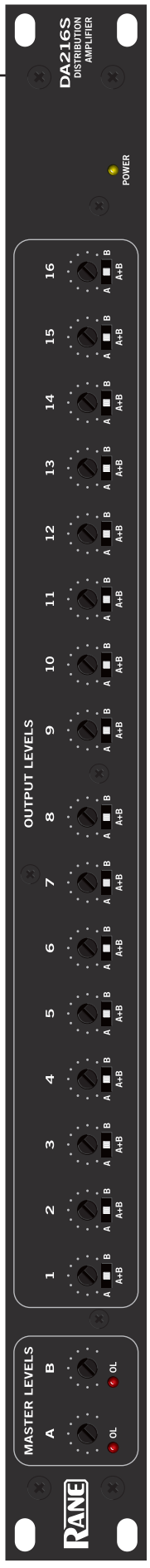
DA216S

DISTRIBUTION AMPLIFIER



IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with manufacturer's instructions.
8. Do not install near any heat sources such as radiators, registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord and plug from being walked on or pinched particularly at plugs, convenience receptacles, and the point where it exits from the apparatus.
11. Only use attachments and accessories specified by Rane.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. The plug on the power cord is the AC mains disconnect device and must remain readily operable. To completely disconnect this apparatus from the AC mains, disconnect the power supply cord plug from the AC receptacle.
16. This apparatus shall be connected to a mains socket outlet with a protective earthing connection.
17. When permanently connected, an all-pole mains switch with a contact separation of at least 3 mm in each pole shall be incorporated in the electrical installation of the building.
18. If rackmounting, provide adequate ventilation. Equipment may be located above or below this apparatus, but some equipment (like large power amplifiers) may cause an unacceptable amount of hum or may generate too much heat and degrade the performance of this apparatus.
19. This apparatus may be installed in an industry standard equipment rack. Use screws through all mounting holes to provide the best support.

WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

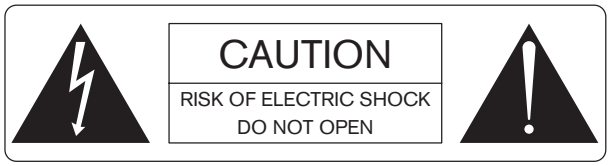
NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION: Changes or modifications not expressly approved by Rane Corporation could void the user's authority to operate the equipment.

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

WARNING

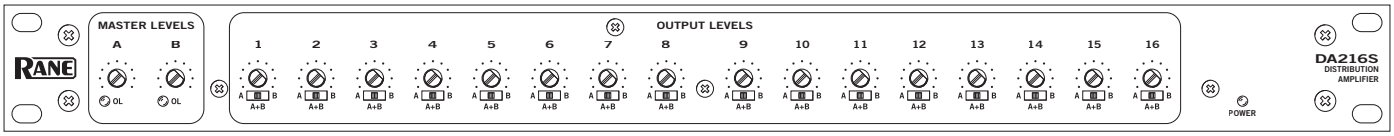


To reduce the risk of electrical shock, do not open the unit. No user serviceable parts inside. Refer servicing to qualified service personnel.

The symbols shown below are internationally accepted symbols that warn of potential hazards with electrical products.

This symbol indicates that a dangerous voltage constituting a risk of electric shock is present within this unit.

This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.



Quick Start

This section is for those that just can't wait to get started. This Distribution Amplifier has a powerful feature not found on most DA's – ***Output assignment switches.*** If your application calls for a single channel set-up with one Input driving all Outputs, set all of the switches to the appropriate Input (**A** or **B**). To mix both inputs, set them all to **A+B**. In this mode, both Inputs drive all Outputs with the Inputs summed. The **MASTER LEVEL** controls set the input level. *Occasionally blinking* **OL** indicators are okay. The individual **OUTPUT LEVEL** controls set the level for each Output channel.

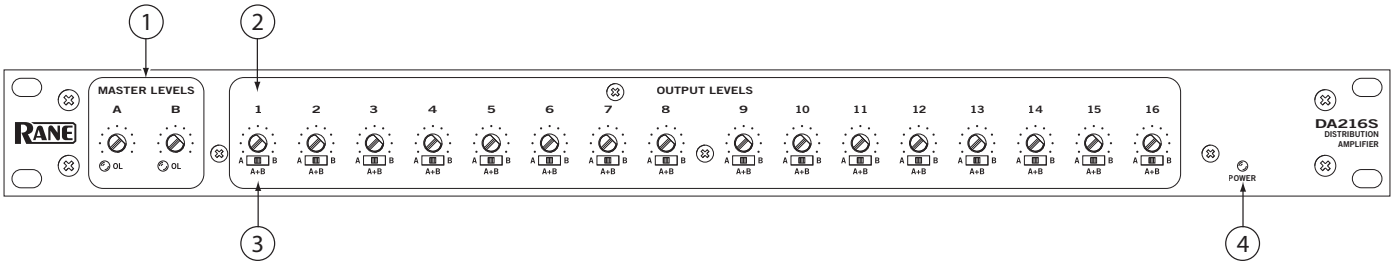
For a stereo application, decide how the stereo Outputs are to be assigned and set the assignment switches accordingly. Eight stereo outputs are possible.

