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## Rack Mount Kits

For rack mounting HP 86120A/B/C instruments.



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## Safety Symbols

The following safety symbols are used throughout this manual. Familiarize yourself with each of the symbols and its meaning before operating this instrument.

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### **CAUTION**

The *caution* sign denotes a hazard to the instrument. It calls attention to a procedure which, if not correctly performed or adhered to, could result in damage to or destruction of the instrument. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.

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### **WARNING**

**The *warning* sign denotes a life-threatening hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning sign until the indicated conditions are fully understood and met.**

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# Introduction

The installation instructions in this book apply to the following kits:

- Rack-mount kit, 86120-60030
- Rack-mount kit with handles, 86120-60031
- Rack-slide kit, 1494-0059

These kits mount 4.5-inch instruments into a rack with 482.6 mm (19 inch) spacing. For a list of parts contained in the kits, refer to “Replacement Parts” on page 17.

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### CAUTION

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When installing the rack-mount kits, the instrument’s cover must be temporarily removed. Because this exposes the internal circuits to electrostatic discharge, perform the procedure at a static-safe workstation. Refer to “Electrostatic Discharge Information” on page 19.

### Required Tools

The following tools are needed to assemble the rack-mount kits. If a 7 mm nut driver is unavailable, the needlenose pliers may be substituted.

- #1 pozidrive screwdriver
- #2 pozidrive screwdriver
- 4 mm hex key (included with kit)
- 7 mm nut driver (preferred) or needlenose pliers
- 5.5 mm nut driver (preferred) or needlenose pliers
- T-6 TORX driver
- T-10 TORX driver, right angle (included with kit)
- T-15 TORX driver

For any assistance, contact your nearest Hewlett-Packard Sales and Service Office. Refer to “Hewlett-Packard Sales and Service Offices” on page 21.

**Contents**

To rack mount the instrument 6  
To install the rack-slide kit 15  
Replacement Parts 17  
Electrostatic Discharge Information 19  
Hewlett-Packard Sales and Service Offices 21

## To rack mount the instrument

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## To rack mount the instrument

Please observe the following. Circled numbers in this procedure refer to items shown in figures. HP part numbers are listed in parenthesis. You will find these part numbers listed on the bags that contain the parts.

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### WARNING

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**The opening of covers or removal of parts is likely to expose dangerous voltages. Disconnect the instrument from all voltage sources while it is being opened.**

1. Disconnect the power cord from the instrument.
2. Place the instrument face down as illustrated in Figure 1.
3. Remove the eight screws (four per side) securing the front bumpers ② to the instrument.
4. Remove the two screws securing the handle, and remove the handle.
5. Use a 4 mm hex key (8710-1755) to loosen the four screws ③ in the rear feet to disengage the cover assembly ① from the instrument.

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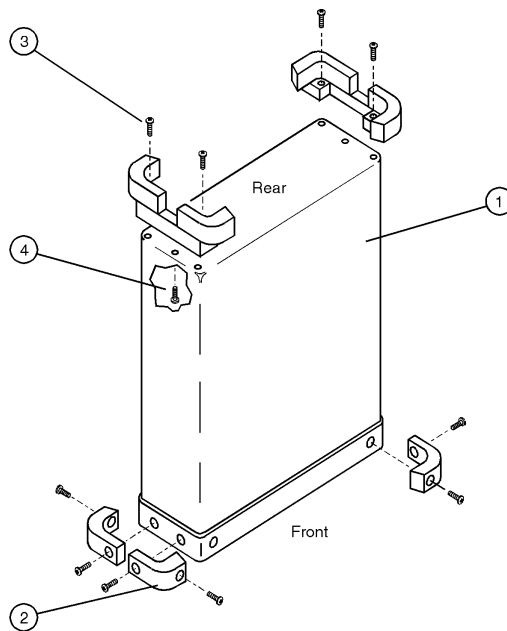
### CAUTION

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Beneath the cover, located in the vicinity of the handle attachment screws, are two finger springs that reduce electro-magnetic interference (EMI). These springs can be damaged. To avoid damage, perform the following steps carefully to remove the cover.

