinstall/tighten screws.
- ( ) Reinstall three outside covers. Ensure the tabs [26] are tight against the frame before fastening screws.



- ( ) Slide unit back into rack and reinstall mounting screws.
- ( ) To reinstall front cover, put the bottom of cover in position first and push in at top to engage the latch.

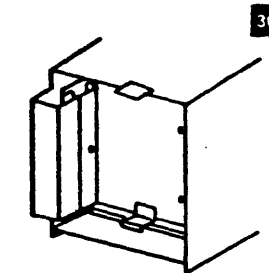
### 4964 Diskette Unit



- ( ) Open diskette door. Remove front cover by pulling out at top.
- ( ) Remove rack mounting screws [27] and slide unit forward 10 centimeters (4 inches). Disconnect signal cable attached at top of unit, and slide unit out far enough to remove top shield.
- ( ) Remove top shield. Remove foam block [28]. Remove plywood insert [29].
- ( ) Reinstall top shield, slide unit back, connect signal cable, and slide unit into rack. Reinstall mounting screws.
- ( ) To reinstall front cover, put the bottom in position first, and push in at the top to engage the latch.

## INSTALLATION PROCEDURES INST

### 4982 Sensor Input/Output Unit



- ( ) Remove tape holding rear gate [30].

### Multiple Rack Enclosure Installation

If your system has more than one rack, go to the instructions for installing multiple rack enclosures which follow immediately. If not, skip the following pages and go straight to "CONNECTING EXTERNAL UNITS TO BACK."

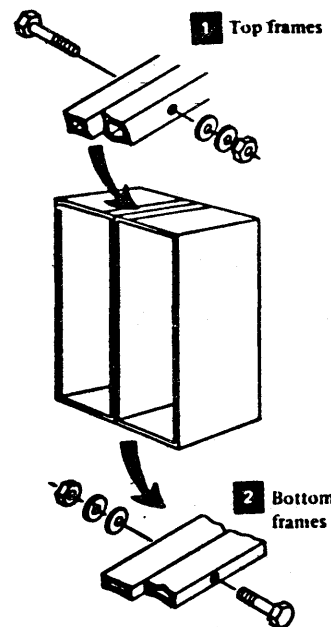
Series/1	Seq No	Part No	EC No	755020			
		8326725	Date	2 Nov 77			

# INSTALLATION PROCEDURES

## MULTIPLE 1.8 METER RACK ENCLOSURE INSTALLATION

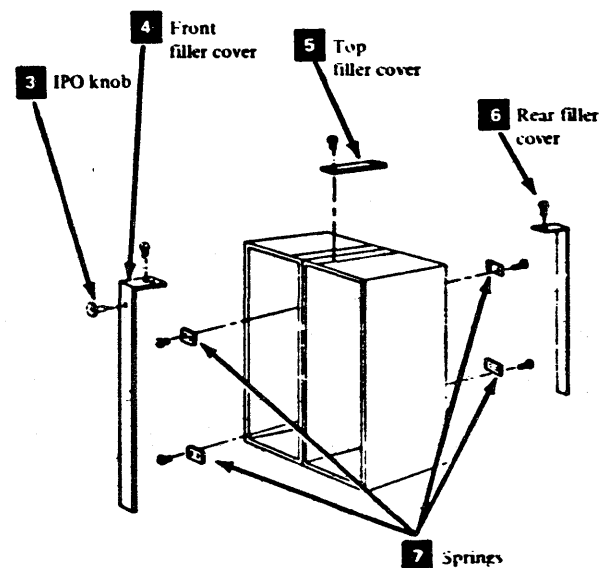
Multiple (more than one) rack configurations will be shipped as single enclosures because of the fixed wheels at the front. All enclosures with a specify code #9197 (Primary Rack Enclosures) will be shipped with a full set of covers. All enclosures with a specify code #9198 (Subsequent Rack Enclosures) will be shipped with no side covers, but with the needed attachment hardware included. These enclosures are "add on" enclosures.

- ( ) Installation in the customer area will start with removal of the side cover of the first enclosure on the side that will become the interface for the multiple rack configuration. Remove the IPO Knob [3] before attempting to remove the



right side cover. The removed cover will be reinstalled on the far side of the last add on enclosure.

- ( ) Move the enclosures to be attached together and align with the rear leveling pads, then connect at the top [1] and bottom [2] with the bolts, washers, and nuts supplied.



- ( ) Install four springs [7] (P/N 4410811) at the front and rear with hardware supplied.

- ( ) Install the "L" shaped front and rear filler covers: the front cover [4] is P/N 4410808 while the rear cover [6] is P/N 4410610. These parts can be identified easily because the front filler cover has a hole for the IPO knob [3]. Both covers are installed by holding against the vertical surface of the interface and then pressing downward until seated and fastened with two screws at the top.

- ( ) The top filler cover, P/N 4410809, [5] is installed with four screws supplied.

NOTE: Perform the assembly of multiple racks before installing external cables.

- ( ) Each rack of a multiple rack system has a primary power line cable. Units must be powered from the power distribution panel in the rack in which they are installed. No primary power cables may cross a two rack interface. To do so would cause a safety hazard.

- ( ) Each rack in a multiple rack system has an IPO knob (Instant Power Off) on the front right side of the enclosure. The IPO knob controls the primary power ONLY for that rack. Observe the warning label:

"THIS CONFIGURATION HAS MULTIPLE PRIMARY SOURCES"

- ( ) After the last positioning of each enclosure, push the enclosure stabilizer down and to the rear until fastened on both ends.

Series/1

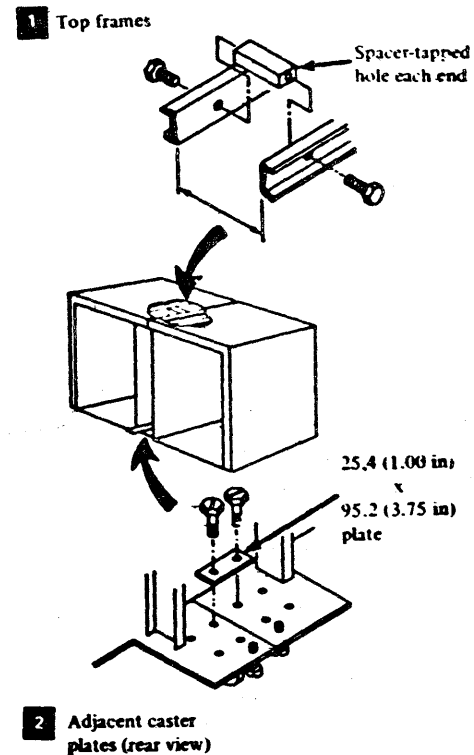
Seq No	Part No	EC No	755020			
	8326725	Date	2 Nov 77			

INSTALLATION PROCEDURES

MULTIPLE 1 METER RACK ENCLOSURE INSTALLATION

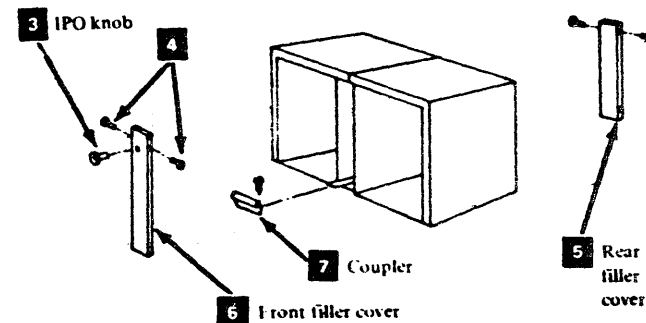
Multiple (more than one) rack configurations will be shipped as single enclosures because of the fixed wheels at the front. All enclosures with a specific code #9197 (Primary Rack Enclosure) will be shipped with a full set of covers. All enclosures with a specific code #9178 (Subsequent Rack Enclosure) will be shipped with no side covers, but with the needed attachment hardware included. These enclosures are "add on" enclosures.

- ( ) Installation in the customer area will start with removal of the side cover of the first enclosure on the side that will become the interface for the multiple



rack configuration. Remove the IPO Knob [3] before attempting to remove the right side cover. The removed cover will be reinstalled on the far side of the last add on enclosure.

- ( ) Move the enclosures to be attached together and align with the rear leveling pads, then connect at the top [1] and bottom [2] with the bolts, washers, and screws supplied.



- ( ) Install the coupler [7] P/N 4410821 at the lower front with hardware supplied.
- ( ) Machine types installed in the upper position of either enclosure must be pulled out to give access to the two screws [4] at the top of the enclosures that holds the front filler cover [6] P/N 4410819. The front cover is installed by placing the bottom end in the coupling then pushing the top in while pressing downward and fastening with the screws supplied.
- ( ) The rear filler cover [5] P/N 4410820 is held in place and fastened with four screws supplied.

NOTE: Complete the assembly of multiple racks before installing external cables.

- ( ) Each rack of a multiple rack system has a primary power line cable. Units must be powered from the power distribution panel in the rack in which they are installed. No primary power cables may cross a two-rack interface. To do so would cause a safety hazard.
- ( ) Each rack in a multiple rack system has an IPO knob (Instant Power Off) on the front right side of the enclosure. The IPO knob controls the primary power ONLY for that rack. Observe the warning label:

"THIS CONFIGURATION HAS MULTIPLE PRIMARY SOURCES"

- ( ) After the last positioning of each enclosure, push the enclosure stabilizer down and to the rear until fastened on both ends.

Series/1

Seq No	Part No	EC No	755020			
	8326725	Date	2 Nov 77			

# INSTALLATION PROCEDURES

## BACK TO BACK CABLE INSTALLATION (MULTIPLE RACK ENCLOSURES)

After two or more racks have been connected together, some cables from I/O units in one enclosure must be mated to attachment cards in another enclosure. Signal cables between enclosures may be normal internal system cables. I/O channel signal cables to and from a 4959 machine may only go between racks that are next to one another.

The following procedure must be followed for each unit that is mated in this way.

- ( ) 1. Determine the location of the attachment card by reviewing the card plug charts (1) (packed with the diagnostic diskettes) for the 4953/4955/4959 units that are in your system.

1

MACH/TYPE 4959		SERIAL NO
DEVICE CODE		
DESCRIPTION		
DEVICE ADDRESS	A B C D E F G H J K L M N P Q	

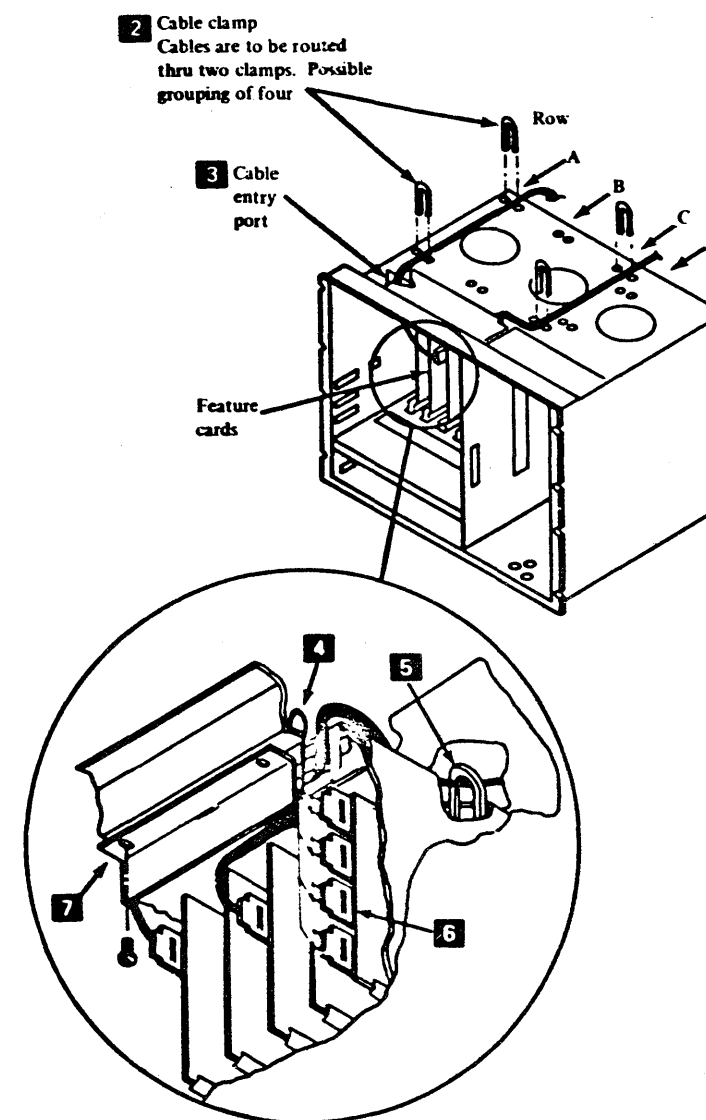
- ( ) 2. Remove the screws that hold the affected card file to the rack.

