

# User's Guide

for the

# CRATE AUDIO

# PM62S, PM82S

# & PM82T



## Powered Mixers

with

# Digital Signal Processing

In order to achieve maximum performance from your new Crate Audio Mixer we recommend that you read this user's guide prior to its use.



## Congratulations.

You are now the proud owner of the compact and versatile Crate Audio PM62S/PM82S/PM82T powered mixer with Digital Signal Processing. In order to obtain the best performance from your new mixer, please read this User's Guide prior to its use.

And Thank You, from

## Table of Contents:

Features . . . . .	3
The Mono Input Channels . . . . .	4
The Stereo Input Channels . . . . .	5
The Master Section . . . . .	6,7
The Rear Panel . . . . .	8
The DSP Section . . . . .	9
System Block Diagram . . . . .	10,11
Technical Specifications . . . . .	back cover

	<b>CAUTION</b> RISK OF ELECTRIC SHOCK DO NOT OPEN	
<small>WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE. TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.</small>		

	<b>PRECAUCION</b> RIESGO DE CORRIENTAZO NO ABRA	
<small>PRECAUCION: PARA REDUCIR EL RIESGO DE INCENDIOS O DESCARGAS ELECTRICAS, NO PERMITA QUE ESTE APARATO QUEDA EXPUESTO A LA LLUVIA O LA HUMEDAD. PARA DISMINUIR EL RIESGO DE CORRIENTAZO, NO ABRA LA CUBIERTA. NO HAY PIEZAS ADENTRO QUE EL USUARIO PUEDA REPARAR DEJE TODO MANTENIMIENTO A LOS TECNICOS CALIFICADOS.</small>		

	<b>ATTENTION</b> RISQUE D'ELECTROCUTION NE PAS OUVRIR	
<small>ATTENTION: PROTEGEZ CET APPAREIL DE LA PLUIE ET DE L'HUMIDITE AFIN D'EVITER TOUT RISQUE D'INCENDIE OU D'ELECTROCUTION. POUR REDUIRE D'ELECTROCUTION NE PAS ENLEVER LE COUVERCLE. AUCUNE PIECE INTERNE N'EST REPARABLE PAR L'UTILISATEUR. POUR TOUTE REPARATION, S'ADRESSEZ A UN TECHNICIEN QUALIFE.</small>		

### IMPORTANT SAFETY INSTRUCTIONS

- READ, FOLLOW, HEED, AND KEEP ALL INSTRUCTIONS AND WARNINGS.
- DO NOT OPERATE NEAR ANY HEAT SOURCE AND DO NOT BLOCK ANY VENTILATION OPENINGS ON THIS APPARATUS. FOR PROPER OPERATION, THIS UNIT REQUIRES 3" (75CM) OF WELL VENTILATED SPACE AROUND HEATSINKS AND OTHER AIR FLOW PROVISIONS IN THE CABINET.
- DO NOT USE THIS APPARATUS NEAR SPLASHING, FALLING, SPRAYING, OR STANDING LIQUIDS.
- CLEAN ONLY WITH LINT-FREE DAMP CLOTH AND DO NOT USE CLEANING AGENTS.
- ONLY CONNECT POWER CORD TO A POLARIZED, SAFETY GROUNDED OUTLET WIRED TO CURRENT ELECTRICAL CODES AND COMPATIBLE WITH VOLTAGE, POWER, AND FREQUENCY REQUIREMENTS STATED ON THE REAR PANEL OF THE APPARATUS.
- PROTECT THE POWER CORD FROM DAMAGE DUE TO BEING WALKED ON, PINCHED, OR STRAINED.
- UNPLUG THE APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF TIME.
- ONLY USE ATTACHMENTS, ACCESSORIES, STANDS, OR BRACKETS SPECIFIED BY THE MANUFACTURER FOR SAFE OPERATION AND TO AVOID INJURY.
- WARNING: TO REDUCE THE RISK OF ELECTRIC SHOCK OR FIRE, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.
- SERVICE MUST BE PERFORMED BY QUALIFIED PERSONNEL.
- OUR AMPLIFIERS ARE CAPABLE OF PRODUCING HIGH SOUND PRESSURE LEVELS. CONTINUED EXPOSURE TO HIGH SOUND PRESSURE LEVELS CAN CAUSE PERMANENT HEARING IMPAIRMENT OR LOSS. USER CAUTION IS ADVISED AND EAR PROTECTION IS RECOMMENDED IF UNIT IS OPERATED AT HIGH VOLUME.