6. Located the side of the instrument opposite to where the handles were attached. While applying pressure to this side, simultaneously pull on the instrument foot that is located on the side where the handle was attached.

This action relieves strain on the springs while removing the cover.



**Figure 1. Preparing the cover assembly**

7. Slide the instrument cover assembly toward the rear of the instrument, and remove the cover from the instrument.
8. Remove the two screws ④ that attach the rear feet to the cover assembly, and remove the feet. These screws are located inside the cover.
9. Remove the six screws that secure the two bottom tilt-stand feet, and remove the feet. The screws are located inside the cover. Use the T-10 right-angle TORX key included with the kit.

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**CAUTION**

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Be careful to protect the instrument's cable assemblies and components from damage when you replace the cover assembly. Use key caution to avoid damaging the EMI springs. If you damage an EMI spring, you can order a new one using HP part number 8160-0656.

10. Slide the cover assembly back onto the instrument chassis while applying pressure to the side of the cover that is opposite the handle

## To rack mount the instrument

attachment points.

Gentle pressure ensures that the cover will not bind against the EMI springs. Make sure that the seam in the cover is located on the bottom of the instrument.

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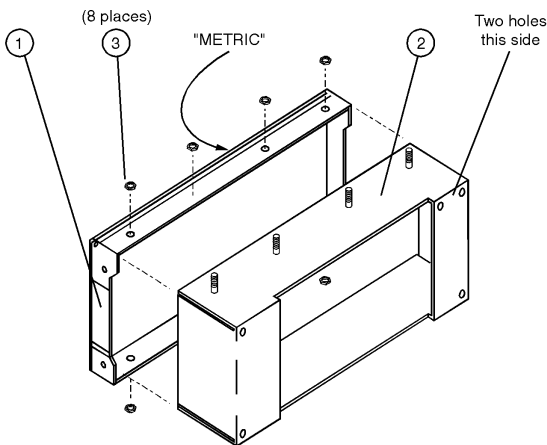
### CAUTION

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Make sure that the instrument's cover properly engages the gasket in the instrument's front frame.

11. Onto each of the four socket-head cap screws (0515-0049), place a split-lock washer (2190-0587) and a flat washer (3050-0894).
12. Use these screws to temporarily attach the instrument's cover.
13. Locate the rack-mount kit's rear support ② (5002-0634) and rear frame ① (5021-5804) as illustrated in Figure 2.

The text "METRIC" on the frame and the two adjacent holes illustrated in the figure identify the top sides. This orientation ensures that the top of the frame and the top of the rear support are joined correctly.



rack2

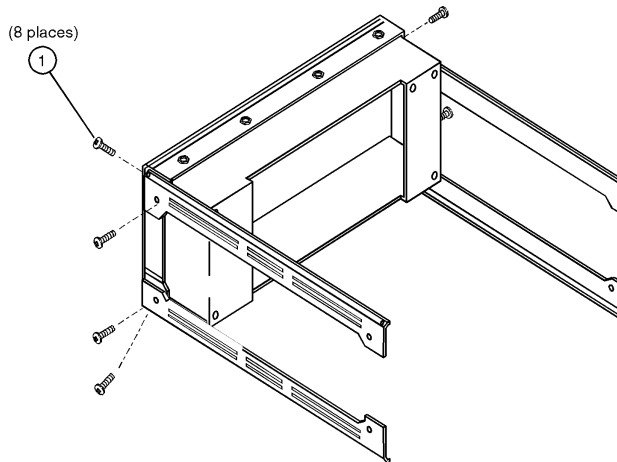
**Figure 2. Assembling the rack's rear frame**

14. Position the rear support's studs into the corresponding top row of holes in the rear frame.
15. Slightly squeeze the rear support until the bottom row of studs clears



the rear frame and insert into the bottom row of holes. Fasten with eight nuts ③ (0535-0031). Alternately tighten each nut to the recommended torque of 6 inch-pounds.

