Overview

The industry leading HP R/T3000 Uninterruptible Power System (UPS) packs up to 3000 watts into a space saving 2U design. Proven Digital Signal Processor (DSP) provides clean, reliable power protection in an energy efficient transformer-less design while reducing generated heat.

The HP R/T3000 UPS includes a Rack to Tower Conversion Kit for non rack applications outside the data center. In this configuration the HP R/T3000 can provide powerful protection to multiple tower servers as well as tower Blade Enclosures such as the HP c3000 BladeSystem.

In addition, Extended Runtime Modules (ERM) are available to increase battery run time during a power outage. ERMs can be used in both rack mount and tower configuration with the HP R/T3000 UPS.





- 1. Front bezel battery compartment behind bezel
- 3. Power control buttons

2. Status LED indicators



Overview



R/T3000 Tower UPS configuration with optional Extended Runtime Module

1. Optional Extended Runtime Module

3. Tower UPS floor stands

2. R/T3000 in Tower UPS configuration

Models

HP R/T3000 2880VA Low Voltage NA/JPN 2U Rackmount Uninterruptible Power System	AF452A
HP R/T3000 3300VA High Voltage NA/JPN 2U Rackmount Uninterruptible Power System	AF453A
HP R/T3000 3300VA INTL 2U Rackmount Uninterruptible Power System	AF454A

Kit Contents

- HP UPS R/T3000
- HP Power Management Software CD
- Power Products Documentation CD
- Depth adjustable fixed rack mounting rails, mounting brackets, cord retention clips
- Rack to Tower Conversion Kit and floor stand
- Communications cables
- AF453A and AF454A also includes 1 PDU Extension Bar (7 x C13 outlets each)



Standard Features

Key Features	 New convertible design can be used as a 2U rack mountable UPS or as a standalone tower UPS Increased power density with up to 3300VA / 3000 Watts (200-240V models) Greater system uptime with support for up to two Extended Runtime Modules (ERM) Easy configuration through enhanced front panel display Enterprise-wide intelligent manageability with bundled power management software Support for the HP UPS Management Module that extends the power management capabilities of the UPS More efficient voltage regulation using digital signal processing technology Ultimate long-term battery reliability with HP Enhanced Battery Management Enhanced system flexibility with two independently controlled load segments Support for Remote Emergency Power Off (REPO) circuitry Easy serviceability through modular design Hot-Swappable Batteries Backed by a three year warranty with the first year including parts and labor. HP's Pre-Failure warranty, and a \$250,000 load protection guarantee*. (Certain restrictions and exclusions apply; *Load protection guarantee available in North America only.) Optional upgrades include: Extended Runtime Modules (ERMs) Management Cards 	
New Convertible Design	The R/T3000 can be used in a traditional rack mount environment or converted to a Tower UPS to support powerful Tower servers even Tower Blade Servers such as the HP c3000 BladeSystem.	
2U Power Packed Design	n Rated near unity at 3300VA / 3000W (200-240V models), the HP UPS R/T3000 packs more power in space-conserving rack-mount design, allowing you to support more critical equipment in your rack.	
Increase System Uptime with Extended Runtime Modules	The Extended Runtime Modules are external battery modules that occupy 2U (3.5 inches) of rack space each. The HP UPS R/T3000 supports up to two Extended Runtime Modules (ERM), in either rack mount or tower configuration, which extend your overall battery runtime.	
Lower Cost of Ownership with Innovative Technology	p The HP UPS R/T3000 utilizes a new industry-leading technology that continually conditions and regulates power without using the battery, thereby increasing the life of the battery. The output voltage is automatically regulated, based on the connected load and the input voltage.	
Investment Protection with HP Enhanced Battery Management	th HP UPS R/T3000 incorporates Enhanced Battery Management: an exclusive, patented technology that doubles battery service life, optimizes battery recharge time, and provides advance notice of pending battery failure. With Enhanced Battery Management, you have a lower total cost of ownership and receive the best in the industry protection for your critical equipment.	
Enhanced Flexibility	The high voltage R/T3000 UPS include one PDU Extension Bar. The extension bar has seven C13 outlets for powering equipment in the rack and attaches to the C19 outlets on the back of the UPS. The 6.5 foot (2 meter) cord allows the extension bar to be mounted in many locations inside the rear of the rack.	



