QUICK START

Great video is easy; great audio is hard, but a SSE 22 makes it a lot easier. Read at least this boxed section and you'll be on your way toward great audio.

Hook-up is intuitive: In from the controller, out to the amplifiers. Just follow the silkscreened legends near the gold-plated RCA jacks on the rear of the unit.
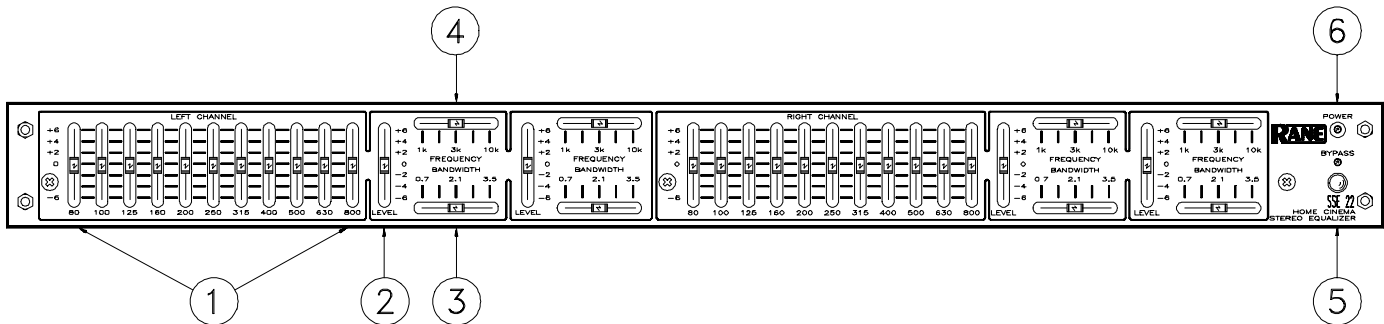
Familiarity with other graphic and parametric equalizers makes the SSE 22 just as familiar. If this is your first equalizer, be gentle; it can overwhelm you.

Use the **BYPASS** switch as an aid in comparing equalized results with unequalized results. Pushbutton *in* and locked (LED *on*) is the bypassed (unequalized) mode; pushbutton *out* (LED *off*) is the normal equalized mode. See the Operating Instructions on the page Manual-4 for alignment information.

Install the supplied security cover after completing all settings. Be sure the **POWER** light fits snugly into the hole in the security cover.

Never connect anything except an approved Rane power supply to the thing that looks like a red telephone jack on the rear of the unit. This is an AC input and requires special attention if you do not have a power supply *exactly* like the one originally packed with your unit. See the full explanation of the power supply requirements on page Manual-3.

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FRONT PANEL DESCRIPTION

1. Graphic equalizer filter level controls. The Left and Right Channels have eleven slide controls used to set the individual levels of the constant-Q filters. Their range is ±6 dB. The grounded center-detent design ensures each filter is off when positioned to 0 dB.

2. Parametric equalizer LEVEL control. Two parametric sections are included in each Channel with a ±6 dB range. This control sets the amount of boost/cut for each parametric section. Same grounded center-detent design as the Graphic Equalizer sections.

3. Parametric equalizer BANDWIDTH control. Slide control used to set the Bandwidth for this filter section. The range is 0.7-3.5 octaves.

4. Parametric equalizer FREQUENCY control. Slide control used to determine the center Frequency for this filter section. The range is 1 kHz-10 kHz.

5. POWER indicator. This LED lights any time power is supplied from the Rane model RS 1 power supply (included). To avoid confusion a distinction is made here between electrical and political.