16. Attach the four side struts (5021-5837) to the rack's rear frame using eight screws ① (0515-1331). See Figure 3.

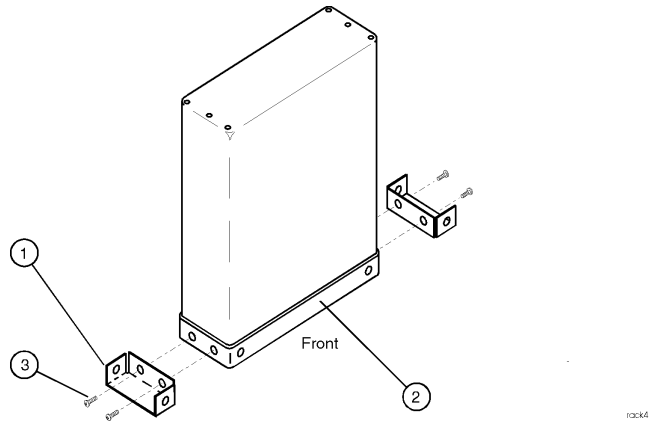


rack3

**Figure 3. Attaching the side struts**

17. Connect the two front mounting brackets ① (5002-0633) to the instrument's front frame using four pan-head screws ③ (0515-1079). See Figure 4. Tighten each screw to a torque of 6 inch-pounds.
18. Locate the kit's front frame (5021-8403). Look into the frame as if you were looking into the front of an instrument. Find the two vent holes which are about half an inch long and a quarter of an inch high. When the frame is installed, these holes must be oriented along the bottom of the instrument.

## To rack mount the instrument



**Figure 4. Attaching the mounting brackets**

19. Slide the kit's front frame ① over the rear of the instrument until it is over the instrument's front frame. See Figure 5.
20. Attach the frame to the front brackets using four flat-head screws ② (0515-1234).
21. Place the dress panel ③ (5002-0640) over the instrument's front panel. Secure with four nuts ④ (0535-0082) tightened to a torque of 6 inch-pounds.

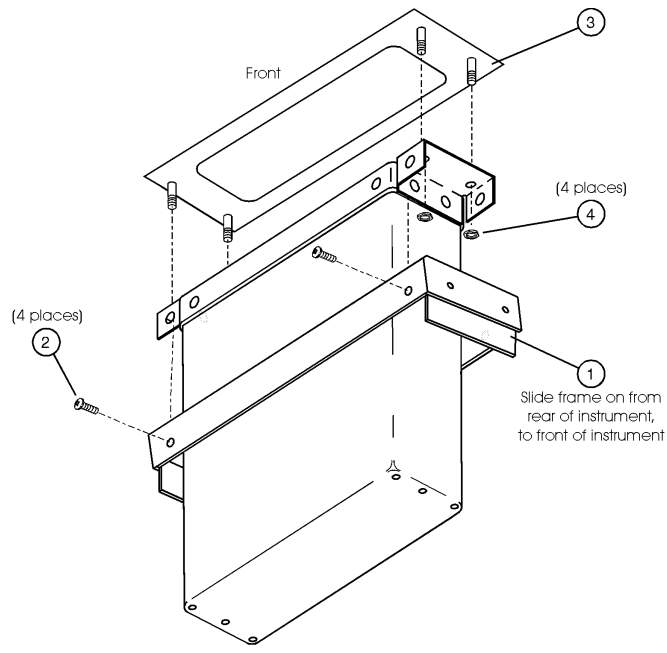
If you *do not* have a 7 mm nut driver, use the spring clips rather than the six nuts. Apply the spring clips to the dress panel studs using needlenose pliers.

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**CAUTION**

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Do not overtorque the nuts.



