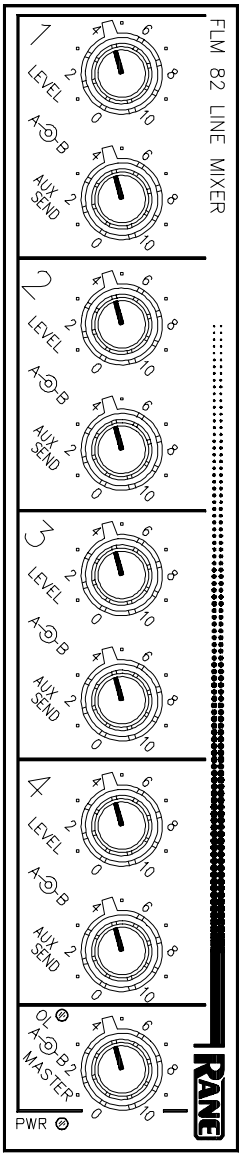


QUICK START

This section has been provided as a convenience for those without enough patience to read the entire manual. If you are experienced with this unit or other Rane Flex modules, these few words should help you refresh your memory.

The FLM 82 is a line level mixer only. It will not accept microphone input levels. Inputs are accepted in unbalanced pairs. Each of the four two-channel Inputs are set up in a tip-ring-sleeve configuration such that the tip is Channel A and the ring is Channel B. Input or mix levels are controlled by a concentric **LEVEL** control on each Input channel. The outer knob determines the mix level for Channel B, the inner is Channel A. The **AUX SEND** Level controls are set up the same way; outer knob determines the send level for Channel B, inner is Channel A.

The Aux Sends may be internally switched so that they are pre or post input fader. FLM 82s are shipped from the factory with the internal switches set to the "pre" position. To change this, the top cover must be removed and the switches reset to the desired position following the legends on the circuit board assembly.

Like many of the Flex Series modules, the FLM 82 provides busing capabilities so that it may be included in a larger mixer configuration with other modules. The **FLEX BUS INPUT** on the rear will sum all previous modules on the Bus with the Inputs of the FLM 82. The **FLEX BUS OUT** connector makes available all signals on the Bus Input as well as locally generated program material in the FLM 82. The **STEREO/MONO** switch on the rear adds Channel A and Channel B signals together for a mono feed to the **MASTER OUTPUTS A** and **B** on the rear of the unit. Engaging this switch also causes the AUX A and B signals to be combined to one. The **AUX LOOP A** and **B** jacks on the rear may be used either as direct Aux Outputs or for inserting processing in series with the Aux buses before the are added to the direct A and B Master Outputs. The use of these jacks will have no effect on Aux signals placed on the FLEX BUS. The **MASTER A** and **B** level controls set the output level to the MASTER A and B Outputs on the module, and have no effect over levels being delivered to the FLEX BUS OUT connector.

Never connect anything except an approved Rane power supply to the red thing that looks like a telephone jack on the rear of the FLM 82. This is an AC input and requires special attention if you do not have a power supply ***exactly*** like the one that was originally packed with your unit. See the explanation of the power supply requirements elsewhere in this manual.

SYSTEM CONNECTION

When connecting the FLM 82 to other components in your system for the first time, *leave the power supply for last* . This lets you make mistakes and correct them without damage to your fragile speakers, ears and nerves.

INPUTS. All inputs on the FLM 82 are unbalanced. Each of the four TRS INPUT jacks is arranged so that tip drives Channel A and ring drives Channel B. Use shielded cable for all input and output wiring. Connect the shield to the sleeve of the input connector. Rane Note 110 specifies that shields should be connected at the receiving end of signal cables only. A copy of this tech note was included with your FLM 82; if you need another, let us know.

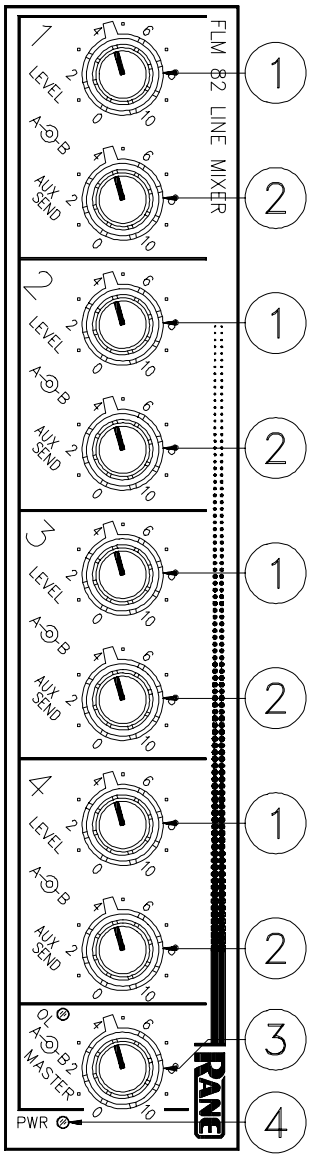
BUS INS AND OUTS When connecting the FLM 82 to other Flex modules through the Bus connectors, it is best to use the DIN connecting cables supplied with the unit or replacements ordered from the factory. If this is inconvenient, any good quality DIN cable may be used as long as it is wired *straight through* , that is pin 1 to pin 1 etc. It must be a shielded cable for optimum performance. You may notice that the DIN connectors on the FLM 82 and other Flex Modules is of the seven-pin variety. The FLM 82 does not use the outer two pins and will therfore not suffer terribly if a five-pin DIN connector is used. The extra two pins have been reserved in the Flex Bus Standard for future use and are there "just in case".