**WARNING** - Be careful to prevent damage to connecting cables.

- ( ) 3. Pull the unit out of the rack approximately 15 centimeters (6 inches).
- ( ) 4. Remove the cable clamp bracket (7).
- ( ) 5. Route the cables (4) (flat or circular) from the machine rear to front.
- ( ) 6. Route the cables into the card file through the large opening (3) on top of the card file. Insert connectors (6) on the correct card.

If I/O units which are installed outside the racks are to connect to attachment cards in this card file, do not perform the following steps. Check them off and go to "Installing External I/O Units".

- ( ) 7. Install and tighten the cable clamp bracket (7).
- ( ) 8. Group cables together and insert cable clamps (2) (5) P/N 1634983 into the card file to hold the cables.
- ( ) 9. Push the card file into the rack and fasten with eight #10-32 screws.
- ( ) 10. Group cables at the rear of the card file and insert the rear cable clamp (2).



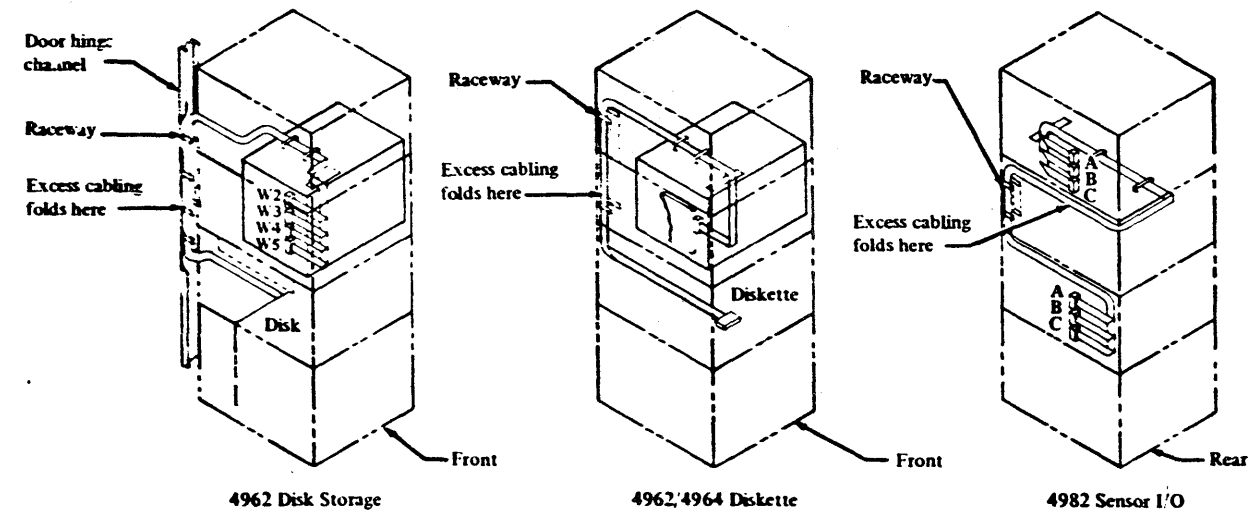
Series/1

Seq No	Part No	EC No	755020			
	8326725	Date	2 Nov 77			

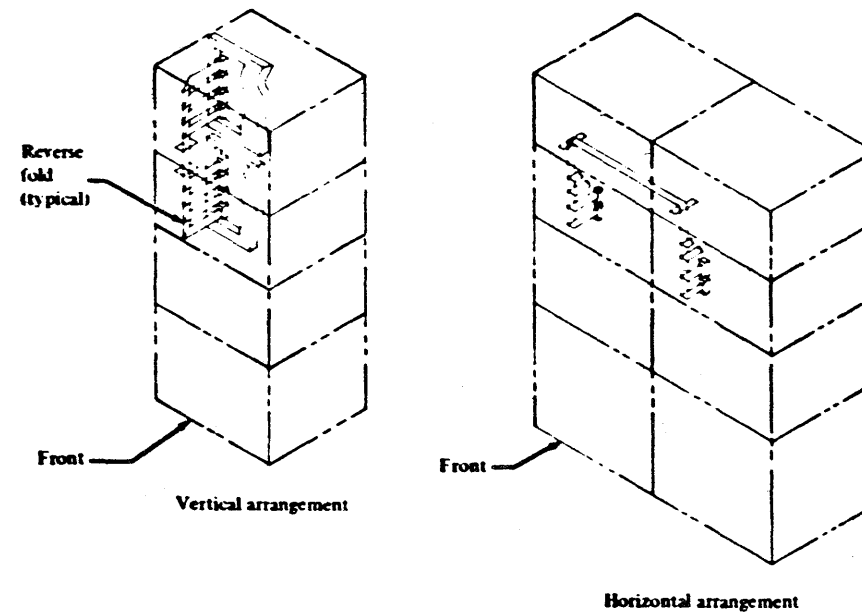
# INSTALLATION PROCEDURES

( ) 11. Use clamps to hold each cable in the suitable raceway beside the vertical posts of the racks. If the units are installed horizontally next to one another in a multiple rack configuration, cables enter and leave the card file the same as if the units were vertical to one another. Typical I/O configurations are shown in [8]. Processor to 4959 I/O expansions are also shown in [9].

8 Typical unit to attachment card cabling



9 Processor to I/O Expansion unit cabling



Series/1	Seq No	Part No	EC No	755020		
		8326725	Date	2 Nov 77		

## INSTALLATION PROCEDURES

### CONNECTING EXTERNAL UNITS TO RACK

External I/O units attach to attachment cards in the 4953/4955/4959 through cables supplied with the units. The following procedure must be followed for each unit that is mated in this way.

- ( ) 1. Determine the location of the attachment card by reviewing the card plug charts (1) (packed with the diagnostic diskettes) for the 4953/4955/4959 units that are in your system.

**1**

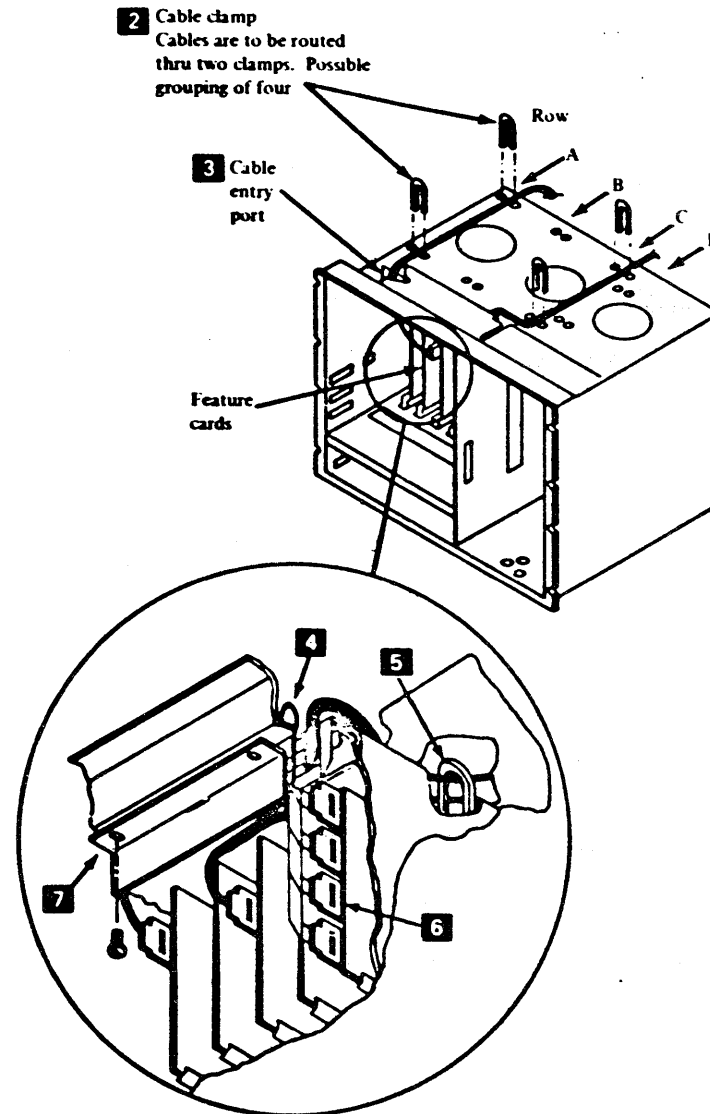
MACH/TYPE 4959		SERIAL NO															
DEVICE CODE	DESCRIPTION	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	POWER SUPPLY
DEVICE ADDRESS																	

- ( ) 2. Remove the screws that hold the affected card file to the rack.
- ( ) 3. Pull the unit out of the rack approximately 15 centimeters (6 inches).

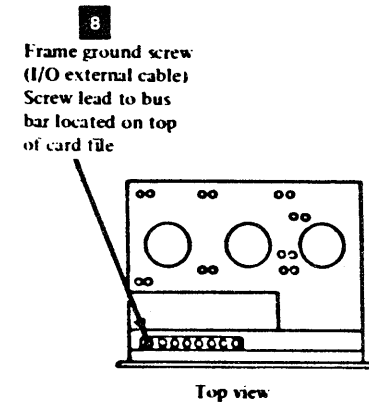
**WARNING** - Be careful to prevent damage to connecting cables.

- ( ) 4. Remove the cable clamps (2) (3) and cable clamp bracket (7).

- ( ) 5. Route the cables (4) (flat or circular) from the machine rear to front. Customer signal cables should enter the system in that rack in which the cable will be terminated. Racks are to be assembled together before cables are routed into the rack enclosure.



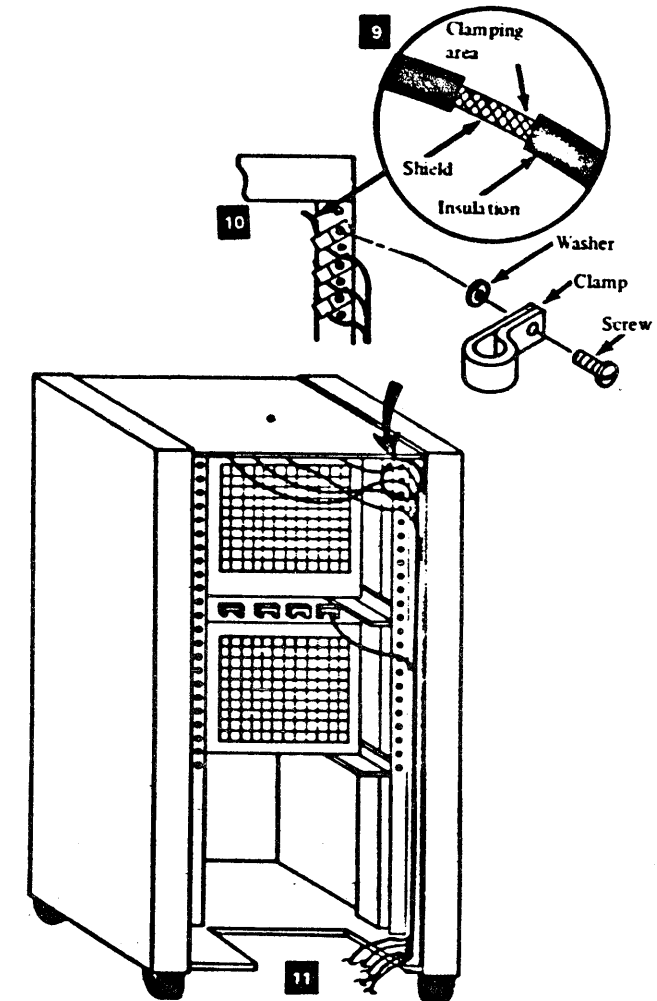
- ( ) 6. Route the cables into the card file through the large opening (3) on top of the card file. Insert connectors (6) on the correct card.
- ( ) 7. After all of the external units have been cabled to their attachment cards, install and tighten the cable clamp bracket (7).



