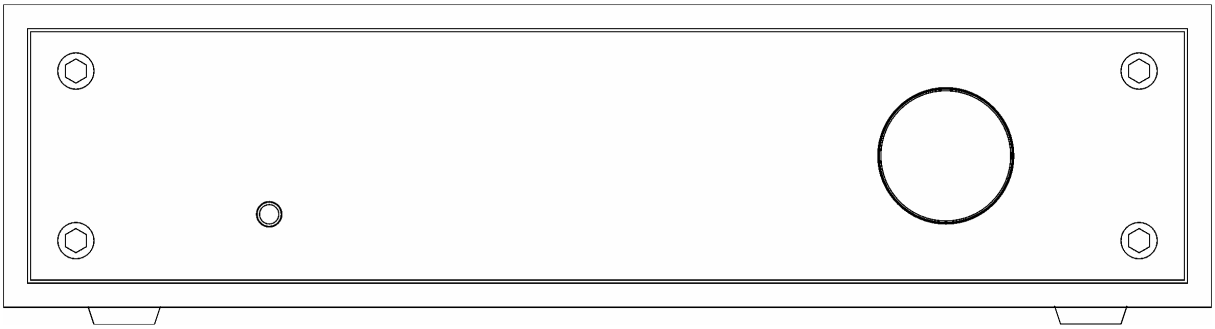
M2TECH

MARLEY

DUAL-DRIVE CLASS-A HEADPHONE AMPLIFIER / PREAMP

USER MANUAL



REV. 1.0 – 11/2013

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Warning!

Changes or modifications not authorized by the manufacturer can invalidate the compliance to CE regulations and cause the unit to be no more suitable to use. The manufacturer refuses every responsibility regarding damages to people or things due to the use of a unit which has been subject to unauthorized modifications or to misuse or to malfunction of a unit which has been subject to unauthorized modifications.

This unit is compliant with the following CE regulations: CEI EN 55022:2009 Class B (Radiated Emissions), CEI EN 55024:1999, CEI EN 55024:A2/2003, CEI EN 55024:IS1/2008 (Radio Frequency Electromagnetic Fields, 50Hz Magnetic Field Immunity Test and Electrostatic Discharges – ESD).

For a proper operation of this unit, all connections to other equipment in the system must be done when all equipment are off. Failing to comply with this advice may lead to damage to the Marley.

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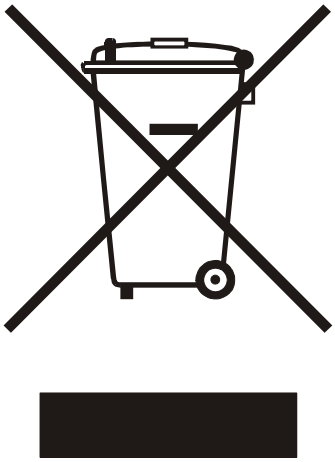

The label above, printed on the product case, indicates that the product, when no more usable, can't be treated as generic garbage, but must be disposed of at a collection point for recycling of electrical and electronic equipment, in compliance with the WEEE regulation (Waste of Electrical and Electronic Equipment).
By making sure that this unit is correctly recycled, you will help preventing potential damages to environment and human health, which could be caused by a wrong treatment of this product as generic garbage. Materials' recycling helps saving natural resources. For more in-depth information about recycling this product, please contact M2Tech Srl.

WARNING: the information contained in this manual are considered to be reliable and accurate. M2Tech reserves the right to change or modify the information any time, without prior advice. It's up to the customer to ensure that the manual being consulted is the latest version.

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Dear customer,

Thank you for purchasing MARLEY. What you have is a first rate dual headphone amplifier with preamp and line outputs. MARLEY also includes many unique features conceived to obtain the best audio performance out of any headphone or source.

MARLEY implements a specific set of functional and technological solutions, from the double output stage to high bias, with the purpose of exalting superior sonic performance, ease of use and reliability.

MARLEY is provided with a complete set of outputs which allow for using any kind of headphones, be they fit for single-ended drive or for balanced drive. The high maximum output level delivered by the MARLEY allows for effectively driving even the most difficult headphones. For your convenience, we allow for two sets of headphones to be operated independently of each other at the same time using single-ended drive.

