



Liebert®

PSA5™

Installer/User Guide

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Technical Support Site

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures. Visit <https://www.VertivCo.com/en-us/support/> for additional assistance.

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IMPORTANT SAFETY INFORMATION

IMPORTANT! This manual contains important safety instructions that must be followed during the installation and maintenance of the UPS and batteries. Read this manual thoroughly and the safety and regulatory information, available at <https://www.vertivco.com/ComplianceRegulatoryInfo>, before attempting to install, connect to supply, or operate this UPS.

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1 PSA5 DESCRIPTION

The Liebert® PSA5 is an economical, line-interactive UPS designed with the features you need providing reliable power protection for small home/office computers, network gear, and home-entertainment equipment. Designed with controls for user-friendly operation, the Liebert® PSA5 provides the run time to save work in process.

1.1 Available Models

Table 1.1 PSA5 Models

MODEL NUMBER	NOMINAL POWER RATING
PSA5-500MT120	500 VA/300 W
PSA5-700MT120	700 VA/420 W
PSA5-1000MT120	1,000 VA/600 W
PSA5-1500MT120	1,500 VA/900 W

1.2 Front and Rear Panel Controls and Features

Figure 1.1 Controls and Indicators



ITEM	DESCRIPTION
1	Power button.
2	Silence-alarm button.
3	Scroll button. To scroll through the LCD-display parameters.
4	LCD display
5	USB charging ports, 5 V/2.1 A max. combined
6	Surge-protected only receptacles.
7	Battery-backed and surge-protected receptacles.
8	USB communication port (Type B)
9	RJ11/45 connectors for phone/fax/modem or network surge protection.
10	Coax connectors for cable-TV or cable-modem or DSS-receiver surge protection.
11	Input Circuit Breaker
12	Input power cord (NEMA 5-15P)

2 INSTALLATION

2.1 What's Included

- USB cable; one 2 m (6.5 ft) long
- Coax cable; one 1 m (3 ft) long
- Quick Installation Guide
- Safety and Regulatory Guidelines

2.2 Unpacking and Inspection

Unpack the UPS and conduct the following checks:

- Inspect the UPS for shipping damage. If any shipping damage is found, report it to the carrier and your local dealer or your Vertiv representative immediately.
- Check the accessories included in packaging list. If there is any discrepancy, contact your local dealer or your Vertiv representative immediately.

2.3 Preparation for Installation

2.3.1 Installation Environment

- Install the UPS indoors in a controlled environment, where it cannot be accidentally turned Off. The installation environment should meet the specifications listed in [Specifications](#) on page 19.
- Place it in an area of unrestricted air-flow around the unit, away from water, flammable liquids, gases, corrosives, and conductive contaminants. Avoid direct sunlight.
- The socket outlet should be nearby and easily accessible.
- This UPS is not for use in a computer room as defined in the standard for the Protection of Electronic Computer/Data Processing Equipment ANSI/NFPA 75.

NOTE: Operating the UPS in temperatures above 77°F (25°C) reduces battery life.

2.3.2 Installation Clearances

Maintain at least 4 in (100 mm) clearance in the front and rear. Do not obstruct the air inlets on the front panel and rear panel. Blocking the air inlets reduces ventilation and heat dissipation, shortening the service life of the UPS.

2.4 Installing the UPS

2.4.1 Connecting Loads

The UPS has 5 battery-backed outlets and surge-protected receptacles and 5 surge-protected-only receptacles. Plug your critical equipment (such as computer, monitors, etc.) into the battery-backed receptacles and your less-critical equipment (such as printers and other less-often used peripherals) into the surge-only receptacles.

2.4.2 Connecting for Network, Telephone or TV Protection

Protection from electrical surges to your computer network or telephone is provided. Use the network/telephone surge-protection ports on the rear panel. Connect the “IN” port to the line from the wall jack and the “OUT” port to your device port. Use of this feature is not required for proper operation of the UPS.

Surge protection for your cable modem, DSS Receiver, or cable-TV connection is also provided using the coax surge-protection ports on the rear panel. Connect the “IN” port to the line from the wall jack and the “OUT” port to your device port. Use of this feature is not required for proper operation of the UPS.

