M2TECH
NASH REV.B
### MC/MM PHONO PREAMPLIFIER

USER MANUAL

REV. 1.0 – 3/2024

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 NASH.
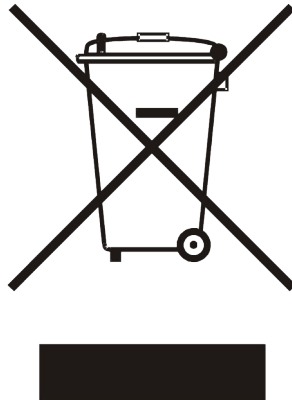
The label above, printed on the product case, indicates that the product, when no more usable, can't be treated as generic garbage, but must be disposed of at a collection point for recycling of electrical and electronic equipment, in compliance with the WEEE regulation (Waste of Electrical and Electronic 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.

Dear customer,

Thank you for purchasing NASH. You are the owner of a very high quality phono preamplifier with many unique features, designed to obtain the best performance in conjunction with every M2TECH product.

NASH implements a specific set of technological and functional solutions, from the all-discrete components design, to the passive RIAA, to a wealth of inputs, to the trigger input.

NASH is designed for low-noise operation, to deliver the same output level as any modern digital source.

We're sure that your expectations will be fulfilled by purchasing NASH: your hi-fi system will exhibit an incredible increase of its sonic performance, so you can now prepare for a whole new listening experience!

Nadia Marino, CEO

Please note here your NASH serial number and purchase info for future reference:

S/N: _____ Date of Purchase: _____

Place of Purchase_____

Note: Proof of retail purchase, such as your purchase receipt, will be required in the unlikely event that any warranty service will be required

TABLE OF CONTENTS

6

1. Unpacking and Placing the Unit

Lay the box on a table and open it with a cutter or a knife, paying attention not to damage the internal box. Extract the internal box and open it The following items are included in a cardboard tray:

- one NASH;
- one IR remote control;
- two AAA batteries;
- one 15V wall adaptor.

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

Remove the NASH from the cardboard tray 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 NASH is a high efficiency low power design, therefore very low power is lost in heat. Anyway an adequate air flow is recommended.

Avoid smoke, moisture, dirt and liquids from reaching the unit. Please note that any signs of abuse will void warranty coverage.