6. Overall BYPASS switch & indicator. This pushbutton switch activates the "hard-wire" BYPASS function. When engaged (red BYPASS LED *on*), the INPUT connectors directly tie to the OUTPUT connectors (hard-wired). Engaging this switch converts the SSE 22 into a relatively expensive patch cord, albeit one with pretty lights. During the initial timed power-up sequence or power loss of any sort, the SSE 22 is automatically in BYPASS mode.
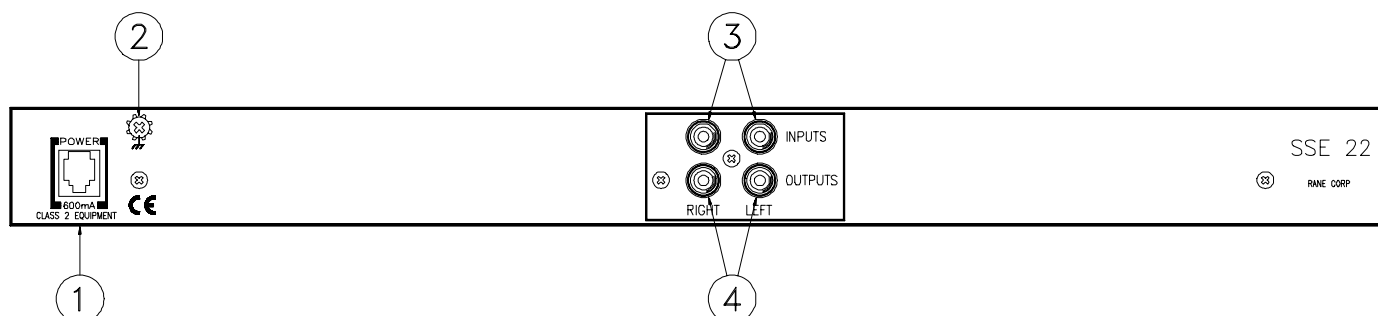
1. Remote POWER supply input. The unit is supplied from the factory with a Model RS 1 Remote Power Supply suitable for connection to this input jack. The power requirements of the unit call for an 18 volt AC center-tapped transformer only. ***This is not a telephone jack.*** *Never use a power supply other than the one supplied, or a replacement approved by Rane Corporation.* Using any other type of supply may damage the unit and void the warranty.

2. Chassis ground. A #6-32 screw is used for chassis grounding purposes. See the CHASSIS GROUNDING note below.

3. RCA OUTPUT connectors. Active unbalanced design. Use only high-grade RCA cables for interconnect to the power amplifier inputs. For balanced amplifier inputs, use a Rane BB 44X Balance Buddy, or consult the RaneNote "Sound System Interconnection" available from the factory or downloadable from the Rane web site.

4. RCA INPUT connectors. Active unbalanced design. Use only high-grade RCA cables for interconnect to the controller outputs.

CHASSIS GROUNDING

If after hooking up your system it exhibits excessive hum or buzzing, there is an incompatibility in the grounding configuration between units somewhere. Your mission, should you accept it, is to discover how your particular system wants to be grounded. Here are some things to try:

1. Try combinations of lifting grounds on units that are supplied with ground lift switches or links.

2. If your equipment is in a rack, verify that all chassis are tied to a good earth ground, either through the line cord grounding pin or the rack screws to another grounded chassis.

3. 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.

SSE 22 CONNECTION

When first connecting the SSE 22 to other components, *leave the power supply for last*. This gives you a chance to correct mistakes before damaging fragile speakers, ears and nerves. The SSE 22 locates between the preamplifier/processor and the amplifier.

INPUTS AND OUTPUTS

Connections are actively unbalanced and fitted with RCA phono pin jacks. Use good quality cables and keep lengths as short as possible. Longer length require balanced lines, using an adaptor such as a Rane BB 44X Balance Buddy.

SIGNAL LEVELS

The SSE 22 is designed for audio reference levels of 0 dBr (150 mV rms), and provides a minimum headroom of 34.5 dB above reference, making it virtually unclippable.

With all LEVEL controls located in their 0 dB detented positions, the SSE 22 operates with unity gain from Input to Output. No additional gain settings are necessary. Use the SSE 22 only for specific equalization, not level control.

SSE 22 BLOCK DIAGRAM
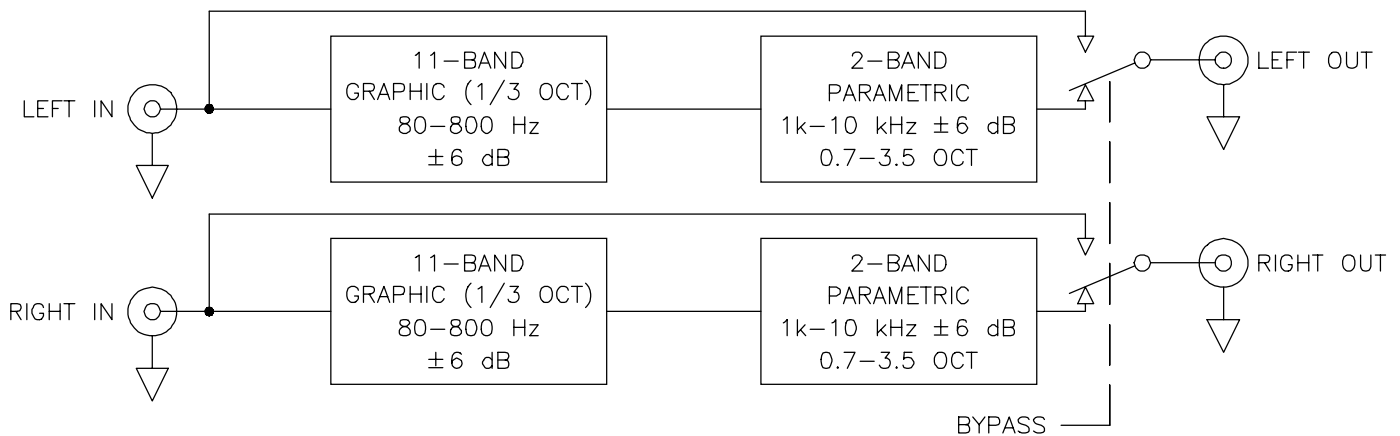
OPERATING INSTRUCTIONS