EXPLANATION OF GRAPHICAL SYMBOLS:  
EXPLICACION DE SIMBOLOS GRAFICOS:  
EXPLICATION DES SYMBOLES GRAPHIQUES:

= "DANGEROUS VOLTAGE"  
"VOLTAJE PELIGROSO"  
"DANGER HAUTE TENSION"

= "IT IS NECESSARY FOR THE USER TO REFER TO THE INSTRUCTION MANUAL"  
"ES NECESARIO QUE EL USUARIO SE REFIERA AL MANUAL DE INSTRUCCIONES."  
"REFERREZ-VOUS AU MANUAL D'UTILISATION"

**Features:*****The Input Channels:***

- Peak LEDs for optimum level settings
- Three bands of equalization
- Monitor, effects, and pan controls
- Output level controls
- Pad switch (mono channels) to accommodate “hot” signals
- XLR balanced low impedance mic input jacks
- 1/4” balanced high-Z line input jacks

***The Master Section:***

- Tri-Power! Three internal power amplifiers (*PM82T only*) - one for the monitor, two for the main speaker outputs
- Two internal power amplifiers (*PM62S, PM82S*) for the main speaker outputs
- Built in Limiter to prevent overdriving the amplifiers
- Two 7-band graphic EQs - one for monitor, one for mains
- Five-step LED displays with Limiter indicators for monitoring the output signals
- Effects send and return controls
- Switchable phantom power (+48V)
- 16-Program Digital Signal Processor (DSP) with on/off switch
- Footswitch jack for remote control of DSP on/off
- Headphones jack with level control
- DSP line out/aux in jacks for external effects
- Tape in and tape out jacks for recording and play back
- Main and monitor line out jacks

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 the 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.

Changes or modifications to this device not expressly approved by SLM Electronics could void the user's authority to operate the equipment under FCC rules.

## The Mono Input Channels:



1. **PEAK LED:** This LED illuminates when the input signal nears clipping. During normal operation, this LED will flash on strong signal peaks. If the LED remains illuminated, depress the Pad switch (#9) and/or reduce the level of the signal connected to the input jack (#10,11).
2. **HIGH:** Use this control to adjust the high frequency level for the channel.
3. **MID:** Use this control to adjust the midrange frequency level for the channel.
4. **LOW:** Use this control to adjust the low frequency level for the channel.
5. **MON:** Use this control to adjust the amount of the channel's signal sent to the monitors.
6. **EFFECT:** Use this control to adjust the amplitude of the internal DSP effect (or external effects, if used) to be applied to the channel's signal.
7. **PAN:** Use this control to adjust the left-to-right balance of the channel's signal.
8. **LEVEL:** Use this control to adjust the channel's output signal level.
9. **PAD:** Use this switch to accommodate "hot" input signals. (Signals too strong to allow a useful setting of the gain control without causing the Peak LED - #1- to remain illuminated.) Depress this switch to engage the 20dB pad, thereby reducing the input signal's level to a more useable range.
10. **HIGH-Z LINE:** Use this jack to connect the output signal from a high impedance microphone or a line level signal (such as an instrument, rhythm machine, tape deck, etc.) to the mixer by means of a shielded cable terminated with a male 1/4" plug. Tip = "+," ring = "-", sleeve = shield.
11. **MIC:** Use this jack to connect the output signal from a low impedance microphone to the mixer by means of a shielded cable terminated with a male XLR plug. Pin 2 = "+," pin 3 = "-", pin 1 = shield.

## The Stereo Input Channels:



**12. PEAK LED:** This LED illuminates when the input signal nears clipping. During normal operation, this LED will flash on strong signal peaks. If the LED remains illuminated, reduce the level of the signal connected to the input jack (#20,21).

**13. HIGH:** Use this control to adjust the high frequency level for the channel.

**14. MID:** Use this control to adjust the midrange frequency level for the channel.

**15. LOW:** Use this control to adjust the low frequency level for the channel.

**16. MON:** Use this control to adjust the amount of the channel's signal sent to the monitors.

**17. EFFECT:** Use this control to adjust the amount of the internal DSP effect (or external effects, if used) to be applied to the channel's signal.