- ( ) 8. Connect all of the ground wires to the bus bar (8) on top of the card file. Ensure a good electrical ground by using the lockwashers provided.
- ( ) 9. Group cables together and insert cable clamp (5) P/N 1634983 into the card file to hold the cables.
- ( ) 10. Push the card file into the rack and fasten with eight black #10-32 screws.
- ( ) 11. Group cables at the rear of the card file and insert the rear cable clamp (2).

## INSTALLATION PROCEDURES INST

- ( ) 12. Use clamps to hold each external cable (3) to the vertical mounting strip (10) in the rear of the rack on the side away from the power cable. Do not use the top hole. Only use every other hole.
- NOTE:** Not all cables have a bare shield as shown in (9). The clamp will go around the insulation or those cables.
- ( ) 13. Route the cables out through the cable entry (11).



Series/1	Seq No	Part No	EC No	755020			
		8326725	Date	2 Nov 77			

INSTALLATION PROCEDURES

INSTALLING EXTERNAL I/O UNITS

Each external I/O unit must be unpacked and placed in the position where it will operate. Follow the pre-installation procedure for each unit and feature in your system. Then go to "Connecting External Units to Rack."

4973 Printer

Using the illustrations on this and the next page, perform the following steps:

- ( ) 1. Remove front and rear covers and remove internal packing materials [1].

- ( ) 2. Set operator panel switch [2] to DISABLE.
- ( ) 3. Set power switch [3] to OFF.
- ( ) 4. If the signal cable is attached to the 4973, check off the following steps and go to Install Type Belt And Ribbon.
- ( ) 5. Remove rear cover.
- ( ) 6. Insert signal cable up through hole [6] in bottom rear of housing.
- ( ) 7. Route cable [9] to the circuit board connector [4] and plug it in.
- ( ) 8. Hold the cable in place, using clamps [5] fastened to housing wall and card frame (do not put a strain on the connector).
- ( ) 9. Place the ground clamp [8] over the shield that is showing on the signal cable.
- ( ) 10. Tighten only if no forms rack is ordered (Model 1 only).

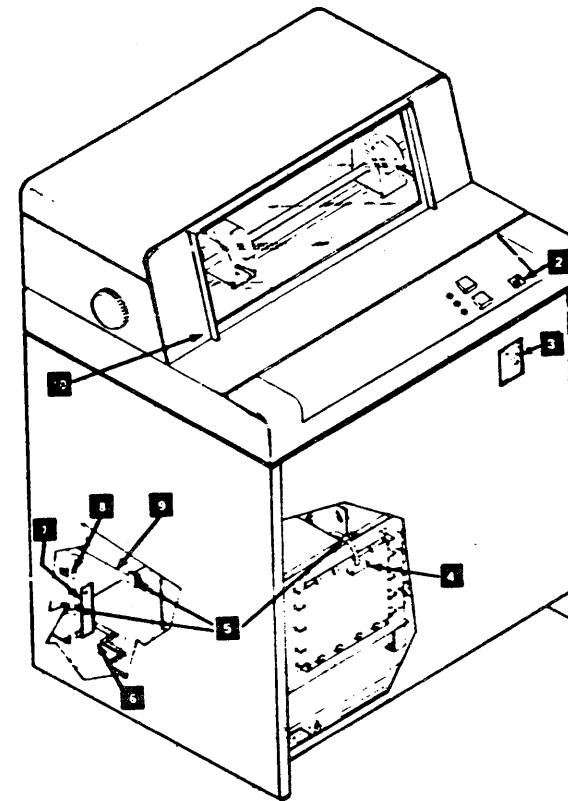


Illustration to be added

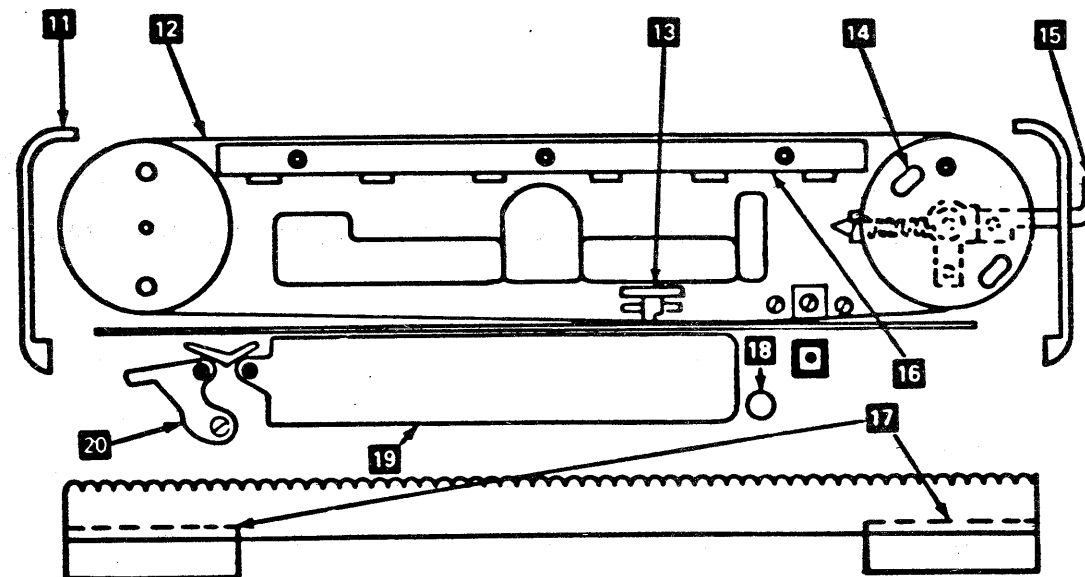
Series/1	Seq No	Part No	EC No	755020			
		8326725	Date	2 Nov 77			

INSTALLATION PROCEDURES

Install Type Belt And Ribbon.

Install the type belt and ribbon by performing the following steps.

- ( ) 1. Lift front cover [ 10 ].
- ( ) 2. Lift both ribbon guides [ 11 ].
- ( ) 3. Move front end assembly release lever [ 13 ] toward the front of the machine.
- ( ) 4. Move the type belt release lever [ 15 ] toward the front of the machine.
- ( ) 5. Model 2 only -- pivot the print position indicator [ 16 ] up.
- ( ) 6. Install the type belt [ 12 ] evenly around the top of the pulleys [ 17 ]. Ensure that the type belt is positioned between the ribbon shield and the hammers.
- ( ) 7. Move the type belt release lever [ 15 ] toward the rear.
- ( ) 8. Using the finger hole in the pulley [ 14 ], turn the pulley counterclockwise until the belt moves down to the positioning rollers located under the platen.
- ( ) 9. Turn the type belt pulley several times to ensure that the belt tracks correctly.
- ( ) 10. Move ribbon drive release lever [ 20 ] to open position.
- ( ) 11. Install ribbon cartridge [ 19 ]. Guide the ribbon in the path shown on the label on the cover. Ensure that the ribbon cartridge is fastened at [ 18 ].
- ( ) 12. Close ribbon drive release lever [ 20 ].
- ( ) 13. Turn print belt pulley [ 14 ] several times to take up loose ribbon.
- ( ) 14. Lower ribbon guides [ 11 ].
- ( ) 15. Model 2 only -- close the print position indicator [ 16 ] and fasten.
- ( ) 16. Turn the print belt pulley [ 14 ] several times to ensure that ribbon tracks correctly.



Series/1	Seq No	Part No	EC No	755020		
		8326725	Date	2 Nov 77		



INSTALLATION PROCEDURES

Install Forms Stand -- Model 1.

Install the bustle (acoustic rear cover), forms stand, and ground straps using the following procedure.

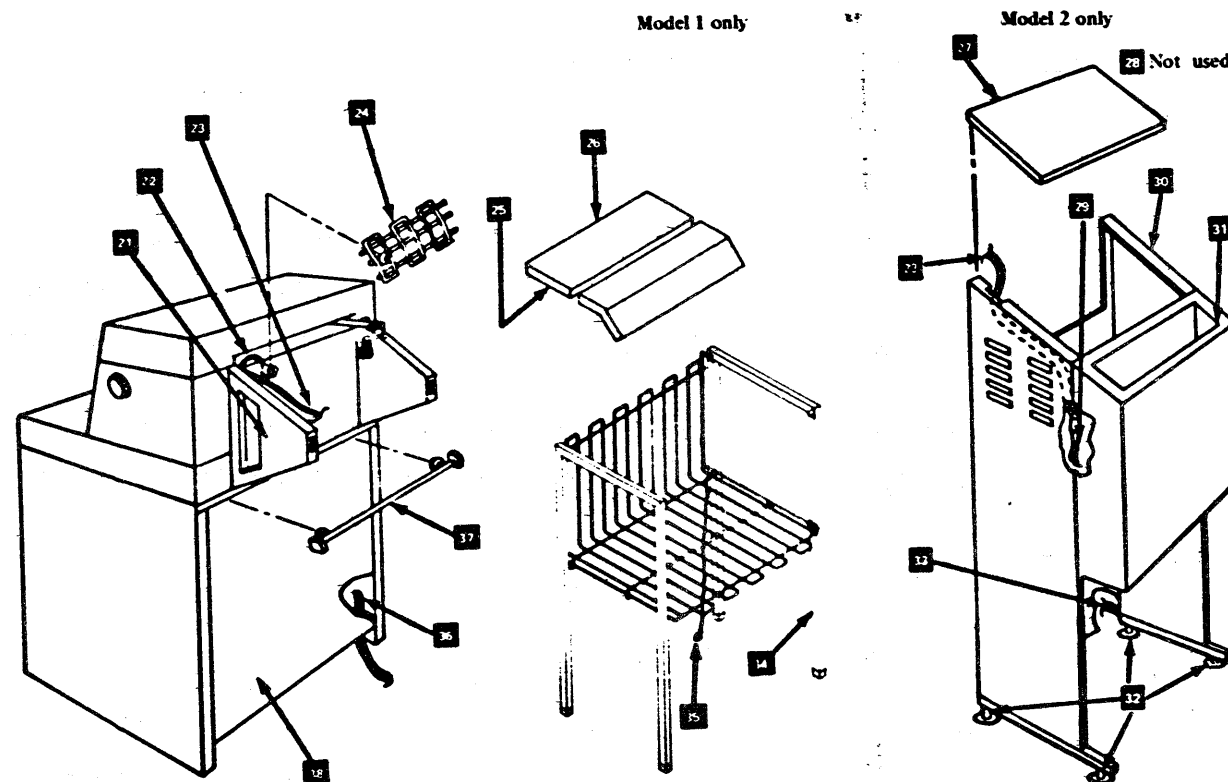
- ( ) 1. Install bustle (acoustic rear cover) [ 21 ] on mounting screws.
- ( ) 2. Install top rear cover [ 26 ] and connect ground wire [ 23 ] to left outside hinge screw [ 25 ]. Adjust cover so that it fits flat on acoustic bustle.
- ( ) 3. Connect ground wire [ 22 ] to left mounting screw of forms stand [ 24 ].
- ( ) 4. Assemble forms stand [ 34 ] (if ordered) as shown using screws shipped with stand.
- ( ) 5. Remove rear cover [ 38 ], and connect ground strap [ 7 ] [ 35 ] from forms stand by placing the strap under the ground clamp and screw [ 8 ] [ 33 ] and tighten. Ensure that all grounds are safely grounded to the housing.
- ( ) 6. Adjust paper guide [ 37 ] for correct width.
- ( ) 7. Reinstall rear cover [ 38 ].
- ( ) 8. Install forms stand so that paper entry and exit stacks will be in alignment with printer paper entry and exit openings.
- ( ) 9. Place paper supply on floor under forms stand, insert, and pull through printer.

- ( ) 10. Set forms thickness control and fasten the front end assembly. Close front cover.
- ( ) 11. Do not plug in power cable at this time.

Connect Signal Cable To System.

Perform the following step:

- ( ) 1. Route and attach the signal cable to the system as described in "CONNECTING EXTERNAL UNITS TO RACK."



Series/1	Seq. No	Part No	EC No	755020			
		8326725	Date	2 Nov 77			

INSTALLATION PROCEDURES

Install Forms Enclosure -- Model 2.

Install the bustle (acoustic rear cover), forms rack, forms enclosure, and ground straps using the following procedure.