STEREO EQUALIZATION

Depending on your philosophy, equalizers can perform the role of fancy tone controls or correct speaker power response in a room. The room is an extention of the speaker cabinet, for the same speaker can sound different in different rooms. Even more critical are in-wall speakers, which depend on the wall as an extension of the cabinet, but not all walls have the same construction or size. These differences are more noticeable and specific in the lower frequencies where 1/3-octave EQ is required. The high frequencies need less control, as they are less susceptible to room acoustics.

The SSE 22 can be adjusted by ear, but we highly recommend the use of a 1/3-octave realtime analyzer or other similar test equipment. The results will be more accurate with less response variance from channel to channel.

SURROUND CHANNEL ALIGNMENT

Whether the home cinema system is Dolby Pro-Logic, Home THX, or Dolby Digital, the same principle applies: to flatten the power response of the surrounds in the room. There are no special curves to follow. Even though the controller may have a preset filter for a given listening mode, set the surrounds for a flat power response, just like the front channels. Since surrounds may be of a different design than the front channels, equalization can help the front and rear speakers sound more similar, important when the sound pans from front to back (as the spaceship flies overhead).

Test equipment is required to properly align a multi-channel system, such as a 1/3-octave realtime analyzer, preferable a model with a memory averaging function. Follow the instructions with the analyzer. Though more time consuming, a test CD and a sound pressure level meter can work. For this method, see the RaneNote on Home Theater Systems, available from the factory or downloadable from the Rane web site.

Align the system for a flat average response from each Channel. Begin with the center channel, then tune each channel separately with the other channels turned off.

Direct-radiating and dipolar surround designs follow the same guidelines. With test equipment, measure the room, not the speaker. Place the mic near the primary listening position(s), aiming straight up, not aimed at the speaker.

For those using the THX 44 for the front channels and the SSE 22 for the rear, follow the alignment procedure specified by Lucasfilm Ltd. as described in the "Home THX® Audio System Room Equalization Manual". It is not possible to align a Home THX Audio system without the use of proper procedures and a one-third octave realtime analyzer with averaging. It cannot be done by ear. The special THX "Wow" Laserdisc comes in handy as well (only supplied with some THX controllers or a licensed THX installer). The same procedure may be used for Dolby Pro-Logic and Digital systems without the THX "Wow" Laserdisc.

SETTING CURVES USING AN ANALYZER

Our unique interpolating constant-Q circuitry makes setting curves easy. For the graphic sections, what you see is what you get – more so than on any other equalizer. Referring to your room result curves, begin by positioning the sliders to create the inverse curve shown by the instrumentation. Most applications require only a few dB of boost or cut. If more is required, use architectural and mechanical means: add, remove, or relocate acoustically sensitive items (speakers, drapes, carpets, mirrors, etc.) as required.

The analyzer comes with a pink noise source. Simply connect the noise source to the right or left auxiliary input on the preamp, adjust volume for a comfortable listening level, and begin alignment.

Some creativity is required when using one of these devices on surround channels, as there is no direct surround channel input on the preamp. If you are using the THX "Wow" Laserdisc, the solution is simple. Use the pink noise Chapters 8-11 on Side 2 for all channels in the system, with the controller in Dolby Pro-Logic mode. Create a loop with the A-B Repeat function on the laserdisc player for each chapter, and align each channel one at a time. Chapter 11 is the surround channel noise source. Disconnect the right surround when you align the left surround, and vice versa.

