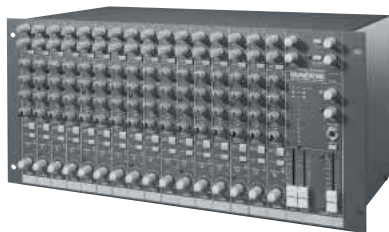


LM-3204 & LM-3204E EXPANDER

32x2x2 STEREO LINE MIXER



1. GENERAL CONFIGURATION. The audio mixer shall have a rack-mountable frame which accommodates 16 stereo input channels, 2 main output channels and 2 alternate output channels. Each input channel shall be capable of accepting either stereo or monaural signals, and shall be fitted with stereo level, equalization, balance, solo, muting and auxiliary send controls, level-indicating (-20) LEDs and overload (O/L) LEDs. Input channels 1 through 4 shall each be fitted with left and right insert jacks. The main output channels shall each have a level control, an electronic level meter and a bus insert jack.

Additionally, the mixer shall include a solo function, a monitor switching and control function, 4 stereo effects return inputs with alternate routing switching, 2 stereo pairs effects send outputs, 2 monaural effects send outputs, 1 stereo pair control room output, 1 stereo headphone output, 1 set of stereo tape recorder RCA outputs, and 1 set of stereo tape monitor RCA inputs. The mixer shall also include 2 independent patchable microphone preamplifiers, each fitted with an electronically balanced

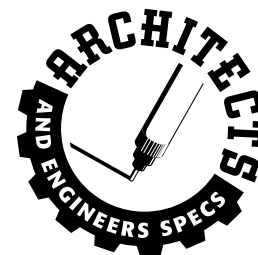
XLR input switchable phantom microphone powering, a preamplifier gain control and a balanced line-level output.

2. POWER SUPPLY. All necessary operating voltages for the mixer shall be provided by an internal shielded power supply.

3. INPUT CHANNEL CONNECTIONS. Each mixer input channel shall have a left and a right electronically balanced line-level input, accommodating a nominal line level of between -10 dBV and +4 dBu, and appearing on the rear panel as 1/4" TRS phone jacks (tip hot, ring cold). The jacks shall be fitted with internal switches to accommodate monaural configuration. Additionally, input channels 1 through 4 shall offer left and right unbalanced insert connections, appearing on the rear panel as 1/4" TRS phone jacks (tip send, ring return).

4. INPUT CHANNEL LEVEL AND ASSIGNMENT CONTROLS AND INDICATORS. Each mixer input channel shall be equipped with a rotary dual gain control, a solo switch, a mute switch which also functions as an assignment switch to the alternate output channels, and a stereo balance control.

5. INPUT CHANNEL EQUALIZATION. Each mixer input channel shall be equipped with a stereo equalization function. The equalizer shall have three sections: a low-frequency



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shelving equalizer with the knee set at 80 Hz and a range of ± 15 dB; a mid-frequency peaking equalizer centered at 2.5 kHz featuring a bandwidth of 2 octaves and a range of ± 12 dB; and a high-frequency shelving equalizer with the knee set at 12 kHz and a range of ± 15 dB.

6. INPUT CHANNEL AUXILIARY SENDS. Each mixer input channel shall have 1 stereo auxiliary send control and 1 monaural auxiliary send control. The auxiliary send controls shall be switchable between 2 sets of auxiliary send buses,

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LM-3204

accommodating a total of 2 stereo auxiliary send buses and 2 monaural auxiliary send buses.

7. MAIN OUTPUT CONNECTIONS. The mixer shall have electronically balanced, line-level left and right main outputs, appearing as 1/4" TRS jacks (tip hot, ring cold) on the rear panel. Additionally, the main buses shall offer left and right unbalanced insert connections, appearing on the rear panel as 1/4" phone TRS jacks.

8. OTHER OUTPUT AND MONITORING CONNECTIONS. The mixer shall have the following balanced line-level connections, appearing as 1/4" TRS jacks on the rear panel: left and right alternate (3-4) outputs, left and right control room outputs. For convenience, the left and right main outputs and the left and right tape monitor inputs shall also appear as RCA phono jacks on the rear panel. There shall also be a stereo headphone output on the front panel of the mixer, carrying the control room monitor signals at levels and impedances proper for headphones. The headphone output connection shall be a stereo 1/4" TRS jack (tip left, ring right).