Standard Features

Remotely Monitor UPSs on The optional HP UPS Management Module features the ability to perform simultaneous network and outthe Network of-band communications. It enables network administrators to remotely monitor UPSs and reboot network devices. It provides SNMP functionality, including power event alerts, network power diagnostics, and remote UPS reboot and testing. Used in conjunction with HP Systems Insight Manager or other SNMP capable Network Management Software, power-related problems on the network are quickly discovered and remedied.

Enhanced Front PanelLED and switch membrane integrated into the front panel with power controls and status and loadDisplayindicators for easy visibility.



HP R/T3000 UPS Front Panel

1.	Dual function LED: Self Test and load indicator (10% load)	7.	Power on button
2.	Dual function LED: Battery fault and Load Indicator (25%	8.	Power off button
	load)		
3.	Dual function LED: Site wiring fault and load indicator (50%	9.	Test/Alarm reset button
	load)		
4.	Dual function LED: Over Temperature and load indicator	10.	On bypass indicator
	(75% load)		
5.	Dual function LED: Overload and load indicator (100%)	11.	On battery indicator
6.	Start on battery button	12.	Utility power indicator

Standard Features				
Intelligent Manageability	ity Free HP Power Management Software, an integrated component of HP Systems Insight Manager, the industry-leading hardware management platform, is included with all HP R/T3000 models. The HP Power Management Software enables you to monitor and control HP UPSs locally or remotely. This software is a versatile, fully configurable, alert response tool that gives system administrators a full overview of the network's conditions. It enables you to monitor system status and power conditions, configure shut down timing, customize alert messages, and perform UPS diagnostic checks quickly and easily.			
Independently Controllable Load Segments	With two load segments, you have the flexibility to configure scheduled startups and shutdowns, in addition to independently control the separate load segments. Working in conjunction with HP Power Management Software, the HP R/T3000 can be configured to extend the shutdown delay time for more critical devices.			
	The UPS R/T3000 is designed with simple access through the front panel for hot swappable batteries. Users can safely install new batteries without ever powering down connected server and server options.			
HP Quality	HP's hardware qualification is the toughest in the industry. Extensive evaluation, testing, product improvement, and an unsurpassed warranty guarantee the highest level of system protection, electrical performance, product quality and compatibility.			
Compatibility	Compatible with all HP servers, storage, racks, rack options, and other rack mountable HP equipment (for PDU options please refer to the UPS/PDU compatibility matrix on www.hp.com/products/ups).			
Optional UPS Management Module	The HP UPS Management Module enables you to monitor and manage power environments through comprehensive control of HP UPSs. The HP UPS Management Module can support either a single UPS configuration or provide additional power protection with support for dual redundant UPS configuration for no-single-point-of-failure. The additional serial ports will provide greater power management control and flexible monitoring.			
	The management module can be configured to send alert traps to HP Systems Insight Manager and other SNMP management programs or used as a standalone management system. This flexibility enables you to monitor and manage UPSs through the network. To facilitate day-to-day maintenance tasks, the embedded management software provides detailed system logs.			
	The HP UPS Management Module provides remote management of a UPS by connecting the UPS directly to the network. Configuration & Management of the UPS from anywhere and at anytime via a standard web browser.			
	NOTE: For more information on the UPS Management Module please see: http://h18004.www1.hp.com/products/servers/proliantstorage/powerprotection/software/module/ ups/index.html web browser.			

Extended Runtime ModuleThe UPS R/T3000 supports up to two Extended Runtime Modules. Each module is a 2U (3.5 inches),
rack mountable battery module that extends your overall battery runtime.