**18. PAN:** Use this control to adjust the left-to-right balance of the channel's signal.

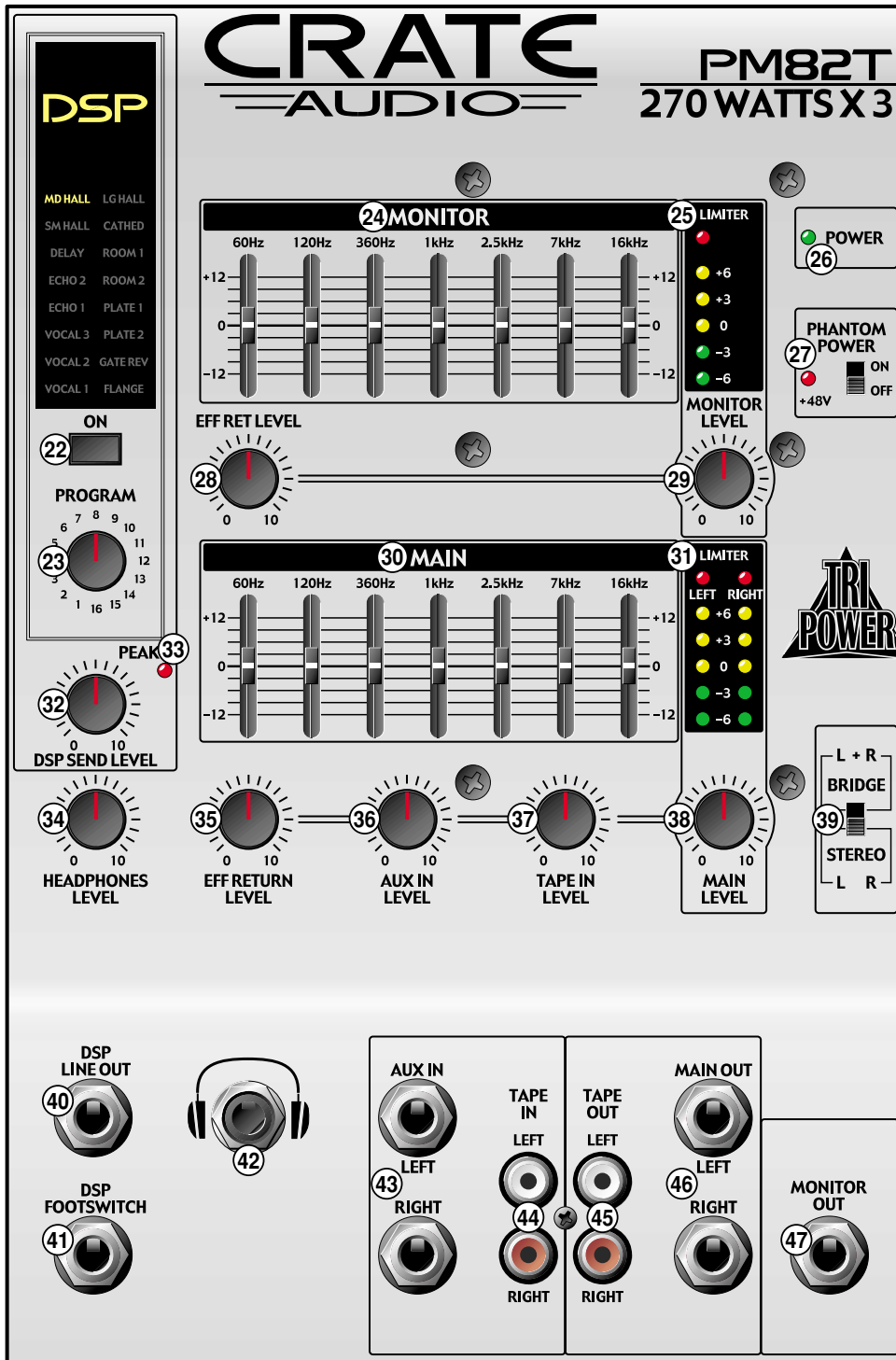
**19. LEVEL:** Use this control to adjust the channel's output signal level.

**20. HIGH-Z LINE:** Use these jacks to connect the output signal from a stereo line level source (such as a stereo instrument, rhythm machine, tape deck, etc.) to the mixer by means of shielded cables terminated with male 1/4" plugs. Tip = "+," ring = "-", sleeve = shield.

The LEFT (MONO) jack serves as a mono input that will feed a single input signal to both the left and right channels. For stereo signals, use the LEFT (MONO) jack as the left channel input and the RIGHT jack as the right channel input.



**21. MIC:** Use this jack to connect the output signal from a low impedance microphone to the mixer by means of a shielded cable terminated with a male XLR plug. Pin 2 = "+," pin 3 = "-", pin 1 = shield.

