

QUICK START

This section provides for those with limited reading patience, and/or a high level of technical expertise. It familiarizes you enough with the FPM 44 to allow operation without wading through the rest of the text. You owe it to yourself to read at least this section to ensure reasonable operation of the unit.

Begin with the **INPUTS**. They are to be connected to the terminal strips on the rear. Follow the indications screened adjacent to the connectors. Balanced sources connect to the respective “+” and “-” **INPUTS**. Connect all incoming shields to the nearest **GND** terminal. Unbalanced inputs connect between the “+” terminal and **GND**.

Connect the **AUX A/B OUTPUTS** as required to the piece of equipment to be driven. Use the unbalanced “+” outputs and the nearest **GND** terminal. Set the internal Pre/Post Aux Assign switches as necessary (shipped “PRE”). The **A** and **B MASTER OUTPUTS** may drive balanced or unbalanced sources. Unbalanced output uses only the “+” and **GND** terminals.

Connect the Flex bus cables to the appropriate source for the **FLEX BUS IN** and the next unit for **FLEX BUS OUT**.

Set the **GAIN** switches on the front of the module so the desired level is obtainable from your sources without illuminating the red **OL** (overload) LEDs on the channels. Set the **A** and **B LEVEL** controls on each input for the desired level. The single **AUX SEND** level control routes signal from each input channel to *both* **AUX A** and **B OUTPUTS** equally.

The **MASTER A/B** output level controls affect only the signal level at the direct outputs of the unit. They have no affect on the main output added to the **FLEX BUS OUT**.

NEVER CONNECT ANYTHING EXCEPT AN APPROVED RANE POWER SUPPLY TO THE RED THING THAT LOOKS LIKE A TELEPHONE JACK ON THE REAR OF THE UNIT. This is an AC input and requires special attention if you do not have an operational power supply *exactly* like the one that was originally packed with your unit. See the full explanation of the power supply requirements elsewhere in this manual.

SYSTEM CONNECTION

When connecting the FPM 44 to other components in your system for the first time, *leave the power supply for last*. This gives you a chance to make mistakes and correct them without damage to your fragile speakers, ears and nerves.

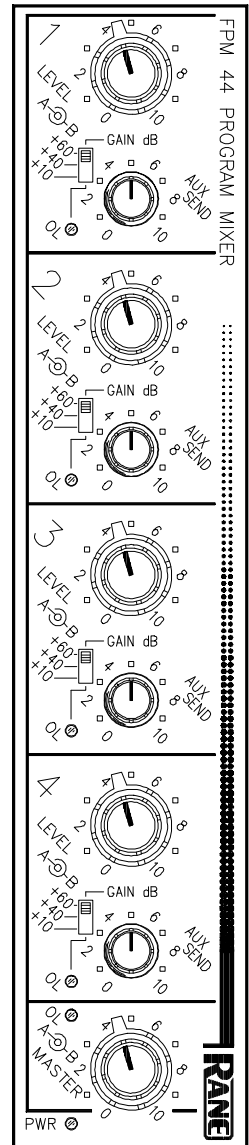
INPUTS. The four channel inputs on the FPM 44 are balanced. They may also be used in an unbalanced configuration. It is a good idea to use crimp-on spade connectors on the ends of the cables connected to the Ins and Outs of the mixer. Using stripped or tinned wire makes an unreliable union. Use only shielded cable for inputs and outputs. This wire should always be two-conductor plus shield, even for unbalanced operation. Balanced inputs should be connected to both the “+” and “-” for signal hot and return. The shield should be tied to the nearest ground terminal on the strip. A neutral “pin 1” ground is not necessary. For unbalanced use, connect the hot side of the input cable to “+” and signal return and shield to a ground terminal. It is never necessary on any Rane Flex module to ground the “-” Input in the unbalanced mode. It won’t, however, hurt anything if you do. If the input is coming from another piece of equipment in the signal path, connect the shield only at the receiving end to help prevent ground induced hum. If a microphone is being connected to the unit, the shield may be connected to the case of the mic as well as to the ground terminal on the unit.