2.4.3 USB Communication Connection

You can connect the PSA5 to a computer via USB allowing unattended, controlled-shutdown of your computer in case of UPS input power failure. The UPS works with the computer running software built-in within the Microsoft® Windows® operating system. Use of this feature is not required for proper operation of the UPS. To use this feature, plug the provided USB cable into USB Type-B port located on the rear panel of the UPS and the other end into an open USB port on your computer.

2.4.4 USB Charging Ports

The PSA5 has two easily-accessible, front-panel USB Type-A charging ports. These ports charge phones or other small USB powered devices. The ports provide up to 2.1 A of charge total shared dynamically between both ports. You may plug devices into these ports at any time during installation and operation.

NOTE: Charging is only available when the UPS is in an On mode.

2.4.5 Connecting AC Input

Ensure that all the loads are first powered off. Connect to an input-power supply/wall outlet that is properly protected by a circuit breaker in accordance with national and local electrical codes. The input receptacle must be grounded. See [Specifications](#) on page 19, for input cord rating.

Once the UPS is plugged into the wall outlet, it begins charging the battery.

NOTE: While every precaution has been taken to ensure that the battery is in good condition, we recommend allowing the UPS to be plugged into AC input and to charge the battery for at least 12 hours prior to providing full back-up time protection for any utility-power abnormality.

3 OPERATION

3.1 Modes of Operation

NOTE: In all of the following modes, including Off mode:

The UPS always provides surge protection and input-breaker protection to the 5 battery backed-up outlets and the 5 surge-only outlets. The UPS does not need to be On to provide this protection.

The surge-only outlets always have the same voltage level as the UPS input voltage, even when the UPS is Off. The surge-only outlets are not voltage regulated, battery backed-up, or switched by the UPS.

3.1.1 Off Mode

The UPS input is plugged into a stable, nominal source, but the battery-backed-up outlets are turned off. The internal batteries are charging.

NOTE: The surge-only outlets will still have power.

3.1.2 On/Normal Mode

The UPS input is plugged into a stable, nominal source, and the battery-backed-up outlets are turned on. The internal batteries are charging.

3.1.3 On/Automatic Voltage Regulation (AVR) Mode

The UPS input is plugged in, but the voltage source is abnormally low (brown-out). The UPS automatically corrects the low voltage and allows the battery-backed-up outlets to be on with the normal, expected voltage. The internal batteries are charging.

NOTE: The surge-only outlets will have the abnormally-low input voltage and equipment plugged into these outlets may not work.

3.1.4 On/Battery Mode

The UPS input is not plugged in, or the voltage source has become extremely low or high and unusable. The UPS automatically switches to the internal battery to provide normal, usable voltage to the battery-backed-up outlets.

NOTE: The surge-only outlets will not have power.

3.1.5 Fault Mode

An error or fault condition has occurred. The battery-backed-up outlets are shut off.

NOTE: The surge-only outlets may still have power if the UPS input is plugged in.

3.1.6 Battery Self-test Mode

The UPS enters a cycle of approximately 10 seconds during which it tests the internal battery. The battery-backed-up outlets are still temporarily powered by the internal battery. Self-test mode occurs at the following instances:

- At start-up turning the UPS On.
- Automatically every 8 weeks as a self-check.
- Manually by pressing and holding the power button for 3 seconds when the unit is On.