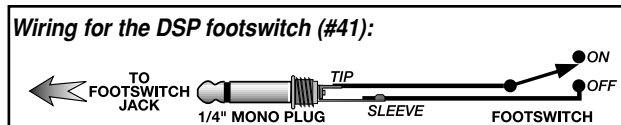
## The Master Section:



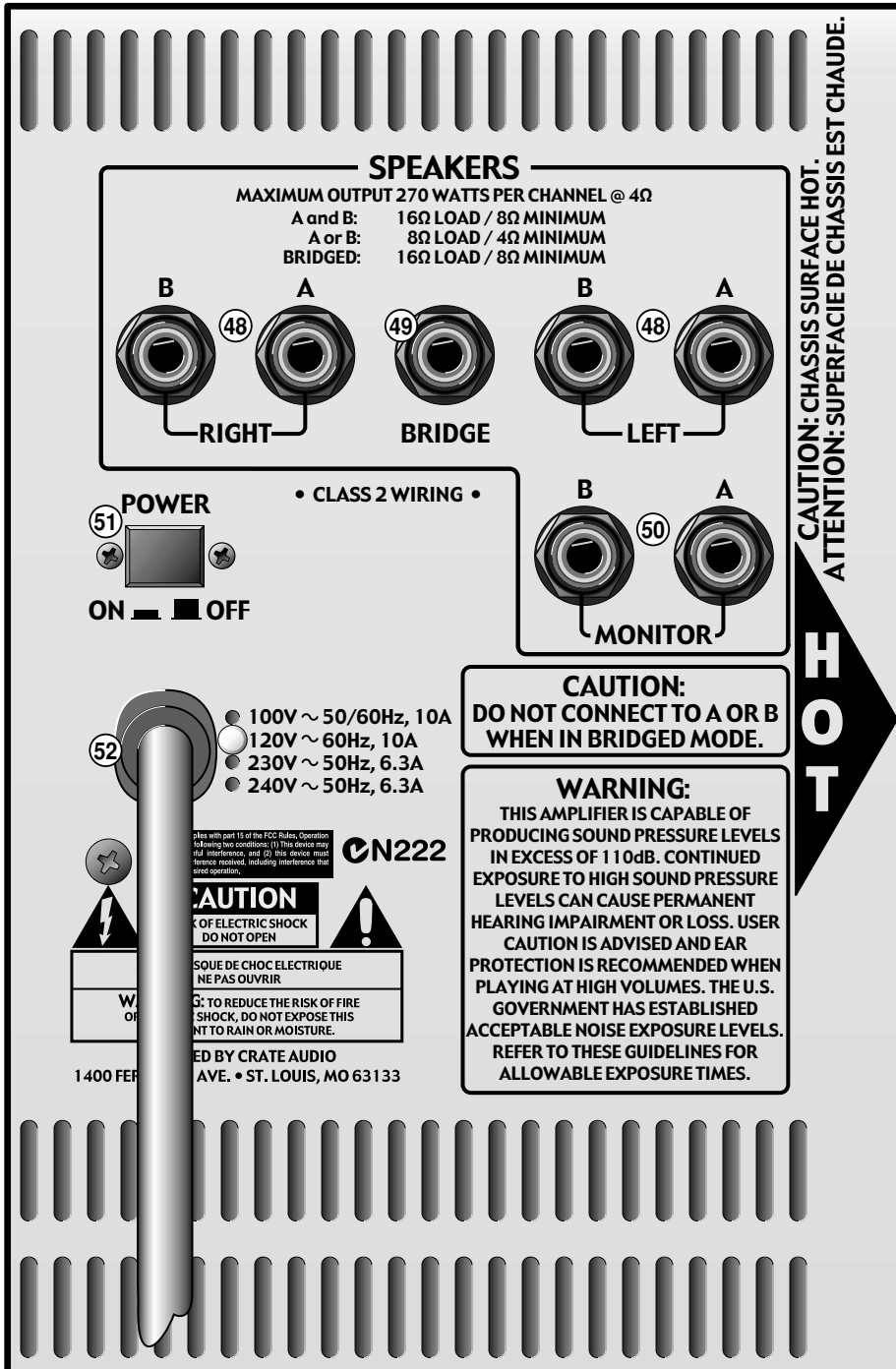
22. **DSP ON:** This switch, when depressed, activates the internal digital signal processor.
23. **PROGRAM:** Use this rotary switch to select the desired digital effect. The name of the selected effect illuminates on the DSP display panel (located above the On switch, #22). A brief description of the DSP effects is provided on page 9.
24. **MONITOR:** Use this seven band graphic equalizer to shape the monitor output signal. This is useful for feedback control and to compensate for room acoustics.
25. **LIMITER/LED METER:** The mixer employs internal limiter circuits to prevent overdrive distortion from being reproduced by the amplifiers. The Limiter LED illuminates when the monitor amplifier's internal limiter circuit is activated.  
  
