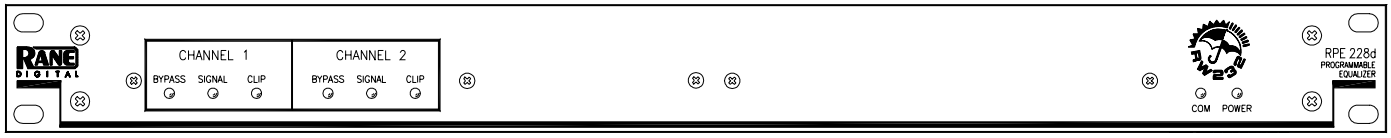


QUICK START

Read this section if you want to install and operate the RPE 228d 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 (see page Manual-4).

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 228d 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 228d. 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 228d. The yellow **COM** (communications) light 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 mode.

WEAR PARTS: This product contains no wear parts.

FRONT PANEL DESCRIPTION

① **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**.

② **SIGNAL** (green) indicates the presence of a significant analog audio signal on the Input to the Channel (typically -27 dBu).

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

④ **COM** (yellow, communications) flashes when a message for the unit is received from a PC compatible computer. There is a brief flash when using the Memory Recall Port.

⑤ **POWER** indicates that the unit is happily connected to a powered remote supply.

RPE 228d CONNECTION

When first connecting the RPE 228d to other components in your system, *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.

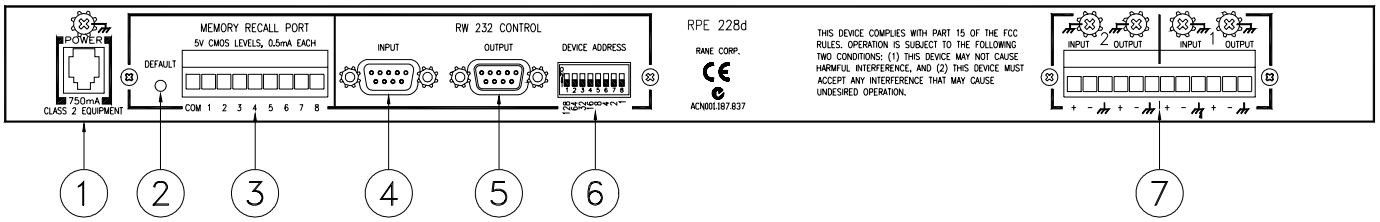
The RPE 228d requires a Rane RS 1 (provided with each unit) or compatible power supply. There are #6-32 screws provided for chassis ground. Connect a wire from this point to a known earth ground, such as an amplifier chassis. This may not be necessary when installed in a rack with other grounded units.

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

The RPE 228d 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 228d is intended to be connected to other balanced equipment with chassis-grounded shields. Connect the non-inverting audio lines to the '+' terminals, and the inverting lines to the '–' terminals. Connect the cable shields to the ground terminal on the Euroblock or screws. *Connect shields at both ends of the cables*.

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.



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

② **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' Memory Recall Port switch*—without the need for an external switch.

③ **MEMORY RECALL PORT (MRP)** provides the ability to recall Memories using contact closures. See below.

④ **RW 232 INPUT** connects to the computer, or to the RW 232 OUTPUT of other RW 232 units.

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

⑥ **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.

⑦ **Channels 1 & 2 Audio INPUT & OUTPUT** are balanced with chassis ground. See RPE 228d CONNECTION, previous page.

MEMORY RECALL PORT

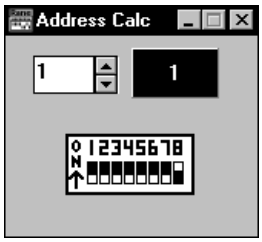
The MEMORY RECALL PORT (MRP) provides contact closure control to recall any of the 16 system Memories for both audio channels. Eight of the Memories are recalled with simple switch closure to a single terminal (see the Normal section of Table 1). There are nine screw terminals: one is chassis ground, and the other eight are inputs which are grounded to recall a preset Memory. Multiple units may be controlled by connecting these terminals in parallel. Either momentary or latching switches may be used. If a latching switch is used, the selected Memory is recalled upon power-up. If more than one terminal is grounded at a time, the lower-numbered contacts will normally be ignored. A "Binary" mode allows access to all Memories. No computer is required after the initial setup.

The MRP may be completely reconfigured in RaneWare. See Device > Edit MRP Configuration on page Manual-6.