**Figure 5. Attaching the front**

22. Place the instrument on its front frame.

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**CAUTION**

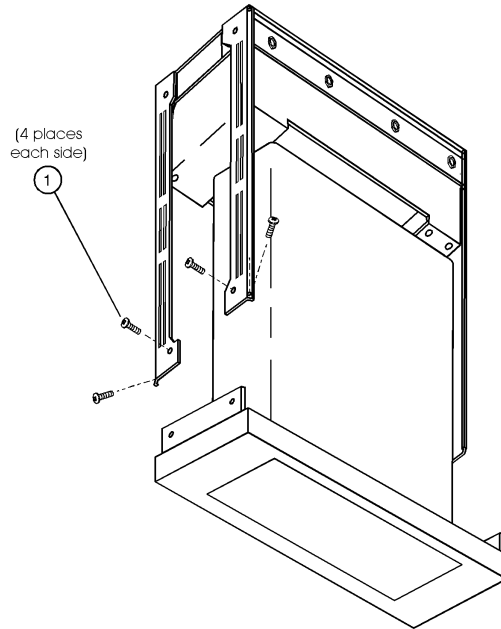
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Avoid damaging the instrument's front panel and input connector by placing it onto a surface protected by cloth.

23. Remove the four socket-head cap screws that secure the instrument's cover. Do not remove the cover. You attached these screws in step 12.

24. Place the rack-mount kit frame onto the instrument as shown in Figure 6.

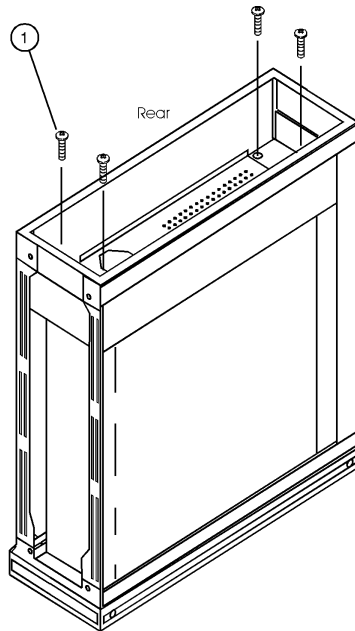
## To rack mount the instrument



rack6

**Figure 6. Attaching the rack frame**

25. Secure the four side struts to the front frame using eight screws ① (0515-1331). Torque the screws to 12 inch-pounds.
26. Use the four socket-head cap screws ① removed in step 23 to secure the instrument's cover as shown in Figure 7.



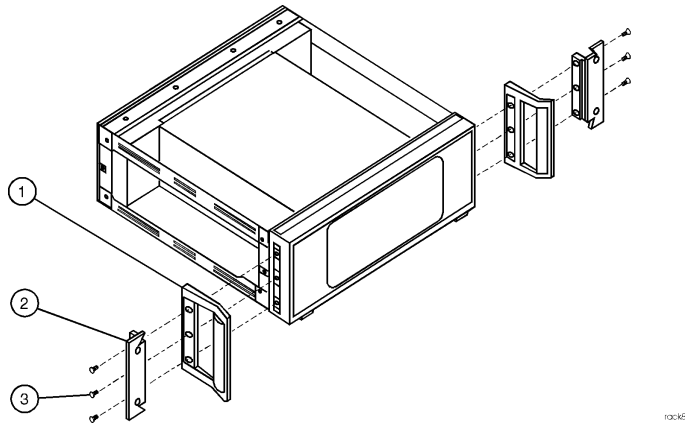
rack7

**Figure 7. Securing the frame**

27. Place the instrument in its operating position. See Figure 8.

28. If you are installing the rack-mount kit with handles (5062-3983), mount the handles ① and rack flanges ② to the rack frame using six pan-head screws ③. Tighten each screw to a torque of 12 inch-pounds.

## To rack mount the instrument



**Figure 8. Attaching the flanges and handles**

29. If you are installing the rack-mount kit without handles (5062-3977), mount rack flanges ② directly to the rack frame using six pan-head screws ③. Tighten each screw to a torque of 12 inch-pounds.