The five-step LED display directly below the Limiter LED indicates the level of the monitor's output signal.
26. **POWER LED:** This LED will illuminate when the mixer is turned on. (The power switch is located on the mixer's rear panel - see #51, page 9.)
27. **PHANTOM POWER:** This switch, when at the "on" position, applies +48 volts DC to pins 2 and 3 of each channel's XLR MIC input jack. The adjacent LED illuminates when the phantom power is turned on.
28. **EFF RET LEVEL:** Use this control to adjust the level of the internal DSP applied to the signal at the Monitor Out jack (#47) and the Speakers - Monitor jacks (*PM82T only* - #50, page 9).
29. **MONITOR LEVEL:** Use this control to adjust the overall level of the signal at the Monitor Out jack (#47) and the Speakers - Monitor jacks (*PM82T only* - #50, page 9).
30. **MAIN:** Use this seven band graphic equalizer to shape the main output signal. This is useful for feedback control and to compensate for room acoustics. Each slider controls both main outputs simultaneously (see Speakers - Left / Right, #48 on page 9).

## The Master Section (con't):

31. **LIMITER/LED METER:** The mixer employs internal limiter circuits to prevent overdrive distortion from being reproduced by the amplifiers. The Limiter LEDs illuminate when either of the main amplifiers' internal limiter circuits are activated. The two sets of five-step LED displays directly below the Limiter LEDs indicate the levels of the left and right main's output signal.
32. **DSP SEND LEVEL:** Use this control to adjust the level of signal at the DSP Line Out jack (#40) and to the internal DSP processor.
33. **PEAK:** This LED illuminates when the DSP signal level nears clipping. During normal operation, this LED will flash on strong signal peaks. If the LED remains illuminated, reduce the DSP Send Level control (#32).
34. **HEADPHONES LEVEL:** Use this control to adjust the level of the signal at the  (Headphones) jack (#42).
35. **EFF RETURN LEVEL:** Use this control to adjust the level of the internal DSP applied to the Tape Out jacks (#45), the Main Out Left / Right jacks (#46), and the Speakers - Left / Right jacks (#48, page 9).
36. **AUX IN LEVEL:** Use this control to adjust the level of the signal applied to the Main outputs from the Aux In - Left / Right jacks (#43).
37. **TAPE IN LEVEL:** Use this control to adjust the level of the signal from the Tape In - Left / Right jacks (#44) applied to the Main outputs.
38. **MAIN LEVEL:** Use this control to adjust the overall level of the signal at the Main Out Left / Right jacks (#46) and the Speakers - Left / Right jacks (#48, page 9).
39. **BRIDGE/STEREO:** Use this switch to determine whether the main power amplifiers are bridged together for a single output signal (at the up position) or work separately for a stereo output signal (at the down position).
40. **DSP LINE OUT:** Use this jack to send an output signal to an external effects device. Connect this jack to the effect's input jack by means of a shielded signal cable.
41. **DSP FOOTSWITCH:** Use this jack to connect a footswitch to the mixer for remote on/off control of the internal DSP. The footswitch must be a normally open / momentarily closed type (such as the Crate model #FSIU). The wiring for the footswitch is shown at the bottom of this page.
42.  **(HEADPHONES):** Use this jack to connect a pair of stereo headphones to monitor the main output signals. The level of the signal is adjusted by the Headphones Level control (#34).
43. **AUX IN - LEFT / RIGHT:** Use these jacks to connect an external effects device's output signal or to feed another mixer's signal into the mixer. These jacks are post-input channel, pre-eq and pre-power amp, and the signal levels are adjusted by the Aux In Level control (#36).
44. **TAPE IN - LEFT / RIGHT:** Use these jacks to connect the output signal from a tape deck or CD player to the mixer. The signal level is adjusted by the Tape In Level control (#37).
45. **TAPE OUT - LEFT / RIGHT:** Use these jacks to connect the output of the mixer to a tape recorder. These jacks are pre-eq, pre-master, and their signal level is adjusted by the channel Level controls (#8, #19).
46. **MAIN OUT - LEFT / RIGHT:** Use these jacks to connect the mixer's pre-amplified output signal to an external power amplifier, recording console, or to the Aux In jack of another Crate powered mixer.
48. **MONITOR OUT:** Use this jack to send a pre-amplified signal to an auxiliary monitor amplifier (or powered monitor).



## The Rear Panel:



**48. SPEAKERS - LEFT / RIGHT: *Stereo Mode Only!*** (See #39, front panel master section.) Use these jacks to connect the mixer to your left and right main speakers. Observe the four ohm minimum load rating and the additional speaker information printed on the rear of the mixer.