Standard Features

Rack to Tower Conversion Kit	The included HP R/T3000 UPS Tower Conversion Kit allows you to use the powerful R/T3000 in a tower configuration for your most powerful tower Servers or Blade Enclosures. The kit contains stabilizing feet and appropriate hardware for a fast, easy form factor change. Each Tower Conversion Kit can support one UPS and up to two Extended Runtime Modules.
Warranty	The HP UPS R/T3000 is covered by a three year warranty, with the first year including parts and labor. Also, standard on all HP UPS units, is our exclusive Battery Pre-Failure Warning, which extends the advantage of a HP three-year, limited warranty by applying it to the battery before it actually fails. This warranty is offered worldwide. Specifically, the Battery Pre-Failure Warning ensures that when customers receive notification from HP Power Management Software that the battery may fail, the battery is replaced free of charge under the warranty. NOTE: \$250,000 Computer/Load Protection Guarantee is also provided in North America, in addition to the HP three year, limited warranty.



Service and Support

HP Care Pack Installation

HP Care Pack Services include HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the enclosure, as well as 22" and smaller external monitors and rack mounted UPS and PDU options. HP Uninterruptible Power Systems will be covered at the same service level and coverage period as the server. For servers or storage systems installed within a rack, service also covers all HP qualified rack options installed within the same rack.

NOTE: For more information on HP Care Pack Services, contact any of our worldwide sales offices or resellers or visit our worldwide web site on the internet at: http://www.hp.com/hps/carepack

NOTE: For more complete information on HP Services offerings, customers and resellers, please visit us at: http://www/hp.com/hps NOTE: Additional information regarding worldwide limited warranty and technical support is available at:

http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html

NOTE: For additional information on Server Services, Rack and Power Options, please visit:

http://h20219.www2.hp.com/services/cache/111072-0-0-225-121.html

NOTE: The information contained herein is subject to change without notice and is provided "as is" without warranty of any kind. **NOTE:** The warranties for HP products and services are set forth in the express limited warranty statements accompanying such products and services.



Related Options

Extended Runtime Module HP R/T3000 2U Extended Runtime Module AF455		
UPS Management	HP Management Card for XR UPS HP RJ45-DB89 DCE Female 5 Pack Serial Adapter	AF401A AF402A
HP Care Pack	HP Install Universal Power Supply 3KVA to Below 6KVA Service	U4693E



Model Matrix

UPS Models

Part Number	Operating Voltage Settings	Power Out (VA/Watts)	Input Connection Output Connection
AF452A Low Voltage (NA/JPN)	100, 110, 120, 127	2880/2700	L5-30P, 3m cord LS1 ² : 2x NEMA 5-20 outlets, 1 x NEMA L5-30R LS2 ³ : 2x NEMA 5-20 outlets
AF453A High Voltage	200/208 ¹ ,	3300/3000	L6-20P, 3m cord LS1 ² : 3x IEC C13, 1x IEC C-19, 1x NEMA L6- 20R_
(NA/JPN	Actual output voltage 204VAC		LS2 ³ : 3x IEC C13, 1x IEC C-19 NOTE: Includes one PDU Extension Bar. Each Extension Bar has 7x C13 outlets and plugs into a C-19 on the rear of the UPS.
AF454A (International)	220, 230, 240	3300/3000	Detachable IEC LS1 ² : 3x IEC C13, 1x IEC C-19 C-20 inlet plug LS2 ³ : 3x IEC C13, 1x IEC C-19 NOTE: Includes one PDU Extension Bar. Each Extension Bar has 7x C13 outlets and plugs into a C-19 on the rear of the UPS.
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¹ Factory default setting.

 2 LS1 = Load Segment 1

 3 LS2 = Load Segment 2



Estimated Backup Times Chart (Minutes)

Low Voltage NA/JPN model

(2880VA / 2700 Watt)

	-	-	
Load (Percent*)	Estimates battery runtime (Minutes)	With One Extended Runtime Module (Minutes)	With Two Extended Runtime Modules (Minutes)
540W (20%)	45	142	256
1350W (50%)	15	55	99
2160W (80%)	7	34	60
2700W (100%)	5	26	47
NOTE: Packup times are estima	A shi fa shutani ang kantang Ashar		d and b automa and the sec

NOTE: Backup times are estimated for typical applications. Actual performance will depend on load and battery conditions.

High Voltage NA/JPN and Int'l model

(3300VA / 3000 Watt)

Load (Percent*)	Estimated battery runtime (Minutes)	With One Extended Runtime Module (Minutes)	With Two Extended Runtime Modules (Minutes)
600W (20%)	40	125	225
1500W (50%)	12	50	99
2400W (80%)	6	30	60
3000W (100%)	4	24	47
		C	1 1 1 Inc.