We're sure that your expectations will be met by purchasing the MARLEY: you'll hear your favorite music like never before. Be ready for a new listening experience!

Nadia Marino, CEO

Please annotate your MARLEY serial number and purchase date for future reference:

S/N: _____

Date of Purchase: _____

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1. Unpacking and Placing the Unit

Lay the box on a table and open it by separating it from the external paperwork and removing or cutting the adhesive tape seal. The following items are included:

- One MARLEY;
- One wall wart;
- This manual.

Should one or more item be missing, please contact your dealer.

Remove the MARLEY from the foam enclosure and place it onto a stable base, far from heat sources. Avoid full sunlight on the unit. Allow for ample room around the unit for venting.

The MARLEY is a high bias dual drive class A amplifier which dissipates 30W while operating, even when idle; therefore a lot of heat is produced. As a result, it is necessary to guarantee adequate air flow.

Avoid smoke, moisture, dirt and water reaching the unit.

Do not place the unit on thick carpets or inside a box or piece of furniture, not even close to curtains.

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2. Front Panel

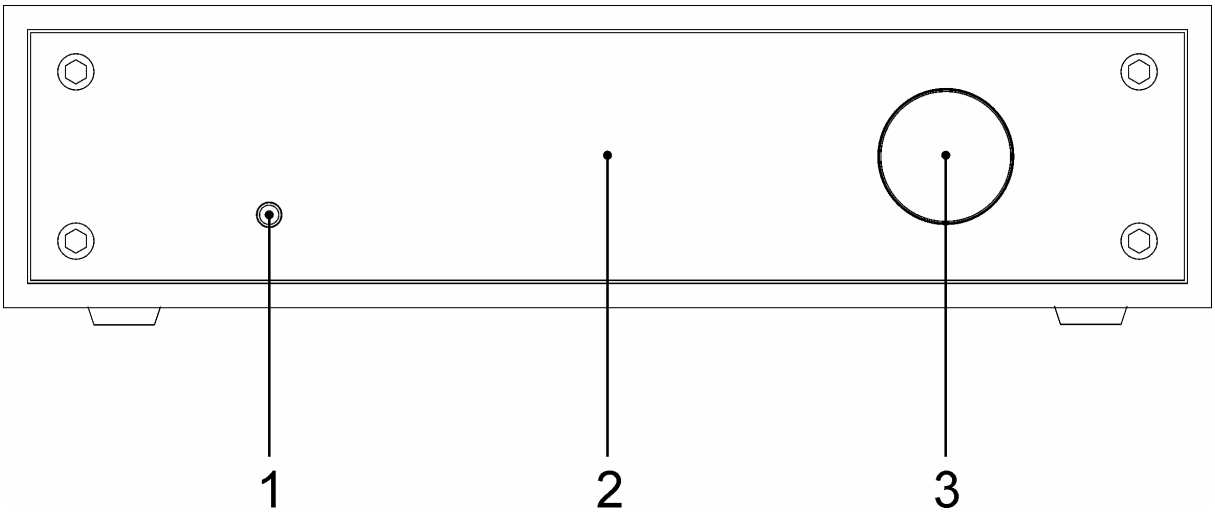

Figure 1

1) On/off/mute/menu escape button. Push this button to turn the MARLEY on when it's off. When the MARLEY is on, a short push will toggle muting, unless the menu has been previously accessed: in the latter, a short push will cause immediate menu escape and configuration changes discard. A prolonged button push while the MARLEY is on will cause it to switch-off.

2) Display. Multi-function LCD display. During normal operation, it indicates the listening level for the active outputs, the selected source and the mute status. When

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the menu is accessed, the display shows the selected menu item and the current value associated to it.

3) Encoder. Allows for accessing and navigating the menu, as well as volume setting. It may be rotated and pushed. Please read chapter 6 for details on its use.