OUTPUTS. The FPM 44’s **MASTER A** and **B OUTPUTS** are balanced. Connect a shielded cable to the device(s) being

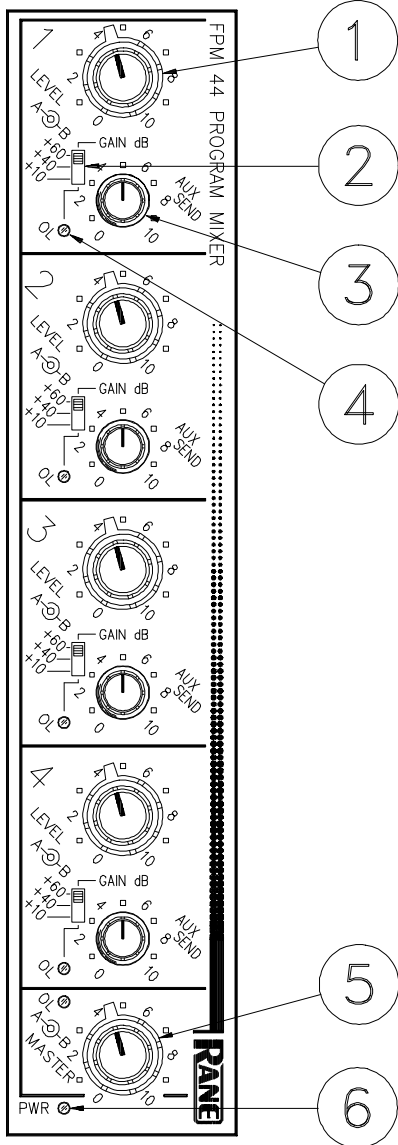
driven. If an unbalanced characteristic is what you desire, use the “+” terminal and one of the grounds for return. Do not short the “-” terminal to ground.

FLEX BUS IN. The 7-pin DIN bus connectors are used primarily with other Flex modules. These are not MIDI connectors. Use only the supplied DIN cable. If for some reason there is not a cable in the FPM 44 box, please contact Rane for a replacement. If you are in a bind, a 5-pin DIN may be used instead of a 7-pin. The two outside pins (6 & 7) are spares on the FPM 44 and have been included for possible future compatibility reasons. All pins should be wired straight through, i.e., 1 to 1, 2 to 2, etc. This Input is to be used when combining the FPM 44 with the bus outputs of other modules such as another FPM 44, an FMI 14, etc. Bringing in bus signals allows the FPM 44’s mix to add to the bus and be routed on to the next unit, and so on.

FLEX BUS OUT. Cable precautions covered in the preceding paragraph apply to the outputs as well. The **FLEX BUS OUT** of the FPM 44 may be connected to other Flex mixer modules to complete a system. The receiving device may be any Flex module with a **FLEX BUS IN**. See the **Flex Users Guide** for additional details.



FRONT PANEL DESCRIPTION



1. INPUT LEVEL CONTROLS. These concentric LEVEL controls set the level of each input to be routed to the MASTER A/B OUTPUTS and Flex Bus. The inner knob controls the level to be sent to A, the outer knob controls the signal applied to B. Rotating the knobs together creates a “pan centered” effect. Leaving one off and increasing the other emulates a full pan to one side.

2. GAIN SELECT SWITCH. These switches set the maximum gain of the input stages in each of the four input sections. The 60dB mode is normally used for most microphones. The 40dB mode would be used for high level microphones or very weak line level inputs. The 10dB mode is suitable for line level inputs. *Phantom power is automatically defeated in the 10 dB position.*

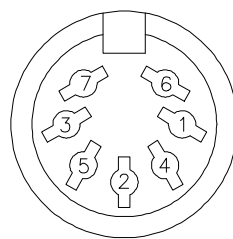
3. AUX SEND LEVEL CONTROL. There is only one of these for both the AUX A and B sends. It controls the amount of channel input fed equally to the AUX SEND A and B OUTPUTS. This control’s range is from off to 0dB, i.e., there is no additional gain after the input stage. The Aux source is selected from either pre- or post fade via internally located switches. See “4-In 4-Out Modification” to dedicate any input to only one Aux Output.

4. OVERLOAD INDICATOR. This red LED comes on anytime the input amplifier exceeds a level of 4dB below clipping.

5. MASTER A & B LEVEL CONTROLS. These concentric knobs set the signal output level of the MASTER A output (inner knob) and the MASTER B output (outer knob). Their range is from off to +10dB.

6. POWER INDICATOR. Indicates power, as indicated.

FLEX BUS (INPUT OR OUTPUT)

