M•1200/M•1400

FAST RECOVERY SERIES HIGH CURRENT POWER AMPLIFIERS

FR FAST RECOVERY SERIES™

ARCHITECTS AND ENGINEERS SPECS

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1. GENERAL. The amplifier shall have a free-standing frame with front and rear brackets for rack-mounting, and supplied with four resilient feet suitable for table-top placement. The amplifier shall be capable of two-channel operation, with a switch to place the amplifier into single-channel operation by bridging the outputs of the two channels.

2. POWER OUTPUT.

M•1200: The power amplifier, being of two channels, shall deliver 225 watts RMS into 8 ohms per channel, 400 watts into 4 ohms, and 600 watts into 2 ohms with both channels operating. In bridge-mode of operation it shall deliver 800 watts RMS into 8 ohms and 1200 watts into 4 ohms.

M•1400: The power amplifier, being of two channels, shall deliver 250 watts RMS into 8 ohms per channel, 425 watts into 4 ohms, and 630 watts into 2 ohms with both channels operating. In bridge-mode of operation it shall deliver 850 watts RMS into 8 ohms and 1260 watts into 4 ohms.

3. POWER SUPPLIES. All necessary operating voltages for the amplifier shall be provided by an internal power supply. A master power switch shall be located on the front panel along with a green power-indicating light.

4. INPUT CHANNEL CONNECTIONS. Each monaural input channel shall have an electronically balanced line-level input, accommodating a nominal line level between –10dBV and +4dBu, and appearing on the rear panel as a female XLR-3 type connector. In addition, each monaural input channel shall have a parallel 1/4" TRS phone jack and a male XLR-3 type connector, which can be used as inputs or “thru” jacks for daisy-chaining the input signal to another amplifier. Pin 2 of the XLR connectors, and the tip of the 1/4" TRS phone jack, shall be non-inverting.

5. INPUT CHANNEL LEVEL CONTROLS. Each monaural input channel shall be equipped with a gain control appearing on the front panel, each having 40 detent positions, and calibrated in dB and volts.

6. FRONT PANEL INDICATORS. Each channel shall have an associated six-segment LED meter appearing on the front panel, capable of displaying signal present, –20dB, –9dB, –6dB, –3dB, and overload. Each channel shall have internal status LEDs appearing on the front panel to indicate activation of protect mode and short-circuit protection. Two tem-

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perature status LEDs shall appear on the front panel, one to indicate normal operation (COLD) and one to indicate thermal protection (HOT).

7. PROTECTION FEATURES. The amplifiers shall provide delayed activation of the outputs at turn-on. Each channel shall have a short-circuit protection circuit for detecting excessive current flow at the output that, when activated, mutes the output for four seconds. The short-circuit protection shall continuously cycle on and off until the shorted condition is remedied. The amplifier shall have a thermal protection circuit to protect the power devices from over-temperature operation. The circuit shall activate when the internal temperature crosses the safe-operating threshold and, when activated, mute the outputs until the internal temperature cools to a safe-operating temperature, at which time the amplifier shall resume normal operation. The amplifier shall have a fan to cool the heat-producing internal components. The fan shall operate at two speeds, the speed being determined by the internal temperature and the signal level present at the output. The amplifier shall have an SCR crowbar circuit to protect the speakers against a catastrophic amplifier failure. The circuit shall activate in the presence of continuous DC at the speaker outputs, and shall shut the amplifier down by turning off the high-voltage rails.

8. OUTPUT CONNECTIONS.
M•1200: Each channel shall have heavy-duty 5-way binding post speaker output connectors appearing on the rear panel, with 3/4" spacing for accommodating standard double banana plugs as well as spade lugs or bare wires. Each channel shall have a 1/4" TS phone speaker output jack appearing on the rear panel in parallel with the binding post output.

M•1400: Each channel shall have heavy-duty 5-way binding post speaker output connectors appearing on the rear panel, with 3/4" spacing for accommodating standard double banana plugs (120V versions only) as well as spade lugs or bare wires. Each channel shall have a Neutrik brand Speakon® speaker output jack appearing on the rear panel in parallel with the binding post output.

9. AMP MODES. The amplifier shall have a three-way switch appearing on the rear panel for selecting the mode of operation, which shall include stereo (two channels in, two channels out), mono (one channel in, two channels out), and bridge (one channel in, one channel out bridged between both speaker outputs).

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10. OUTPUT APPLICATION. The amplifier shall have a three-way switch appearing on the rear panel for selecting between limiter on, limiter off, and subwoofer mode. The defeatable electronic limiter circuit shall sense the onset of clipping and shall limit the input signal and thereby prevent the output from clipping. The amplifiers shall have a two-way switch appearing on the rear panel for selecting between a 63Hz and 125Hz low-pass cutoff frequency when subwoofer mode is selected.

11. LOW-CUT FILTER. Each channel shall have a low-cut filter with a variable frequency control appearing on the rear panel covering a range of 10Hz (OFF) to 170Hz.

12. CONSTANT DIRECTIVITY HORN EQ. Each channel shall have a two-way switch appearing on the rear panel for selecting a constant directivity horn equalization circuit. When selected, this circuit shall provide a 6dB per octave high frequency boost. The EQ shall have a variable frequency control appearing on the rear panel covering a range of 2kHz to 6kHz. The 6kHz position shall be called AIR.