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3. Back Panel

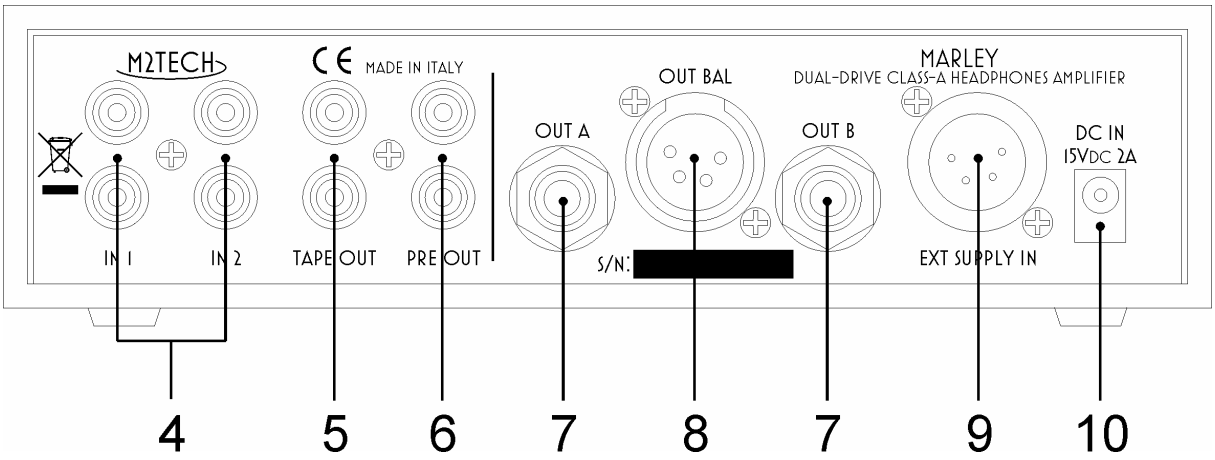

Figure 2

4) Inputs. Connect stereo music sources to these two inputs. Gold-flashed RCA sockets. Black indicates left channel, red indicates right channel.

5) Tape output. Connect the input of a tape recorder or other recording device to this output to record the selected source. Gold-flashed RCA sockets. Black indicates left channel, red indicates right channel.

6) Preamplifier output. If used, connect a power amplifier to this output, to use the MARLEY as a preamplifier. Gold-flashed RCA sockets. Black indicates left channel, red indicates right channel.

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7) Output for single-ended headphone connections. Connect the jack of a headphone set to each of these two outputs. It is possible to use one output or both outputs at the same time. These two connectors should be used as alternative to the balanced headphones connector (item 8). 6,35mm (1/4”) stereo socket.

8) Output for balanced headphones connection. Connect the XLR connector of a headphone set to this output. This connector should be used as alternative to the single-ended headphones connectors (item 7). 4-pin female XLR socket.

9) Input for high-current, low-noise power supply. Connect the plug from the dedicated high-current, low-noise power supply dedicated for the MARLEY. 4-pin, male XLR socket (optional purchase).

10) Input for power from wall wart. Connect the jack from the supplied 15V-2A wall wart included in the package. 5.5/2.1mm jack with positive on tip.

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4. Connecting and Powering the Unit

WARNING: All connections between the MARLEY and other equipment must be made when all units are off. Failing to do so may cause damage to the MARLEY and/or other units.

Please refer to chapter 3, “Back Panel”.

Connect one or two high-level stereo audio sources (CD/SACD/DVD player, DAC USB, tuner, preamplifier) to the inputs (Figure 2, 4). Low-level sources, such as magnetic pick-ups, cannot be connected to the inputs.

If needed, connect MARLEY’s “TAPE OUT” output to a recorder’s input (Figure 2, 5).

If MARLEY‘s operation as preamplifier is desired or required, connect the “PRE OUT” output to the input of a power amplifier (Figure 2, 6).

Connect one or two headphones to headphones outputs, avoiding using single-ended and balanced outputs at the same time (Figure 2, 7/8).

Connect the wall wart jack to the MARLEY ‘s power supply input (Figure 2, 10).

Connect the wall wart to a mains outlet. The wall wart is designed to automatically fit any mains voltage from $90V_{AC}$ to $265V_{AC}$.

Turn the MARLEY on by pushing the front panel button (Figure 1, 1).

