DigiTech

The Metal Machine

MM-4

OWNER'S MANUAL

Quick Start

For quick set-up of the Metal Machine, follow the instructions below. For best performance, follow the detailed instructions in "Making Connections" (page 3) and "Operation" (page 4).

INSTALL	Mount the Metal Machine in a rack with the provided screws. Rubber feet have also been affixed to the unit for free-standing use.
CONNECT CABLES	Plug guitar into either the front or rear INPUT. Connect the Metal Machine OUTPUT to an amp, or plug in headphones on front. See "Making Connections" (page 3).
CONNECT FOOTSWITCH	If desired, connect a DigiTech FS-305 Footswitch (optional) to the FOOTSWITCH jack for remote bypass of the MM-4's functions.
ADD POWER	Route the power cord away from audio lines to prevent interference.
ADJUST MIX	Set the EFFECT MIX to slightly left of center (10 o'clock).
ADJUST EQUALIZATION	Set the four EQUALIZER controls to their center (12 o'clock) positions.
ADJUST COMPRESSION	Set the COMPRESSION RATIO and RELEASE TIME to their center (12 o'clock) positions.
ADJUST INPUT AND OUTPUT	Set both the INPUT LEVEL and OUTPUT LEVEL to their center (12 o'clock) positions. Play the guitar at the loudest level that will be used. If the CLIP LED lights frequently, turn down the INPUT LEVEL.
SELECT DISTORTION AND EFFECTS	Select the desired DISTORTION and EFFECTS.

LET THE GOOD TIMES ROCK AND ROLL!

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The Metal Machine

DigiTech's incredible Metal Machine produces a full range of guitar effects with just a twist of a knob. Rehearse at home with headphones on, or plug into an amp and crank up the sound.

The front panel tells it all. There are four different effects available at the same time, with an infinite combination of settings:

* Digital Tube™ Distortion
* Reverbs and Delays
* Equalization
* Compression

Choose from tube, overdrive, crunch, and metal distortion sounds, then mix in some reverb or delay, set the EQ just right, and compress the signal for fantastic sustain.

DigiTech's own Digital Tube™ distortion processor and VLSI engine create smooth, dynamic sound effects with maximum frequency response. With so many features, the Metal Machine brings out creativity in every guitarist.

Safety Precautions

Use only standard AC voltage. Uninsulated dangerous voltages are present within the product enclosure. Opening the chassis for any reason will void the manufacturer warranty.

Do not get the MM-4 wet. If liquid is spilled on the unit, shut it off immediately and take it to the dealer for service.

Use of a surge protector is recommended to decrease chances of equipment damage from voltage surges or spikes. The MM-4 may also be damaged during electrical storms if connected to an AC outlet. Disconnect the equipment during storms to prevent damage.

