QUICK START

Read this section if you want to install and operate the RPE 228 without wading through the detailed descriptions in this manual. If the control software has not yet been installed on your computer, refer to SOFTWARE OPERATION on page Manual-5 first.

Turn the amplifier(s) down or off until all connections are complete. Connect balanced audio INPUTS and OUTPUTS to the handy Euroblock connectors on the rear. Connect the RW 232 INPUT jack on the rear to a serial (COM) port on a PC-compatible computer using a standard 9-pin RS-232 cable (a short one is supplied with the unit, which is intended to connect between units in a rack). The cable or adaptor must not be a null-modem type.

Locate the RW 232 DEVICE ADDRESS switch on the rear panel. If this unit is to be tested by itself, set it to ‘1’ by setting all switches off (down), except switch one (labeled ‘1’ on the chassis, the right-most switch). If there is more than one unit, refer to SETTING THE DEVICE ADDRESS to set a unique number.

Apply power by connecting the RS 1 remote power supply to the red telephone-style jack on the rear of the unit. CAUTION: don’t connect anything but an approved RANE power supply to this jack. If the RS 1 and the RPE 228 are getting power, the front panel yellow POWER light will be on.

Start your computer, run Windows®, and launch our software by double-clicking on the RaneWare® icon. The System Setup window may appear. If it doesn’t, select System Setup from the Setup menu. Be careful to select the COM port which is physically connected to the RPE 228. Click OK. Now, the Device Selection window may appear. If it doesn’t, choose Select from the Device menu. Click on Poll, … and the Devices Found will display the number of units found. Click the Stop button. Select the unit listed in the Device Selection window and click OK. If no unit was found, please refer to the TROUBLESHOOTING section.

Several clues indicate communication between the computer and the RPE 228. The yellow COM (communications) lights on the unit should flash periodically. The Memory numbers (1-16) near the top of the computer screen should be black rather than grey. Clicking the BYPASS button on the screen causes one Channel of the unit to enter bypass.

WEAR PARTS: This product contains no wear parts.
Windows is a registered trademark of Microsoft Corporation.
RaneWare is a registered trademark of Rane Corporation.
FRONT PANEL DESCRIPTION

1. **POWER** indicates that the unit is happily connected to a powered remote supply.

2. **Parameter Switch** adjusts the frequency of the Low-Cut filters for each Channel incrementally up to the maximum setting, then down to the minimum setting, and back.

3. **COM** (yellow, communications) flashes when a message for the unit or the specific Channel is received from a PC compatible computer. There is a brief flash when using the Remote Switch Interface is used.

4. **BYPASS** (red) lights whenever the audio relay Bypass for the Channel is active. This occurs for a few seconds after power-up, or when BYPASS is selected in RaneWare.

5. **SIGNAL** (green) indicates the presence of a significant audio signal on the Input to the Channel (typically -27 dBu).

6. **CLIP** (red) flashes when an audio level for the Channel in the unit approaches the clipping level (typically 3 dB below clipping).

RPE 228 CONNECTION

When connecting the RPE 228 to other components in your system for the first time, leave the power supply for last. This will give you a chance to correct any mistakes before any damage is done to your speakers, ears, etc.

The RPE 228 will operate at moderately high ambient temperatures. Large racks of equipment may generate excess heat, requiring extra space between units, and/or forced air ventilation to reduce the ambient temperature in the rack.

The RPE 228 has balanced Inputs and Outputs, with chassis-grounded shields. This chassis ground is not signal ground, although the two grounds are connected internally. The chassis ground is intended to be connected to an earth ground. The RPE 228 is intended to be connected to other balanced equipment with chassis-grounded shields. Connect the非-inverting audio lines to the ‘+‘ terminals, and the inverting lines to the ‘–‘ terminals. Connect the cable shields to the center terminal on the terminal block. Connect shields at both ends of the cables.

There is a #6-32 screw provided for chassis ground. Connect a wire from this point to a known earth ground, such as an amplifier chassis. This may not be necessary when installed in a rack with other grounded units.

The RPE 228 requires a Rane RS 1 or compatible power supply, provided with each unit. Optionally, our model RAP 10 power supply provides power for up to ten units at a time.