NOTE: It is possible to use a dedicated high-current, low-noise power supply in place of the included wall wart for increased sonic performance. In this case,

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the power supply must be connected to the dedicated connector on MARLEY's back panel (Figure 2, 9). Be sure to make this connection with the MARLEY disconnected from any power source and with the MARLEY disconnected from any other device that may have its power source turned on.

WARNING: When the dedicated power supply (optional) is used, DO NOT connect the wall wart also. The wall wart is NOT needed and NOT used when you use the external dedicated power supply.

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5. Cleaning the Unit

The MARLEY should be cleaned with a soft, damp cloth. Do not use alcohol nor other types of cleaning fluids as they could damage the unit.

Avoid fluids from dropping or leaking through the venting grid holes. Fluids of any type poured into the venting holes will void your warranty.

Be careful not to scratch the Plexiglas front screen.

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6. Using the Marley

At power up, the MARLEY observes a start-up heating period lasting a few seconds, during which the flashing writing in Figure 3 is displayed.

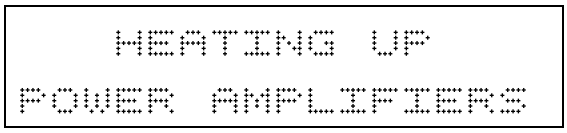

Figure 3

Once heating is completed, some general information about MARLEY operation will appear on the display, as shown in Figure 4 and Figure 5. The two pictures refer to the two different output configurations (balanced and double single-ended). In Figure 4 the word “MUTE” appears to indicate that muting is switched on.

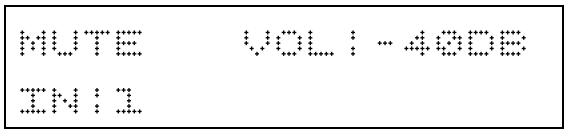

Figure 4

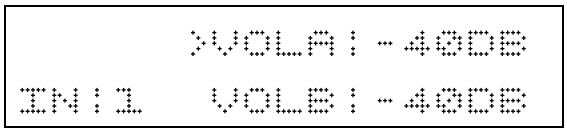

Figure 5

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6.1. Volume Setting

Volume setting is performed by encoder knob rotation (Figure 1,3). Depending on the output configuration, it is possible to set one or two volumes.

When the MARLEY is configured in balanced mode, the two stereo amplifiers which are used in this mode are bridged and make for a single balanced amplifier. This is why only one balanced output is present and why only one volume control can be set when using the balanced headphone connection (Figure 4).

When the MARLEY is configured in dual single-ended mode, each amplifier drives one jack output. Each amplifier has its own dedicated volume control, it is therefore possible to set the listening level of each amplifier independently. Two volumes are thus shown: “VOLA”, related to output “A,” and “VOLB”, related to output “B”. The “>” sign indicates which volume can be set. As shown in Figure 5, output “A” volume can be set by rotating the encoder knob.

To set volume for output “B” it is necessary to push the encoder knob once, so that the “>” moves to the front of “VOLB” (Figure 6).

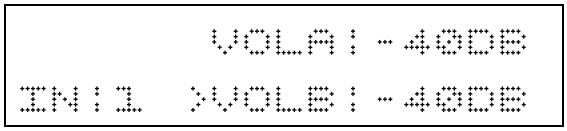

Figure 6

NOTE: After setting output “B” volume, the button to the left of the front panel may be pushed to restore equipment’s “idle” status as in Figure 4. As an

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alternative, after a few seconds past the encoder rotation the unit automatically reverts to "idle" status.

6.2. Muting Toggle

The MARLEY is provided with a feature (muting) which allow for lowering the volume 20dB without touching the encoder knob. This feature is useful when user needs to listen to another person for a moment, or while changing music programs in the source, etc.

Muting is toggled by pushing the button to the left of the front panel (Figure 1, 1). When muting is engaged, the word "MUTE" appears on the display (Figure 4).

In dual single-ended mode, muting affects both outputs.

WARNING: Carefully operate on volumes when muting is engaged: If volume is raised too much and muting is disengaged, the resulting listening level could be so high that damage to the headphone sets or to the listener's ears may occur.