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

2. Front Panel
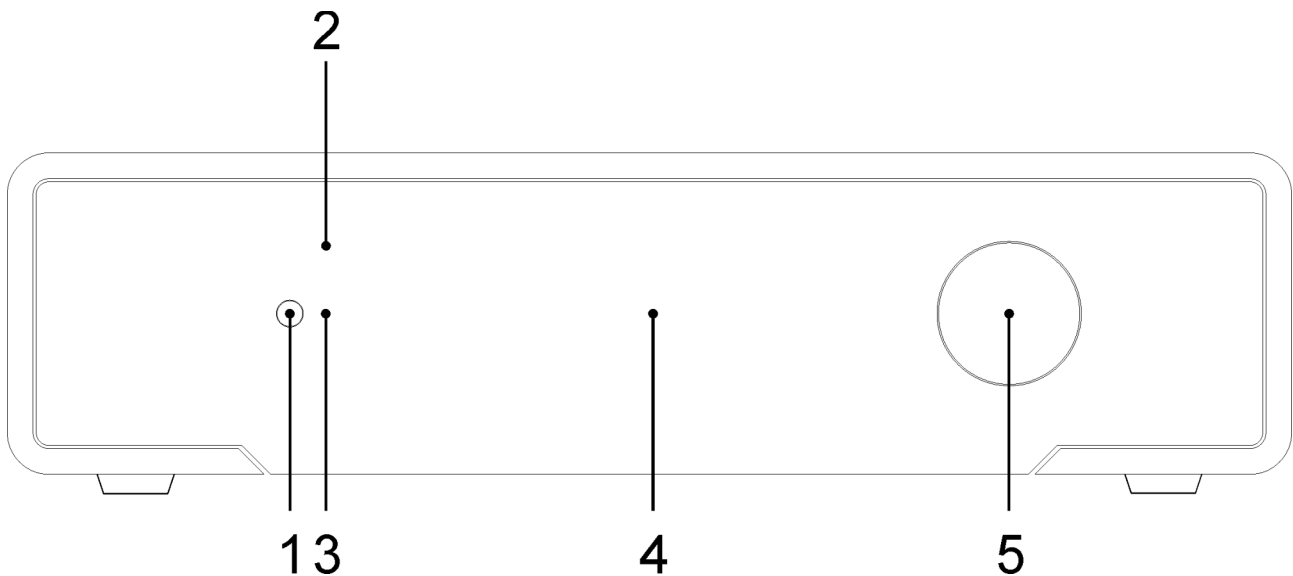
Figure 1

1) Power on/power off/menu exit button. Press this button to switch the NASH on when it's off. When the menu is active, a short press will cause the menu to exit discarding any configuration change. A more prolonged press while the NASH is on will cause it to switch off.

2) Standby LED. When the NASH is in standby mode, this LED blinks to indicate to the user that the device can be switched on by the included remote control. This LED is steadily lit during the firmware update procedure.

3) IR receiver. Aim the remote control to this point to send commands to the NASH.

4) Display. Multifunction OLED display. During normal operation, it indicates the selected source, the gain of MM stage and the status of high-pass filter. When the menu is accessed, the display shows the selected menu item and its current value.

5) Encoder. It allows for accessing and navigating the menu and selecting inputs. It can be rotated and pushed. Please refer to Chapter 7 for more details.

3. Back Panel

Figure 2

5) MC gain pot. Set the MC stage gain by this pot as indicated by the app or following your preferences. Gain can be selected 3dB to 30dB, which adds to the MM gain.

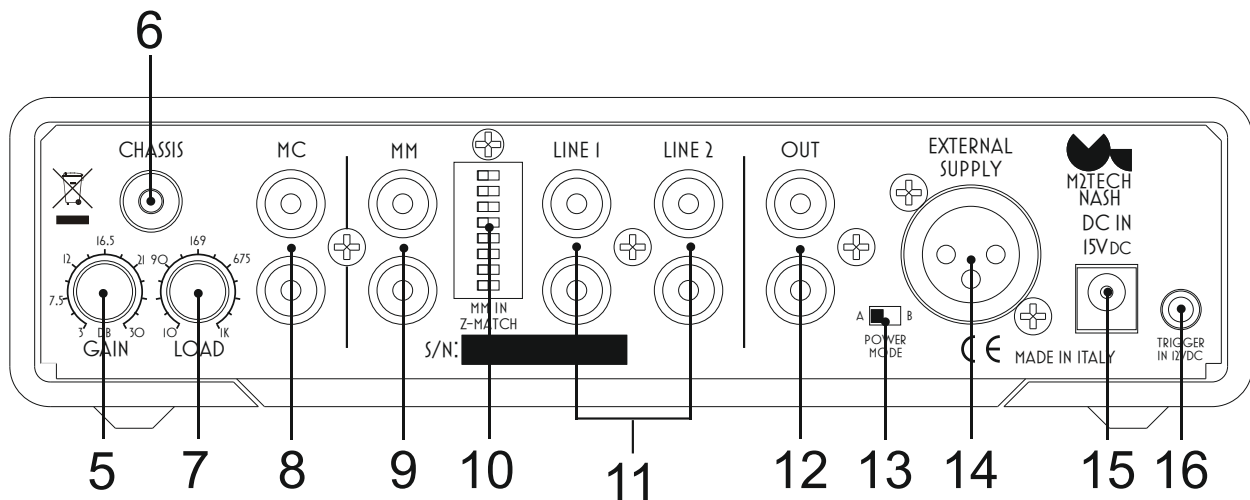**6) Chassis post.** Connect the earth wire of the turntable's cable. It can also be used to connect the NASH to a good earth to reduce stray noises pickup.

7) MC input resistance pot. Set the MC stage input impedance by this pot as indicated by the app or following your cartridge's manual indications. Resistance can be selected 10 Ohms to 1000 Ohms.

8) MC input. Connect a low output cartridge (typically less than 1mV). Female RCA.

9) MM input. Connect a medium or high output cartridge (typically 1-5mV). Female RCA.

10) MM input resistance and capacitance selection DIP-switches. When using the MM input, set these switches according to the app or following your cartridge's manual indications. See chapter 10 for details.

11) Line inputs. Connect line-level sources like tuners, tape decks, TV's. Female RCA.

12) Outputs. Connect to your preamplifier or integrated amplifier. Female RCA.