1	2	3	4	5	6	7	8	Mode	Result
1	0	0	0	0	0	0	0	Normal	1
0	1	0	0	0	0	0	0		2
0	0	1	0	0	0	0	0		3
0	0	0	1	0	0	0	0		4
0	0	0	0	1	0	0	0		5
0	0	0	0	0	1	0	0		6
0	0	0	0	0	0	1	0		7
0	0	0	0	0	0	0	1		8
0	0	0	0	1	1	0	1	Binary	1
1	0	0	0	1	1	0	1		2
0	1	0	0	1	1	0	1		3
1	1	0	0	1	1	0	1		4
0	0	1	0	1	1	0	1		5
1	0	1	0	1	1	0	1		6
0	1	1	0	1	1	0	1		7
1	1	1	0	1	1	0	1		8
0	0	0	1	1	1	0	1		9
1	0	0	1	1	1	0	1		10
0	1	0	1	1	1	0	1		11
1	1	0	1	1	1	0	1		12
0	0	1	1	1	1	0	1		13
1	0	1	1	1	1	0	1		14
0	1	1	1	1	1	0	1		15
1	1	1	1	1	1	0	1		16

Table 1. MRP Switch Closure Logic

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. In the RaneWare program group or folder, launch the **RaneWare Address Calculator**. This binary calculator converts decimal numbers into corresponding dipswitch settings.

1	00000001	51	00110011	101	01100101	151	10010111	201	11001001
2	00000010	52	00110100	102	01100110	152	10011000	202	11001010
3	00000011	53	00110101	103	01100111	153	10011001	203	11001011
4	00000100	54	00110110	104	01101000	154	10011010	204	11001100
5	00000101	55	00110111	105	01101001	155	10011011	205	11001101
6	00000110	56	00111000	106	01101010	156	10011100	206	11001110
7	00000111	57	00111001	107	01101011	157	10011101	207	11001111
8	00001000	58	00111010	108	01101100	158	10011110	208	11010000
9	00001001	59	00111011	109	01101101	159	10011111	209	11010001
10	00001010	60	00111100	110	01101110	160	10100000	210	11010010
11	00001011	61	00111101	111	01101111	161	10100001	211	11010011
12	00001100	62	00111110	112	01110000	162	10100010	212	11010100
13	00001101	63	00111111	113	01110001	163	10100011	213	11010101
14	00001110	64	01000000	114	01110010	164	10100100	214	11010110
15	00001111	65	01000001	115	01110011	165	10100101	215	11010111
16	00010000	66	01000010	116	01110100	166	10100110	216	11011000
17	00010001	67	01000011	117	01110101	167	10100111	217	11011001
18	00010010	68	01000100	118	01110110	168	10101000	218	11011010
19	00010011	69	01000101	119	01110111	169	10101001	219	11011011
20	00010100	70	01000110	120	01111000	170	10101010	220	11011100
21	00010101	71	01000111	121	01111001	171	10101011	221	11011101
22	00010110	72	01001000	122	01111010	172	10101100	222	11011110
23	00010111	73	01001001	123	01111011	173	10101101	223	11011111
24	00011000	74	01001010	124	01111100	174	10101110	224	11100000
25	00011001	75	01001011	125	01111101	175	10101111	225	11100001
26	00011010	76	01001100	126	01111110	176	10110000	226	11100010
27	00011011	77	01001101	127	01111111	177	10110001	227	11100011
28	00011100	78	01001110	128	10000000	178	10110010	228	11100100
29	00011101	79	01001111	129	10000001	179	10110011	229	11100101
30	00011110	80	01010000	130	10000010	180	10110100	230	11100110
31	00011111	81	01010001	131	10000011	181	10110101	231	11100111
32	00100000	82	01010010	132	10000100	182	10110110	232	11101000
33	00100001	83	01010011	133	10000101	183	10110111	233	11101001
34	00100010	84	01010100	134	10000110	184	10111000	234	11101010
35	00100011	85	01010101	135	10000111	185	10111001	235	11101011
36	00100100	86	01010110	136	10001000	186	10111010	236	11101100
37	00100101	87	01010111	137	10001001	187	10111011	237	11101101
38	00100110	88	01011000	138	10001010	188	10111100	238	11101110
39	00100111	89	01011001	139	10001011	189	10111101	239	11101111
40	00101000	90	01011010	140	10001100	190	10111110	240	11110000
41	00101001	91	01011011	141	10001101	191	10111111	241	11110001
42	00101010	92	01011100	142	10001110	192	11000000	242	11110010
43	00101011	93	01011101	143	10001111	193	11000001	243	11110011
44	00101100	94	01011110	144	10010000	194	11000010	244	11110100
45	00101101	95	01011111	145	10010001	195	11000011	245	11110101
46	00101110	96	01100000	146	10010010	196	11000100	246	11110110
47	00101111	97	01100001	147	10010011	197	11000101	247	11110111
48	00110000	98	01100010	148	10010100	198	11000110	248	11111000
49	00110001	99	01100011	149	10010101	199	11000111	249	11111001
50	00110010	100	01100100	150	10010110	200	11001000	250	11111010