30. The instrument is now ready to mount into the system rack.

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### **WARNING**

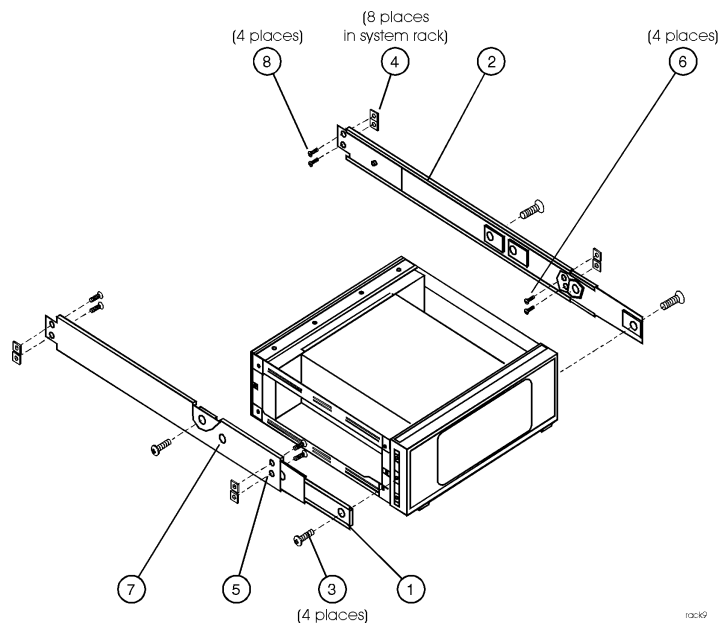
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**If an instrument handle is damaged, it should be replaced immediately. Damaged handles can break while the instrument is being moved or lifted. This may cause damage to the instrument or personal injury.**

## To install the rack-slide kit

1. Install the rack-mount kit as described in “To rack mount the instrument” on page 6.
2. Expand each rack slide to its full length.

Note that Figure 9 does not show the rack slide extended to its full length.



**Figure 9. Installing rack slides**

3. Separate the inner slide member ① from the outer slide member ② by pressing the release button located on the inner slide member.

### **To install the rack-slide kit**

4. Pull the inner slide member out of the assembly.
5. Attach an inner slide member to each side of the rack-mount frame using four (two per side) M5 X 0.8 X 14 mm pan-head screws ③.
6. Insert two unistrut nuts ④ in each of the four vertical columns of the systems rack.
7. Compress each outer-slide member to its shortest length, revealing the holes ⑤ for screws ⑥. If necessary, press the release button ⑦.
8. Attach an outer slide member to each side of the systems rack, using two M4 X 0.7 X 12 mm flat-head screws ⑥ in the front and two M4 X 0.7 X 12 mm pan-head screws ③ in the rear.
9. Place the instrument into the rack by sliding the inner slide members into the outer slide members. Use the release buttons, located on the slides, to enable complete compression of the slides.
10. To prevent the rack slides from accidentally opening, use screws to secure the rack frame to the system cabinet.



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## Replacement Parts

**Table 1. Rack-Mount Kits (86120-60030 and 86120-60031)**

<b>HP Part Number</b>	<b>Qty</b>	<b>Description</b>
5062-3983	1	Front-handle kit ( <i>with handles</i> ). Supplied with 86120-60031 kit.
5062-3977	1	Front-handle kit ( <i>without handles</i> ). Supplied with 86120-60030 kit.
8710-1755	1	Hex Key, 4mm
8710-1657	1	T10 right-angle TORX key
5002-0640	1	Dress Panel
5021-8403	1	Front Frame
5002-0633	2	Front Bracket
5002-0634	1	Rear Support
5021-5804	1	Rear Frame
5021-5837	4	Side Strut
0535-0031	8	Nut M3 X 0.5mm
0535-0082	4	Nut M4 X 0.7mm
2190-0587	4	Lock Washer M5.0 ID
3050-0894	4	Flat Washer M5.0 ID
0510-1148	6	Push-On Retainer Clips
0515-0049	4	Screw, Socket-Head M5 X 0.8 X 12 mm-LG
0515-1079	4	Screw, Mach M3 X 0.5 8 mm-LG PAN-HD
0515-1234	4	Screw, Mach M3.5 X 8 mm-LG FLAT-HD
0515-1331	16	Screw, Mach M4 X 0.7 6 mm-LG FLT-HD