13) Power mode switch. Allows for choosing the way the NASH behaves when power is applied. See chapter 8 for details.

14) External supply input. To improve the NASH performance, power it by the VAN DER GRAAF MKII connecting one of its 4-pin outputs to this input using the cable provided with the VAN DER GRAAF MKII.

15) 15V$_{DC}$ power input. Connect the stock wall adaptor to this input. 5.5/2.1mm barrel plug with positive on internal contact.

16) Trigger input. Connect the trigger output of another device to automatically power the NASH on and OFF. $5V_{DC}$ to $15V_{DC}$ accepted. 3.5mm jack.

4. Remote Control
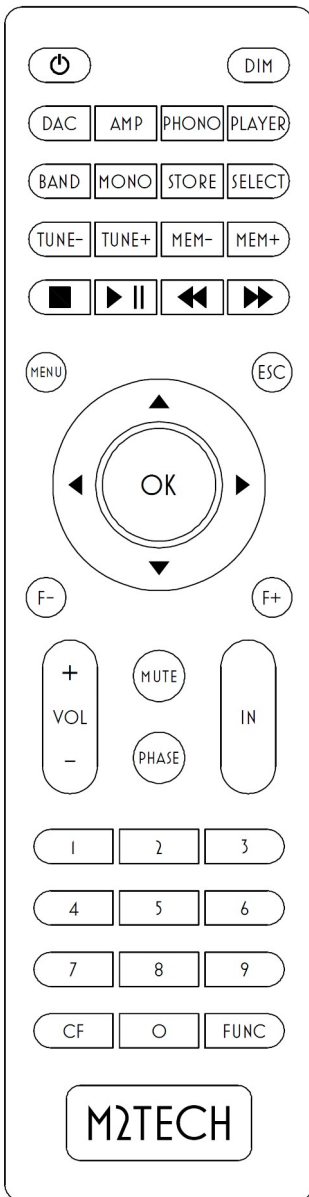
Figure 3

The NASH comes with a fully-loaded remote control which allows for setting all of its controls, as well as for controlling other M2Tech Rockstars series products.

Please note when a command is sent to the NASH the "PHONO" key blinks in green. If any of the other key "DAC", "AMP" or "PLAYER" blinks instead, the NASH will not receive the command. In this case, press the "PHONO" key to select the right commands codes for the NASH.

Below is a brief description of the relevant keys for the NASH.

Standby key: This allows for putting the NASH in standby mode (prolonged push) and for awakening it.

DIM: Display dimming.

PHONO: Instructs the remote to send commands using the phono system code.

MENU: Configuration menu access.

ESC: Menu exit with changes discarded.

Cursor keys: Allow for menu navigation.

OK: Menu exit with changes stored.

IN+/IN-: Input selection.

5. Connecting and Powering the Unit

WARNING: All connections between the NASH and other equipment must be made when all units are turned off and completely powered down or unplugged. Failing to do so may cause damage to the NASH and/or other units.

Please refer to chapter 3, "Back Panel".

Connect the turntable, as well as other sources, to the dedicated inputs (Fig. 2, 8, 9 and 11). Please note you can connect two turntables at the same time: one fitted with an MC or other low-level cartridge, another fitted with MM or other high-level cartridge. Optionally, a second low-level cartridge can be connected to the MM input by means of an external step-up transformer or MC stage. Alternatively, if a reduced output level can be accepted and a high load resistance is not problematic for the frequency response, an MC cartridge can be directly connected to the MM input.

Connect the NASH output (Fig. 2, 12) to your preamplifier or integrated amplifier input.

If the trigger feature is to be used, connect a mono cable with 3.5mm jack to the NASH trigger input (Fig. 2, 16).

WARNING: Be sure to apply a voltage in the allowed range.

Connect the stock wall adaptor to the NASH power input (Fig. 2, 15) and to a wall outlet.

NOTE: If you also own the VAN DER GRAAF MKII and you with to power the NASH with it, do not connect the stock wall adaptor and connect the NASH to the VAN DER GRAAF MKII instead, using one of the 4-pin cables provided with the latter.

Set the power mode switch (Fig. 2, 13) according to the way the NASH should behave when power is applied.

6. Cleaning the Unit

The NASH should be cleaned with a soft, slightly damp cloth. Do not use alcohol or any other types of cleaning fluids as they could damage the unit.