RANEWARE REQUIREMENTS

• RaneWare works under Microsoft Windows 3.1, 95, 98 or NT® on a PC or laptop with an available serial port. *Note: Windows 3.1 will not be supported after Dec 31, 1999.*

• RW 232 needs a DB-9 cable less than 50' long, connecting from the serial port of a computer to the RW 232 Control Input port. No interface boxes are required; just a cable and your computer.

• RaneWare can be fully demonstrated and used without an actual RPE 228d attached.

• A RaneWare 3½" floppy comes with each unit. Installation is simple and follows standard procedure with Windows. The latest version is downloadable anytime from Rane's web site, *http://www.rane.com.*

SOFTWARE OPERATION

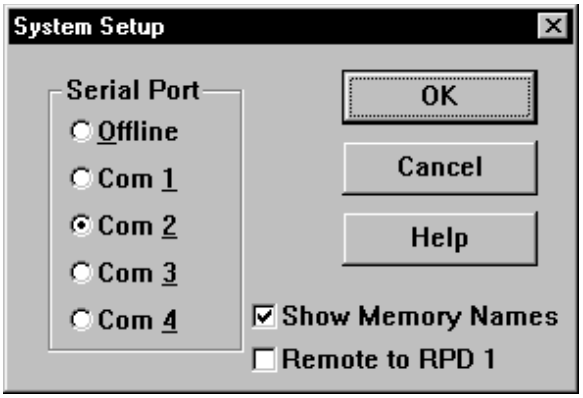
Step by Step Installation

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 to start installation. In Windows 95 or 98, use Add/Remove Programs in the Control Panel.

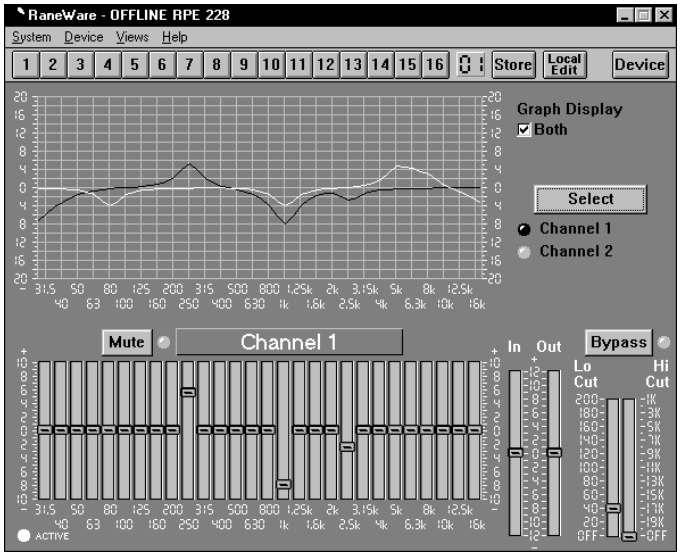
If you downloaded RaneWare from the web, decompress the file first with an unzip utility (such as Winzip™, the link is on our web site). Install as described above, except that the install program will be in the folder that holds the decompressed files.

Starting RaneWare

A RaneWare folder 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!



First, go to System > System Setup to select a Serial Port. Next, go to Device > Select, where you may select and poll for units. This process checks if any RW 232 units are connected to the serial port. If a Device is found, you are in control! (If not, with an RPE connected, read the Help file [Reference, Troubleshooting Hints]). If you don't have an RPE connected, you can still use RaneWare offline. After selecting the RPE 228d, the Graph Editing window appears.



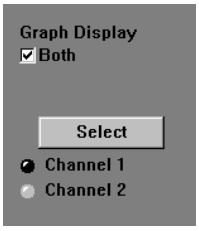
When active, the Editing window provides:

- 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.