3.2 Controls

Figure 3.1 Buttons on the front panel

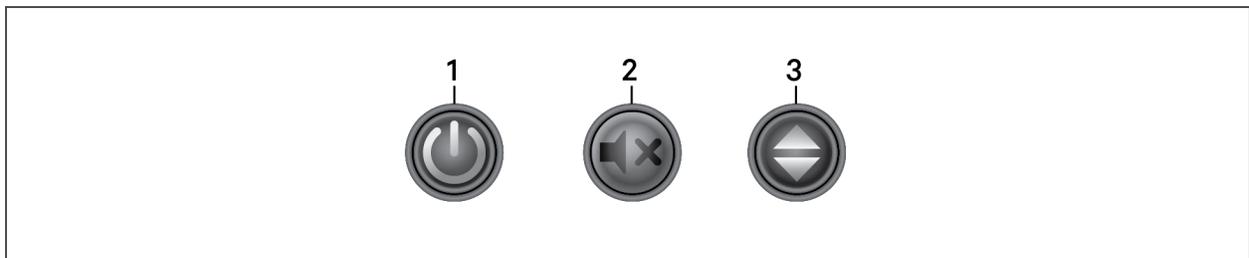


Table 3.1 Button Controls

ITEM	DESCRIPTION
1	Power button. <ul style="list-style-type: none">• Press-and-hold for 1 second to cycle between On and Off mode.• Press-and-hold for 3 seconds to enter Battery Self-test mode.• Press quickly to wake the display
2	Silence Battery-mode Alarm button. <ul style="list-style-type: none">• Press-and-hold for 2 seconds during On/Battery mode to mute the battery-alarm beep.• Press quickly to wake the display.
3	Scroll button. <ul style="list-style-type: none">• When the UPS is On, press to cycle through UPS operating parameters.• Press quickly to wake the display.

3.3 Display-panel Indicators

NOTE: The display automatically powers-off to conserve power. However, the display remains on when there is a warning or fault to call attention to the event.

Figure 3.2 LCD Display

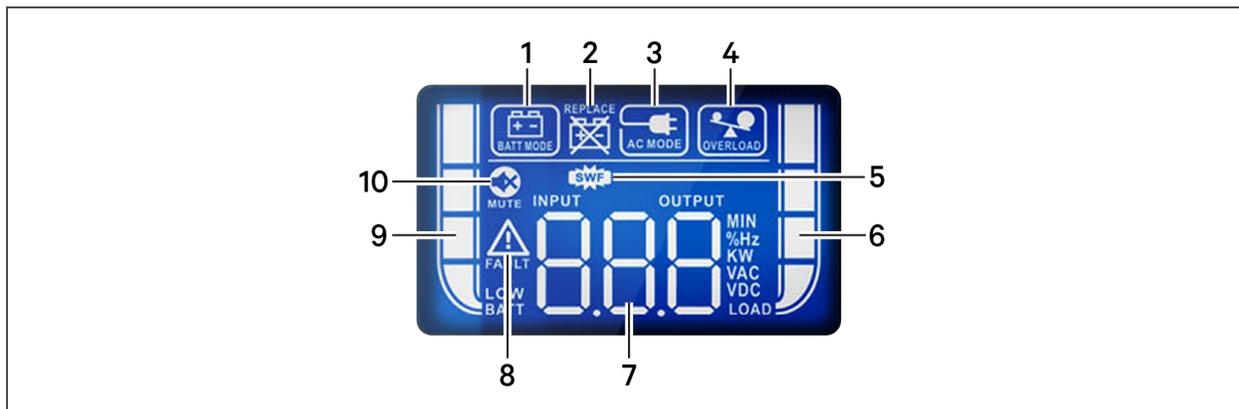


Table 3.2 Display Icons and Indicators

ITEM	DESCRIPTION
1	Battery mode when lit.
2	Replace battery warning when lit. See Warnings on the next page, for more details
3	AC-mode: <ul style="list-style-type: none"> On solid = Normal mode. Flashing = Automatic Voltage Regulation mode
4	Output-overload warning when flashing. See Warnings on the next page, for more details
5	Site-wiring fault warning when lit. See Warnings on the next page, for more details
6	Output-load level graph in 25% increments
7	Numeric display of UPS operational parameters: <ul style="list-style-type: none"> VAC = input/output voltage Hz = input/output frequency KW = output power MIN = estimated battery back-up time
8	Fault when lit. Fault codes indicated: <ul style="list-style-type: none"> E01 E02 E03 E04 E05 E06 <p>See Faults on page 15, for more details</p>
9	Battery-capacity graph in 25% increments
10	Battery-mode alarm muted when lit. See Audible-tone Indicators on the next page, for more details

3.4 Audible-tone Indicators

Table 3.3 Tones and Beeps of the UPS

TYPE	INDICATES
1 beep every 10 seconds	Battery mode
2 beeps every second	UPS warning
2 beeps every 5 seconds	Low-battery warning
3 beeps every 30 seconds	Replace-battery warning
Constant, solid tone	UPS fault
3-second tone followed by 2 beeps	Power-on in battery self-test mode
1 long tone	Power off
3 beeps	Manual battery self-test

3.5 Warnings

The UPS has three early-warning indicators that allow the UPS to function normally for a short period before the outputs are shut-off.