## Replacement Parts

**Table 2. Rack Slide Kit (HP part number 1494-0059)**

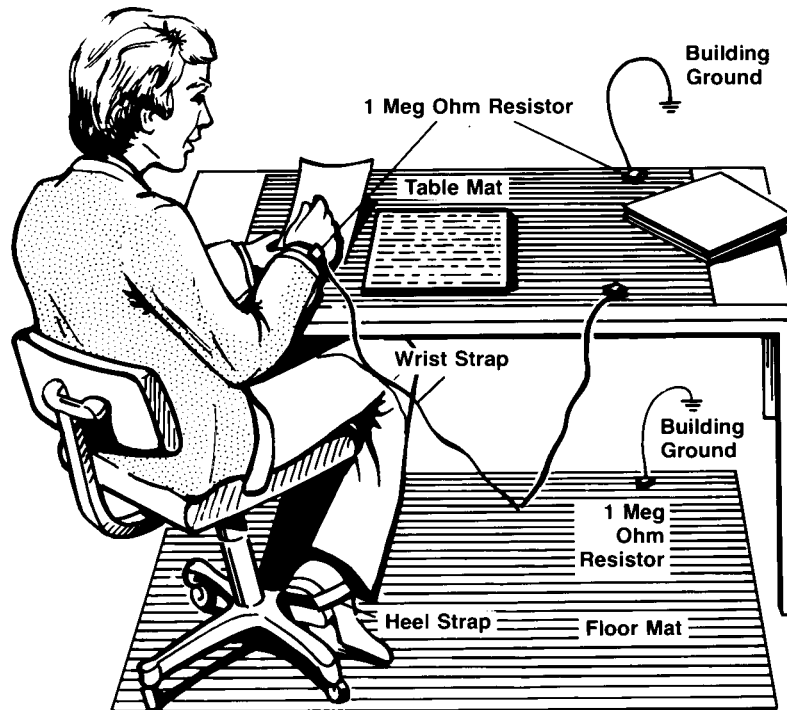
<b>HP Part Number</b>	<b>Qty</b>	<b>Description</b>
—	2	Slides (not sold separately)
0515-0949	4	Screw, Mach M5 X 0.8 14 mm-LG PAN-HD
0515-1013	4	Screw, Mach M5 X 0.7 12 mm-LG FLAT-HD
0515-0909	4	Screw, Mach M4 X 0.7 12 mm-LG PAN-HD
0535-0080	8	Unistrut Nut M4 X 0.7

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## Electrostatic Discharge Information

Electrostatic discharge (ESD) can damage or destroy electronic components. All work on electronic assemblies should be performed at a static-safe work station. The following figure shows an example of a static-safe work station using two types of ESD protection:

- Conductive table-mat and wrist-strap combination.
- Conductive floor-mat and heel-strap combination.



## Electrostatic Discharge Information

Both types, when used together, provide a significant level of ESD protection. Of the two, only the table-mat and wrist-strap combination provides adequate ESD protection when used alone.

To ensure user safety, the static-safe accessories must provide at least 1 M $\Omega$  of isolation from ground. Refer to Table 3 on page 20 for information on ordering static-safe accessories.

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**WARNING**

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**These techniques for a static-safe work station should not be used when working on circuitry with a voltage potential greater than 500 volts.**

The following suggestions may help reduce ESD damage that occurs during testing and servicing operations.

- Personnel should be grounded with a resistor-isolated wrist strap before removing any assembly from the unit.
- Be sure all instruments are properly earth-grounded to prevent a buildup of static charge.

Table 3 on page 20 lists static-safe accessories that can be obtained from Hewlett-Packard using the HP part numbers shown.

**Table 3. Static-Safe Accessories**

<b>HP Part Number</b>	<b>Description</b>
9300-0797	Set includes: 3M static control mat 0.6 m $\times$ 1.2 m (2 ft $\times$ 4 ft) and 4.6 cm (15 ft) ground wire. (The wrist-strap and wrist-strap cord are not included. They must be ordered separately.)
9300-0980	Wrist-strap cord 1.5 m (5 ft)
9300-1383	Wrist-strap, color black, stainless steel, without cord, has four adjustable links and a 7 mm post-type connection.
9300-1169	ESD heel-strap (reusable 6 to 12 months).

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