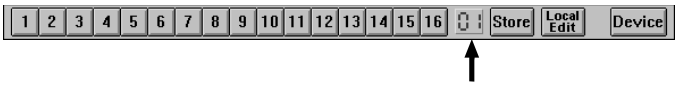
Clicking the Select key changes the audio Channel being controlled. Channel 1 appears in red. Channel 2 appears in yellow. Checking the Both box under Graph Display shows both Channels at the same time, but only the active Channel's sliders can be operated.

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

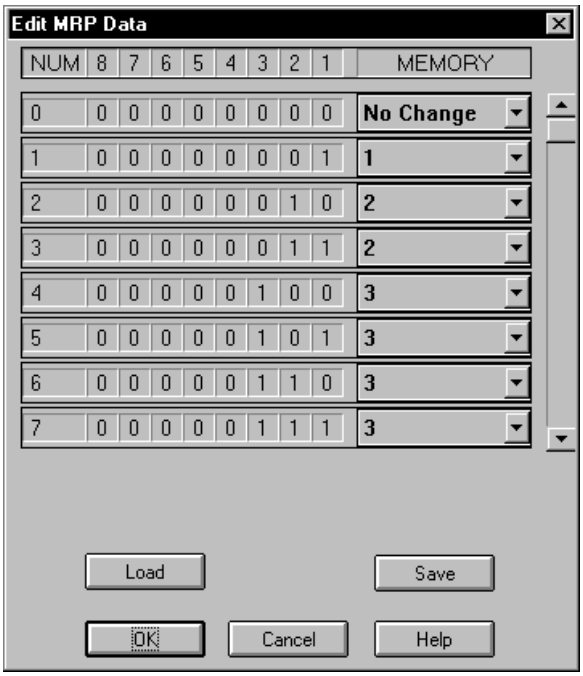


The red Memory number flashes to indicate that the current Memory settings have changed. If you wish to save these settings in one of the 16 Memories, simply click Store, and the Memory number key. It's that easy! Go ahead and store different curves in different Memories. After storing a few, clicking any Memory number instantly recalls that Memory. Store your favorites in Memories 1 through 8, since these can be recalled via the rear panel MEMORY RECALL PORT 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 228d. While Local Edit is selected, clicking on any of the Memory buttons displays the preview curve without recalling it in the RPE 228d.

The Device button brings up a selection menu of offline devices and the first 15 RaneWare units connected to the computer. Simply select the device you wish to control.

Device > Edit MRP Configuration



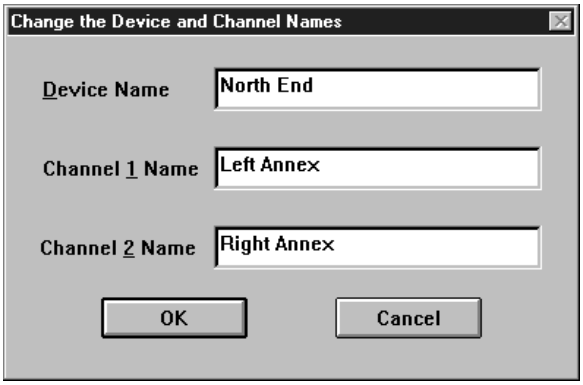
This dialog allows you to configure the MRP (Memory Recall Port).

Each possible MRP pattern is shown as a decimal number and binary code where 1 represents a switch closure on the numbered contact. To its right is a drop-down menu for each input pattern, where you select the Memory to be recalled.

You can customize Memory recall values, save them to a MRP file and load them into future units.

After exiting this dialog with the OK button, the MRP in the unit will be updated.

Device > Name Device



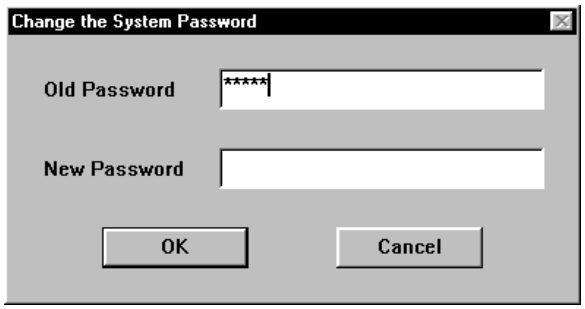
Devices and channels can also be given custom names, tailored to your installation.

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.