Table 3.4 Warning Indicators and Actions

ICON DISPLAYED	AUDIBLE TONE	DESCRIPTION	SUGGESTED TROUBLESHOOTING
	1 beep every second	Output-overload. The load devices plugged-in to the UPS output are drawing more power than the UPS rating.	Reduce the load to below the UPS rating in the specifications table, see Specifications on page 19.
	Constant, solid tone	Site-wiring fault. Problem detected with the outlet wiring to which the AC input of the UPS is connected.	Power-off the UPS and contact an electrician to correct the wiring. Possible causes are line and neutral are reversed or there is no ground conductor.
	3 beeps every 30 seconds	The battery is weak or damaged.	Charge the UPS battery for at least 12 hours, or replace the battery, see Battery Replacement on page 18.

3.6 Faults

The UPS displays fault codes when it detects a problem and automatically shuts-off output power.

Table 3.5 Fault Codes and Actions

FAULT CODE	DESCRIPTION	SUGGESTED TROUBLESHOOTING
E01	Output short circuit.	Turn-off the UPS, disconnect all loads, and restart the UPS. <ul style="list-style-type: none"> • If the fault is still active, contact Vertiv technical support for a replacement. • If the fault is no longer active, plug in equipment one at a time to locate the device with the short circuit.
E02	Output overload exceeded warning time, and output is shut off.	Turn-off the UPS, disconnect all loads, and restart the UPS. Plug in equipment one at a time and make sure not to exceed the UPS rating for load capacity.
E03	Un-used.	Un-used.
E04	Internal inverter circuitry failure during start-up self-test.	Turn-off the UPS and call Vertiv technical support for a replacement unit.
E05	Battery-charge failure.	Turn-off the UPS and call Vertiv technical support for a replacement unit.
E06	Internal battery is dead or damaged.	Charge the UPS for at least 12 hours or replace the battery, see Battery Replacement on page 18.

3.7 Normal Start-up

- With the UPS connected to AC input, press-and-hold the power button for 1 second. A long tone and 2 short beeps sound while the UPS is in battery self-test mode for a few seconds. After a successful self-test, the outlets are on.

3.8 Normal Shut-down

1. Press-and-hold the power button for 1 second. The outlets are turned off.
2. Disconnect AC-input power.
3. Remove the battery cover and disconnect the battery connector.

3.9 Full Shut-down

1. Press-and-hold the power button for 1 second. The outlets are turned off.
2. Disconnect AC-input power.
3. Remove the battery cover and disconnect the battery connector. The unit is fully shut down.

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4 MAINTENANCE AND BATTERY REPLACEMENT

4.1 Precautions

Although the PSA5 is designed and manufactured to ensure personal safety, improper use can result in electrical shock or fire. To ensure safety, observe the following precautions:

- Turn off and unplug the UPS before cleaning it.
- Clean the UPS with a dry cloth. Do not use liquid or aerosol cleaners.
- Never block or insert any objects into the ventilation holes or other openings of the UPS.
- Do not place the UPS power cord where it might be damaged.

4.2 Battery Charging

The batteries are valve-regulated, non-spill-able, lead acid and should be kept charged to attain their design life. The PSA5 charges the batteries continuously when it is connected to the utility input power. If the PSA5 will be stored for a long time, we recommend connecting the UPS to input power for at least 24 hours every 4 to 6 months to ensure full recharge of the batteries.