9. OUTPUT AND MONITORING CONTROLS AND SWITCHES. The mixer shall include 2 linear fader controls for gain adjustment of the main L/R outputs, covering a range from infinite attenuation to +10 dB above unity gain. A tape monitor switch shall alternately select either the main L/R outputs or the signal at the tape inputs as the source for the control

room and headphones monitoring circuits. There shall be a stereo linear fader control for level adjustment of the control room monitor output, and a stereo rotary control for level adjustment of the headphone monitor output. The mixer shall have a stereo control for adjustment of the monitoring level of the internal solo signals, and a blinking LED to indicate channel solo condition. Additionally, any soloed channel(s) shall have their -20 and O/L LEDs light steadily, to indicate a solo condition.

10. OUTPUT METERING. The mixer frame shall include 2 12-segment LED meters each displaying a signal range from -40 dBu to +10 dBu, each with an additional LED indicating mixer clipping level at +22 dBu. The meters shall monitor the main left and right output channels; alternately, the meters shall monitor the tape return signals when the tape monitor switch is depressed; or, the soloed input channel signals when any combination of solo switches is depressed.

11. AUXILIARY SEND CONNECTIONS. The mixer shall include balanced line-level outputs from the auxiliary send buses. The left and right outputs of the 2 stereo auxiliary send buses and the outputs of the 2 monaural send buses shall appear on the rear panel as 1/4" TRS phone jacks (tip hot).

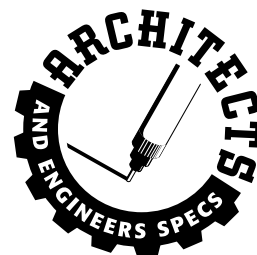
12. AUXILIARY RETURN CONNECTIONS. The mixer shall include 4 stereo auxiliary return inputs. Each auxiliary return shall have a left and a right unbalanced line-level input, accommodating a nominal line level of between -10 dBV and +4 dBu,

and shall appear on the rear panel as 1/4" phone TRS phone jacks. The jacks shall be fitted with internal switches to accommodate monaural configuration, by using only the left jack(s).

13. AUXILIARY RETURN CONTROLS AND SWITCHES. The mixer shall include 4 dual-channel auxiliary return gain controls, each feeding the main stereo buses. Auxiliary return #3 shall have its signal source switchable between the auxiliary return #3 inputs or the signals available on the alternate (3-4) mix outputs. Auxiliary return #4 shall be assignable to two different destinations, feeding either the main left and right buses or the monitor system only.

14. MICROPHONE PREAMPLIFIERS. The mixer shall include two microphone preamplifiers mounted on the rear of the mixer frame. Each microphone preamplifier shall feature electronically balanced transformerless inputs using female XLR-3-type connectors with gold-plated pins, a rotary sensitivity control adjustable from -50 dBu to -10 dBu, and a line-level impedance-balanced output appearing at a 1/4" TRS phone jack. Globally switchable phantom power shall be available at the microphone inputs.

15. MIXER EXPANDER FUNCTION. The mixer buses shall accommodate up to 48 additional stereo input channels when connected to up to 3 Mackie Designs LM-3204E Expander units. The mixer shall be fitted with a 20-pin IDC-type "expander input" connector mounted on the rear of the mixer frame, which shall carry all audio and control signals



LM-3204

between the mixer and the optional expander unit(s), if used; and which shall be designed to mate with the connectors on the expander ribbon cable provided with each Expander unit.

16. PHYSICAL CONFIGURATION. The mixer shall have a steel chassis frame painted grey-black and designed to mount in a standard 19" relay rack. The mixer's dimensions shall be 8.73" high (5 rack units) by 19.00" wide (rack ears are built-in) by 9.66" deep.

17. OVERALL MINIMUM SPECIFICATIONS. In addition to specifications previously cited, the mixer shall meet or exceed the following performance criteria:

Noise. (20 Hz–20 kHz bandwidth, Line inputs to Main L/R outputs, all channels assigned.) Master fader down, Channel gains down, –104.2 dBu. Master fader unity, Channel gains down (Mix Noise), –86.6 dBu. Master fader unity, Channels gains unity, –84.0 dBu.

Total Harmonic Distortion. (1 kHz @ +14 dBu, 20 Hz–20 kHz.) Channel input to any output, below .0025% typical.

Attenuation (1 kHz @ 0 dBu. 20 Hz–20 kHz bandwidth, Channel in, to Main Left outputs.) Channel gain down, –73 dBu. Channel muted, –81 dBu.

Frequency Response. (Any input to Main output.) 20 Hz to 60 kHz, +0 dB/–1 dB. 10 Hz to 100 kHz, +0 dB/3 dB.

Maximum Levels. Mic preamp input, +14 dBu. All other inputs, +22 dBu. All outputs, +22 dBu.

Impedances. Mic preamp input, 2.5 k Ω . All other inputs, 10 k Ω . All outputs, 120 k Ω .