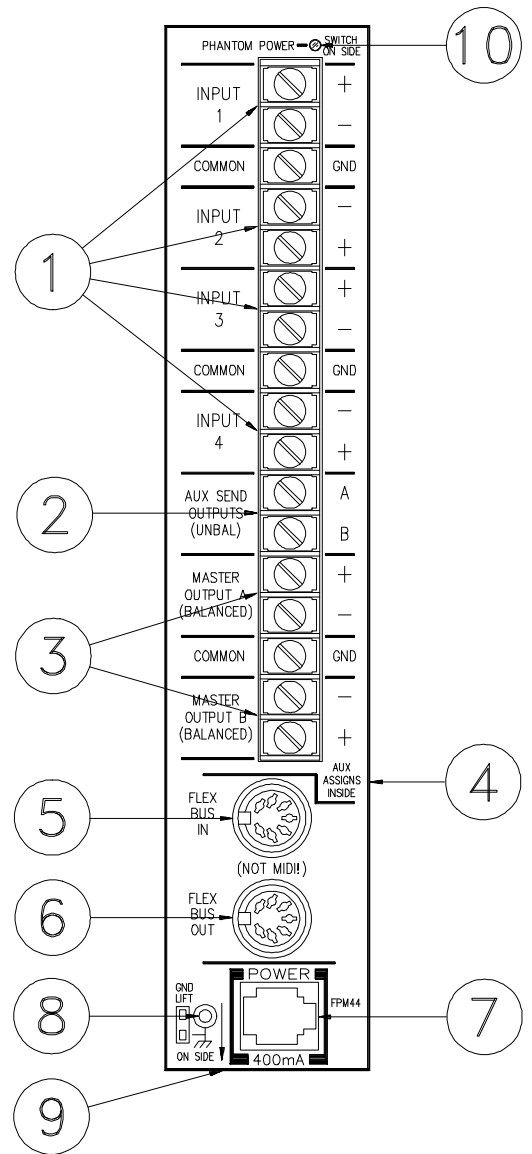


PIN	ASSIGNMENT
1	MASTER A
2	SIGNAL GROUND
3	AUX B
4	MASTER B
5	AUX A
6	SPARE A
7	SPARE B
SHELL	SHIELD

CONTACT NUMBERS AS SEEN LOOKING AT THE REAR OF THE FLEX MODULE

REAR PANEL DESCRIPTION

1. **CHANNEL INPUT CONNECTORS.** These terminal strip points are used for either microphone or line level inputs. Connect balanced sources to “+”, “-” and GND terminals. Unbalanced inputs connect to “+” and GND only. When an unbalanced input is used, the “-” may be left open or shorted to GND.
2. **AUX SEND OUTPUTS.** These are unbalanced terminals and non-inverting with respect to the inputs. Ground return is picked up from the GND connector located between the output terminals.
3. **MASTER OUTPUTS.** These “+” and “-” terminals supply a balanced direct output of Master A/B. If balanced operation is your choice, use both terminals. If an unbalanced line is required, use “+” and one of the GNDs located nearby.
4. **AUX PRE/POST ASSIGN SWITCHES.** Slide switches located inside the FPM 44. Used to select Aux source to be Pre- or Post- input LEVEL A/B controls. See the Assembly Diagram. **NOTE: AUX ASSIGN SWITCHES SHIPPED IN “PRE” POSITION.**
5. **FLEX BUS IN CONNECTOR.** This input accepts bus information from other FLEX mixer modules, such as an FMI 14, FLM 82 or another FPM 44. This input adds to the program material connected to the FPM 44. The combined results appear at the FLEX BUS OUT jack, as well as the terminal strip outputs.
6. **FLEX BUS OUT CONNECTOR.** This seven-pin DIN connector provides output to other mixer modules, such as another FPM 44, an FMI 14 or an FMM 42. Signals present here include the AUX of both this FPM 44 as well as any AUX sends generated by other FLEX mixer modules connected to the FLEX BUS IN above. The Master A and B signals are also available, which are the sum of this module and any other modules connected to the BUS IN.
7. **POWER INPUT CONNECTOR.** Use only a model RS 1, FRS 8, RAP 10, VC 18 or other remote AC power supply approved by Rane. The FPM 44 is supplied with a remote power supply suitable for connection to this input jack.
8. **CHASSIS GROUND POINT.** A #6-32 ground screw is used for chassis grounding purposes. See the **CHASSIS GROUNDING** note on the last page for details.
9. **GROUND LIFT SWITCH.** On this unit, the GROUND LIFT switch is located along the bottom edge (vertical mounting), or along the right-hand side (horizontal mounting). Since the switch’s location prevents easy use once installed, it is suggested you decide which position is required, and set it before installation. *The LIFT position is when the switch is slid toward the rear of the unit.* This switch provides the ability to separate chassis ground and signal ground. Normally, this switch should be in the *lift* (rearmost) position. In some circumstances it may be necessary to move it to the opposite position to eliminate stubborn hum and buzz problems. If you are tempted to try moving this switch with your power amplifiers turned on or turned up, *don't be. Always turn your amplifier levels down before changing your grounds around and then bring them up slowly. Put a speaker re-coner out of work today!*
10. **MASTER PHANTOM POWER SWITCH & LIGHT.** On this unit, the MASTER PHANTOM POWER switch is located along the top edge (vertical mounting), or along the left-hand side (horizontal mounting). Since the switch’s location prevents easy use once installed, it is suggested you decide if Phantom Power is required, and set it before installation. *The ON position lights the LED when the switch is positioned to the rear of the unit.* Individual internal PHANTOM POWER switches allow Phantom to be defeated on selected channels. See the Assembly Diagram. *For line-level applications, phantom power automatically dis-engages in the GAIN = 10dB position.*