13. PHYSICAL CONFIGURATION. The amplifier shall be rack-mountable with rear support rails for extra support, and shall have a steel chassis frame painted grey-black. The amplifier shall be 19" wide, 3.5" tall (2U) and 15.25" deep, and shall weigh 36 pounds.

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

Continuous Average Output Power, both channels driven:

M•1200

225 watts per channel into 8 ohms from 20Hz to 20kHz, with no more than 0.025% THD

400 watts per channel into 4 ohms from 20Hz to 20kHz, with no more than 0.050% THD

600 watts per channel into 2 ohms from 20Hz to 20kHz, with no more than 0.095% THD

Bridged mono operation:

800 watts into 8 ohms from 20Hz to 20kHz, with no more than 0.05% THD

1200 watts into 4 ohms from 20Hz to 20kHz, with no more than 0.095% THD

Maximum Power at 1% THD (per IHF-A-202):

250 watts per channel into 8Ω

425 watts per channel into 4Ω

640 watts per channel into 2Ω

850 watts into 8Ω bridged

1280 watts into 4Ω bridged

M•1400

250 watts per channel into 8 ohms from 20Hz to 20kHz, with no more than 0.012% THD

425 watts per channel into 4 ohms from 20Hz to 20kHz, with no more than 0.025% THD

630 watts per channel into 2 ohms from 20Hz to 20kHz, with no more than 0.050% THD

Bridged mono operation:

850 watts into 8 ohms from 20Hz to 20kHz, with no more than 0.025% THD

1260 watts into 4 ohms from 20Hz to 20kHz, with no more than 0.050% THD

Maximum Power at 1% THD (per IHF-A-202):

280 watts per channel into 8Ω

480 watts per channel into 4Ω

700 watts per channel into 2Ω

960 watts into 8Ω bridged

1400 watts into 4Ω bridged

Note: Power ratings are specified at 120VAC (U.S. and Canada) and 240VAC (Export) line voltages.

Power Bandwidth:
20Hz to 70kHz (+0, –3dB)

Frequency Response:
20Hz to 40kHz (+0, –1dB)
10Hz to 70kHz (+0, –3dB)

Distortion:
THD, SMPTE IMD, TIM
< 0.025%@8Ω
< 0.050%@4Ω
< 0.150%@2Ω

Signal to Noise Ratio:
> 107dB below rated power into 4 ohms

Channel Separation:
> 80dB@1kHz

Damping Factor:
> 350 from 0 to 400Hz

Input Impedance:
20kΩ balanced bridging

Input Sensitivity:
1.23 volts (+4dBu) for rated
power into 4 ohms

Gain:
30.25dB (32.5V/V)

Maximum Input Level:
9.75 volts (+22dBu)

Rise Time: < 4.4µs

Slew Rate:
Voltage Slew Rate > 50V/µs
> 100V/µs bridged
Current Slew Rate
> 32A/µs at 2Ω

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CMRR:
> 40dB, 20Hz to 20kHz

Transient Recovery:
< 1µs for 20dB overdrive @ 1kHz

High Frequency Overload and Latching:
No latch up at any frequency or level

Variable Low-Cut Filter:
10Hz (Off) to 170Hz, 2nd Order Bessel

Subwoofer Low-Pass Filter:
Switched: 63Hz/125Hz, 3rd Order Bessel

Constant Directivity High Frequency Boost:
2kHz to 6kHz (+3dB points) 6dB/octave high-frequency shelving filter, (shelving occurs at approximately 30kHz)

Turn On Delay:
3 seconds

Limiter Section:
Complementary Positive and Negative Peak Detecting

Indicators:
Six meter LEDs per channel
- SIG (Signal Present), –20, –9, –6, –3, OL (Overload)

CH 1 & 2
- PROTECT LEDs
- SHORT LEDs

TEMP STATUS
- COLD, HOT LEDs

Power Consumption:

M•1200	120V	240V
65 watts at idle	0.9A	0.5A
500 watts with musical program fully loaded (4Ω per side, or 8Ω bridged)	6.4A	3.2A
850 watts with musical program fully loaded (2Ω per side, or 4Ω bridged)	10.0A	5.0A
800 watts at full power into 8Ω (cont. sine wave)	9.3A	4.7A
1400 watts at full power into 4Ω (cont. sine wave)	15.0A	7.5A
2400 watts at full power into 2Ω (cont. sine wave)	24.3A	12.2A

M•1400	120V	240V
65 watts at idle	0.9A	0.5A
550 watts with musical program fully loaded (4Ω per side, or 8Ω bridged)	6.7A	3.4A
900 watts with musical program fully loaded (2Ω per side, or 4Ω bridged)	10.5A	5.3A
850 watts at full power into 8Ω (cont. sine wave)	9.6A	4.8A
1500 watts at full power into 4Ω (cont. sine wave)	15.6A	7.8A
2500 watts at full power into 2Ω (cont. sine wave)	24.8A	12.4A

AC Line Power:

US	120VAC, 60Hz
Europe	240VAC, 50/60Hz
Japan	100VAC, 50/60Hz
Korea	220VAC, 60Hz

AC Drop-out Voltage:
At approximately 50% of rated line voltage

Physical:

Height:	2U = 3.5" (89mm)
Width:	19.0" (483mm)
Depth:	15.25" (387mm)
Handle Depth:	1.25" (32mm)
Overall Depth:	16.25" (413mm)
Weight:	36 lbs (16.3kg)

15. DESIGNATION.
The power amplifier shall be a Mackie Designs (M•1200, M•1400).

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