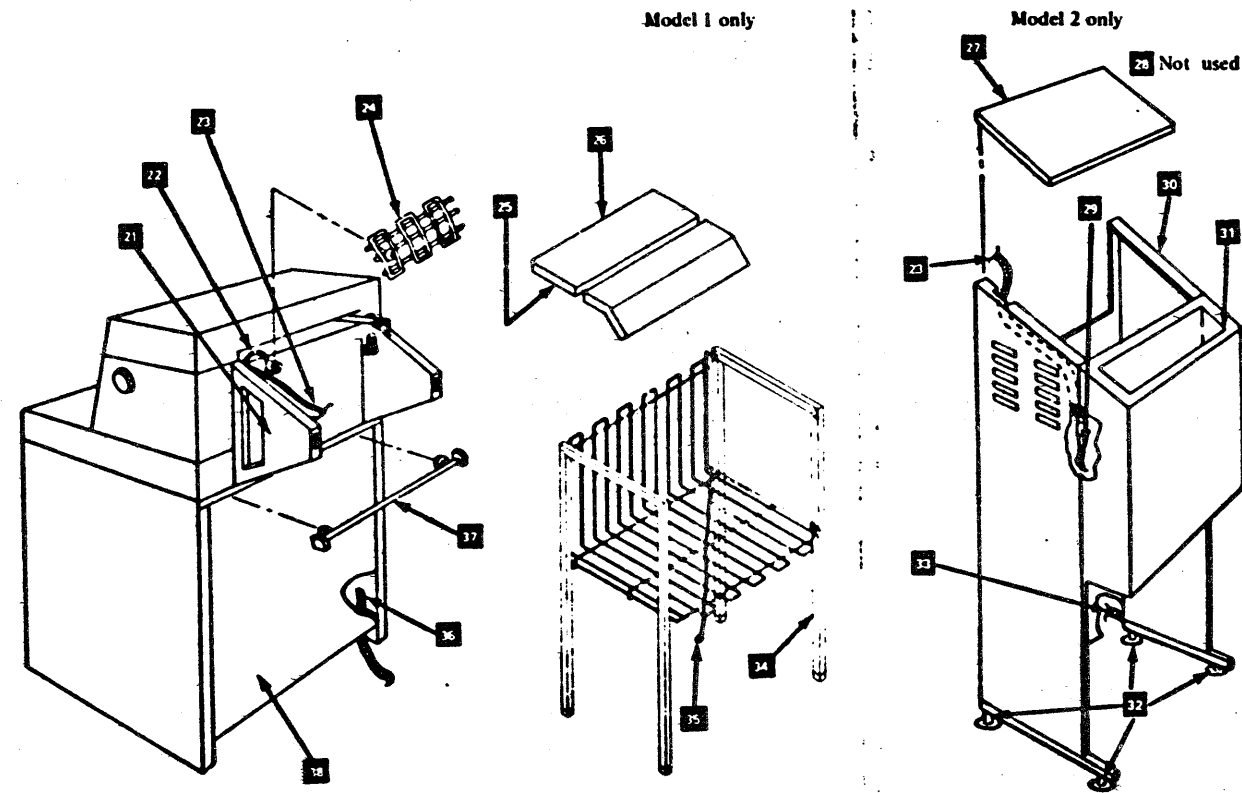
- ( ) 1. Install bustle (acoustic rear cover) [ 21 ] on mounting screws.
- ( ) 2. Install top rear cover [ 27 ].
- ( ) 3. Install forms rack [ 24 ] and connect ground wire [ 22 ] to left mounting screw.
- ( ) 4. Remove rear cover [ 38 ], and connect ground strap [ 7 ] [ 33 ] from forms enclosure by placing the strap under the ground clamp and screw [ 8 ] [ 35 ] and tighten. Ensure that all grounds are safely grounded to the housing.
- ( ) 5. Reinstall rear cover [ 38 ].
- ( ) 6. Slide forms enclosure [ 30 ] over bustle [ 21 ] until latches engage.
- ( ) 7. Plug ground wire [ 29 ] into ground wire [ 23 ] (ensure that the ground wire [ 23 ] is routed through the opening on the left side of the forms enclosure, as shown).
- ( ) 8. Adjust glides [ 32 ] on bottom of forms enclosure so that it installs squarely against the housing.
- ( ) 9. Adjust top rear cover [ 27 ] so that it fits flat on the enclosure.

- ( ) 10. Pivot the hinged platform down and adjust paper guide [ 37 ] for correct paper width. Pivot the hinged platform up.
- ( ) 11. Place paper supply on floor under enclosure, insert, and pull through printer.
- ( ) 12. Set forms rack inside rear housing cover [ 31 ] for correct paper fold width.
- ( ) 13. Set forms thickness control and fasten the front end assembly. Close front cover.
- ( ) 14. Do not plug in the power cable at this time.

Connect Signal Cable To System.

Perform the following step:

- ( ) 1. Route and attach the signal cable to the system as described in "CONNECTING EXTERNAL UNITS TO RACK."



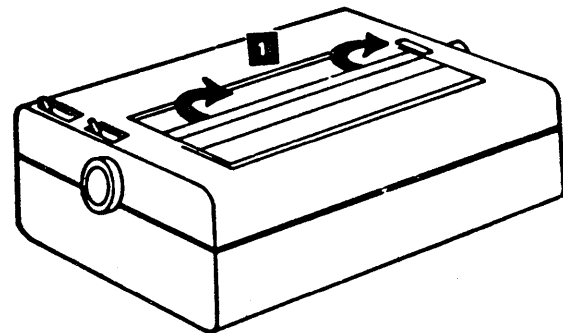
Series/1	Seq No	Part No	EC No	755020		
		8326725	Date	2 Nov 77		

INSTALLATION PROCEDURES

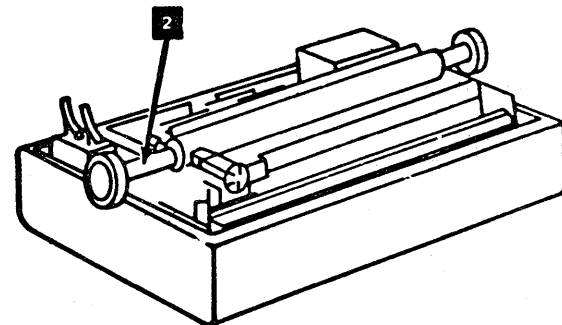
4974 Printer

Perform the following steps:

- ( ) 1. Remove the viewer cover by placing both hands under plastic and lifting upward [1].



- ( ) 2. Hold the top cover at the front corners and lift to remove.
- ( ) 3. If the signal cable is not attached to the 4974, connect it to the 4974.
- ( ) 4. Remove rubber bands holding printhead [2].
- ( ) 5. Reinstall top cover.



- ( ) 6. Tilt printer on back side and remove two rear shipping bolts.
- ( ) 7. Install the forms feed assembly.
- ( ) 8. Install ribbon.
- ( ) 9. Route and attach the signal cable to the system as described in "Connecting External Units to Back".
- ( ) 10. Do not plug in the power cable at this time.

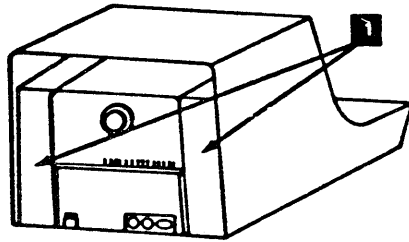
Series/1	Seq No	Part No	EC No	755020			
		8326725	Date	2 Nov 77			

## INSTALLATION PROCEDURES

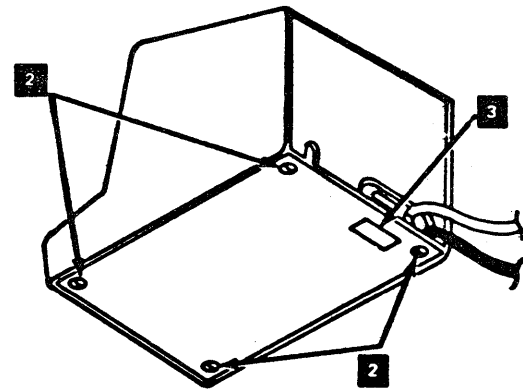
### 4979 Display Station

Perform the following steps:

- ( ) 1. Remove two screws holding the rear cover and remove the cover.
- ( ) 2. Remove 2 foam pads [1].

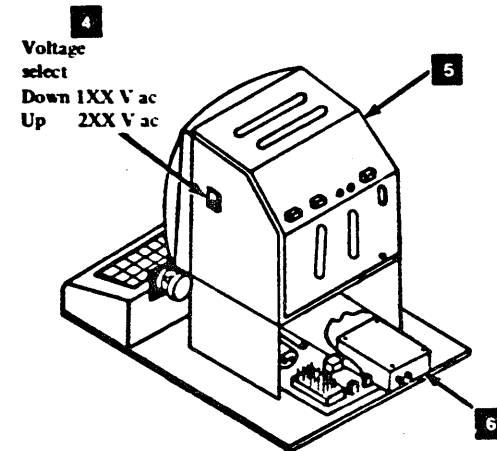


- ( ) 3. Invert the unit onto its top and remove the four screws that hold the cover to the base plate [2].
- ( ) 4. Locate the power rating plate [3] and verify that the user's voltage matches the specifications stated on the plate.
- ( ) 5. Return the unit to the normal position, remove the power and contrast knobs, and lift the top cover from the unit.



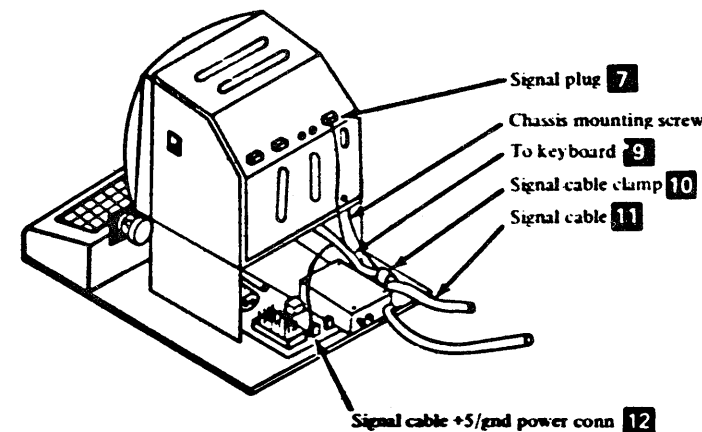
- ( ) 6. Verify that the power select switch [4] equals the user's voltage. If necessary, change position of the switch to match.

**CAUTION.** Hazardous voltages are present in the unit. The safety shield [5] and primary power box cover [6] should be installed before power is turned on.



- ( ) 7. If the signal cable is installed on the display unit, go to step 15. If not, continue with the following steps.
- ( ) 8. Remove the cable clamp (NYLON) and screw, located at the right rear corner of the 4979 unit (viewed from the rear), [10].

- ( ) 9. Take the 4979 end of the cable and plug the SLT connector card and card guide supplied, into the connector located at the right corner of the keyboard assembly (viewed from the rear). This branch from the cable assembly is routed under the video part of the unit [9]. Connect the cable connector and the connector on the keyboard with the spring clip supplied.
- ( ) 10. Take the two wire branch from the cable assembly [11], and plug into the connector located on the mounting bar of the unit. The correct connector is: the one located on the right side of the mounting bar as viewed from the rear [7].
- ( ) 11. Take the four wire branch from the cable assembly and plug into the +5V and ground connector located on the power supply card. The power supply card is located at the left-rear corner of the unit and the connector is located on the rear of this card next to the fuse (as viewed from the rear) [12].



## INSTALLATION PROCEDURES INST

- ( ) 12. With the cable clamp and screw supplied, clamp the cable assembly to the 4979 frame at the right-rear corner of the frame [10].
- ( ) 13. Remove the right rear video frame mounting screw and place the ground lead of the cable assembly between the video frame and base plate [8]. Reinstall the mounting screw, fastening the ground lead at the same time.
- ( ) 14. Ensure that the cable assembly is routed in such a way that it will not get pinched when the covers are reinstalled. Ensure that all connections are secure.
- ( ) 15. Reinstall the covers and holding screws. **NOTE:** Before tightening the holding screws for the top covers, ensure that the cover does not provide interference with the top or bottom row of keys. Slide the cover as necessary to release the keys.
- ( ) 16. Reinstall the power and contrast knobs.
- ( ) 17. Route and attach the signal cable to the system as described in "Connecting External Units to Rack".
- ( ) 18. Do not plug in the power cable at this time.