4.3 Battery Replacement

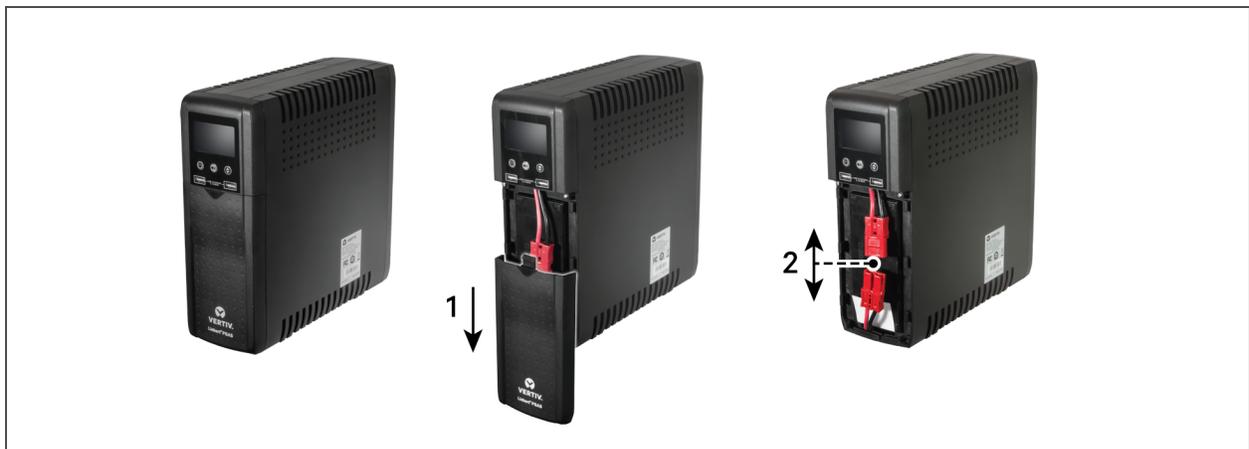
IMPORTANT! Before you proceed, please review the battery safety precautions available at <https://www.vertivco.com/ComplianceRegulatoryInfo>.

You may safely replace the internal battery pack. See the in [Specifications](#) on page 19, for the part number of the replacement battery for your UPS model number.

To replace the battery:

1. Turn the UPS on its side or slide it to the edge of a table.
2. Remove the front battery-compartment cover: While firmly pressing in on the V indentation located in the center just below the USB charging ports, slide the battery compartment cover down, then lift off the cover and expose the battery, see [Removing cover and disconnecting battery](#) below.
3. Disconnect the battery connector by squeezing and gently pulling the two pieces apart see [Removing cover and disconnecting battery](#) below.

Figure 4.1 Removing cover and disconnecting battery



4. Slide out the existing battery and disconnect bottom top half of the connector cable from the two battery terminals. Disconnect the red wire first, then the black.
5. Plug the removed connector into the terminals of the new replacement battery. Plug the black wire in first, then the red.
6. Orient the connector and the replacement battery in the same way as the removed battery and slide into the UPS.
7. Reconnect the two halves of the battery connector and slide the front panel back on until it clicks.
8. Press-and-hold the power button for 3 seconds to initiate the battery self-test and clear any previous battery fault warning.
9. Properly dispose of the old batteries at an appropriate recycling facility or return them to Vertiv in the packing material for the new batteries.

5 SPECIFICATIONS

Table 5.1 PSA5 Specifications

MODEL NUMBER: PSA5-	500MT120	700MT120	1000MT120	1500MT120
Capacity (VA / W)	500 / 300	700 / 420	1000 / 600	1500 / 900
Unit Dimensions, in. (mm) W x D x H	3.9 x 11.4 x 11.0 (99 x 290 x 280)			3.9 x 16.2 x 11.0 (99 x 412 x 280)
Unit Weight, lbs (kg)	13 (5.9)	15.2 (6.9)	18 (8.2)	25.7 (11.7)
Shipping Dimensions, in. (mm) W x D x H	7.2 x 14.7 x 14.8 (182 x 373 x 377)			7.2 x 19.5 x 14.8 (182 x 495 x 377)
Shipping Weight, lbs (kg)	14.7 (6.7)	17.7 (7.7)	19.8 (9.0)	27.5 (12.5)
Input AC				
Nominal Voltage	120 VAC			
Voltage Range	86-143 VAC			
Input Voltage Measurement Tolerance	±5%			
High Line Normal Mode to Battery Mode	143 VAC			
High Line Battery Mode to Normal Mode	138 VAC			
Low line AVR Mode to Normal Mode	110 VAC			
Low line Normal Mode to AVR Mode	105 VAC			
Low line Battery Mode to AVR Mode	92 VAC			
Low line AVR Mode to Battery Mode	86 VAC			
Frequency Range	60 Hz, ±5 Hz			
Internal Rear-panel Input Breaker Rating	7 A, 250 VAC	15 A, 250 VAC		
Surge Energy Rating	316 Joules			
Input Cord	6 ft. attached with NEMA 5-15P			
Output AC (On Utility)				
Nominal Voltage	120 VAC			
Voltage Range	105-143 VAC			
Frequency Range	60 Hz, ±5 Hz			
Efficiency	>90% at full load			
Output AC (On Battery)				
Nominal Voltage	120 VAC			
Voltage Range	Nominal ±5%			
Frequency Range	60 Hz, ±1 Hz			
Waveform	PWM Simulated Sine wave			
Transfer Time	10 ms, max.			

