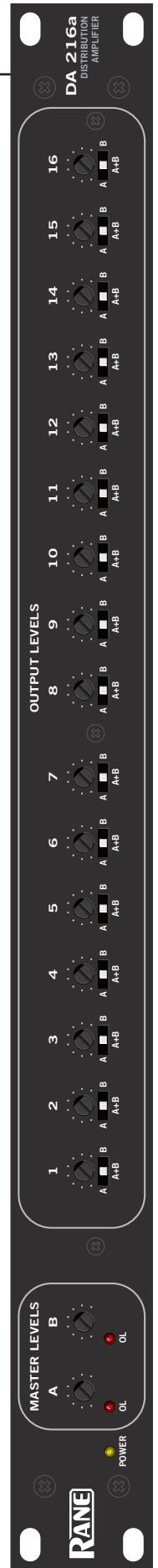




DA 216a

DISTRIBUTION AMPLIFIER



IMPORTANT SAFETY INSTRUCTIONS

For the continued safety of yourself and others we recommend that you read the following safety and installation instructions. Keep this document in a safe location for future reference. Please heed all warnings and follow all instructions.

Do **not** use this equipment in a location where it might become wet. Clean only with a damp cloth.

This equipment may be installed in an industry standard equipment rack. We recommend that all mounting holes be used, providing the best physical support. The equipment may be used as a table top device, although stacking of the equipment is dangerous and not recommended.

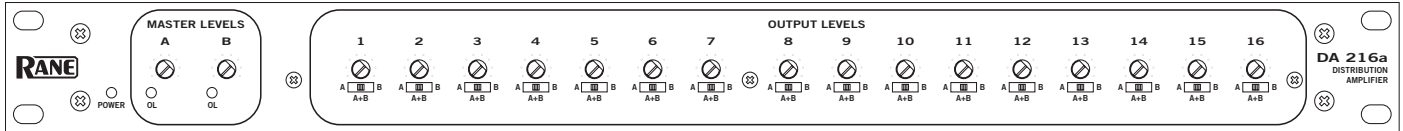
Do not directly block any of the ventilation openings. If rackmounting, please provide adequate ventilation. Equipment may be located directly above or below this unit, but note that some equipment (like large power amplifiers) may cause an unacceptable amount of hum or may generate too much heat and degrade the performance of this equipment.

Protect the power cord and plug from damage caused by being walked on or pinched. Protect the line cord, where it exits the unit, from excessive strain. Only use attachments and accessories specified by Rane.

Unplug this equipment during lightning storms or when unused for long periods of time.

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 damage, spilled liquid, fallen objects into an opened chassis, exposure to rain or moisture, a dropped unit, or abnormal operation.





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.

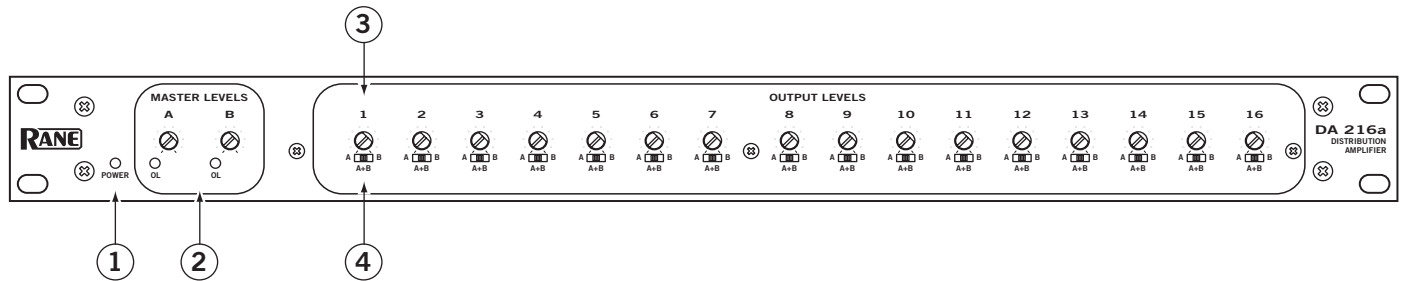
For a stereo application, decide how the stereo Outputs are to be assigned and set the assignment switches accordingly. Eight stereo outputs are possible.

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 DA 216a. *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).