Series/1

Seq No	Part No	EC No	755020		
	8326725	Date	2 Nov 77		

## INSTALLATION PROCEDURES

### INSTALLING OTHER I/O DEVICES

Other I/O devices which may be installed before the card files are returned to their normal positions are:

- Timers
- Communications features
  - Asynchronous communications Control (ACC)
  - Binary Synchronous Communications (BSC)
  - Synchronous data link control (SDLC)
- Direct program control (DPC)
- Start-stop devices to the teletypewriter adapter
  - Printer-keyboards
  - Printer-displays
  - Keyboard-display-printers
  - Printers
  - Tape cassettes
  - Tape
  - Card readers
  - Badge readers
  - Plotters
- IBM RPQ (Request Price Quotation) devices

These devices can attach to the attachment cards in one of three methods determined by 1) the device and 2) accessories ordered with the system. These methods are:

- 1 Through the customer access panel
- 2 Through optional IBM-supplied cables
- 3 By connection directly to the attachment cards

NOTE--The IBM Customer Engineer does NOT connect non-IBM cables or equipment to the customer access panel, optional IBM-supplied cables, or attachment cards. The

installation of all IBM supplied equipment must be completed before any non-IBM cables and/or equipment are installed. IBM cables and attachment cards are tested using MAPS, diagnostics, wrap connectors, and/or terminators. Do NOT use non-IBM equipment to verify correct installation of IBM equipment.

When cables must be routed inside the rack, use "CONNECTING EXTERNAL UNITS TO RACK" as a procedure.

**CAUTION** - Integrated DI/DO cables must NOT be connected until after power has been connected. This is because grounding continuity is vital. After all devices have been installed, push the card files into the rack and fasten them securely.

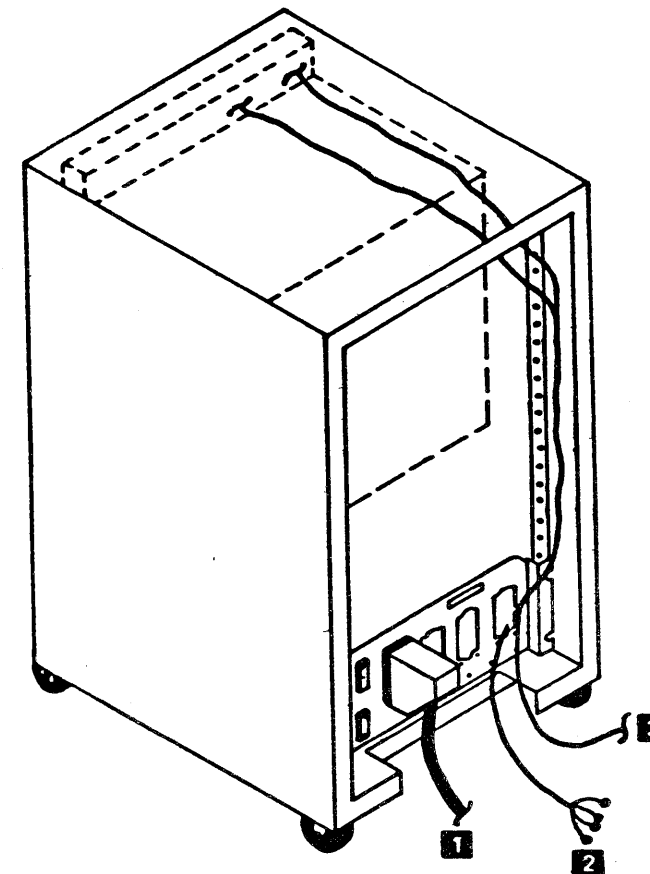
Cables from the customer access panel to the user's external source are connected by the user.

#### Attached Equipment (Non-IBM)

Equipment not supplied by IBM but attached to or installed in the IBM enclosure, must not use or share ac or dc power from IBM units except as specifically permitted by IBM.

Mounting non-IBM equipment in the same enclosure with IBM units can affect system performance because of electrical noise, increased thermal load, or changes in air flow.

If you want to know if IBM will permit a specific device to share power with the IBM units, contact your local IBM Branch Office.



Series/1

Seq No	Part No	EC No	755020			
	8326725	Date	2 Nov 77			

This page intentionally left blank

Series/1

Seq No	Part No	EC No	755020			
	8326725	Date	2 Nov 77			

# INSTALLATION PROCEDURES

## ADDRESSING/TERMINATION

All addressing and terminating is completed before shipment. If address must be assigned or changed, refer to APPENDIX A. FEATURE PRIORITY AND ADDRESS ASSIGNMENT.

## CHECKS

### Prepower Checks

- ( ) Check ac voltages at service outlets and verify that they are inside the limits given in the table for the power source. Use Simpson 260 meter, or similar ( $\pm 3\%$  tolerance) meter. Check all phases. If the line voltages are not inside tolerance, they must be corrected before you continue with the installation.
- ( ) Verify that the machine voltage labels and customer's service voltages are equal.
- ( ) The Processor Card Files and Expansion Card Files use a high frequency power supply and as such are not limited to absolute voltages but operate over a range of either high (200-235 Vac) or low (100-123.5 Vac voltages). Ensure that the voltage rating of the machine matches the ac input voltage range (high or low).

Some power supplies are limited to absolute ac input voltages. Therefore, the inputs for the following products must measure as shown in the table.

- ( ) 4964 DISKETTE - Pull the unit 1/2 out of the Rack Adapter. Locate the "this machine is wired for \_\_\_Vac" label on top of the unit's outer cover.
- ( ) 4962 DISK STORAGE - Pull the unit out from the rack enclosure and remove the outer cover. Locate the "this machine is wired for \_\_\_Vac" label on the voltage barrier terminal strip.
- ( ) 4982 SENSOR I/O - Remove the front cover and open the gate. Locate the "this machine is wired for \_\_\_Vac" label on front of the power supply.
- ( ) If voltage changes are to be made to the power supply to equal the ac input service voltages, you are to install an IBM PFBM Voltage Conversion (Feature Field Bill Material).

If the AC service input voltages are not inside the high and low range as specified in the table do not continue with the installation until the voltages are corrected.

	Machine voltage level (nominal input)	Acceptable range							
		4997		4973		4974		4979	
	60 Hz	High	Low	High	Low	High	Low	High	Low
Low voltage	100	110	90	110	90	110	90	-	90
	110	121	99	121	99	121	99	-	-
	115	126	104	126	104	126	104	-	-
	123.5	136	111	136	111	136	111	136	-
High voltage	200	220	180	220	180	220	180	-	180
	208	229	187	229	187	229	187	-	-
	220	242	198	242	198	242	198	-	-
	230	253	207	253	207	253	207	-	-
	235	258	212	258	212	258	212	258	-

	Machine voltage level (nominal input)	Acceptable range							
		4997		4973		4974		4979	
	50 Hz	High	Low	High	Low	High	Low	High	Low
Low voltage	100	110	90	110	90	110	90	-	90
	110	121	99	121	99	121	99	-	-
	115	126	104	126	104	126	104	-	-
	123.5	136	111	136	111	136	111	136	-
High voltage	200	220	180	220	180	220	180	-	180
	220	242	198	242	198	242	198	-	-
	230	253	207	253	207	253	207	-	-
	235	258	212	258	212	258	212	258	-

Series/1	Seq No	Part No	EC No	755020		
		8326725	Date	2 Nov 77		

## INSTALLATION PROCEDURES

### Turn On Power

If, after a thorough visual inspection of the units, no shipping damage is found, turn on ac power to the system including all I/O units as follows:

- ( ) Switch off all the main power switches for each unit.
- ( ) Insert free end of ac power cable into customer service outlet.
- ( ) Set the Rack IFO (Instant Power Off) circuit breaker in the rear of the Rack to the ON position.
- ( ) Switch on all switches, one at a time.

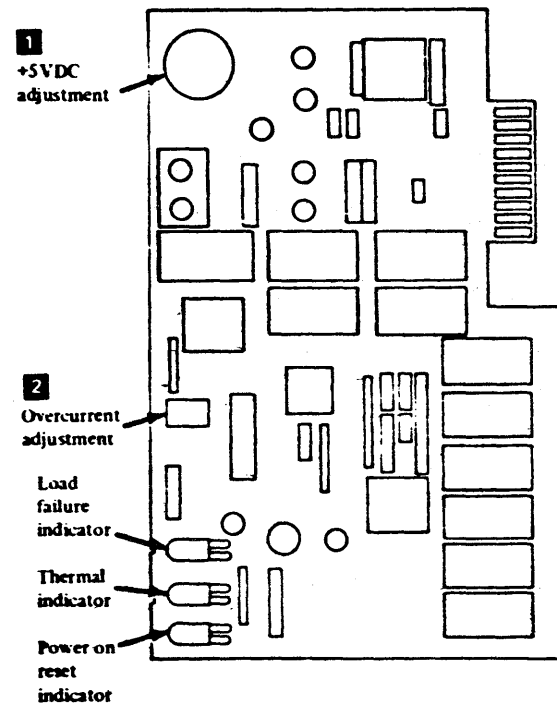
**NOTE:** If power does not come up, see power supply MAP charts for correcting power supply problems. If all voltages are not present, the power will drop. If needed, a dc voltmeter of  $\pm 1\%$  tolerance should be used, such as Simpson Model 260, Weston 901, Fluke Model 885A/CC.

### Adjust Overcurrent Setting

Adjust the overcurrent setting on the sequence and control card on both the full width and half width card files only if features are added to the product beyond the original plant order.

**NOTE:** Do Not Adjust if feature cards are not added to the machine beyond original plant shipment configuration.

- ( ) a) See the figure below and turn the current limit potentiometer [2] on the sequence and control card counterclockwise until the power unit powers off.
- ( ) b) Turn the potentiometer four (4) turns clockwise.
- ( ) c) Turn the power switch Off and then On.



### Adjust +5 Volts DC Potentiometer

Adjust the +5 Volt dc potentiometer [1] located on the power supply sequence and control card between 5.0 and 5.1 Vdc for both the full and half width card files. Measure the voltage using the pins shown in the chart on the next page.

### Measure DC Voltages

Measure each dc voltage. Use the chart on the next page to determine the correct test points for the processor and/or I/O Expansion Unit that you are installing.

**CAUTION** If a signal and voltage pin are short circuited, one of the processor cards will be destroyed.

Turn power switch off before the backpanel cover is removed. Turn the power on after the cover is removed and perform the steps below, turn power switch off and reinstall the cover after you end this subsection. It is recommended that the pin extender P/N 2594238 (shipped in the processor Ship Group) be used when testing voltages on the pin side of the board.

Full Width Card Files: (machines #4955, 4959, 4953B and D)

Ensure that the +8.5 Vdc, -5 Vdc, +12 Vdc, and -12 Vdc voltages are present and in tolerance, as measured at the rear of the backboard. The +12 Vdc and -12 Vdc voltages will be present only if the optional  $\pm 12$  regulator card is installed in the power supply. This regulator card is the left most card position on the front of the power supply. Note that these four voltages are not adjustable.

## INSTALLATION PROCEDURES INST

Half Width Card Files (Machine 4953 A and C).

The  $\pm 12$  volts are always present on this machine. All D.C. voltages of the 4953 Models A and C are adjusted to levels within tolerance by adjusting the potentiometer on the power supply sequence and control card. Observe the voltage on J11 pin 1. The J11 connector is located on the front of the power supply; pin 1 is on the left side of J11. The voltage on this pin with respect to ground will be +5V  $\pm 0.5V$  when the potentiometer is properly set. All D.C. output voltages will be within tolerance when this is done.

**NOTE:** DC Voltage Range at each voltage as measured on the board pins are:

+8.5 = (+9.35 to +7.82 volts)  
 -5.0 = (-5.5 to -4.55 volts)  
 +12.0 = (+13.2 to +10.92 volts)  
 -12.0 = (-13.2 to -10.92 volts)

If voltages are not inside these specifications, see the maintenance PAPS.