NOTE: Backup times are estimated for typical applications. Actual performance will depend on load and battery conditions.



Technical Specifications

Shipping Dimensions 11.25 x 23.48 x 36.25 interview / 28.57 x 59.64 x 92.07 cm Unit Weight 82 lbs/37 kg Shipping Weight 89 lbs UPS and 127 lbs LEW / 40.37 kg & 57.6 kg BTU Break Down BTU On Line 540 BT/hr BTU De Bothery 11.38 BTU/hr Battery Type 12 V, 5 AH, sealed, maintenance-free, rechargeable, volve regulated lead-acid batteries with a 3-5 year service life at 25C (77F). Electrical Input Voltage Range See Model Matrix for nominal and user selectable voltage settings Frequency 50/60 Hz Online Efficiency PSW REPO Remote Emergency Power-Off disables AC power to load Electrical Output On battery Regulation -10% to +6% of nominal voltage Voltage Woore Form Size Model Selection Matrix; divided into 2 Load Segments Connections See Model Selection Matrix; divided into 2 Load Segments Electrical Output Quitage Woore Form Size Model Selection Matrix; divided into 2 Load Segments Battery Steindel Batteries Up to two Efficiency Voltage Woore Battery Steindel Batteries Voltage Woore Size Model Selection Battery Steindel Batteries Voltage Moore Seleckup Times Chart Battery Steindel Batteries Voltage Moore Seleckup Times Chart Battery	Unit Dimensions (HxWxD)	3.5 x 17.5 x 25 inches / 8	3.9 x 44.5 x 63.5 cm	
Shipping Weight 89 lbs UPS and 127 lbs ERM / 40.37 kg & 57.6 kg BTU Break Down BTU On Line 540 BT/hr BTU On Bottery 1138 BTU/hr Bottery Type acid botteries with a 3-5 year service life at 25C (77F). Electrical Input Voltage Range See Model Matrix for nominal and user selectable voltage settings Frequency 50/60 Hz Online Efficiency 95% REPO Remote Emergency Power-Off disables AC power to load Online Regulation -10% to +6% of nominal voltage Online Regulation ±5% of nominal voltage Voltage Wove Form Sine wave Connections See Model Selection Matrix; divided into 2 Load Segments Output Protection Sine wave Voltage Wove Form Sine wave Standard Batteries Up to two ERMs supported Backup Time Sea Backup Times Chart Recharge Time <3 hours to 80% usable capacity; <48 hours for complete recharge Serial Ports Standard DB-9 and USB ports (ships with communication cables) Communications Operating Tumperature IED Indicators LED and switch membrane integrated into the front panel Software HP Power Manager software included IED Indicators LED and switch membrane integrated into the front panel Softwar	Shipping Dimensions	11.25 x 23.48 x 36.25 inches / 28.57 x 59.64 x 92.07 cm		
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Backup TimeSee Backup Times ChartRecharge Time<3 hours to 80% usable capacity; <48 hours for complete rechargeSerial PortsStandard DB-9 and USB ports (ships with communication cables)CommunicationsOption SlotOption CardsHP UPS Management ModuleLED IndicatorsLED and switch membrane integrated into the front panelSoftwareHP Power Manager software includedEnvironmental and SafetOperating TemperatureNon-operating Temperature-20°C to 50°C (-4°F to 122°F)Non-operating Temperature20% to 80% (non-condensing)Storage Humidity5% to 95%Operating AltitudeUp to 6,562 ft (2000 m) above sea levelTransit Altitude49,212 ft (15,000 m) above sea levelAudible Noise<45db in normal operation. <50bd on battery operationSafety MarkingsNA/JPN: UL, cUL Int'!: GS, CE, GOST		Туре	Maintenance-free, sealed, valve-regulated lead acid (VRLA)	