**49. SPEAKERS - BRIDGE: *Bridge Mode Only!*** (See #39, front panel master section.) Use this jack to connect the mixer to your main speakers. Observe the eight ohm minimum load rating and the additional speaker information printed on the rear of the mixer.

**50. SPEAKERS - MONITOR (*PM82T only*):** Use these jacks to connect the mixer to your monitor speakers. Observe the four ohm minimum load rating and the additional speaker information printed on the rear of the mixer.

“Class 2 Wiring” for all other terminals provided the audio output power exceeds 10 W per channel under normal operating conditions or the apparatus is intended to be installed or interconnected in the field by a skilled person.

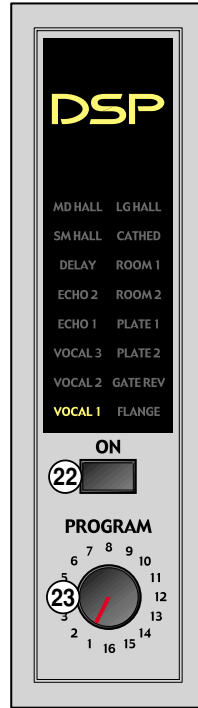
**51. POWER:** Use this switch to turn the mixer on (switch de-pressed) and off (switch in the out position). The front panel Power LED (#26) illuminates when the mixer is on.

**52. AC LINE CORD:** The grounded power cord should only be plugged into a grounded power outlet that meets all applicable electrical codes and is compatible with the voltage, power and frequency requirements stated on the rear panel. **Do not attempt to defeat the safety ground connection!**



## The DSP Section:

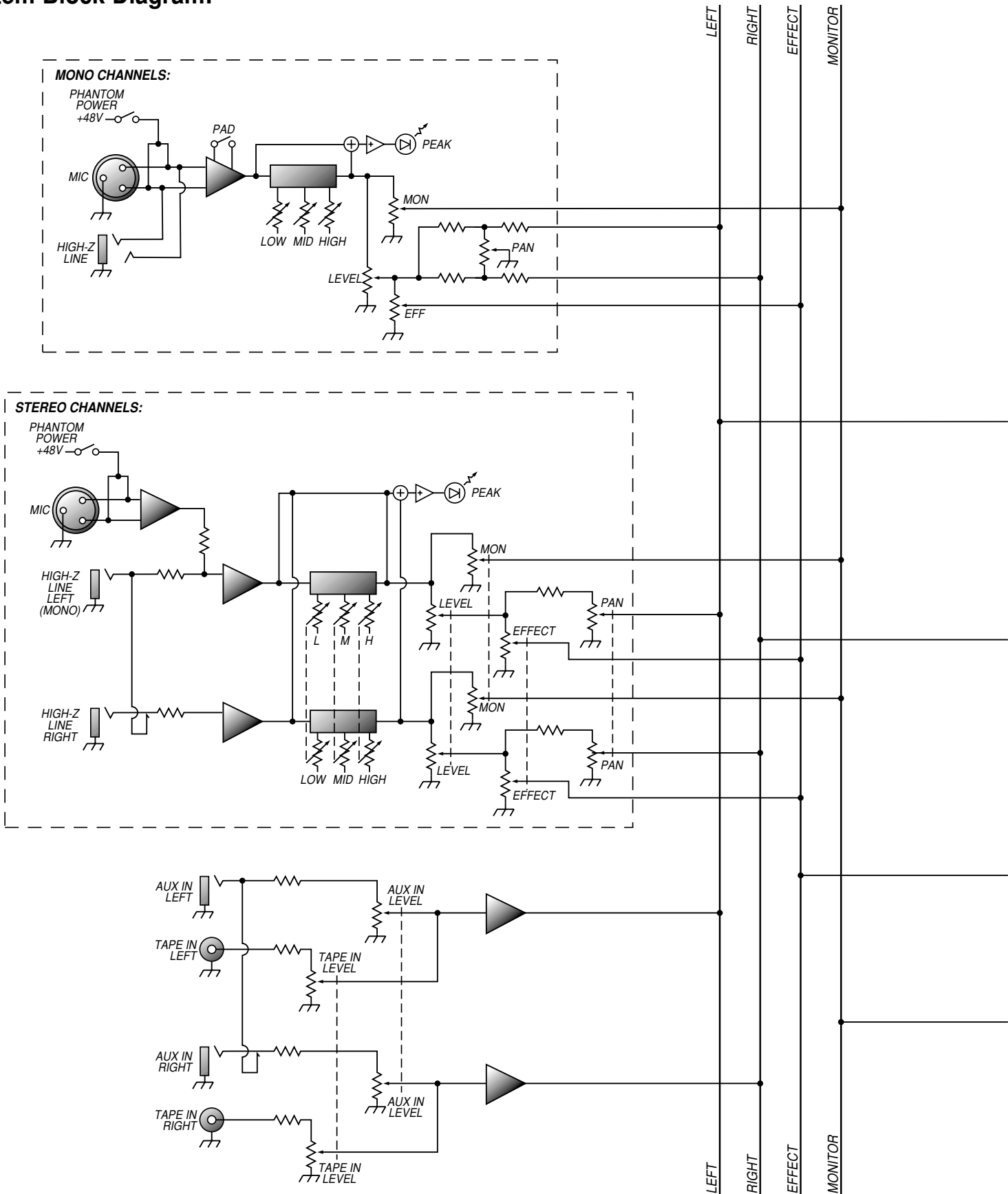
Use the DSP Program control (#23) to select one of the sixteen digital effects - the selected effect illuminates on the display panel. (The effects are only active when the DSP On switch - #22 - is depressed.)