6.3. Source Selection

The MARLEY is provided with two inputs, it is therefore possible to connect two sources to it and select one for listening. To do this, it is necessary to push the encoder once in balanced mode or twice in dual single-ended mode: the input selection feature is then accessed as shown in Figure 7.

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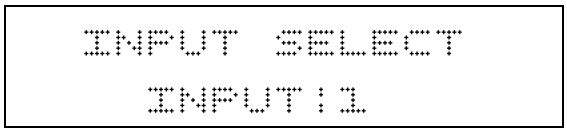

Figure 7

It is possible to select input 1 or input 2 by rotating the encoder knob.

To confirm the chosen input the encoder must be pushed: this way, the input is selected and the unit reverts to “idle” status.

Note that if the user changes her/his minds and goes for keeping the source previously selected, she/he only needs to push the button to the left of the front panel (Figure 1, 1) or avoid doing any other action on the unit, as after a few seconds, the MARLEY automatically reverts to its “idle” status without changing the source selection.

6.4. Balance Setting

The MARLEY allows for setting the balance (that is, the relative level between left and right channels) in a range of +/-6dB. To do this, it is necessary to push the encoder twice in balanced mode or three times in dual single-ended mode: the input selection feature is then accessed as shown in Figure 8.

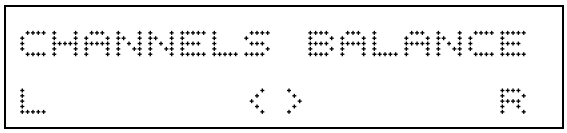

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Figure 8

Left channel level will be increased with respect to right channel's by rotating the encoder knob counter clockwise. Right channel level will be increased with respect to left channels by rotating the encoder knob clockwise.

To confirm the selected balance setting, push the encoder: the balance setting will be stored and the unit will revert to "idle" status.

Optionally, if the user changes her/his minds and goes for keeping the balance previously set, she/he only needs to push the button to the left of the front panel (Figure 1, 1) or avoid doing any other action on the unit, as after a few seconds, the MARLEY automatically reverts to its "idle" status without changing the balance setting.

6.5. Output Mode Selection

As previously mentioned, the MARLEY may operate in two different output modes, depending on which type of headphone arrangements the user needs to drive: one or two single-ended headphones with 6.35mm (1/4") jack (dual single-ended mode) or one balanced headphone set with 4-pin XLR connector (balanced mode). To select the appropriate output mode, it is necessary to push the encoder three times in balanced mode or four times in dual single-ended mode: As a result, the output mode selection feature is then accessed as shown in Figure 9.

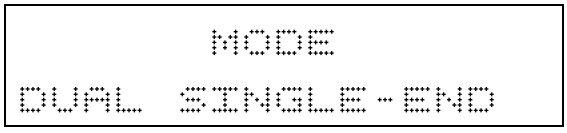

Figure 9

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The desired output mode is selected by rotating the encoder knob: “DUAL SINGLE-END” or “BALANCED”.

To confirm the selected output mode, push the encoder knob: the output mode will be set and the unit will revert to “idle” status.

Optinally, if the user changes her/his minds and goes for keeping the output mode previously set, she/he only needs to push the button to the left of the front panel (Figure 1, 1) or avoid doing any other action on the unit. As a result, after a few seconds, the MARLEY automatically reverts to its “idle” status without changing the output mode.

6.6. Volume Display Mode Selection

The MARLEY’s volume levels may be displayed in two different fashions: deciBels or in steps.

In the former, the highest volume is represented by 0dB, while negative figures with increasing magnitude indicate increasingly lower volume. E.g., -15dB is lower volume than -20dB.

In the latter, the highest volume is represented by 78, while positive figures with decreasing magnitude indicate increasingly lower volume. E.g., 40 indicates higher volume than 30.

To choose the volume display mode, it is necessary to push the encoder knob four times in balanced mode or five times in dual single-ended mode: The volume mode display selection feature is then accessed as shown in Figure 10.

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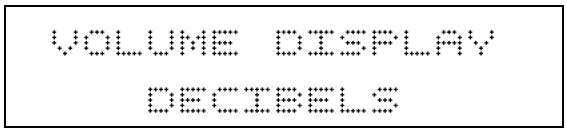

Figure 10

The desired volume display mode is selected by rotating the encoder knob: "DECIBELS" or "STEPS".