Recharge Time<3 hours to 80% usable capacity; <48 hours for complete recharge	Battery	Extended Batteries	Up to two ERMs supported	
Serial PortsStandard DB-9 and USB ports (ships with communication cables)CommunicationsOption Slot0neOption CardsHP UPS Management ModuleLED IndicatorsLED and switch membrane integrated into the front panelSoftware0°c to 40°c 150°c Fto 104°c F); UL-tested at 25°c (77°c F)Environmental and SteipOperating TemperatureOperating Temperature0°c to 40°c 160°c Fto 104°c F); UL-tested at 25°c (77°c F)Operating Temperature0°c to 40°c 160°c Fto 120°c F)Operating Humidity0%to 80% (non-condensing)Operating Altitude10°c to 50°c 14°C 100°c F)Operating Altitude10°c to 40°c 10°c 10°c 10°c 10°c 10°c 10°c 10°c 1		Backup Time	See Backup Times Chart	
Communications Option Slot One Option Cards HP UPS Management Module LED Indicators LED and switch membrane integrated into the front panel Software HP Power Manager software included Environmental and Safety Operating Temperature Non-operating -20°C to 40°C (50°F to 104°F); UL-tested at 25°C (77°F) Non-operating -20°C to 50°C (-4°F to 122°F) Temperature 20% to 80% (non-condensing) Storage Humidity 5% to 95% Operating Altitude Up to 6,562 ft (2000 m) above sea level Transit Altitude 49,212 ft (15,000 m) above sea level Audible Noise <45db in normal operation. <50bd on battery operation Safety Markings NA/JPN: UL, cUL Int'l: GS, CE, GOST Int'l: GS, CE, GOST		Recharge Time	<3 hours to 80% usable capacity; <48 hours for complete recharge	
Option CardsHP UPS Management ModuleLED IndicatorsLED and switch membrane integrated into the front panelSoftwareHP Power Manager software includedOperating Temperature10°C to 40°C (50°F to 104°F); UL-tested at 25°C (77°F)Non-operating Temperature-20°C to 50°C (-4°F to 122°F)Operating Humidity20% to 80% (non-condensing)Storage Humidity5% to 95%Operating AltitudeUp to 6,562 ft (2000 m) above sea levelTransit Altitude49,212 ft (15,000 m) above sea levelAudible Noise<45db in normal operation. <50bd on battery operationSoftey MarkingsNA/JPN: UL, cUL Int'l: GS, CE, GOST		Serial Ports	Standard DB-9 and USB ports (ships with communication cables)	
LED Indicators LED and switch membrane integrated into the front panel Software HP Power Manager software included Environmental and Safety Operating Temperature 10°C to 40°C (50°F to 104°F); UL-tested at 25°C (77°F) Non-operating Temperature -20°C to 50°C (-4°F to 122°F) Temperature 20% to 80% (non-condensing) Storage Humidity 5% to 95% Operating Altitude Up to 6,562 ft (2000 m) above sea level Transit Altitude 49,212 ft (15,000 m) above sea level Audible Noise <45db in normal operation. <50bd on battery operation Safety Markings NA/JPN: UL, cUL Int'l. GS, CE, GOST	Communications	Option Slot	One	
SoftwareHP Power Manager software includedEnvironmental and SafetyOperating Temperature10°C to 40°C (50°F to 104°F); UL-tested at 25°C (77°F)Non-operating remperature-20°C to 50°C (-4°F to 122°F)-20°C to 50°C (-4°F to 122°F)Operating Humidity0% to 80% (non-condensing)-20°C to 50°C (-4°F to 122°F)Storage Humidity5% to 95%-20°C to 50°C (-4°F to 122°F)Interst Altitude0perating Altitude-20°C to 50°C (-4°F to 122°F)Audibe Noise10°C to 40°C (50°C for 00°C)-20°C to 50°C (-4°F to 122°F)Safety MarkingsVariage for 00°C (-4°F to 122°F)-20°C to 50°C (-4°F to 122°F)Name-20°C to 50°C (-4°F to 122°F)-20°C to 50°C (-4°F to 122°F)Safety MarkingsNaj Poly (-20°C for 00°C)-20°C to 50°C (-4°F to 122°F)Name-20°C to 50°C (-4°F to 122°F)-20°C