To control the units from a computer, use nine-pin RS-232 cables which are 50 feet or shorter. The cable must *not* be a null-modem type. A short cable is supplied for connecting adjacent units. Daisy-chain up to 16 units at a time by connecting the COM port on the computer to the INPUT connector on the first unit, and the OUTPUT connector of each unit to the next unit’s INPUT.

The DEVICE ADDRESS switch identifies each unit with an ‘address’, and must be set uniquely for each unit. The switches form a binary code from 0 through 255. Only the numbers 1-250 may be used. The place values of each switch are marked on the rear panel. To set a specific address, refer to the “Setting the Device Address” section.

The REMOTE SWITCH interface provides contact closure control for up to eight preset memories. No computer is required after the initial setup. There are nine screw terminals; one is chassis ground, and the other eight are for Memories 1-8. Connection of one of these to ground causes both Channels of the unit to recall a preset Memory. Multiple units may be controlled by connecting these terminals in parallel. Either momentary or latching switches may be used. A latching switch should only close one contact at a time. Use of a latching switch results in an additional Memory recall upon power-up.
1. **Channel 2 Audio Input and Output** are balanced. The center terminal is chassis ground.

2. **Channel 1 Audio Input and Output** are balanced. The center terminal is chassis ground.

3. **DEFAULT** switch recalls Memory 1 for both audio Channels. This may be useful in case of computer failure and duplicates the function of the number ‘1’ Remote Memory Switch—without the need for an external switch.

4. **REMOTE SWITCH** provides the ability to recall one of 8 Memories using contact closures.

5. **RW 232 OUTPUT** connects to the RW 232 INPUT on other units.

6. **RW 232 INPUT** connects to the computer, or to the RW 232 OUTPUT of other RW 232 units.

7. **RW 232 DEVICE ADDRESS** identifies each unit uniquely by assigning it a number from 1 to 250. Refer to the Device Address Table on the following page.

8. **Chassis Ground Point** is provided for chassis ground when required. Units with outboard power supplies do NOT ground the chassis through the line cord. Make sure that these units are grounded either to another chassis which is earth grounded, or directly to the grounding screw on an AC outlet cover by means of a wire connected to a screw on the chassis with a star washer to guarantee proper contact. See TROUBLESHOOTING, back page.

9. **Remote POWER** jack is for connection to a Rane RS 1 or compatible power supply.

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**CANADIAN EMC NOTICE**

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet Appareil numerique de la classe A respecte toutes les exigences du Reglement sur le material broilleur du Canada.

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**FCC NOTICE**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of the equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense. Changes or modifications not expressly approved by Rane Corporation could void the user's authority to operate the equipment.
## SETTING THE DEVICE ADDRESS

The Device Address is set using a binary code which may be determined using the following table, our Windows Address Calculator program, or by adding the place values (1-128) silkscreened on the chassis. Ignore any numbers printed directly on the switch. For example, turning ON the switches labeled ‘1’ and ‘2’ yields address ‘3’. In the following table, 0 means switch down (OFF), 1 means switch up (ON), and the left-most digit corresponds to the switch labeled ‘128’. Rane provides a special calculator to assist in setting the dip switches on the back of each unit. Alt-Tab to the Windows Program Manager, and in the RaneWare program group, launch the RaneWare Address Calculator. This binary calculator converts decimal numbers into corresponding dipswitch settings.

| Device Address | Switch 1 | Switch 2 | Switch 3 | Switch 4 | Switch 5 | Switch 6 | Switch 7 | Switch 8 | Switch 9 | Switch 10 | Switch 11 | Switch 12 | Switch 13 | Switch 14 | Switch 15 | Switch 16 | Switch 17 | Switch 18 | Switch 19 | Switch 20 | Switch 21 | Switch 22 | Switch 23 | Switch 24 | Switch 25 | Switch 26 | Switch 27 | Switch 28 | Switch 29 | Switch 30 | Switch 31 | Switch 32 | Switch 33 | Switch 34 | Switch 35 | Switch 36 | Switch 37 | Switch 38 | Switch 39 | Switch 40 | Switch 41 | Switch 42 | Switch 43 | Switch 44 | Switch 45 | Switch 46 | Switch 47 | Switch 48 | Switch 49 | Switch 50 |
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SOFTWARE OPERATION

Step by Step Installation

If you have the RaneWare 3.5" floppy disk, insert it in your drive. In Windows 3.1 Program Manager, under File, select Run. On the command line, type A:\install. Click OK. This starts installation. In Windows 95, use Add/Remove Programs in the Control Panel.