Series/1	Part No	EC No	755020		
		Date	2 Nov 77		



# INSTALLATION PROCEDURES

## Measure DC Voltages (Continued)

MACHINE VOLTAGE TEST GROUND  
TYPE MODEL LEVEL POINT POINT

4953 A00	+ 5.0	D2D03	
and	+ 8.5	B2G11	
4953 C00	- 5.0	B2G06	C2D08
	+12.0	B2B11	
	-12.0	B2B06	

4953 B00	+ 5.0	F2D03	F2D08
and	+ 8.5	G3B11	G3D08
4953 D00	- 5.0	G3B06	
	+12.0	G2B11	G2D03
	-12.0	G2B06	

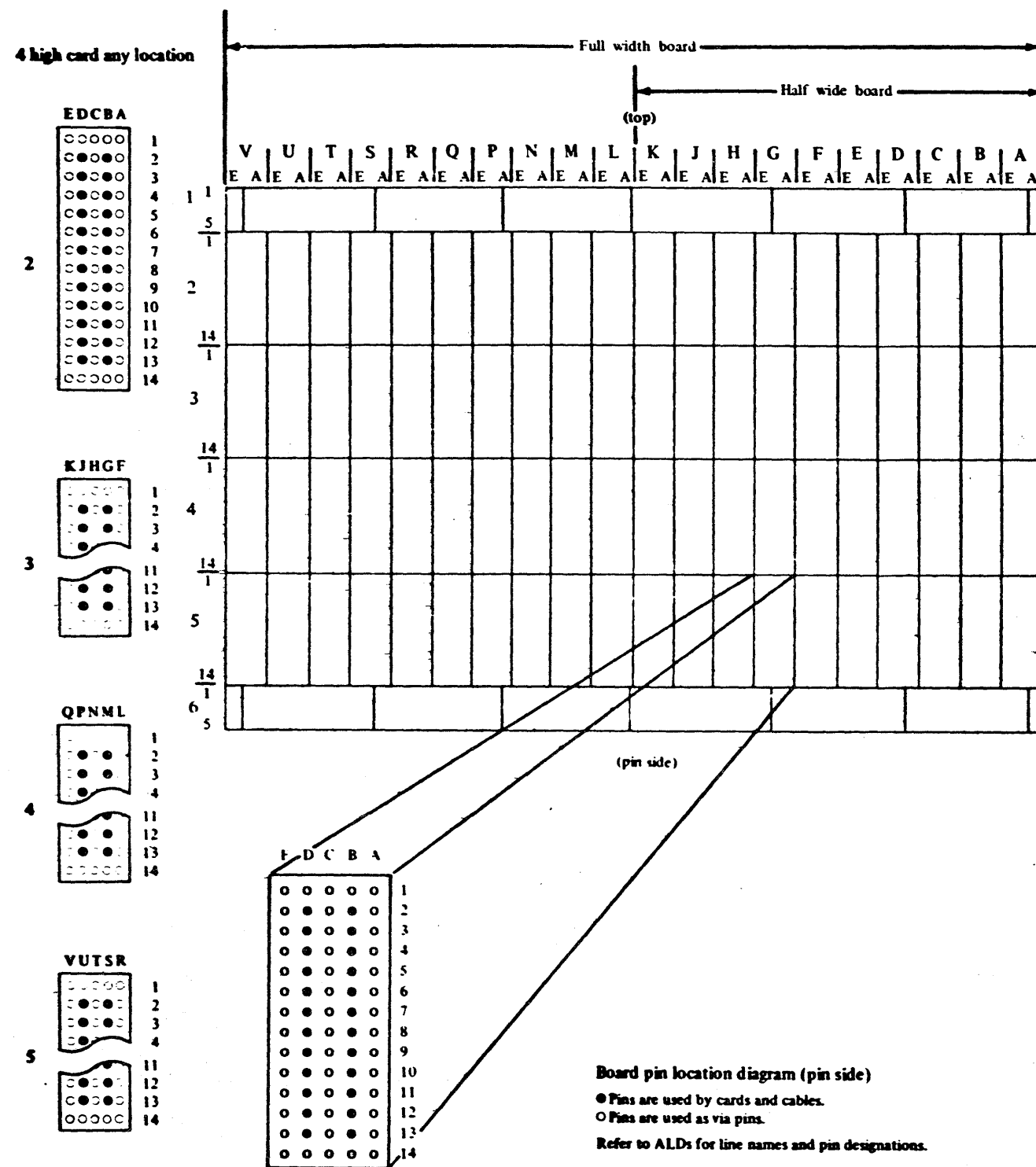
4955 A00	+ 5.0	H3D03	H3D08
	+ 8.5	M3D10	M3D08
	- 5.0	M3D05	
	+12.0	G2B11	G2D08
	-12.0	G2B06	

4955 B00	+ 5.0	I3D03	I3D08
	+ 8.5	G3D10	G3D08
	- 5.0	I3D05	
	+12.0	B2B11	B2D09
	-12.0	B2B06	

4955 C00	+ 5.0	K3D03	K3D08
	+ 8.5	P3D10	P3D08
	- 5.0	P3D05	
	+12.0	J2B11	J2D08
	-12.0	J2B06	

4955 D00	+ 5.0	L3D03	L3D08
	+ 8.5	L3D10	L3D08
	- 5.0	L3D05	
	+12.0	F2B10	F2D08
	-12.0	F2B06	

4959	+ 5.0	F2D03	F2D08
	+ 8.5	G3B11	G3D08
	- 5.0	G3B06	
	+12.0	G2B11	G2D08
	-12.0	G2B06	



Series/1	Seq No	Part No	EC No	755020			
		8326725	Date	2 Nov 77			

INSTALLATION PROCEDURES

**System Checkout**

This section gives a summary of the procedure for system checkout (test) of hardware with diagnostics.

System checkout starts with verifying the power, an internal test of the basic processor operations, and a test of the program load ability. The testing continues outward from the processor to include all parts of the system.

Inside the machine ship group are the following diskettes which are used to verify that the machine is operational:

1. Diagnostic Diskette (one or more)
2. System Test Diskette

The maintenance documents are included to aid the user in determining and locating problems if the system does not perform correctly during its checkout phase.

A Diagnostic diskette is shipped with all systems. This diskette is preconfigured to match the system. If any changes are made to the system, the diskette is to be changed to match the system. The person installing the changes will enter the real device information as specified in Diagnostic Service Guide P/N 1635010 (MAP 10.00) subsection 08.00.00 for Configurator Program.

If a Diskette Unit is not a part of the system, then the Diskette Maintenance Program Load Device P/N 1635514 must be used.

The System Test is on a separate diskette. The purpose of the System Test is to run device exercisers in an overlap mode under a System Test Supervisor. The test is to verify the hardware system.

A non-IBM device cannot be used to install and verify the system without specific permission from the customer. If the only supported alternate console device on the system is a TTY, obtain the customer's permission or use the programmer console. See 07.01.00 for message and response procedures for programmer console operation. Enter the system entry MAP, (MAP 0020, entry point A) and execute the processor and storage tests. If configuration errors occur during the configurator program auto verify, follow the MAPs and see:

- 08.00.00 of the MAPs (configurator program),
- APPENDIX A, FEATURE PRIORITY AND ADDRESS ASSIGNMENT of these installation procedures, and
- MLD Volume 01 (address and option jumpering).

When the diskette has been correctly configured, run disk surface analysis program 7869. Upon completion of 7869, run CE disk initialization program 78F0. After 78F0 has terminated, select auto mode without options. When a good auto run has been completed, see the map prolog for each of the installed devices (located in binder MLM following the service guide) and run wrap tests when available.

**NOTES:**

1. The configurator program auto verify function does not check system data (in entry 00) or device-dependent data (in entry 01-XX). Errors in this data will cause map errors.
2. When the basic diskette has been configured, use the general utility program (ID 38P9, see 09.00.00 this document) to copy the configuration record to the system test diskette and any secondary diagnostic diskette(s).

If a TTY is available, it can now be assigned the alternate console function (see Diagnostic Service Guide 08.00.00 and MAP 3881).

See System Test User's Guide, Volume SYT. Execute system test, starting and stopping on device addresses until all devices have been tested in combination with (all/several) other devices.

Each device should run a total of at least two minutes.

System installation testing is complete.

When a problem is found in loading or running a program, refer to the Diagnostic Service Guide to determine the cause.

These instructions are also available in MAP 10.00 Section 16.00.00 of the Maintenance package. However, disk initialization procedures are not included in the MAP.

Series/1	Seq No	Part No	EC No	755020		
		8326725	Date	2 Nov 77		

INSTALLATION PROCEDURES

EMC TESTING

There are no EMC tests for Series/1 and its units.

COVERS

Reinstall all covers before turning the system over to the customer.

Series/1	Seq No	Part No	EC No	755020			
		8326725	Date	2 Nov 77			

INSTALLATION PROCEDURES

AFTER INSTALLATION

RECORD UPDATING

- ( ) 1. Complete installation records and report that the installation is complete to the Branch Office dispatcher.
- ( ) 2. Install these procedures in the Maintenance Information Manual binder for future reference.

DISPOSITION OF SHIPPING MATERIAL

- ( ) Give all shipping material to the customer for his disposition.

Series/1	Seq No	Part No	EC No	755020			
		8326725	Date	2 Nov 77			

INSTALLATION PROCEDURES

USER'S INSTALLATION PROCEDURES

The IBM Customer Engineer does not connect non-IBM cables or equipment to the customer access panel, attachment cards, or sensor I/O cards. The following procedures are supplied so that the user or user's representative can complete the installation. CAUTION: Grounding circuit continuity is vital. On a system with sensor I/O attachments, the power plugs must not be disconnected without first disconnecting all user input/output circuits.

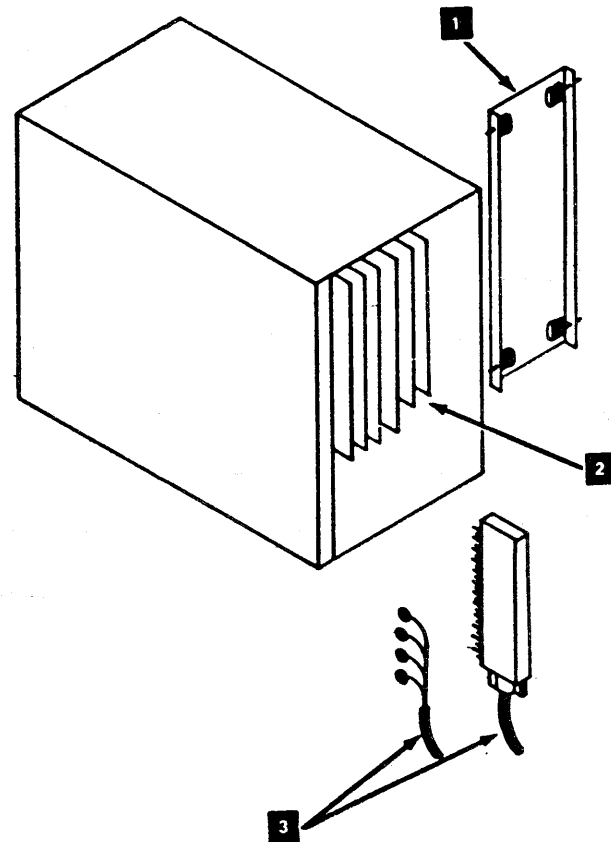
INSTALLING SENSOR I/O EQUIPMENT

4982 Sensor I/O Unit

The 4982 Sensor I/O Unit is a rack-installed unit, but external connections must be made to it. To connect the user's sensor devices to the 4982, perform the following steps:

1. Review your planning documents to determine where their cables attach in the 4982.

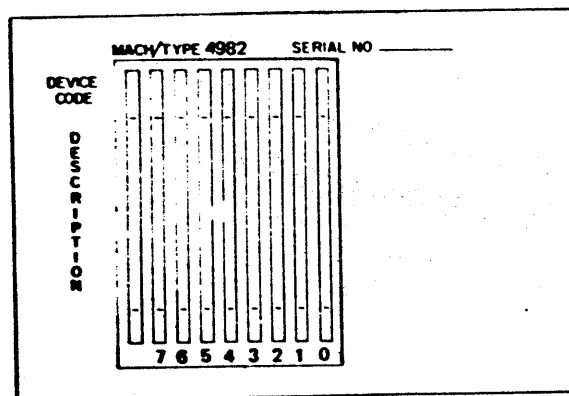
2. Review the 4982 card plug chart and ensure that the 4982's I/O cards match the planned locations.
3. Remove the cover [1] from the rear of the 4982 to the I/O cards [2].



4. Connect the user's connectors [3] to the I/O cards.
5. Use clamps to hold the cables to the right rear vertical mounting flange beside the signal cables for the other I/O devices.
6. Reinstall the cover [1].