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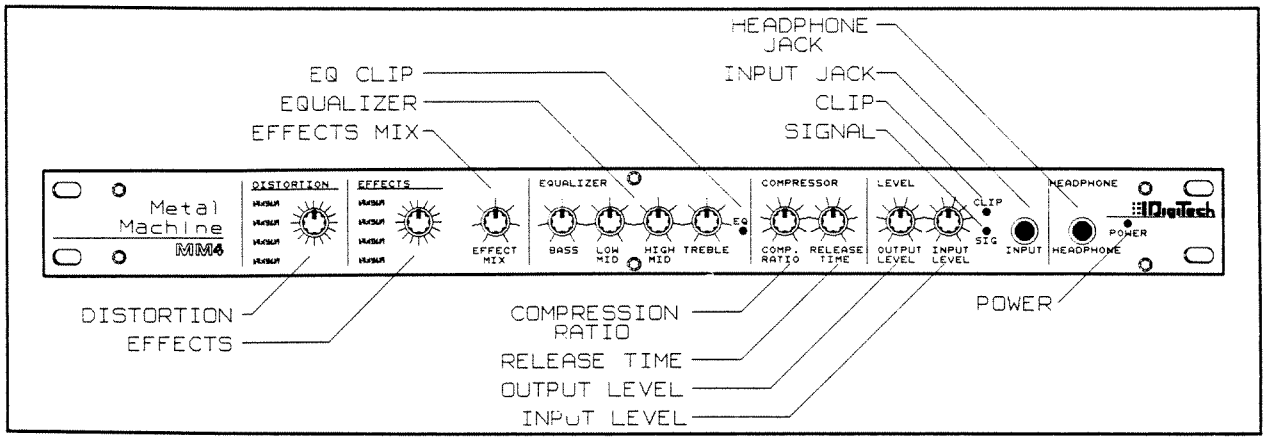
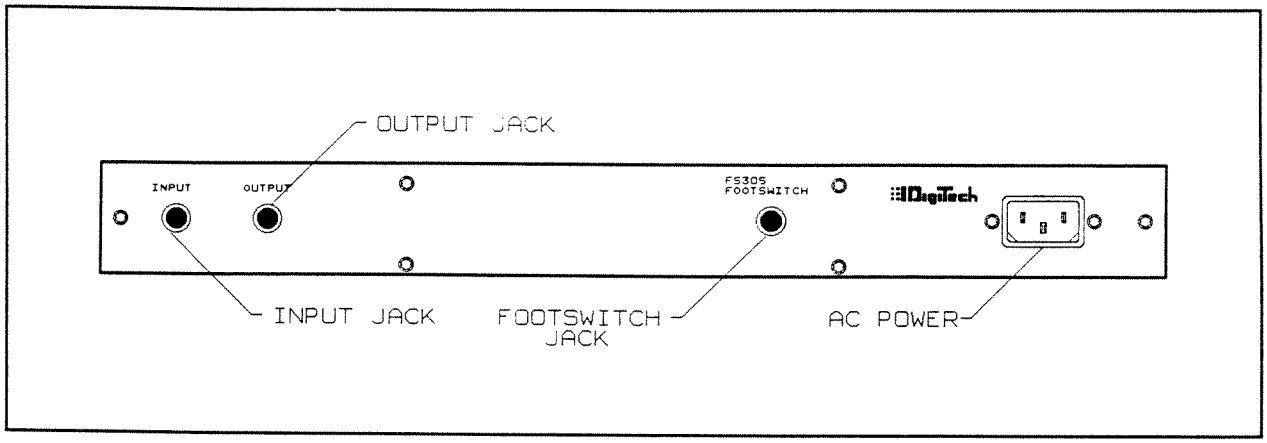
Front Panel Controls



DISTORTION	Sets the MM-4 to one of 15 distortion settings, or turns distortion off. See "Operation" (page 5).
EFFECTS	Selects one of 15 digital effects, or turns effects off. See "Operation" (page 5).
EFFECT MIX	Adjusts the output signal mix from dry (no effects, counter-clockwise) to wet (maximum effects, clockwise). See "Operation" (page 6).
EQUALIZER	Changes the tonal balance of the MM-4 output signal. Used to tailor the distortion sound. Can also be used as a preamp EQ control. See "Operation" (page 6).
EQ CLIP	Red LED indicating clipping in the EQ section. Turn down the OUTPUT LEVEL. See "Operation" (page 6)
COMPRESSION RATIO	Varies the amount of sustain and compression. See "Operation" (page 6).
RELEASE TIME	Varies the length of time notes are sustained. See "Operation".
OUTPUT LEVEL	Adjusts the output signal to the desired level. See "Operation" (page 4).
INPUT LEVEL	Adjusts the level of the input signal to an optimum level. See "Operation" (page 4).
CLIP	Red LED indicating clipping in the unit. If it lights too frequently, turn down the INPUT LEVEL. See "Operation" (page 4).
SIGNAL	Green LED indicating presence of an input signal.
INPUT	Standard 1/4-inch jack for guitar or line level signals. Rear INPUT is bypassed when front INPUT is used. See "Making Connections" (page 3).
HEADPHONE	1/4-inch stereo jack for stereo headphones only. Permits using the MM-4 without an amplifier.
POWER	Red LED indicating the MM-4 is plugged in and powered up.