Avoid fluids from dropping or leaking inside the unit. Fluids of any type poured into the unit will void your warranty.

Be careful not to scratch the Plexiglas front screen.

7. Using the NASH

At activation, the NASH spends a little time to ensure that all supplies reach their nominal levels, during which the model name is displayed.

```
M2TECH
NASH
```

After the activation delay is expired, some general operational information is shown on the NASH display: the selected source, MM stage gain (not for line inputs) and the high pass filter setting (not for line inputs).

```
INPUT    HPF OFF
PHONO MM   +55dB
```

```
INPUT
ANALOG 1
```
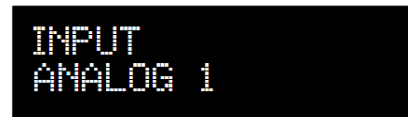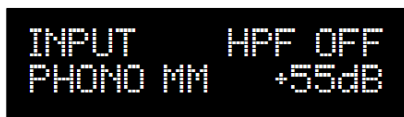
7.1. Source selection

The NASH is provided with various inputs, therefore it is possible to connect different sources and select which one to listen to.

To select a source, press the encoder shortly. The name of the current source will start flashing on the display. Rotate the encoder until the desired source is displayed. Then, press the encoder again to confirm: the new source will be selected.
Should the user change his/her mind and keep the current source, it is sufficient to push the button to the left of the front panel (item 1 Fig. 1) or avoid doing anything else: After a few seconds the NASH will automatically return in its "idle" status without changing the source setting.

Sources can also be selected using the remote control, by the IN- and IN+ keys.

7.2. Menu Navigation

The NASH allows for configuring various parameters, some of which (the ones less frequently changed) are grouped in a menu which can be navigated by both the front panel's controls and the dedicated keys on the remote control.

To access the menu, keep the encoder pressed for at least two seconds or push the "MENU" key on the remote control.

It is possible to scroll the various menu items with successive short pushes of the encoder or with the "arrow up" and "arrow down" keys on the remote control.

Once the desired menu item is displayed, it is possible to choose the desired value amongst the allowed values rotating the encoder or using the "arrow left" and "arrow right" keys on the remote control.

The new value can therefore be confirmed with a new short push of the encoder or by pushing the "OK" key on the remote control.

If, at this point, the user changes his/her mind and wants to keep the current value, it's possible to exit the menu by pressing the front panel's left button or by pushing the "ESC" key on the remote control.

Following is a description of all menu items.

7.2.1. DISPLAY BACKLIGHT: setting the display backlight

The NASH display backlight can be set to two di fferent modes: AUTO OFF and ALWAYS ON. In AUTO OFF mode, the display is always off except when a command is executed. In ALWAYS ON mode, the display is always on.

To set the backlight mode it is necessary to access the first menu item or to use the "DIM" key on the remote control.

```
SETUP
DISPLAY
```

```
DISPLAY          DISPLAY
AUTO OFF         ALWAYS ON
```

This feature is applied in real-time to give user the possibility to immediately see the results; a short message indicating the present setting appears on the display when the "DIM" key is used.

7.2.2. MC GAIN: Setting the gain of the MM stage when the MC input is used

When the MC Input is used, the gain chain of the NASH is made of three stages: the MC preamp, the MM first stage and the MM second stage. The MC preamp gain is set by the rear panel gain pot (Fig.2, 6). This gain adds to the MM stages total gain, which can be set to one of three value: 55dB, 60dB and 65dB.

Please note that the gain setting for the MM stage when the MC input is used is not applied to the MM stage when the MM input is used: a separate setting is provided in the menu. Conversely, changing the MM gain does not change this setting.

```
SETUP
MC GAIN
```

```
MC GAIN          MC GAIN          MC GAIN
+55 dB           +60 dB           +65 dB
```
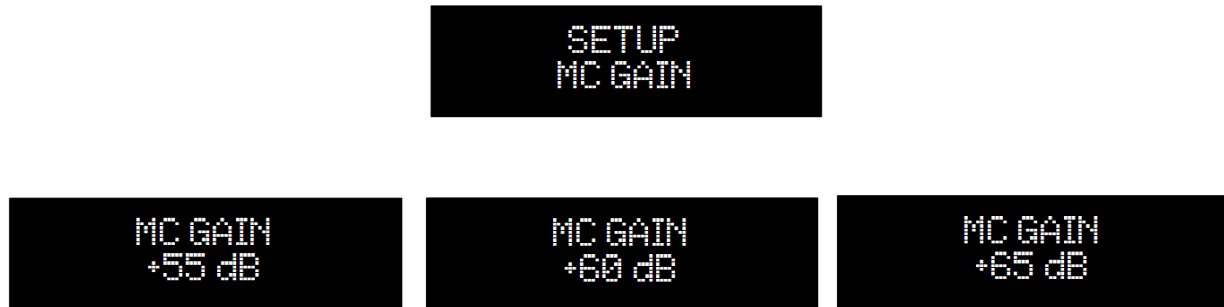
7.2.3. MC FILTER 16Hz: setting the high pass filter for the MC input