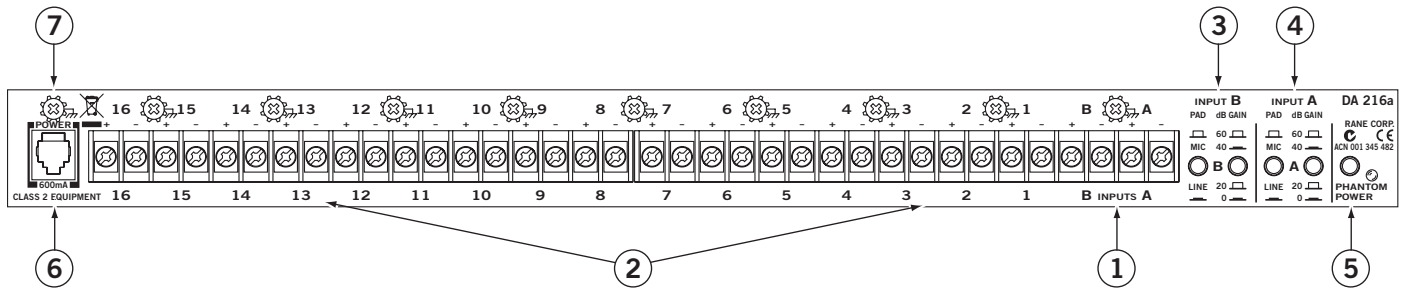
Never connect anything except an approved Rane power supply to the Input that looks like a telephone jack on the rear of the DA 216a. This is an AC Input and requires specific voltage and current. This is *not* a good place to experiment or improvise. Use only the supply sent with your DA 216a.

DA 216a FRONT PANEL



- ① **POWER Indicator:** When this yellow LED is illuminated power is available to the DA 216a.
- ② **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.
- 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 DA 216a 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 **OUTPUT LEVEL controls:** Each Output channel has an independent LEVEL control. Each Output may be adjusted from *off* to +6 dB gain.

DA 216a REAR PANEL



- ① **INPUT terminals:** Attach either Microphone or Line-level sources here. Connect balanced sources to the respective “+” and “-” terminals, and tie the shield to chassis ground. Connect unbalanced sources with two conductor shielded cable connected to “+” and “-”, with the shield connected to one of the chassis ground screws (⑦). See *DA 216a Connection* on page Manual-4.
- ② **Output terminals 1-16:** Balanced Outputs are provided for each of 16 channels. Connect two conductor shielded cable to “+” and “-” terminals. Connect the shield to one of the chassis ground screws. For unbalanced use, do not connect “-” to chassis ground...doing so results in improper operation. 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 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 PHANTOM POWER 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 Input connector:** Use only a model RS 1 or other remote AC power supply approved by Rane. Consult the factory for replacement or substitution. *Never use a power supply with your DA 216a other than the one supplied from the factory or an exact replacement obtained or approved from Rane Corporation.* This unit’s power supply input is designed for an AC supply, delivering 18 volts from a center-tapped transformer capable of supplying at least the current demanded by this product. Using any other type of supply may damage the product and void the warranty, which at two years (three if you send in the warranty card) parts and labor is worth safeguarding, don’t you think?
- ⑦ **Chassis ground screws:** #6-32 screws are used for chassis grounding purposes. Attach the shields of the audio cables to these points. See the *Chassis Grounding* note below.

IMPORTANT NOTE

CHASSIS GROUNDING

The DA 216a is supplied with an external power supply (the RS 1). This power supply does not ground the unit to the power line ground. On the rear chassis a #6-32 screw is provided to allow for attachment of the grounding wire. This chassis ground point must be connected to earth ground either through another product, which utilizes a three-prong grounded AC power cord, or by attaching the wire to a known earth ground (such as the screw on a grounded AC outlet).

DA 216a CONNECTION

When connecting the DA 216a 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 DA 216a 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 to avoid hum or radio pick up. When connecting Inputs, use both Input terminals. For unbalanced, the “hot” Input goes to the “+”, and the common wire goes to the “-” while the shield connects to one of the chassis grounds. 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 DA 216a’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 one of the chassis grounds. 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 DA 216a 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 DA 216a 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 DA 216a. The user may still want to turn down the OUTPUT LEVEL to avoid overloading downstream equipment.

LINE-LEVEL

In the LINE-level configuration, unity gain is the best place to start.

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.