If you downloaded RaneWare from the web, decompress the file first. Create a new directory named RANEWARE, and move the RW232***.EXE file to this new directory. Now run this file, and all the separate files will decompress. Locate INSTALL.EXE, click OK. Installation now proceeds as file locations are verified.

Starting RaneWare

A RaneWare program group is now created, containing RaneWare, the RaneWare Address Calculator, and RaneWare Help. When the software is first installed, RaneWare Help appears. Here any questions can get answered. Subsequent activation does not bring up RaneWare Help until you ask for it. But let’s get on with the program. Close the Help file, and welcome to RaneWare!

RANEWARE REQUIREMENTS

- RaneWare 232 works under Microsoft Windows 3.1, 95 or NT® on a PC or laptop with an unused serial port.
- RaneWare 232 needs a fully wired DB9 cable less than 50' long, connecting from the serial port of a computer to the RPE 228 communications input port. No interface boxes are required; just a cable and your computer.
- RaneWare 232 can be fully demonstrated and used without an actual RPE 228 attached.
- A RaneWare 3½" floppy comes with each unit. Installation is simple and follows standard procedure with both Windows 3.1 and 95. The latest version is downloadable 24 hours a day from Rane’s Internet web site, http://www.rane.com.
After Polling, the Graph Editing window appears.

When active, the Editing window provides:
- Memory Recall & Storing
- EQ Band Editing
- Low & High Cut Filter Adjustment
- Input & Output Level Control
- Bypass & Mute
- Local Edit Mode, which allows you to alter the EQ without immediately changing the unit
- Display of current control settings using the right mouse button

The menus also provide:
- Extensive On-Line Help
- Device Selection
- Device Naming
- Device Settings Backup (to computer disk)
- Memory Channel Copying
- EQ Curve and Report Printing
- Device Locking
- Three different Device Editing Channel Views
- Changing Password

Changing curves

Go ahead, grab any slider with the mouse cursor. An accurate representation of the full audio frequency response is portrayed in the graph. Once a filter band is selected, clicking above or below the slider can make fine half decibel adjustments. The up/down cursor keys can also make these adjustments, while the left/right keys move from one band to the next.

Clicking the Select key changes the audio Channel being controlled. Channel 1 appears in red. Channel 2 appears in yellow. Checking the Both box under Graph Display shows both Channels at the same time, but only the active Channel’s sliders can be operated.

Go ahead, play! You'll find Low and High Cut filters, Input and Output level controls, Mute and Bypass switches, just like our other high end equalizers. Only now you can instantly see the equalizer response! If you have an equalizer connected, changes are instantly heard.

The Device menu contains a few handy tools. Flatten does just that, and gives you a clean slate on either or both Channels by clicking in the submenu. Copy lets you transfer curves between Channels.

The Views menu lets you switch between viewing a single channel with graph and sliders, or both sets of sliders on one screen, or both graphs on one screen. This is useful for comparing channels and stereo equalization.

Memories

The red local memory number flashes to indicate that current Memory settings have changed. If you wish to save these settings in one of the 16 Memories, simply click Store, and the Memory number key. It's that easy! Go ahead and store different curves in different Memories. After storing a few, clicking any Memory button instantly recalls that Memory. Store your favorites in Memories 1 through 8, since these can be recalled via the rear panel REMOTE SWITCH contact closures when the computer is removed.

To change a curve without affecting the audio in the RPE, simply select Local Edit before making any changes, make them, and re-click Local Edit. You will be asked: Accept the Edited Curve? Answering Yes sends that curve to the RPE 228. While Local Edit is selected, clicking on any of the Memory buttons displays the preview curve without sending it to the RPE 228.