Integrated DI/DO

Integrated DI/DO can be connected by connecting the user's cables to the connectors on the customer access panel. If the panel is not used, the cables will be connected to the feature in the card file.



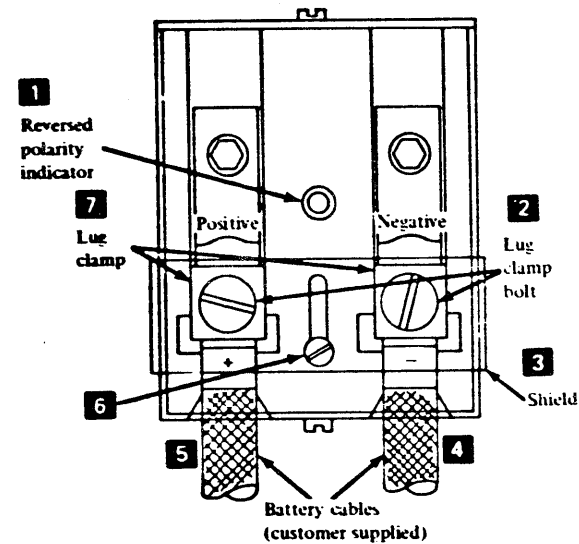
Series/1	Seq No	Part No	EC No	755020			
		8326725	Date	2 Nov 77			

INSTALLATION PROCEDURES

4999 BATTERY BACKUP UNIT

The 4999 Battery Backup Unit is a rack mountable unit, but external connections must be made to it. To connect the user's battery and charger to the 4999, perform the following steps:

- ( ) 1. Ensure that the battery circuit breaker lever on the front panel has been pulled all the way forward before any battery connection is attempted. If the breaker is in the "ON" position, it will make an audible sound when pulled forward.
- ( ) 2. Ensure that the user's battery charger cables are not connected to the battery.
- ( ) 3. Locate the battery connections block at the rear of the unit.
- ( ) 4. Loosen the clamp bolt shield screw [3] and slide the shield downward to show the clamp lug bolts [2].
- ( ) 5. The battery cables must have their insulation stripped back and all wires aligned in the same direction. #2 - #6 wire should be stripped 3.2 centimeters (1.25 inches), and #8 wire should be stripped 5.1 centimeters (2 inches) and folded back.
- ( ) 6. Insert a screwdriver through the leftmost (+) bolt hole in the transparent cover and unscrew the lug bolt. The lug clamp must be opened all of the way (until the lug bolt touches the transparent cover).



- ( ) 7. Carefully insert the positive (+) battery cable [5] through the left cable hole on the bottom of the connection block. While slightly turning the cable continuously in one direction, force it upward into the (+) lug clamp [7] as far as it will go. Hold the cable in position and tighten the cable bolt with a screwdriver. Ensure that none of the insulation is trapped inside the clamp. Tighten the bolt until the clamp has closed tightly down on the cable.
- ( ) 8. Connect the other end of the (+) cable to the battery's positive terminal.
- ( ) 9. Connect the negative (-) battery end of the cable to the battery.

- ( ) 10. Repeat step 7 for the negative (-) cable. If the reversed polarity indicator [1] flashes, the battery has been connected with the polarity reversed. Exchange the position of the cable ends at the battery end.
- ( ) 11. The user may now connect his battery charger and turn it on.
- ( ) 12. Do not reset the battery circuit breaker (step 1) until you are ready to turn on power to all of the system.

Series/1	Seq No	Part No	EC No	755020		
		8326725	Date	2 Nov 77		

INSTALLATION PROCEDURES

APPENDIX A. FEATURE PRIORITY AND ADDRESS ASSIGNMENT

FEATURE ATTACHMENT CARD RULES

In most cases, attachment cards will be plugged-in and jumpers will be installed by IBM before shipment to the user; however, if the user (1) changes the Device Address, select features, and/or card location or (2) purchases additional features after the first machine purchase, reference to this information is needed. Verification of installed jumpering on the feature card during installation is recommended.

Before installing feature cards, reference should be made to all existing customer assigned address and IPL needs. Jumpers are installed on each card, as shown in the Logics for the specific feature attachment card. The device address is installed by the Device Address Jumpers. For physical location of jumpers, see the specific feature card logics shipped with the machine and/or feature.

Cards are installed in the card file sequentially from right to left as viewed from front of the machine. Cards must be plugged next to one another or in every other socket.

When there are two or more sequential card socket spaces empty between plugged feature cards, 2.5 cm (1 inch) red jumpers (P/N 452608) must be installed to ensure proper channel operation. The jumper for each vacant socket is installed on the pin side of the backpanel from pin #11 to

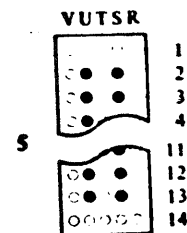
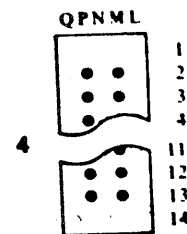
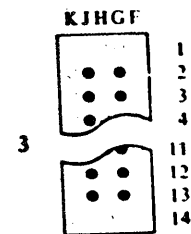
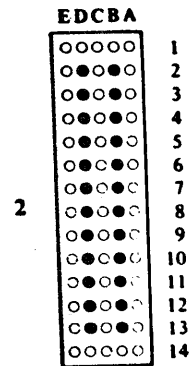
pin #12. If the "0" socket of the 4959 is empty, it and all following empty sockets must be jumpered from pin #11 to pin #12.

For Power-On-Reset for card location A, install jumper P/N 452608 on the pin side of the backpanel from pin S05 of socket position B to pin S05 of socket position A. Always install the jumper except when I/O cables are plugged directly into location A.

If the Floating Point feature #3920 is field installed, the card must be plugged in specific socket locations. The chart below shows the position of the feature card and the processor data card. Connect the half wide flat cable supplied with the feature card to the bottom half of the top connector on the Processor Data Card.

Feature #3920 position	Processor data card position
4955-A H	J
4955-B C	D
4955-C K	L
4955-D G	H

4 high card any location



Series/1	Seq No	Part No	EC No	755020			
		8326725	Date	2 Nov 77			

## INSTALLATION PROCEDURES

### FEATURE LOCATION PRIORITY ASSIGNMENTS

Priority 1 -- Processor A-slot assignment for 4953-B, 4955-A, and 4955-B.

NOTE: The A-slot location in the 4953B and D, and 4955 processors are restricted to those features that use +5 V dc only. No other voltages are available at this board location. In the 4955 processors, the power on reset is not available in this location.

- If features are in the Processor A-slot, assignment is limited to one of the following listed in order of priority:

#7840  
#6305  
#1560  
#5430

Priority 2 -- Other processor assignments

- #6315, #6325, #3920, and #6335 must be in the processor if they are ordered.
- #3581, first occurrence, must be in the processor.
- #2074 or #2075 should be in the processor if specify codes #9154 or 9155 and 4999 are selected and #2010 is included in the processor.

Priority 3 -- Units containing communication features

- #2010 is needed for all units except 4953-A.

- #2092 adapters must be installed next to the #2091 Controller.
- #2094 adapters must be installed next to the #2093 controller.
- Up to 24 lines permitted per unit.
- #2000 is recommended for all units except 4953-A.
- If remote IPL and 4999, all communications should be assigned to the processor.
- If all communications features will not install in the processor, groups of 24 lines should be assigned to 4950-A. Priority will then be given to remote IPL feature #2074 with specify code 9154 or #2075 with specify code 9155 in the processor.
- If no remote IPL, then Communications feature should be assigned to units in groups of 24 lines.

Priority 4 -- All other assignments in order of priority:

7850 if 4999  
3581  
2074 if 9154  
2075 if 9155  
1610  
2090  
2092 2nd or 2N occurrence

2091 1st or 2N-1 occurrence  
2092 1st or 2N-1 occurrence  
2094 2nd or 2N occurrence  
2093 1st or 2N occurrence  
2074 if 9154  
2075 if 9155  
3585  
3580  
5620  
5630  
7850 if no 4999  
5430  
1560  
6305  
7840  
1595

### ADDRESS ASSIGNMENT SUMMARY

As part of system configuration single device features are assigned device addresses starting with the specified first occurrence address. Multiples (more than one) of each feature will be assigned address in the same column in rows 0 to 3. The specified first occurrence of a device will always take priority over the multiple assignment of another feature in the same column. The device address configuration chart shows the priorities for assignments in one column. When a column is

## INSTALLATION PROCEDURES INST

full, additional assignments are made in the work area in the following sequence.

0C, 1C, 2C, 3C, 3D, 2D, 1D, 0D,  
0E, 1E, 2E, 3E, 3F, 2F, 1F, 0F.

RPO (Request for Price Quotations) features are assigned in the work area in the following sequence.

0F, 1F, 2F, 3F, 3E, 2E, 1E, 0E,  
0D, 1D, 2D, 3D, 3C, 2C, 1C, 0C.

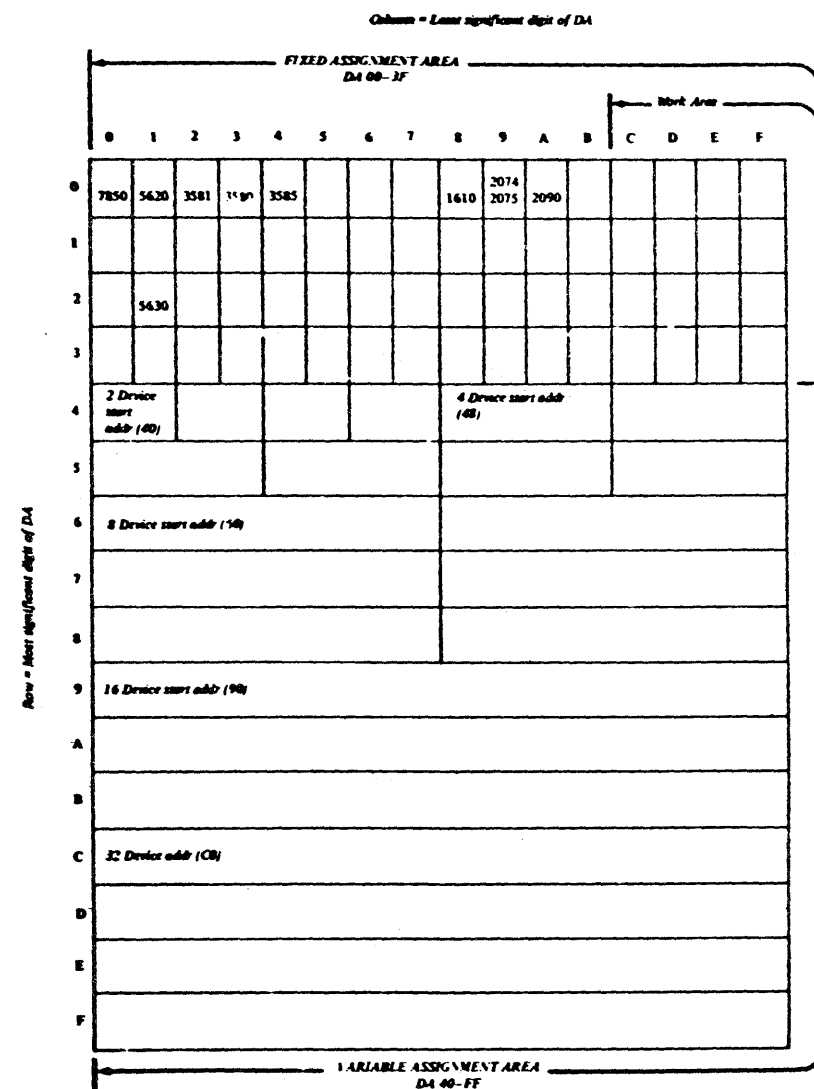
Series/1

Seq No	Part No	EC No	755020		
	8326725	Date	2 Nov 77		



# INSTALLATION PROCEDURES

# INSTALLATION PROCEDURES INST



Series/1 device address configuration chart

## FEATURE CODE IDENTIFICATION

The following feature codes are for features that plug into the 4953, 4955, and 4959 units.