Set the back panel switches for either **LINE** or **MIC** Inputs. When using microphones that require a "phantom" voltage, turn on the **PHANTOM POWER** switch, illuminating its rear panel LED. Because the phantom voltage is applied to both Inputs, don't mix phantom powered and non-phantom powered mics in the same DA216S. *Never engage the phantom voltage when using an unbalanced mic*—doing so may damage the mic. If the mic is too "hot", press the **INPUT GAIN** switch *in* to reduce the gain by 20 dB. Incidentally, the **INPUT PAD** switch reduces the gain 40 dB when in the **LINE** position (pressed *in*). When using the Inputs for line-level, pressing in both the **INPUT PAD** and the **INPUT GAIN** switches provides a nominal gain of 0 dB. An additional 16 dB of gain is available when both the **MASTER LEVEL** and **OUTPUT LEVEL** controls are turned all the way up (clockwise).

The internal universal supply allows operation in almost any part of the world. All that is required in different countries is the correct IEC line cord.

WEAR PARTS: This product contains no wear parts.

DA216S Front Panel

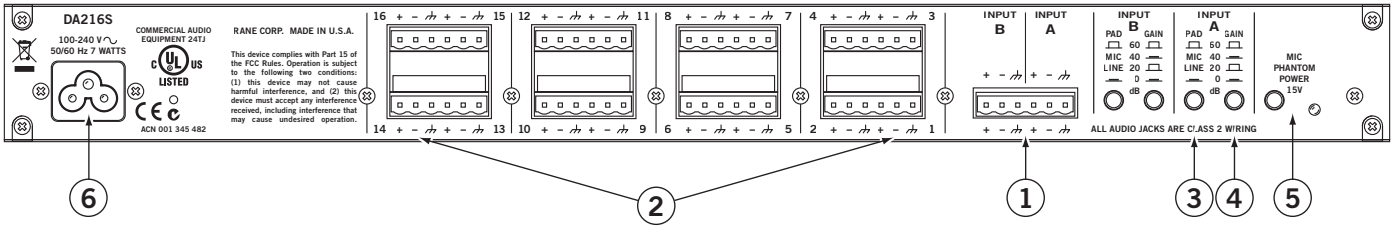


① **MASTER LEVELS:** These screwdriver adjustable controls set the level of each Input to be routed to bus A, B, or A+B. The Overload (OL) LEDs illuminate whenever either Input section (both pre-gain and post-gain) approach clipping. Each MASTER LEVEL may be adjusted from *off* to +10 dB gain.

② **OUTPUT LEVEL controls:** Each Output channel has an independent LEVEL control. Each Output may be adjusted from *off* to +6 dB gain.

③ **Output Assign switches:** Each switch has three positions, which assign the Output to the A-Input, the B-Input, or A+B (sum). This powerful feature allows the DA216S distribution amplifier to be set up as 1 Input to 16 Outputs. Or 1 stereo Input pair to 8 stereo Output pairs. Or 1 Input to 3 Outputs, with the other Input to 13 Outputs. And so on. For those of you that like impressive numbers, that amounts to 43,046,721 possible combinations (3^{16})! Go ahead – count them. By the way, for those that really like this stuff, if we allow turning the gain all the way down on any Output as part of the combination, the number jumps to 4,294,967,295 (4^{16}). Fortunately, most users will only be concerned with one or two of these possibilities.

④ **POWER Indicator:** When this yellow LED is illuminated power is running through the DA216S.



① **INPUT Euroblocks:** Attach either Microphone or Line-level sources here. Euroblocks accept any #14 to #26 guage wire. Connect balanced sources to the respective "+" and "–"terminals, and tie the shield to chassis ground. For unbalanced sources use two-conductor shielded cable as described in *DA216S Connection* on page Manual-4.

② **Output Euroblocks 1-16:** Balanced Outputs are provided for each of 16 channels. Connect two conductor shielded cable to "+" and "–" terminals, and connect the shield to the ground terminal. For unbalanced use, do not connect "–" to chassis ground. See the *Outputs* section on page Manual-4.

③ **INPUT PAD switches:** In the MIC position (*out*), the gain is appropriate for a microphone Input (40 dB or 60 dB). In the LINE position (*in*), the gain is line-level (0 dB or 20 dB). When this switch is in the LINE position, PHANTOM POWER (⑤) for the channel is disabled.

④ **INPUT GAIN switches:** Changes the gain by 20 dB. That is, with mic Input, the INPUT GAIN switch sets the gain to 60 dB (*out*) or 40 dB (*in*). With a line-level Input, it sets the gain to 20 dB (*out*) or 0 dB (*in*).

⑤ **PHANTOM POWER switch:** When activated (*in*), 15 VDC Phantom Power appears at each mic-level Input and the LED illuminates. If an Input is selected for line-level, the Phantom Voltage is disabled for that channel, even when the PHANTOM LED is lit.