Table 5.1 PSA5 Specifications (continued)

MODEL NUMBER: PSA5-	500MT120	700MT120	1000MT120	1500MT120
Overload Capacity in Normal or AVR mode (measurement tolerance ±10%)	105% - alarm warning. 120% - alarm warning and shutdown after 1 minute 130% - alarm warning and shutdown after 10 seconds 150% - alarm warning and immediate shutdown			
Overload Capacity in Battery mode (measurement tolerance ±10%)	120% - alarm warning and shutdown after 20 seconds 130% - alarm warning and shutdown after 10 seconds 150% - alarm warning and immediate shutdown			
Protection	Electronic (over current, short circuit w/ latching shutdown)			
Battery Type	Valve Regulated Lead Acid (VRLA) in compliance with UL 1989			
Battery Manufacturer / Model	Leoch / DJW12-7.0 CSB / GP1272	Leoch / DJW12-9.0 CSB / HR1234W or UPS12460	Vertiv/PSA5-24VBATTKIT Leoch / DJW12-9.0 CSB / HR1234W or UPS12460	
Battery Quantity x VDC x Ah	1 x 12V x 7.0 Ah	1 x 12V x 9.0Ah	2 x 12V x 9.0Ah	
Battery Backed Outlets	(5) NEMA 5-15R			
Surge Only Outlets	(5) NEMA 5-15R			
Environmental Requirements				
Operating Temperature, deg(degC)	32-104 (0-40)			
Operating Elevation, feet (meter)	0-9,842 (0-3,000)			
Relative Humidity	0-95% non-condensing			
Storage Temperature, degF (degC)	5 to 113 (-15 to 45)			
Storage Elevation, feet (meter)	0-49,212 (0-15,000)			
Audible Noise	<40 dBA @ 3 ft (1 m) from all sides		<45 dB @ 3 ft (1 m) from all sides	
Agency				
Safety	cTUVus Listed (UL 1778, 5th Edition; CSA 22.2 No. 107.3:2014)			
RFI / EMI	FCC part 15 subpart B, CLASS B			
Surge Immunity	EN61000-4-5, Level 2 (Line-Neutral) EN61000-4-5, Level 3 (Line-Ground)			
Transportation	ISTA Procedure 1A			

5.1 Run-time Tables

Table 5.2 PSA5-120 Battery Run Times

LOAD PERCENT OF CAPACITY	MODEL RATING			
	500 VA/300 W	700 VA/420 W	1000 VA/600 W	1500 VA/900 W
10%	74	60	53	64
20%	33	27	22	37
25%	23	17	16	25
30%	21	15	14	23
40%	14	10	10	15
50%	8	8	7	11
60%	7	5	5	8
70%	5	4.5	4	6
75%	4.2	3.2	3.6	4.5
80%	4	3	3.5	4
90%	3	2.5	2.5	3.5
100%	2	2	2	3

Note: Run times in this table are approximate. They are based upon new, fully charged standard battery modules at a temperature of 25 degC (77 degF) with 100% resistive UPS loading.

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APPENDICES

Appendix A: Technical Support

Our Technical Support staff is ready to assist you with any installation or operating issues you may encounter with your Liebert® product. Please call or e-mail us:

Technical support:

e: liebert.upstech@vertivco.com

p: 1-800-222-5877 menu option 1

Monitoring support:

e: liebert.monitoring@vertivco.com

p: 1-800-222-5877 menu option 2

Warranty support:

e: microups.warranty@vertivco.com

p: 1-800-222-5877 menu option 3

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