OUTPUTS. Although labeled as loops, the AUX LOOP A and AUX LOOP B connectors may be used as outputs. If one wishes to use the loops as outputs and break the signal path so that the Aux signals do not reach the Master A and B Outputs, use a mono ¼" tip-sleeve plug, use the tip as hot and the sleeve as signal ground. If you do not wish to break the signal path between the Aux Bus and the Master Output, short the tip and ring of a TRS plug together and use this junction as your Aux Output.

The other application for this set of jacks is for inserting processing of your choice between the Aux A and B Buses of the mixer and the direct Master A and B Outputs. If this is your choice, use the tip as send and the ring as return. Connecting devices to these jacks has no effect over what the FLM sends the Aux Buses on the FLEX BUS OUT connector.

The MASTER A and B outputs are fully balanced. Use the tip of each connector as "hot", ring is "not hot" and the sleeve is signal ground.

FRONT PANEL DESCRIPTION



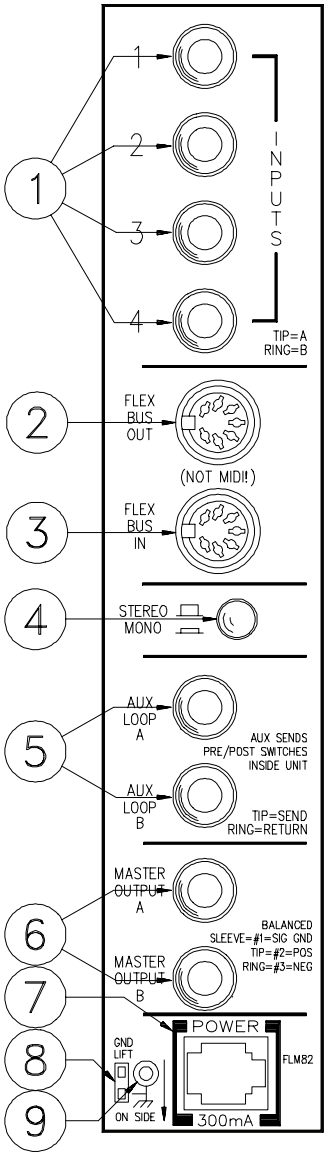
1. INPUT LEVEL CONTROLS. Each of the four input channels has one pair of concentric LEVEL controls. These controls allow the user to set the amount of level from each pair of input channels (A and B) to be delivered to the respective mix buses. The inner knob controls Channel A, the outer Channel B. These set the input mix for both the FLEX BUS OUTs and the MASTER A and B Outputs on the rear of the unit.

2. AUX SEND LEVEL CONTROLS. These concentric level pots adjust the Aux mix on both the FLEX BUS OUT as well as the levels to the AUX LOOP A and B jacks on the rear panel. The inner knob adjust Channel A, the outer Channel B. As mentioned elsewhere in this manual, the AUX SENDS may be either PRE or POST fade (before or after the input LEVEL controls). This determination is made internally based on the switch positions located on the printed circuit board beneath the top cover.

3. MASTER A AND B LEVEL CONTROLS. Another set of concentric controls, the inner knob adjusts the MASTER OUTPUT A level on the rear panel, the outer sets the MASTER OUTPUT B level. These controls have no effect on the FLEX BUS OUT levels.

4. POWER INDICATOR. This is a yellow light emitting diode. The light, when present, is created by the forward bias condition of the gallium arsenide junction encapsulated within the yellow plastic, which serves two purposes: one, to act as a lens for the light and the other to protect the delicate solid state chip within. Or, if you prefer, if this light is lit the power's on.

REAR PANEL DESCRIPTION



1. LINE INPUTS. These are the four main stereo inputs to the FLM 82. The tip of each connects to the respective Channel A input, the ring is used for Channel B.

2. FLEX BUS OUT. This DIN connector supplies all local master A and B program signal as well as the Aux A and B signals. It also sends any information coming into the FLEX BUS IN connector on to other modules further down the line.

3. FLEX BUS IN. This connector is used to tie other Flex Series mixing modules to the FLM 82. Both master & aux program material from the FLM 82 is added to this BUS INPUT.

4. STEREO / MONO SWITCH. Engaging this switch causes the A and B MASTER buses (local only, not the Flex Bus) and the Aux A and B buses to be added together to create one signal from two. It may be used in instances where only mono inputs are connected to the FLM 82 and two outputs (A and B) are required on both MASTER and AUX Outputs. It may be also used to convert a two channel program input to a mono output. This switch affects only the direct outputs on the rear of the unit. It has no effect over FLEX BUS INPUTS or FLEX BUS OUTPUTS.