To confirm the selected volume display mode, push the encoder: the volume display mode will be set and the unit will revert to "idle" status.

Optionally, if the user changes her/his minds and goes for keeping the volume display mode previously set, she/he only needs to push the button to the left of the front panel (Figure 1, 1) or avoid doing any other action on the unit. As a result, after a few seconds, the MARLEY automatically reverts to its "idle" status without changing the volume display mode.

NOTE: The choice of either mode won't affect the way volume is actually set: the MARLEY allows for setting volumes between 0 and -78dB with 1dB steps. Volume display only is changed depending on the choice made as indicated above.

6.7. Auto Switch-Off Setting

Compliant to UE rules about energy saving, the MARLEY is able to automatically switch off after a certain time of idle operation. Idle means a time lapse in which the user doesn't operate the unit's controls.

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Auto switch-off time is user selectable (30 to 240 minutes in 30 minutes steps); the auto switch-off function may be disabled. To do any of the two, it is necessary to push the encoder five times in balanced mode or six times in dual single-ended mode: The auto switch-off selection feature is then accessed as shown in Figure 11.

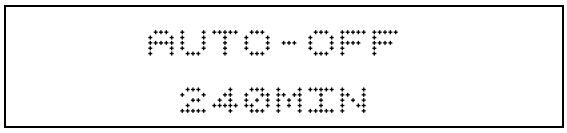

Figure 11

The idle time after which the MARLEY switches off is set by rotating the encoder knob.

To confirm the desired auto switch-off time, push the encoder: Time to switch-off is then stored and the unit will revert to “idle” status.

Optionally, if the user changes her/his minds and goes for keeping the auto switch-off mode previously set, she/he only needs to push the button to the left of the front panel (Figure 1, 1) or avoid doing any other action on the unit: After a few seconds, the MARLEY automatically reverts to its “idle” status without changing the auto switch-off time.

NOTE: To disable auto switch-off, select “DISABLED”, which is one of the values which appear on the display while rotating the encoder knob, as shown in Figure 12.

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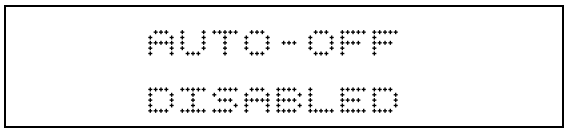

Figure 12

6.8. Display Dimming

The MARLEY display backlight intensity may be set in four different levels, depending on user's preference. Moreover, it's possible to set an "automatic" mode in which the display is always of except, for a few seconds, when the unit is operated by the user. To set display dimming, it is necessary to push the encoder six times in balanced mode or seven times in dual single-ended mode: Display dimming is then accessed as shown in Figure 13.

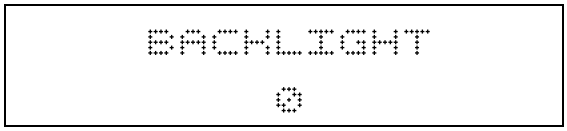

Figure 13

Intensity is chosen by rotating the encoder knob: Level "0" is for highest intensity, level 3 is for lowest intensity. "Automatic" mode is selected when choosing "AUTO".

To confirm the desired display backlight intensity, push the encoder: Intensity is set and the unit will revert to "idle" status.

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Optionally, if the user changes her/his minds and goes for keeping the display backlight intensity previously set, she/he only needs to push the button to the left of the front panel (Figure 1, 1) or avoid doing any other action on the unit: after a few seconds, the MARLEY automatically reverts to its “idle” status without changing the display backlight intensity.

6.9. Firmware Revision

The MARLEY is operated by a microcontroller. It may be useful to know the revision of the firmware being executed by the microcontroller. To display the firmware revision, it is necessary to push the encoder seven times in balanced mode or eight times in dual single-ended mode: the firmware revision is then displayed as shown in Figure 14.