Rear Panel



INPUT — Standard 1/4-inch jack for guitar or line level signals. Rear INPUT is bypassed when front INPUT is used. See "Making Connections".

OUTPUT — Standard 1/4-inch jack for output to amplifier or mixing console.

FOOTSWITCH — Stereo 1/4-inch tip-ring-sleeve jack for use with a DigiTech FS-305 three switch pedal. See "Footswitch" (page 7).

Making Connections

The MM-4 creates Digital Tube™ distortion and effects from instruments or line level signals. Sophisticated, yet easy-to-use, the MM-4 may be used by itself with headphones, as an effects device with a guitar amp, or as a preamp for use with a power amp and speaker combination. There are five possible connection configurations:

Without an Amplifier — Plug the guitar into the MM-4 front or rear INPUT, then plug in stereo headphones. Do not use mono headphones because they will short one side and damage the headphone amplifier circuit. Use the OUTPUT LEVEL to control the volume in the headphones.

With A Guitar Amplifier — Plug guitar into the MM-4 front or rear INPUT. Connect the MM-4 OUTPUT to a guitar amp input. Turn the MM-4 DISTORTION and EFFECTS to off, then set the four EQ controls to the center (12 o'clock) position. Adjust the OUTPUT and INPUT LEVELs for unity gain. See "Operation" (page 4).

Set up the amp with no distortion, no effects. Set the amp EQ for the desired clean sound.

Now select the desired MM-4 DISTORTION and EFFECTS. Use the MM-4 EQ to tailor the sound.

Making Connections (continued)

As a Preamp Plug guitar into the MM-4 front or rear INPUT. Connect the OUTPUT of the MM-4 to a power amp input. Set the MM-4's INPUT LEVEL so the CLIP light comes on occasionally. Set the MM-4 OUTPUT LEVEL to the desired level. If the EQ CLIP light comes on, reduce the MM-4 OUTPUT LEVEL.

In an Effects Loop Plug the guitar into a mixing board or guitar amp. Connect the effects send to the MM-4 front or rear INPUT. Connect MM-4 OUTPUT to the effects return. Adjust the MM-4 OUTPUT and INPUT LEVELs for unity gain. See "Operation".

With Other Instruments Besides Guitar The MM-4 will operate with any instrument as long as the instrument's output signal is below +18 dBv. When used with line level signals, the compressor should be bypassed.

Operation

Use the following procedures to optimize the performance of the MM-4:

ADJUST INPUT AND OUTPUT LEVEL

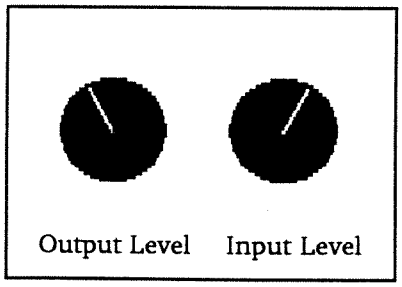
Input After connecting the MM-4 to other equipment, set the source to the loudest signal that will be used. Adjust the MM-4 INPUT LEVEL so the red CLIP LED only occasionally comes on. If the CLIP light comes on too frequently, turn down the INPUT LEVEL.

Output When using the MM-4 as a preamp or with headphones, use the MM-4 OUTPUT LEVEL for volume control.

For all other connections, best performance is achieved when the MM-4 OUTPUT and INPUT LEVELs are set for unity gain.

UNITY GAIN

Unity gain is achieved when the MM-4 input and output signals are at the same level. To do this, set the INPUT LEVEL as previously explained, then adjust the OUTPUT LEVEL so that it is the mirror opposite of the INPUT LEVEL, as shown below:



For example, if the INPUT LEVEL is set to the right of center (1 o'clock), set the OUTPUT LEVEL an equal amount to the left of center (11 o'clock).

Operation (continued)

DigiTech's Digital Tube™ distortion and HISC processor create the following sounds:

DISTORTION

Turn the DISTORTION knob to select the desired distortion sound, or to turn the distortion off. There are 15 different digital distortions, each with a varying amount of distortion and internal EQ.