The NASH is provided with a high-pass (anti-rumble) filter. This filter cuts low frequencies below 16Hz and is very useful with warped records. Also, the 16Hz filter complies with the new IEC curve used in modern records, which adds a 16Hz high-pass to the standard RIAA curve.

The use may enable or disable the high-pass filter accessing this menu item. Like the MC gain setting, this setting only relates to the MC input and doesn't affect the same setting for the MM input.

```
SETUP
MC FILTER 16Hz
```

```
MC FILTER 16Hz          MC FILTER 16Hz
DISABLED                ENABLED
```

7.2.4. MM GAIN: Setting the gain of the MM stage when the MM input is used

This setting allows for choosing the gain of the MM stages when the MM input is used. The MM gaoin can be set to one of three value: 55dB, 60dB and 65dB.

Please note that the gain setting for the MM stage when the MM input is used is not applied to the MM stage when the MC input is used: a separate setting is provided in the menu. Conversely, changing the MC gain does not change this setting.

```
SETUP
MM GAIN
```

MM GAIN	MM GAIN	MM GAIN
+55 dB	+60 dB	+65 dB

7.2.5. MM FILTER 16Hz: setting the high pass filter for the MM input

The NASH is provided with a high-pass (anti-rumble) filter. This filter cuts low frequencies below 16Hz and is very useful with warped records. Also, the 16Hz filter complies with the new IEC curve used in modern records, which adds a 16Hz high-pass to the standard RIAA curve.

The use may enable or disable the high-pass filter accessing this menu item. Like the MM gain setting, this setting only relates to the MM input and doesn't affect the same setting for the MC input.

```
SETUP
MM FILTER 16Hz
```

```
MM FILTER 16Hz          MM FILTER 16Hz
  DISABLED                ENABLED
```

7.2.6. AUTO OFF: Setting the Automatic Switch-off

To comply with UE requirements regarding energy saving, the NASH is able to automatically switch off after a certain idle time. Idle means a time lapse in which user didn't access any control.

```
SETUP
AUTO OFF
```

```
AUTO OFF               AUTO OFF
   OFF                  50 MIN
```

User can set the auto switch-off time (between 10 and 240 minutes in 10 minutes steps) or he/she can disable this feature.

NOTE: To disable this feature, the value "OFF" must be selected, which is one of the allowed values.

7.2.7. STANDBY LED: Setting the Front Panel LED behaviour

The front panel LED of the NASH (Fig.1, 2) can be set to operate in three different modes, at user's convenience:

- ON: the LED will be continuously blowing when the NASH is in standby
- FLASHING: the LED will blink when the NASH is in standby
- OFF: the LED will be off when the NASH is in standby

SETUP
STANDBY LED

STANDBY LED
ON

STANDBY LED
FLASHING

STANDBY LED
OFF
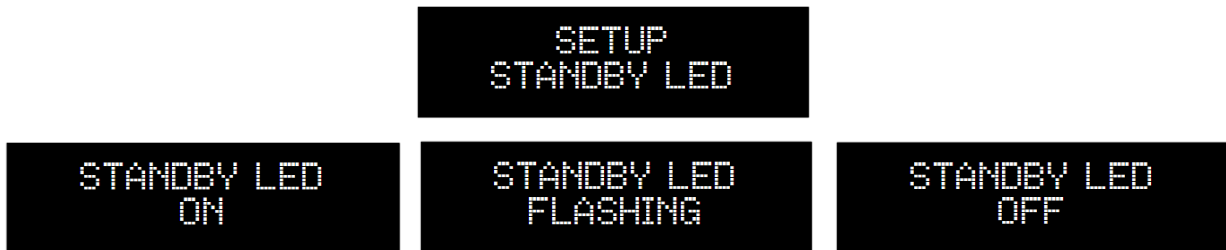
7.2.8. POWER MODE: Setting the NASH behaviour when power is applied

The NASH may behave in different ways when power is applied to its power sockets (Fig.2, 14 and 15), according to user needs. The behaviour depends on the power mode switch (Fig.2, 13) and this setting.