⑥ **Power connector:** The internal universal switching power supply operates on any AC mains 100 to 240 VAC, 50 or 60 Hz (most places in the world). All that is required when traveling is the appropriate IEC line cord.

DA216S Connection

When connecting the DA216S to other components in your system, leave the power supply for last. This gives you a chance to make mistakes and correct them without announcing what you did to the whole world and without damaging "downstream" equipment. Remember this when setting INPUT PAD, INPUT GAIN and PHANTOM POWER switches. These switches should never be changed in a live system. Suddenly changing the gain by 40 dB can have a profound impact on the ears of the listening audience.

INPUTS

The two Inputs on the DA216S are balanced. They may also be used in an unbalanced configuration. However, if used unbalanced, *do not engage Phantom Power*. Use only shielded cable for the Inputs. This cable should always be two conductors plus shield, even for unbalanced operation. If you *must* use shielded single conductor, keep the cable as short as possible (under 10 feet [3 meters]) to avoid hum or radio pick up.

When connecting Inputs, use all three Input terminals. For unbalanced, the "hot" Input goes to the "+", and the common wire goes to the "–" while the shield connects the ground. Since the common wire and shield are to be tied together at one end in an unbalanced system, this connects the "–" Input to chassis ground. In a balanced system (highly preferred), the "+" Input connects to the "+" Output of the previous equipment. The "–" Input then connects to the "–" Output and the shield goes to the chassis ground. These Input connections may be reversed if it is necessary to reverse the polarity of the Input signal.

Be aware, if a microphone is used which requires Phantom Power, the shield must be connected to chassis ground to complete the Phantom Power circuit. Remember, a dynamic mic will likely be damaged if used unbalanced while the Phantom Power is turned on. At the very least, it will saturate the mic's output transformer and spoil the sound quality. With the INPUT PAD switched to LINE, Phantom Power is disabled for that Input only. That is, a balanced, Phantom Powered mic may be used at one Input and a line input at the other without problems.

See the RaneNote "Sound System Interconnection" for additional information on grounding and shielding.

OUTPUTS

The DA216S's Outputs are balanced and quite substantial. They will easily drive long cables and 600 Ω loads to full level. The same wiring conventions as the Inputs apply. For unbalanced Outputs, "hot" goes to the "+", and the shield connects to chassis ground. When wiring unbalanced Outputs, do ***not*** tie the unused terminal (normally "–") to Ground — leave it floating.

32 Unbalanced Outputs Tip: *The ("–") Output may also be used as an unbalanced line driver, albeit inverted. The balanced Input terminals of the next stage must be reversed (+) for (–) to correct for the inversion. This nets a total of 32 Outputs!*

Operating Instructions

Using the 3-position Output Assign switches, select either the A Input, the B Input, or A+B Inputs. If the sum of both Inputs is selected, but only one Input is driven, the Output is reduced by 6 dB compared to the Output being assigned to only the driven Input. Since normally the Output would be assigned to both Inputs only if both Inputs are driven, this isn't usually an issue. With the sum of the Inputs available in this way, the DA216S may be used as a two-input mixer with 16 assignable Outputs. Each Output has an independent Gain control which ranges from *off* to +6 dB gain in the output stage. Coupled with a maximum gain of +10 dB for the MASTER LEVEL controls, a total of +16 dB gain is available with the OUTPUT LEVEL controls. The INPUT GAIN switch provides for an additional 20 dB gain increase.

MIC-LEVEL

For optimum noise performance with microphones, obtain as much gain as possible in the Input stage of the DA216S without overdriving the unit.

1. Set the appropriate INPUT PAD switch to MIC (*out*).
2. Set the appropriate INPUT GAIN switch to 40 dB (*in*).
3. Set the MASTER LEVEL controls fully counterclockwise.
4. Set the OUTPUT LEVEL controls midway.
5. Adjust the MASTER LEVEL clockwise until the OL LED just blinks on the loudest expected program material. If the MASTER LEVEL is turned all the way up and the OL LED is not lighting, set the INPUT GAIN to 60 dB and adjust the MASTER LEVEL again. Adjust the OUTPUT LEVELs for the desired output level. If the OL LED is *not* lit, adjusting the OUTPUT LEVEL cannot cause clipping within the DA216S. The user may still want to turn down the OUTPUT LEVEL to avoid overloading downstream equipment.

LINE-LEVEL

In the LINE-level configuration, start with unity gain.

1. Set INPUT PAD switch to LINE position (*in*).
2. Set appropriate INPUT GAIN switch to 0 dB.
3. Set MASTER LEVEL controls fully counterclockwise.
4. Set OUTPUT LEVEL controls midway.
5. Adjust the MASTER LEVEL clockwise until the OL LED just blinks on the loudest expected program material. If the MASTER LEVEL is turned all the way up and the OL LED never comes on, set the INPUT GAIN switch *out* to the 20 dB position. Adjust the MASTER LEVEL control as before for optimum gain, then adjust the OUTPUT LEVEL controls for the desired output level.