Tube Distortion Tube distortion emulates the warm, rich sound created by tube amplifiers. There are three tube distortion settings:

1. Tube Distortion A
2. Tube Distortion B
3. Tube Distortion C

Overdrive Distortion Overdrive distortion is similar to tube distortion with an added overdriven, high-gain punch. Select from three overdrive settings:

4. Overdrive Distortion A
5. Overdrive Distortion B
6. Overdrive Distortion C

Crunch Distortion Crunch distortion gives music a hard metallic edge. Choose one of four crunch distortion settings:

7. Crunch Distortion A
8. Crunch Distortion B
9. Crunch Distortion C
10. Crunch Distortion D

Metal Distortion Creates the heavy metal sound used by many popular groups. There are five possible metal distortion settings:

11. Metal Distortion A
12. Metal Distortion B
13. Metal Distortion C
14. Metal Distortion D
15. Metal Distortion E

EFFECTS

Turn the EFFECTS knob to select the desired sound effects, or to turn the effects off. There are 15 different digital effects:

Delay Time between the original signal and echoes. Shortest delays provide a quick slap or double effect. Longer delays create an echo effect. Feedback repeats the echo. Choose from five delay positions:

1. 25 millisec, 0 % feedback
2. 150 millisec, 0 % feedback
3. 200 millisec, 30 % feedback
4. 325 millisec, 20 % feedback
5. 400 millisec, 10 % feedback

Reverb Repeated reflection of sound off surfaces in an enclosed space. Short reverb settings sound like a small room. Long settings sound like an empty warehouse. The MM-4 reverb includes decay and predelay. Decay is the time it takes for the sound to die out. Predelay is the time before reflections are heard. There are five reverb positions:

6. 0.9 seconds, 0 millisec predelay
7. 1.4 seconds, 0 millisec predelay
8. 2.6 seconds, 6 millisec predelay
9. 4.0 secs, 60 millisec predelay
10. 10 secs, 60 millisec predelay

Gated Reverb Reverb effect that decays for a preset time, then cuts off abruptly. Like an electronic gate that closes quickly when the signal falls below a preset level. The longer the gated reverb setting, the longer the reverb sound is held. Select from three gated reverb positions:

11. 300 millisec gated reverb
12. 400 millisec gated reverb
13. 570 millisec gated reverb

Operation (continued)

Reverse Reverb Normal reverb sound is loud following the initial sound, then decays. With reverse reverb, the decay is heard first and builds into the initial sound. There are two reverse reverb positions:

14. 480 millisec reverse reverb
15. 580 millisec reverse reverb

Effects Mix The effects mix can be adjusted at any time to change the ratio of wet (digitally processed effects) to dry (original sound) signal.

For a wet signal, turn the EFFECT MIX clockwise. For a dry signal, turn the EFFECT MIX counter-clockwise. The center position provides a 50-50 mix.

EQUALIZER

Equalization is used to control the MM-4's tonal balance and quality. The MM-4's four bands of equalization were chosen especially for guitars.

Bass:	Shelving at 40 Hz
Low Mid:	Bandpass at 280 Hz
High Mid:	Bandpass at 1.3 kHz
Treble:	Shelving at 10 kHz

Tailor the EQ controls to the desired sound. Each is adjustable from -12 to +12 dB.

If the EQ CLIP light comes on, the equalizer section is being clipped. Turn down the OUTPUT LEVEL to eliminate clipping.

COMPRESSOR

Compression is an effect which adjusts the source's dynamic range (the difference between the loudest and quietest sounds). By compressing the range, notes can be sustained longer and the sound will be tighter.

Compression Ratio Varies the amount of compression. A low setting (counter-clockwise) gives a full dynamic range. A high COMPRESSION RATIO (clockwise) provides a tight sound.

Release Time Varies the time it takes for compression to let go. A low RELEASE TIME (counter-clockwise) gives instant release. A high RELEASE TIME (clockwise) prolongs compression and lengthens the sustain time.