OPERATING INSTRUCTIONS

This unit serves two similar yet different functions. It may be operated as a stand-alone 4-input to 4-output mixer, or it may be used in conjunction with other Flex mixer modules to create a larger system. For instance, via the Flex bus system, the FPM 44 may be connected to other input modules to accommodate an infinite number of inputs, which may be mixed to 4 outputs. It may also be used in conjunction with FMI 14s when the equalization features of that unit are required on one or more inputs. The module may also be used with the FMM 42 Master Module which features Auxiliary Bus Outputs, which also may be mixed with the A and B Main Outputs for effects mixing. The possibilities are staggering and we shall attempt to describe them, so you may fully understand the range of talent provided by the FPM 44.

STAND-ALONE. As an independent 4-input to 4-output mixer, the FPM 44 is a reasonably straightforward device. The 4 Inputs are mixed to either, or both, of two Master buses, A and B, as well as to both Auxiliary buses via the AUX SEND control on the front of the unit. The A and B input LEVEL controls determine the amount of input signal to be applied to each of the main buses. The A and B MASTER level controls at the end of the signal path set the levels for the final output at the A and B MASTER OUTPUT terminals on the rear of the unit. The AUX send control on each input places an equal amount of program on each of the AUX A/B OUTPUTS. The source for the Aux is determined by setting the internal assign switches to be either pre- or post- the input LEVEL controls. *This is a single control for both outputs—see 4-In 4-Out Modification below.*

MULTIPLE MODULES. As previously mentioned, the FPM 44 may be used in conjunction with other Flex mixer modules to create a large system. This is accomplished through the use of the FLEX BUS IN and OUT jacks on the rear of the unit. Each mixer module in the system places its Master and Aux mixes on the respective buses internally and provides this information to the BUS OUT jack. When these signals are connected to the BUS IN jack on a succeeding unit, they combine in the next unit with any local program material generated in that unit and the sum of the two will be available at the second unit's BUS OUT jack.

Each Flex mixer module sums all bus information in such a way that the Flex BUS OUT is a low impedance line. This differs rather dramatically from the way most mixers operate. Normally this line would be very sensitive to noise and would be impossible to bring out of the mixer, even in a well shielded cable. This is not a problem with the Flex Bus System and thus allows as many modules to be combined on one bus as could ever be necessary.

For further system connection possibilities, please refer to the **Flex Users Guide**.

4-IN 4-OUT MODIFICATION. Because of space limitations, dual concentric AUX SEND pots are not possible. By internally disabling the output of this pot to either of the Aux Outputs, the FPM 44 can become a quad mic preamp.

WARNING: *This modification should only be attempted by factory authorized service center to preserve the warranty.*

Step 1: Switch the internal Pre-Post switches to the PRE position (see Board Layout).

Step 2: There are resistors that connect each input to the aux A or B outputs. On input 1, 1R31 connects to the aux A output, and 1R32 connects to the aux B output. On input 2, the resistors are 2R31 (to A) and 2R32 (to B); etc. So to make any input send only to aux A, disconnect one end of the R32 resistor that connects to aux B. To make any input send to aux B, disconnect the R31 resistor.

To create a 4-In, 4-Out, only 3R32 and 4R31 need to be removed. Then on the front panel, begin by turning all controls down. Input 1, turn up the inner concentric LEVEL. Input 2, turn up the outer concentric LEVEL. Inputs 3 and 4, turn up the SEND controls. Unused knobs can be pulled off to simplify operation if desired.

POWER SUPPLY. As noted elsewhere in this manual, never use a power supply with your FPM 44 other than the one supplied from the factory or an exact replacement authorized by Rane Corporation. This unit's power supply input is designed for an AC supply, delivering 18-24 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 unit and void the warranty (which at two years parts and labor is worth safeguarding, don't you think?).

IMPORTANT NOTE

CHASSIS GROUNDING

The Rane FPM 44 is supplied with either a bottom/side mounted ground-lift switch. The unit is shipped with this switch in the "grounded" position, tying circuit ground to chassis ground. 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 the ground screw on the chassis.

Please refer to Rane Note 110 (supplied with your unit and available on request at no charge if you lost your first one) for further information on system grounding.