- 1560 Integrated Digital Input/Output Non-isolated
- 1565 Channel Repower
- 1595 Channel Socket Adapter
- 1610 Asynchronous Communications Single Line Control
- 2000 Communication Indicator Panel
- 2010 Communications Power
- 2074 BSC Single Line Control
- 2075 BSC Single Line Control/High Speed
- 2090 SDLC Single Line Control
- 2091 Asynchronous Communications 3 Line Control
- 2092 Asynchronous Communications 4 Line Adapter
- 2093 BSC 8 Line Control
- 2094 BSC 4 Line Adapter
- 3580 4962 Disk Storage Unit Attachment
- 3581 4964 Diskette Unit Attachment
- 3585 4979 Display Station Attachment

- 3920 4955 Floating Point Processor
- 5430 Customer Direct Program Control
- 5620 4974 Printer Attachment
- 5630 4973 Printer Attachment
- 5650 Programmer Console
- 6305 Sensor Input/Output Unit Attachment
- 6315 4953 STG Increment
- 6325 4955 STG Increment
- 6335 Relocation Translator
- 7840 Timer
- 7850 Teletypewriter Adapter
- 9154 Remote IPL for Feature 2074
- 9155 Remote IPL for Feature 2075

## MACHINE TYPE IDENTIFICATION

- 4953A Processor 4 STG ±I/O
- B Processor 13 SIG ±I/O
- 4955B Processor 8 I/O
- C Processor 3 I/O
- 4962 Disk Storage
- 4964 Diskette
- 4973 Line Printer
- 4974 Printer
- 4979 Display Station
- 4999 Battery Backup

Series/1

Seq No	Part No	EC No	755020			
	8326725	Date	2 Nov 77			

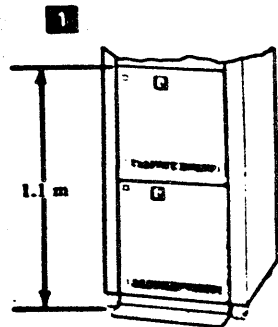
INSTALLATION PROCEDURES

APPENDIX B. INSTALLING RACK MOUNTABLE UNITS

If a rack mountable unit is shipped separately (uninstalled), it must be installed before external units are cabled to the rack. There are several rules that must be followed. Decide which of these rules to use before you continue with the installation.

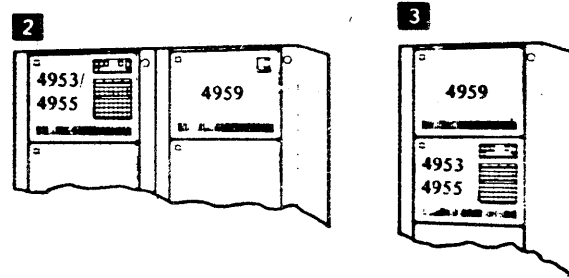
RULES

1. The 4962 Disk Storage Unit must be installed in the lower location(s) of the rack. It is recommended that (for service stability) the top of the unit [1] be no more than 1.1 Metre (42.0 inches) from the floor. This will allow two 4962 units to be installed in one rack.

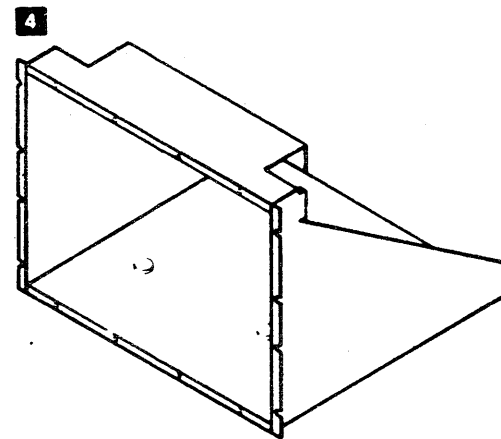


2. Install processor (4953/4955) and I/O Expansion Units (4959) next to one another in the top most locations of the rack(s). They can be vertically [3] or horizontally [2] next to one another. The user may need the I/O expansion unit

to be placed above the processor in a vertical arrangement.

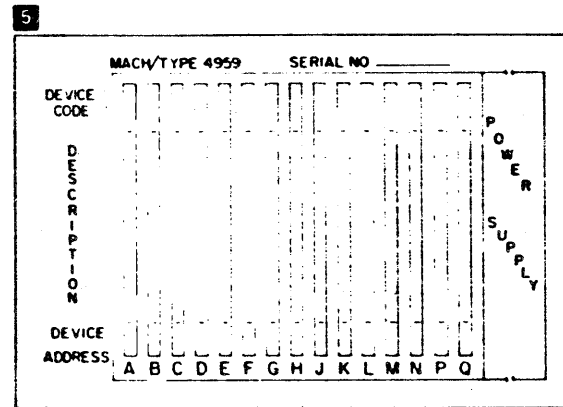


3. All half wide devices must be installed in a rack mounting fixture [4].



4. Determine the location of the attachment card by reviewing the card plug charts [5] (packed with the diagnostic diskettes) for the 4953/4955/4959 units that make up your system.

NOTE: If the attachment card is not installed and no location or address is assigned, see APPENDIX A -- FEATURE PRIORITY AND ADDRESS ASSIGNMENT.



5. Install each machine using the Installation Procedures that accompany it.

Series/1	Seq No	Part No	EC No	755020			
		8326725	Date	2 Nov 77			

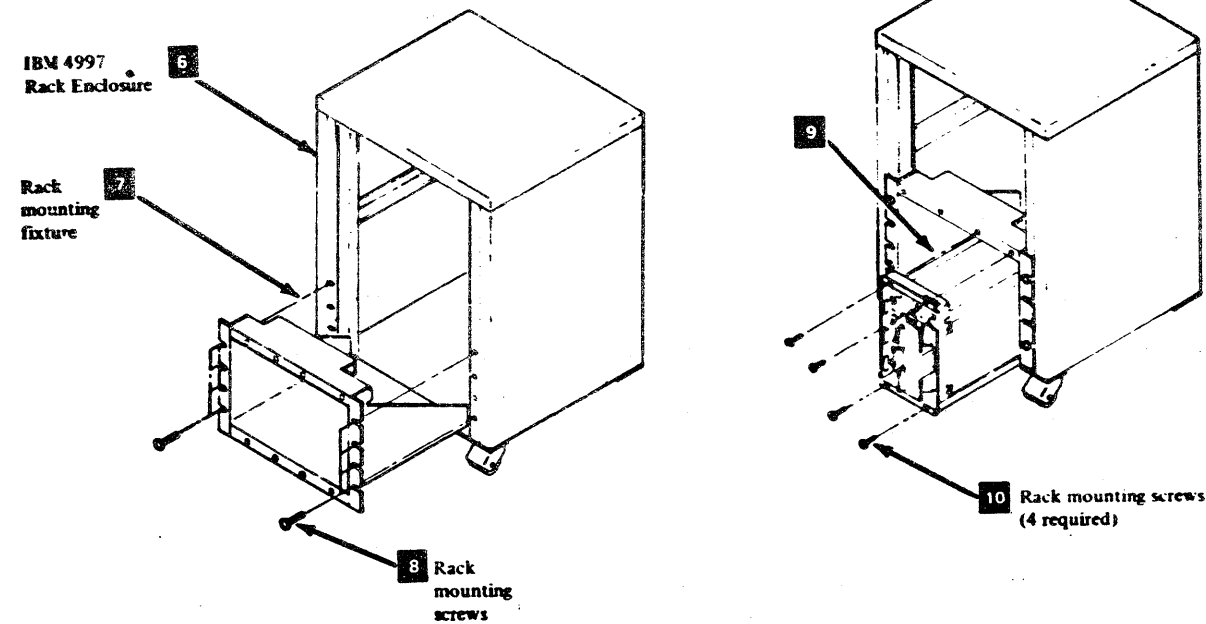
# INSTALLATION PROCEDURES

## RACK MOUNTING FIXTURE INSTALLATION

Several units of the Series/1 are half wide and need the installation of a rack mounting fixture. These units are the 4982 Sensor I/O Unit, 4964 Diskette Unit, 4999 Battery Backup Unit, and 4953 A or C Processor Unit.

1. Check Installation Procedures for the unit(s) that will be installed in the fixture for special instructions. For example, the diskette service guide pin must be installed in the fixture before the 4964 is installed.

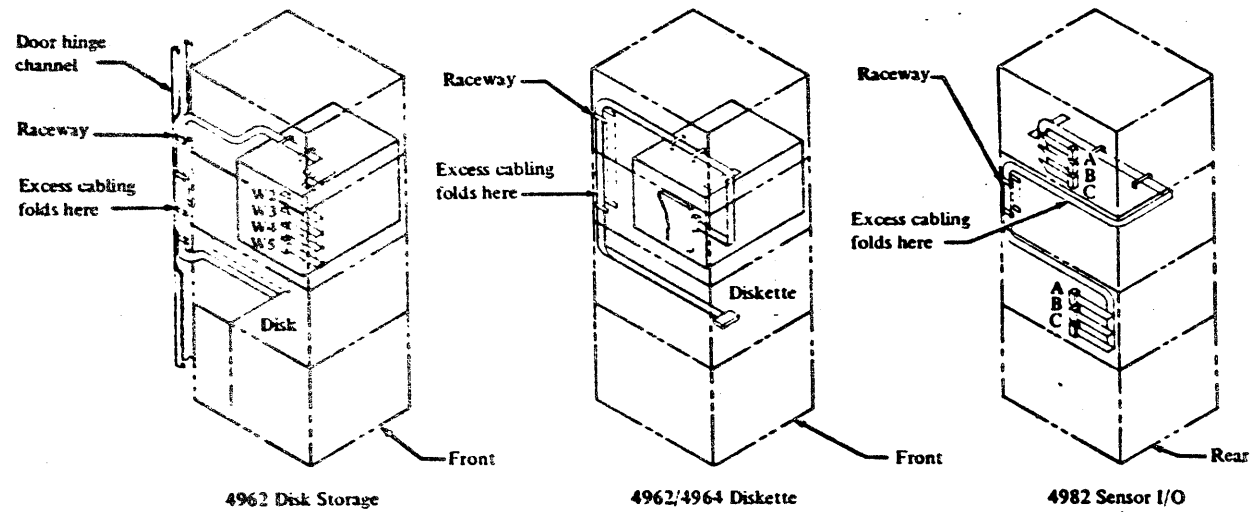
2. Install the fixture [7] from the front of the rack [6] and fasten with eight black #10-32 screws [8].



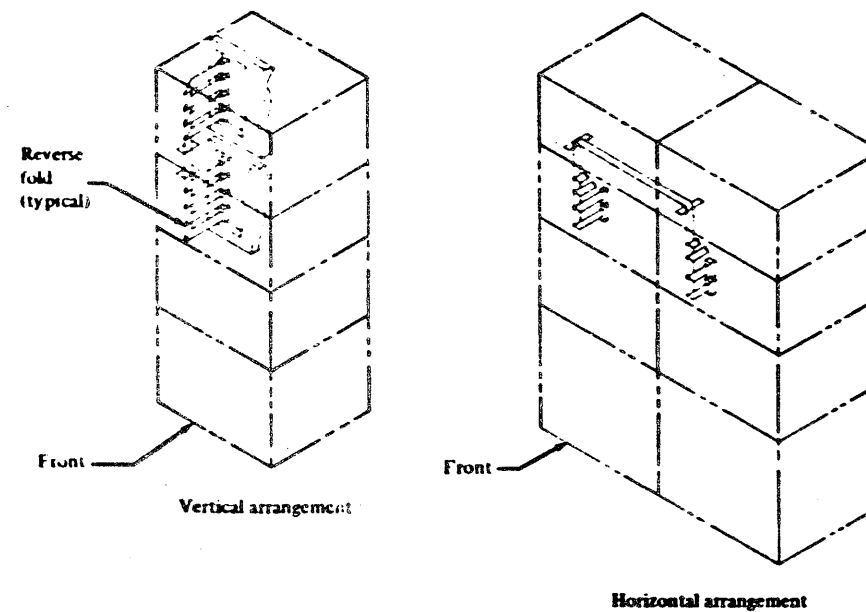
3. Install the unit(s) [9] in the fixture using four blank #10-32 screws [10]. Follow the unit's Installation Procedures.
4. Adjust the front cover by loosening the screws and bracket latch, centering the ON-OFF switch, and tightening the screws.
5. Route the cables to the attachment card using the unit's installation instructions. Figures [11] and [12] show typical cable paths.

## INSTALLATION PROCEDURES INST

11 Typical unit to attachment card cabling



12 Processor to I.O Expansion unit cabling



Series/1

Seq No	Part No	EC No	755020		
	8326725	Date	2 Nov 77		