5. AUX LOOPs A and B. Primarily designed to allow signal processing to be inserted in the Aux buses, these jacks may also be used for direct Aux Outputs should the need arise. See the System Connection section on the front page of this manual for more information.

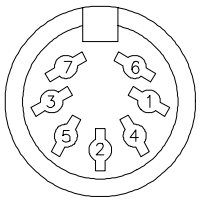
6. MASTER OUTPUTs A and B. These are TRS balanced jacks. The tip is the "pos" connection, the ring is "neg" and sleeve is signal ground.

7. POWER INPUT CONNECTOR. USE ONLY A MODEL RS 1, FRS 8, OR OTHER REMOTE AC POWER SUPPLY APPROVED BY RANE. The FLM 82 is supplied with a remote power supply suitable for connection to this input jack. Consult the factory for replacement or substitution.

8. GROUND LIFT SWITCH. This switch provides the ability to separate chassis ground and signal ground. Normally, this switch should be in the LIFT position. In some circumstances it may be necessary to move it to the opposite position to eliminate stubborn hum and buzz problems. We realize a scientific explanation of this switch would be helpful, unfortunately science doesn't seem to have much to do with it. See the CHASSIS GROUNDING note on the last page for details. 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.

9. CHASSIS GROUND POINT. A 6-32 screw is used for chassis grounding purposes. See the CHASSIS GROUNDING note on the last page for details.

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

OPERATING INSTRUCTIONS

Having read this manual in its proper order, you should be convinced that the FLM 82 is a four stereo input line mixer. The section on the front cover titled "SYSTEM CONNECTION" has given you the ammunition needed to properly connect the inputs and outputs as well as the FLEX BUS interconnections. Now for some knob twisting.

The level of a stereo source connected to the #1 INPUT jack on the rear panel is controlled by the Channel 1 concentric LEVEL controls on the front. The inner knob is for Channel A, the outer for Channel B. This is the only level control available for controlling signals going to the FLEX BUS OUT connector. For identical levels on Channel A and Channel B, the knobs should be kept at the same position relative to each other. If a different level needs to be set for each input, the controls may be rotated separately. The Channel 1 AUX SEND level controls operate the same way and control the same source. AUX SEND A and B levels are delivered to the Aux A and B Buses and forwarded to the FLEX BUS OUT connector as well as to the tips of the A and B AUX LOOPs on the rear panel. All four Input channels and front panel LEVEL controls operate in the same fashion.

The MASTER OUTPUT A and B jacks on the rear have another level control possibility. The concentric MASTER A and B knobs set the final output level for these jacks.

When engaged, the STEREO/MONO switch on the rear panel sums the MASTER OUTPUT A and B signals together. This switch does the same thing to the AUX A and B signals. It should be noted that the action of this switch does not apply to the FLEX BUS outputs. They will remain independent in either mode.

The AUX LOOPs are used to insert processing or effects between the AUX SENDs and the MASTER OUTPUTs. Two possible options will accomplish this feat. If you wish to insert a Flex series equalizer such as an FPE 13 or an FME 15, all you need is a shielded stereo cable. Use this cable between the AUX LOOP connector(s) on the FLM 82 and the PATCH I/O jack on the equalizer. This one connection accommodates inputs and outputs from both units. If you are using a piece of gear built by someone rude enough to omit this convenience, a cable with a stereo plug on one end and two mono plugs on the other is required. The tip of the AUX LOOP jack is "send" or "output" and the ring is "return" or "input". Connect the tip of the TRS plug to the tip of the plug to be used as the input to the processor. Connect the ring of the TRS plug to the tip of the processor's output plug. All sleeves should be tied together through the cable shields. This slightly unusual cable is a standard product for most cable companies. The SYSTEM CONNECTION section on the front page of this document explains how to use the AUX LOOPs as Aux Outputs.

The Aux signals may be picked up before or after the Input level controls. The switches which determine the pick-up points are located beneath the top cover of the unit and require some disassembly to reach them. All FLM 82s are shipped from the factory in the "pre fade" position. To change, remove the screws securing the top and rear cover (one piece) and carefully remove the metalwork. You will see that the switches have directions printed on the PCB assembly, directing your further actions.

MULTIPLE MODULES. As you have already learned, the FLM 82 may be used in conjunction with other Flex mixer modules to create a large system by utilizing the FLEX BUS IN and OUT jacks on the rear of the unit. Each mixer module in the system will place its Master and Aux mixes on the respective buses internally and provide this information to its FLEX BUS OUTPUT. When these signals are connected to the FLEX BUS INPUT on a succeeding unit, they will be combined in the next unit with any local program material and the sum of the two will be available at the second unit's FLEX BUS OUT jack. When daisy chaining several Flex mixer modules together, the Master Outputs of the last module in the chain will contain the sum of all modules before it. The Aux Output on this last module is not a sum, though proper mixing and summing of Masters and Auxes can be accomplished with a FMM 42 Master Module

IMPORTANT NOTE

CHASSIS GROUNDING

Rane Flex units are supplied with a rear or 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 a screw on the chassis with a star washer to guarantee proper contact.

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