Equalization. Lo EQ Shelving @ 80 Hz, ± 15 dB. Mid EQ Peak @ 2.5 kHz, ± 12 dB. Hi EQ Shelving @ 12 kHz, ± 15 dB.

Microphone Preamp. E.I.N. (150 Ω terminated, maximum gain), –129 dBm.

18. DESIGNATION. The audio mixer shall be a Mackie Designs LM-3204.

LM-3204E Expander



19. GENERAL CONFIGURATION. The expander unit shall not be designed to operate alone, but in conjunction with a Mackie Designs LM-3204 Line Mixer. The expander shall have a rack-mountable frame which accommodates 16 stereo input channels. Each input channel shall be capable of accepting either stereo or monaural signals, and shall be fitted with stereo level, equalization, balance, solo, muting and auxiliary send controls, level-indicating (–20) LEDs and overload (O/L) LEDs. Input channels 1 through 4 shall each be fitted with left and right insert jacks.

Additionally, the expander shall include 4 stereo effects return inputs.

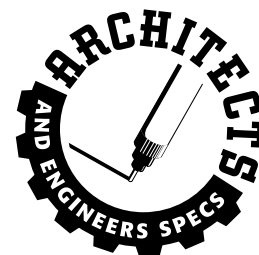
20. POWER SUPPLY. All necessary operating voltages for the expander shall be provided by an internal shielded power supply.

21. INPUT CHANNEL CONNECTIONS. Each expander input channel shall have a left and a right electronically balanced line-level input, accommodating a nominal line level of between –10dBV and +4dBu, and appearing on the rear panel as 1/4" TRS phone jacks (tip hot, ring cold). The jacks shall be fitted with internal switches to accommodate monaural configuration. Additionally, input channels 1 through 4 shall offer left and right unbalanced insert connections, appearing on the rear panel as 1/4" TRS phone jacks (tip send, ring return).

22. INPUT CHANNEL LEVEL AND ASSIGNMENT CONTROLS AND INDICATORS. Each expander input channel shall be equipped with a rotary dual gain control, a solo switch, a mute switch which also functions as an assignment switch to the alternate output channels, and a stereo balance control. Additionally, any soloed channel(s) shall have their –20 and O/L LEDs light steadily, to indicate a solo condition.

23. INPUT CHANNEL EQUALIZATION. Each expander input channel shall be equipped with a stereo equalization function. The equalizer shall have three sections: a low-frequency shelving equalizer with the knee set at 80Hz and a range of ± 15 dB; a mid-frequency peaking equalizer centered at 2.5kHz featuring a bandwidth of 2 octaves and a range of ± 12 dB; and a high-frequency shelving equalizer with the knee set at 12kHz and a range of ± 15 dB.

24. INPUT CHANNEL AUXILIARY SENDS. Each expander input channel shall have one stereo



auxiliary send control and one monaural auxiliary send control. The auxiliary send controls shall be switchable between 2 sets of auxiliary send buses, accommodating a total of 2 stereo auxiliary send buses and 2 monaural auxiliary send buses.

25. AUXILIARY RETURN CONNECTIONS. The expander shall include 4 stereo auxiliary return inputs. Each auxiliary return shall have a left and a right unbalanced line-level input, accommodating a nominal line level of between -10dBV and +4dBu, and shall appear on the rear panel as 1/4" phone TRS phone jacks. The jacks shall be fitted with internal switches to accommodate monaural configuration, by using only the left jack(s).

26. AUXILIARY RETURN CONTROLS AND SWITCHES. The expander shall include 4 dual-channel auxiliary return gain controls, each feeding the main stereo buses.

27. EXPANDER FUNCTION. The expander shall be fitted with an "expander output" connector and an "expander input" connector mounted on the rear of the expander frame, each of

which shall be a 20 pin IDC-type connector and shall be designed to mate with the connectors on the expander ribbon cable provided with the each Expander unit. The expander output connector shall carry all audio and control signals between the expander and the mixer (or next downstream expander). The expander input connector shall carry all audio and control signals between the expander and the next upstream expander, if used.

28. PHYSICAL CONFIGURATION. The expander shall have a steel chassis frame painted grey-black and designed to mount in a standard 19" relay rack. The expander's dimensions shall be 8.73" high (5 rack units) by 19.00" wide (rack ears are built-in) by 9.66" deep.

29. OVERALL MINIMUM SPECIFICATIONS. When properly interfaced and used with the LM-3204 Stereo Line Mixer, the total system (mixer plus expander) specifications remain the same as the mixer specifications cited in paragraph 17.

30. The mixer expander shall be a Mackie Designs LM-3204E.



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