Specifically, when the power mode switch is set to "B" and power is applied to the NASH, the 3 available settings for POWER MODE operate as follows;

1. Disable: when power is applied the NASH enters standby. The user may activate the NASH by pushing the front panel button (Fig.1, 1), sending an "on" command by the IR remote control or sending an "on" command by the Android app;
2. Enable: when power is applied the NASH becomes immediately operative;
3. Trigger in: when power is applied the NASH enters standby. The user may activate the NASH by pushing the front panel button (Fig.1, 1), sending an "on" command by the IR remote control or sending an "on" command by the smartphone app. The NASH will also activate when the trigger input (Fig.2, 16) is driven high ($5V_{DC}$ to $15V_{DC}$).

SETUP
POWER MODE

POWER MODE
DISABLE

POWER MODE
ENABLE

POWER MODE
TRIGGER IN
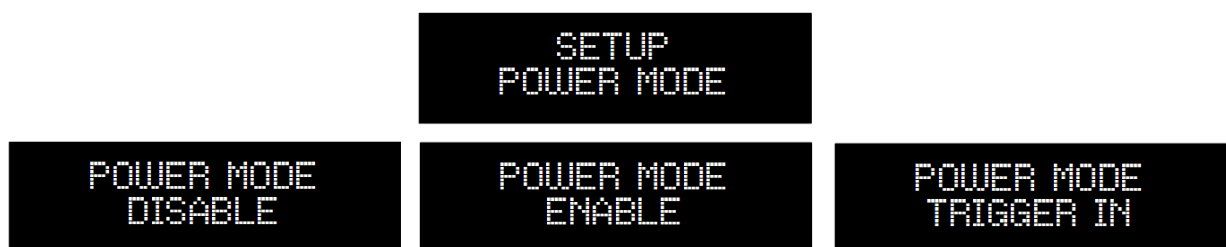
Option 1 and 3 also apply when the power mode switch is set to "A" and the NASH was previously powered by pushing the front panel button (Fig.1, 1) and then put in standby using the "ON/OFF" key on the remote control or the "ON/OFF" button in the app.

7.2.9. REMOTE ON/OFF: Setting the NASH to Accept/Ignore the IR Remote ON/OFF command

When the NASH is used together with the VAN DER GRAAF MKII, the power mode switch is set to "B" and the power mode is set to "enable", it may be desirable to inhibit the on/off command from the IR remote control, as the VAN DER GRAAF MKII will receive and execute the on/off command from the remote instead.

This way, pushing the on/off key on the remote will instruct the VAN DER GRAAF MKII to enable/disable its outputs to power the NASH and other attached M2TECH units on/off in the programmed order. Please read the VAN DER GRAAF MKII user manual for details.

```
      SETUP
   REMOTE POWER
```

```
 REMOTE POWER          REMOTE POWER
    ENABLE                DISABLE
```
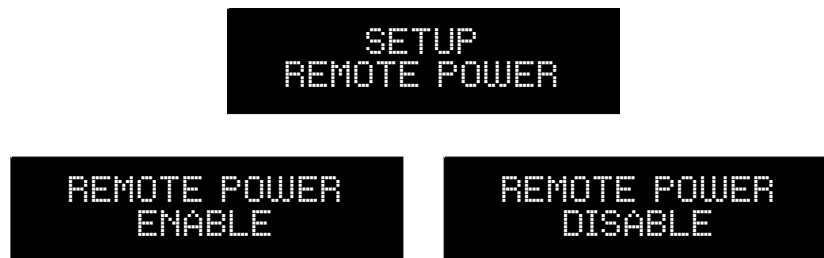
7.2.10. FIRMWARE REVISION: Accessing Firmware Revision Information