The Device button brings up a selection menu of up to 15 RaneWare units connected to the computer. Simply select the device you wish to control.
Devices and channels can also be given custom names, tailored to your installation.

If your installation changes by adding more RaneWare units, choose Device > Select, and the POLL button to make the computer recognize currently connected units in the system.

When multiple units are connected, assign each unit a unique Device Address number. See page Manual-4.

Security

The RPE can be operated on a daily basis either through a computer or through the contact closures. To preserve preset security with a computer operator, the software can be locked (under Device), and a system password can be assigned (under System > Change Password). The default password is please.

With the device locked, and a user tries to change a curve, this friendly screen appears.

This selection allows you to enter the Project name, installation Site and System Engineer for a given project. All of these are printed on the Device Report printouts. Click in the edit box or hold the Alt key and press the underlined character to type new names.

Similar to the password, the Site Installation Info is stored in the computer, not in each unit. The Site Installation Info is also stored with backup Memories when you save a unit’s Memories to a file.

Presets can be customized with names, through System > Site Control Panel Setup. Here each Memory can have a logical name.
This Site Control Panel is all an operator needs to see to recall memories. If only a few presets are required, blanking an entry in the Site Control Panel Setup removes the button from this screen, reducing the number of buttons. A password is not required to operate the RPE from this screen.

If more than 16 memories are needed, they can be saved to disk and recalled later. For mobile sound trucks, presets for a particular venue can be saved to disk and loaded when returning to that venue. Memory names are stored in the computer, along with other site information. Job files can be used for multiple installations. Printouts of device data, graphs, and curves are available for those who still like to file paper. These can be kept in the project file.

**Hints for Windows 95 Users**

If you find yourself squeezed for room at the bottom of the screen, you can modify the Task Bar so it only appears when you move the mouse pointer below the bottom of the screen.

To do this,

- Right-Click on a blank spot on the task bar.
- Select Properties
- Enable Auto Hide
- Press OK.

While operating the Device Control Panel in Windows 95, there is no button-box for the system menu on the title bar. There is, however, a Close-Window button-box.

As expected, the Close-Window button-box does exit the Device Control Panel, but unfortunately, it also quits RW 232.

To get back to edit mode, Right-Click the mouse on the Device Control Panel title bar. This will open the menu allowing you to return to Device Edit mode or exit the program altogether. As usual, a password is required for either option.

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**TROUBLESHOOTING**

**POWER LED is Off:**

Check POWER connection on rear panel, and that the remote supply is connected to a live AC source.

**No communication between the unit and the computer:**

Set the DEVICE ADDRESS to a unique small number, and try polling for units in RaneWare (under Device > Select, Poll). The unit should be found quickly. If more than 16 units are daisy-chained from one serial port, communication to the furthest units may be unreliable.

Check that the COM port selected in RaneWare (under Setup > System Setup) is the one on your computer that is connected to the unit.

Check that the cable is a standard RS-232 cable (not a null modem type). If an adaptor is used, it must not be null modem. The cable must be connected to the RW 232 INPUT jack on the rear of the unit.

**Audio hum or noise:**

Try Muting the unit. If this helps significantly, the problem may be with the Input connection, or the equipment driving the Input. If Muting has little effect, the problem is likely either the Output connection, or equipment driven by the Output.

The RPE 228 is intended to connect with equipment with balanced audio I/O and chassis-grounded shield/common. This kind of audio interconnection should maximize audio quality. Connecting equipment with signal grounded shields or unbalanced connections may result in hum or noise due to induced currents in the signal path. It may be possible to reduce or eliminate these problems, although some experimentation may be required:

Try disconnecting the audio cable shields at one end, particularly between chassis grounded and signal grounded equipment.

Try combinations of lifting grounds on units supplied with ground lift switches (or links).

Verify that all chassis are tied to a good earth ground. Units with outboard power supplies do not ground the chassis through the line cord. Make sure these units are grounded by tying the Chassis Ground Point to a known earth ground. A star washer guarantees proper contact.

For more information on balanced interconnection and grounding, please refer to RaneNote 110, “Sound System Interconnection” (next section).