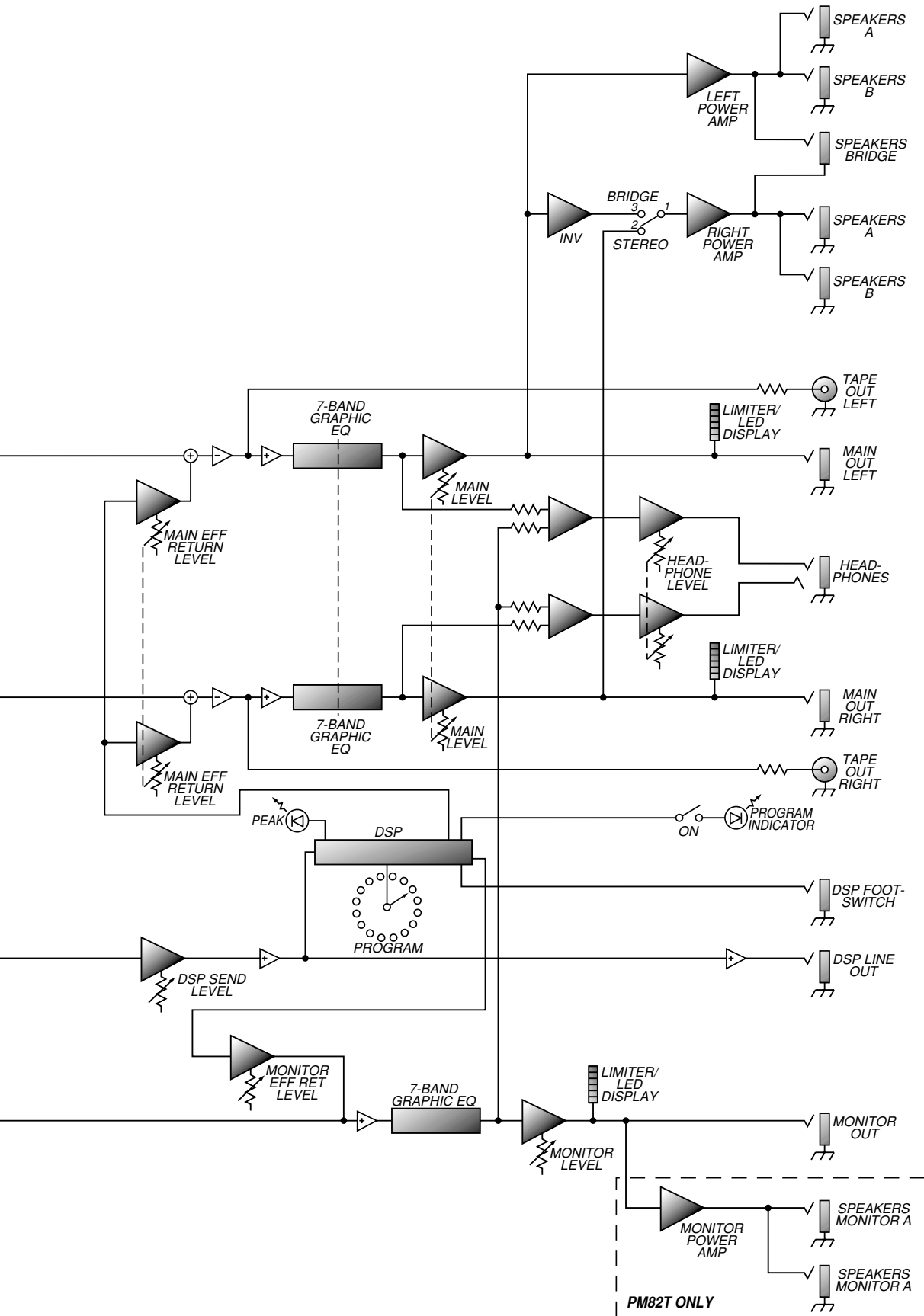
The chart below lists each of the sixteen digital effects by its Program number, its name (as indicated on the DSP display panel), and a brief description of the effect:

PROGRAM #	NAME	DESCRIPTION
1	VOCAL 1	slight chorus, short slapback delay, medium hall reverb
2	VOCAL 2	chorus with large hall reverb
3	VOCAL 3	doubler, short flange, large plate reverb
4	ECHO 1	125 ms echo with long regeneration
5	ECHO 2	250 ms echo with short regeneration
6	DELAY	125 ms delay
7	SM HALL	small hall reverb
8	MD HALL	medium hall reverb with early reflections
9	LG HALL	large hall reverb
10	CATHED	large saturated reverb - similar to church/cathedral
11	ROOM 1	small tight room reverb
12	ROOM 2	medium room reverb
13	PLATE 1	small plate reverb
14	PLATE 2	large plate reverb
15	GATEREV	gated reverb (medium hall)
16	FLANGE	large deep flange, slow rate, low resonance

## System Block Diagram:



## System Block Diagram (con't):





# PM62S/PM82S/PM82T Powered Mixers

## Technical Specifications

<b>MAXIMUM VOLTAGE GAIN (PAD OFF)</b>	87dB Mic In to Power Amp Out Main 1, 2 and Monitor 59dB Mic In to Main Out, Monitor Out 64dB Mic In to Effect Out 47dB Mic In to Rec Out 47dB Line In to Main Out, Monitor Out 26dB Aux In to Main Out, Left (Mono), Right 17dB Stereo Left/Mono to Main
<b>INPUT CHANNEL EQUALIZATION</b>	±15dB Maximum High: 12kHz (shelving); Mid: 2kHz (peaking); Low: 80Hz (shelving)
<b>FREQUENCY RESPONSE</b>	+1/-3dB, 20Hz-20kHz @ 1W output into 8 ohms (Power Amp Out) +1/-3dB, 20Hz-20kHz @ +4dB output into 10k ohms (Main Out, Monitor Out, Effects Send)
<b>MAXIMUM OUTPUT POWER</b>	PM62S, PM82S: 2 X 400W/4 ohms @ 0.5% THD @ 1kHz PM82T: 3 X 270W/4 ohms @ 0.5% THD @ 1kHz
<b>TOTAL HARMONIC DISTORTION</b>	<0.3% @ 20Hz-20kHz, 100W output into 4 ohms (Power Amp Out) <0.3% @ 20Hz-20kHz, +14dB output into 10k ohms (Main Out, Monitor Out, Effects Send)
<b>HUM AND NOISE (Average, Rs=150Ω) (with 20Hz-20kHz BPF)</b>	-115dB equivalent input noise, -53dBv residual output noise (Power Amp Out) -74dBv residual output noise (Main Out, Monitor Out, Effects Send) -71dBv (75dB S/N) (Main Out, Monitor Out) All channel Level controls at minimum -67dBv (72dB S/N) (Main Out, Monitor Out) One channel Level control at maximum -73dBv (77dB S/N) Effects Send All channel Level controls at minimum -62dBv (66dB S/N) Effects Send One channel Level control at maximum
<b>CHANNEL CROSSTALK @ 1kHz</b>	< -90dB
<b>GRAPHIC EQUALIZER</b>	+/-12dB @ 60Hz, 120Hz, 360Hz, 1kHz, 2.5kHz, 7kHz, 16kHz
<b>INTERNAL DIGITAL EFFECT</b>	16 programs
<b>PHANTOM POWER</b>	+48V is supplied to electrically balanced inputs for powering condenser microphones via 6.8kΩ current limiting/isolating resistors
<b>LIMITER LED ON</b>	Output Level: +34dBv
<b>FOOT SWITCH</b>	DSP On/Off
<b>POWER CONSUMPTION</b>	1500W
<b>SIZE AND WEIGHT</b>	PM62S: 19" (483mm) W x 13" (330mm) H x 11" (279mm) D; 49 lbs (22kg) PM82S: 21.25" (540mm) W x 13" (330mm) H x 11" (279mm) D; 51 lbs (23kg) PM82T: 21.25" (540mm) W x 13" (330mm) H x 11" (279mm) D; 52 lbs (24kg)

*Due to ongoing product development and improvement, the specifications contained herein are subject to change without notice.*