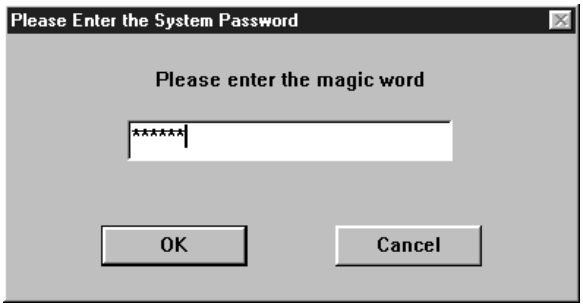
When multiple units are connected, assign each unit a unique Device Address number. See page Manual-4.

Password Security

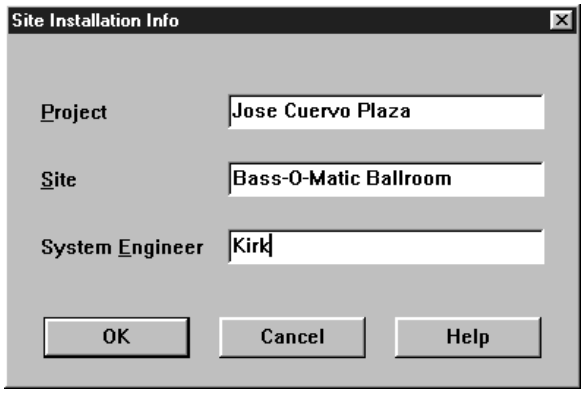
The RPE can be operated on a daily basis either through a computer or through the contact closures. To preserve preset security with a computer operator, the software can be locked (under Device), and a system password can be assigned (under System > Change Password). The default password is *please*.



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



System > Edit Installation Info

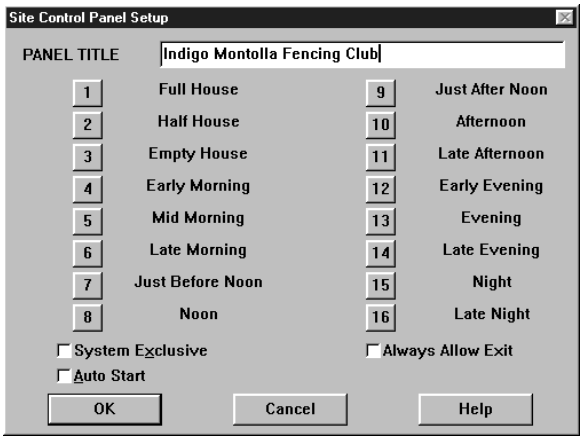


This selection allows you to enter the Project name, installation Site and System Engineer for a given project. All of these are printed on the Device Report printouts. Click in the edit box or hold the Alt key and press the underlined character to type new names.

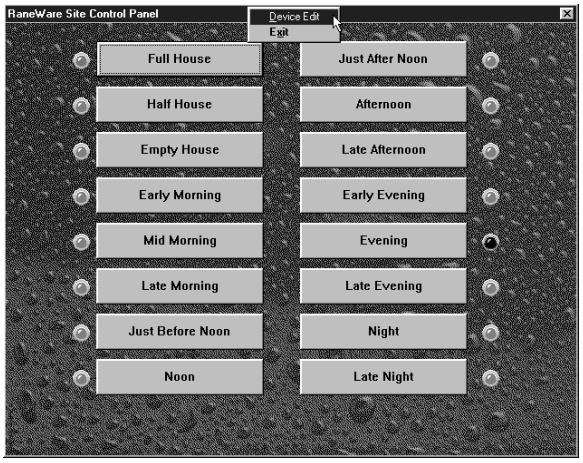
Similar to the password, the Site Installation Info is stored in the computer, not in each unit. The Site Installation Info is also stored with backup Memories when you save a unit's Memories to a file.

System > Site Control Panel Setup

Presets can be customized with names, through System > Site Control Panel Setup. Here each Memory can have a logical name.



System > Site Control Panel



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 under the Device menu. 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. These job files are usable for multiple installations. Printouts of device data, graphs, and curves are also available.

Windows 95/98/NT 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,

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

While operating the Site Control Panel in Windows 95 or 98, 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 Site Control Panel, but unfortunately, it also quits RW 232.

To get back to edit mode, Right-Click the mouse on the Site 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.

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.

Bypass can't be turned off:

The unit is probably waiting for the computer to download firmware. Removing and reapplying power to the unit will prompt it to revert to the last firmware.

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 228d 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).