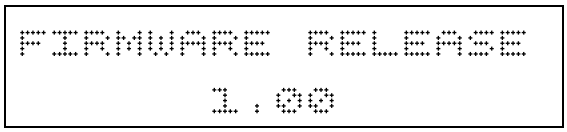

Figure 14

Of course, no value can be changed when accessing this feature: The firmware release indicator only changes when a firmware update is performed (which can only be done in the factory).

To exit this feature and revert the MARLEY into “idle” mode, the button on the left of the front panel may be pushed (Figure 1, 1) or the user should avoid doing any other action on the unit: After a few seconds, the MARLEY then automatically reverts to its “idle” status.

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6.10. Switch-Off

The MARLEY may be turned off by a long push on the button on the left of the front panel (Figure 1, 1). After a few seconds, the advice shown in Figure 15 appears.

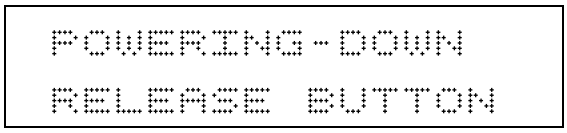

Figure 15

Once the button is released, the unit switches off and may be turned on again by a new short push on the button.

NOTE: In the "Off" status, the MARLEY actually draws a very low current, such as it may be considered negligible.

6.11. Notes About Menu Use

When the firmware release screen is displayed and the encoder knob is pushed further, menu navigation restarts from the first item not related to volume control that is from source selection. If the volume setting mode is desired, it's then necessary to exit the menu by either pushing the button on the left of the front panel (Figure 1, 1) or avoid operating the unit for a while, to allow the MARLEY to automatically revert to "idle" status.

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7. Balanced Drive and Single-ended Drive

Most headphones are fitted with a 3-pole cable (and related connector), one of which is used for common return, one for left channel send and the third one for right channel send.

Optionally, some headphones are provided with a 4-pole cable and connector: two poles for left channel drive and two poles for right channel drive.

Headphones of the first type can only be driven in single-ended mode, whereas the amplifier drives one of the wires running to each speaker and the other wires are connected to the amplifier's ground.

Headphones of the second type can be driven in balanced mode, in which two amplifiers drive one wire of each headphone speaker.

The first setup is a low cost manufacturing option as it only requires one stereo amplifier. If this low cost manufacturing option is used, this severely limits sound quality (as the two channels signals may partly mix due to the non-zero impedance of the common return wire. This leads to reduced channel separation and a slight dynamic loss).

These problems may be reduced by separating the returns to ground, thus improving the sound quality.

An additional improvement is obtained by "lifting" from the amplifier's ground the return wire of each speaker: this can be accomplished, as mentioned earlier in this manual, by using a bridge amplifier (that is, an amplifier provided with two output stages operating in push-pull). In this setup, called "balanced" the two speakers

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cannot interfere each other anymore and the best performance may be obtained by the transducers used.

Despite the common belief, no specific driver technology takes a specific advantage from balanced drive: any pair of speakers, be they dynamic, electrostatic, electret or isodynamic, will give better performance when balance-driven.

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8. Technical Specifications

Inputs:	2 line level on gold-flashed RCA sockets
Outputs:	2 6,35mm (1/4”) stereo jacks
	1 4-pin female XLR socket
	Preamp out on gold-flashed RCA sockets
	Tape out on gold-flashed RCA sockets
Supply input:	5.5/2.1mm jack with positive on tip
	4-pin male XLR socket for +15V/-15V/+5V
Output voltage:	8Vrms max (single-ended)
	16Vrms max (balanced)
Output power:	4Wrms p.c. @ 8 Ohm (single-ended)
Input impedance:	40kOhm
Gain:	12dB (single-ended)
	18dB (balanced)
SNR:	120dB (8Vrms, 1kHz, “A” weighted)
THD+N:	0,003% (2Vrms, 1kHz)
Volume range	0dB to -78dB with 1dB steps
Muting	-20dB
Balance range	+/-6dB with 1dB steps
Auto switch-off	30 to 240 minutes with 30 minutes steps, or disabled
Power supply:	$15V_{DC}$ 2A
Power consumption:	30VA
Size:	200x50x200mm (w x h x d)
Weight	2kg (unit only)
	3kg (with packaging)

For technical support please contact your retail dealer or e-mail to:
support@m2tech.biz

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