The COMPRESSION RATIO and RELEASE TIME work together. A low COMPRESSION RATIO and short RELEASE TIME give the guitar an open and natural sound. A high COMPRESSION RATIO and long RELEASE TIME create the sustained heavy metal sound.

Footswitch

The MM-4 can be used with the DigiTech FS-305 Footswitch for hands-free control of distortion, effects and compressor bypass.

Plug the optional FS-305 Footswitch into the rear FOOTSWITCH jack. The three switches provide the following functions:

Left = Distortion on/off
Center = Effects on/off
Right = Compression on/off

Problem Guide

SYMPTOM	PROBABLE SOLUTION
Grainy, harsh clipping noise when EFFECTS and DISTORTION are turned off. CLIP LED coming on. EQ CLIP LED not on.	Reduce the MM-4 INPUT LEVEL.
Undesirable distortion sound, but not harsh clipping noise with Compressor on and Distortion off. CLIP LED and EQ CLIP not coming on.	Reduce the instrument's output level.
Harsh clipping noise, CLIP LED not coming on, EQ CLIP LED coming on.	Turn down the MM-4 OUTPUT LEVEL.
Signal sounds muddy or unclear with EFFECT set to a reverb setting.	Turn the MM-4 EFFECT MIX counter-clockwise to a dryer position.
The MM-4 output signal is low.	Turn up the MM-4 INPUT LEVEL until the CLIP LED comes on occasionally. Set the OUTPUT LEVEL for unity gain. See "Operation" (page 4).

Maintenance and Service

Keep the MM-4 clean by occasionally dusting the cover and wiping the front panel with a dry cloth. Periodically check the wires and connectors on the back of the unit to make sure they are not crimped or frayed.

There are no user-serviceable parts inside the MM-4. Opening the chassis for any reason will void the warranty.

All service and repair must be performed by the factory for the warranty to remain in effect. Should a problem arise with the MM-4, contact a DigiTech dealer for repair procedures.

FCC Compliance

This equipment has been tested and found to comply with the limits of a Class B computing 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 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.

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le prèsent appareil numèrique n'èmet pas de bruits radioèlectriques dèpassant les limites applicables aux appareils numèriques de Classe B prescrites dans le règlement sur le brouillage radioèlectrique èdictè par le Ministère des Communications du Canada.

Specifications

Freq. Response:	40 Hz to 12 kHz (+0, -3 dB)
THD:	Less than 0.05% at 1 kHz, with distortion off
Signal-to-Noise:	Greater than 85 dB with a 12 kHz measurement bandwidth
Maximum Input:	+18 dBv (ref. $0.775V_{rms}$)
Maximum Output:	+18 dBv (ref. $0.775V_{rms}$)
Input Impedance:	230k ohms
Output Impedance:	51 ohms
Bass Control:	$\pm$12 dB of boost/cut at 40 Hz
Low Mid Control:	$\pm$12 dB of boost/cut at 280 Hz with a Q of 1
High Mid Control:	$\pm$12 dB of boost/cut at 1.3 kHz with a Q of 1
Treble Control:	$\pm$12 dB of boost/cut at 10 kHz

Warranty

1. The warranty registration card must be mailed within ten days after purchase date to validate this warranty.

2. DigiTech warrants this product, when used solely within the U.S., to be free from defects in materials and workmanship under normal use and service.

3. DigiTech liability under this warranty is limited to repairing or replacing defective materials that show evidence of defect, provided the product is returned through the original dealer, where all parts and labor will be covered up to a period of one year. The company shall not be liable for any consequential damage as a result of the product's use in any circuit or assembly.

4. Proof-of-purchase is considered to be the burden of the consumer.

5. DigiTech reserves the right to make changes in design or make additions to or improvements upon this product without incurring any obligation to install the same on PRODUCTS PREVIOUSLY MANUFACTURED.

6. The foregoing is in lieu of all other warranties, expressed or implied, and DigiTech neither assumes nor authorizes any person to assume for it any obligation or liability in connection with the sale of this product. In no event shall DigiTech or its dealers be liable for special or consequential damages or from any delay in the performance of this warranty due to causes beyond their control.

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