Some analyzers require their own noise source to be used. A "Wow" Laserdisc may not be available. For these situations, some temporary patching is required. Connect the pink noise to an auxiliary Left input on the processor. Temporarily connect the preamps Left front output to the Left SSE 22 Input. Connect the SSE 22 Outputs to an amplifier and surrounds. With the SSE 22 set flat (0 dB), adjust volume to a comfortable level on the processor and leave it set. Perform the left surround alignment. Now move the cable coming from the processor to the Right SSE 22 Input, and align. Once alignment is complete, remove the analyzer and connect the cables to their normal routing.

Once equalization for all channels is set, perform a final channel level check with the Dolby Test on the processor. Use the enclosed security cover to guard your precious settings from inquisitive guests.

USING THE BYPASS SWITCH

The SSE 22 provides an overall BYPASS switch & indicator as a useful tool for optimizing settings. Use the BYPASS switch for making quick "A-B" comparisons, i.e., comparing "A", equalized (BYPASS *out*, LED *off*), versus "B", unequalized (BYPASS *in*, LED *on*).

Since the SSE 22 always operates at unity gain in the BYPASS mode, comparison can result in startling level differences between the two when a lot of boosting or cutting has been done. Therefore, keep the system level down during the first use of the BYPASS switch. *Be careful!*

SSE 22 FEATURES AND SPECIFICATIONS

Parameter	Specification	Limit	Units	Conditions/Comments
Graphic Equalizer Sections:				Left & Right
..........Bands	(11) 1/3-Octave ISO Spacing			From 80 Hz to 800 Hz
..........Type	Interpolating Constant-Q			Smooth Combining
..........Travel	20		mm	Positive Grounded Center Detent
..........Range	±6	0.25	dB	
Parametric Equalizer Sections:				Left & Right
..........Frequency Range	1 kHz-10 kHz			
..........Bandwidth Range	0.7-3.5 octaves (Q=2.0-0.33)			
..........Amplitude Range	±6	0.25	dB	
Inputs: Type	Active Unbalanced			RCA Phono Connectors
..........Impedance	10k	1%	ohms	
..........Maximum Level	34.5	1	dBr	11 Volts peak
Outputs: Type	Active Unbalanced			RCA Phono Connectors
..........Impedance	50	1%	ohms	
..........Maximum Level	+34.5 > = 2k ohm	1	dBr	11 Volts peak
Frequency Response	20 Hz-20 kHz	+0/-.2	dB	
Group Delay	Linear (Minimum Phase)	±5°		20-20 kHz
THD+Noise	0.001	.0005	%	1 kHz, +27.5 dBr (5 V peak)
Signal-to-Noise	120	1	dB	re 5 V pk; A-wtg; input short; flat
	-92.5	1	dBr	A-wtg; input short, flat
	-90.5	1	dBr	20 kHz BW; input short, flat
	-84.5	1	dBr	A-wtg; input short, full boost
	-87.5	1	dBr	A-wtg; input short, full cut
Dynamic Range	127	1	dB	Max out/noise floor (+34.5dBr/-92.5dBr)
Channel Separation	90	min	dB	20-20 kHz
Unit: Agency Listing				
..........120 VAC model	Class 2 Equipment			National Electrical Code
	UL 813 Exempt			Class 2
	CSA Exempt			Class 2
..........230 VAC model	VDE, SELV			Safety Extra Low Voltage
	CE-EMC			EMC directive 89/336/EEC
	CE-Safety Exempt			Article 1 of LV Directive 73/23/EEC
Power Supply: Agency Listing				Class 2 Equipment
..........120 VAC model	UL listed			File no. E88261
	CSA Certified			File no. LR58948
..........230 VAC model	CE-EMC			Meets EMC Directive 89/336/EEC
	CE-Safety			LV Directive 73/23/EEC
Power Supply: Input	18 VAC w/center tap	10%	Vrms	Model RS 1
..........Current	750	max	mA	RMS Current From Remote Supply
Unit: Size	1.75"H x 19"W x 8.5"D (2U)			(4.4 cm x 48.3 cm x 21.6 cm)
	17 3/8" wide w/o rack ears			(44.2 cm wide without rack ears)
..........Weight	5 lb			(2.3 kg)
Shipping: Size	4.25" x 20.3" x 13.75"			(11 cm x 52 cm x 35 cm)
..........Weight	8 lb			(3.6 kg)

Note: 0 dBr=150 mVrms=Home THX Equalizer Reference Level

All features & specifications subject to change without notice. AUG97