to 50°C (-4°F to 122°F)Name-20°C to 50°C (-4°F to 122°F)-20°C to 50°C (-4°F to 122°F)Name-20°C to 50°C (-4°F to 122°F)-20°C to 50°C (-4°F to 122°F)Name-20°C to 50°C (-4°F to 122°F)-20°C to 50°C (-4°F to 122°F)Name-20°C to 50°C (-4°F to 122°F)-20°C to 50°C (-4°F to 122°F)Name-20°C to 50°C (-4°F to 122°F)-20°C to 50°C (-4°F to 122°F)Name-20°C to 50°C (-4°F to 122°F)-20°C to 50°C (-4°F to 122°F)Name-20°C to 50°C (-4°F to 122°F)-20°C to 50°C (-4°F to 122°F)Name-20°C to 50°C (-4°F to 122°F)-20°C to 50°C (-4°F to 122°F)Name-20°C to 50°C (-4°F to 122°F)-20°C to 50°C (-4°F to 122°F)Name<		Option Cards	HP UPS Management Module	
Environmental and SafetyOperating Temperature10°C to 40°C (50°F to 104°F); UL-tested at 25°C (77°F)Non-operating Temperature-20°C to 50°C (-4°F to 122°F)Operating Humidity20% to 80% (non-condensing)Storage Humidity5% to 95%Operating AltitudeUp to 6,562 ft (2000 m) above sea levelTransit Altitude49,212 ft (15,000 m) above sea levelAudible Noise<45db in normal operation. <50bd on battery operationSafety MarkingsNA/JPN: UL, cUL Int'I: GS, CE, GOST		LED Indicators	LED and switch membrane integrated into the front panel	
Non-operating Temperature-20°C to 50°C (-4°F to 122°F)Operating Humidity20% to 80% (non-condensing)Storage Humidity5% to 95%Operating AltitudeUp to 6,562 ft (2000 m) above sea levelTransit Altitude49,212 ft (15,000 m) above sea levelAudible Noise<45db in normal operation. <50bd on battery operationSafety MarkingsNA/JPN: UL, cUL Int'l: GS, CE, GOST		Software	HP Power Manager software included	
TemperatureOperating Humidity20% to 80% (non-condensing)Storage Humidity5% to 95%Operating AltitudeUp to 6,562 ft (2000 m) above sea levelTransit Altitude49,212 ft (15,000 m) above sea levelAudible Noise<45db in normal operation. <50bd on battery operationSafety MarkingsNA/JPN: UL, cUL Int'l: GS, CE, GOST	Environmental and Safety	Operating Temperature	10°C to 40°C (50°F to 104°F); UL-tested at 25°C (77°F)	
Storage Humidity5% to 95%Operating AltitudeUp to 6,562 ft (2000 m) above sea levelTransit Altitude49,212 ft (15,000 m) above sea levelAudible Noise<45db in normal operation. <50bd on battery operation			-20°C to 50°C (-4°F to 122°F)	
Operating AltitudeUp to 6,562 ft (2000 m) above sea levelTransit Altitude49,212 ft (15,000 m) above sea levelAudible Noise<45db in normal operation. <50bd on battery operation		Operating Humidity	20% to 80% (non-condensing)	
Transit Altitude49,212 ft (15,000 m) above sea levelAudible Noise<45db in normal operation. <50bd on battery operation		Storage Humidity	5% to 95%	
Audible Noise<45db in normal operation.		Operating Altitude	Up to 6,562 ft (2000 m) above sea level	
Safety Markings NA/JPN: UL, cUL Int'l: GS, CE, GOST		Transit Altitude	49,212 ft (15,000 m) above sea level	
Int'l: GS, CE, GOST		Audible Noise	<45db in normal operation. <50bd on battery operation	
Safety Certifications UL1778, UL60950-1; CSA22.2 No.107.3-05,; EN60950-1 IEC62040-1-1		Safety Markings		
		Safety Certifications	UL1778, UL60950-1; CSA22.2 No.107.3-05,; EN60950-1 IEC62040-1-1	
REPO Port Meets NEC code 645-10 and 645-11 and UL requirements		REPO Port	Meets NEC code 645-10 and 645-11 and UL requirements	



Technical Specifications

Environment-friendly End-of-life Mana Products and Approach and Recycling	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.
		The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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