All NASH features are handled by a microcontroller. It may be useful to check the version of the firmware executed by the microcontroller, using this menu feature.

```
      SETUP
   FIRMWARE REV.
```

```
     FIRMWARE
    REV.   0.10
```

7.2.11. DEFAULT: Restoring Factory Settings

User may need or want to restore the factory settings. This can be achieved by accessing this menu item. Please note that all previous settings will be lost.

```
      SETUP
      DEFAULT
```

```
   DEFAULF              DEFAULT
 ARE YOU SURE?            NO
```

8. Trigger and power modes

The NASH accepts trigger signals, $5V_{DC}$ to $15V_{DC}$. A trigger signal can be used to automatically activate the NASH by a preamplifier, so that all the system is powered on and off by the preamplifier's remote control. To use the trigger input to switch the NASH on and off, the trigger enable switch (Fig. 2, 13) must be set to "B" and the "power mode" must be set to "Trigger in" by the menu.

As the NASH may be used in different setups and powered by either a simple wall adaptor or by the Van Der Graaf MkII or any other main power supply, it is possible to choose how it behaves when power is applied, as detailed in the table below:

Power mode switch	Power mode setting	Effect
A	any	NASH is off, push the front panel button to activate
B	disable	NASH enters standby
B	enable	NASH activates immediately
B	trigger in	NASH enters standby and trigger input is active

Of course, whenever the NASH is in standby it is possible to activate it by pushing the front panel button (Fig.1, 1) or by sending an ON/OFF command by the IR remote control or by the smartphone app.

The setting with the power switch mode in "B" and the power mode set to "enable" is very useful when using the Van Der Graaf MkII or any other external power supply with on/off switch to power the NASH.

9. Setting MC input resistance and gain

The NASH is provided with an internal MC preamplifier which allows for very low output cartridges to be adequately amplified. A correct input resistance is overly important to obtain the best performance by an MC cartridge. As this parameter is not standardized amongst MC models, it's important to have it adjustable. The NASH allows user to set the input resistance to any value between 10 Ohms and 1000 Ohms by a pot on the back panel (Fig. 2, 7).

As it happens with load resistance, every MC cartridge has its own output voltage, which is not a standard value. Therefore, the MC preamplifier gain needs to be adjustable as well. The NASH allows for setting the gain between 3dB and 30dB (that is, between 1.5x and 31x) by a rear panel pot (Fig.2, 5). The gain should be set so that the voltage out of the MC preamplifier is around 5mV. An example: if your MC cartridge delivers 0.48mV, then the MC preamplifier gain should be set to 10x, that is 20dB.

10. Setting MM input resistance and capacitance

The NASH is provided with a dedicated MM input. Correct input resistance and capacitance are overly important to obtain the best performance by an MM cartridge, as well as by a high output MC cartridge or other technology cartridges with output level 1mV to 5mV. Most MM cartridges need a load resistance of 47 kOhms, which is the standard input resistance of most MM phono preamplifiers. On the other hand, many medium and high output MC cartridges work better with a lower value, around 15 kOhms. The NASH offers both values, which can be selected by the rear panel DIP-switches (Fig.2, 10).

MM cartridges are also very sensitive to the capacitive load: many of them work better when the phono preamplifier's input impedance is slightly capacitive. As the NASH MM input has a very small capacitance, user can add more capacitance by the rear panel DIP-switches. Capacitance base values are 100pF, 220pF and 470pF. By setting more than one value, user can also set 320pF, 570pF, 690pF and 790pF.

Please refer to the tables below for DIP-switches usage:

Switch 4,8	Input resistance
OFF	47 kOhms
ON	15 kOhms

Switch 1,5	Switch 2,6	Switch 3,7	Input capacitance
OFF	OFF	OFF	0pF
OFF	OFF	ON	100pF
OFF	ON	OFF	220pF
OFF	ON	ON	320pF
ON	OFF	OFF	470pF
ON	OFF	ON	570pF
ON	ON	OFF	690pF
ON	ON	ON	790pF

Switches 1-4 are for left channel, switches 5-8 are for right channel.

11. Considerations on NASH gain and output level

The NASH can deliver up to 95dB total gain on the MC input, and up to 65dB on the MM input. These values largely exceed the usual gains for a phono preamplifier, which range between 40dB for an MM input and 60-65dB for an MC input.

The fact is that the more the gain, the more the noise. Therefore designers usually apply the minimum gain to obtain a reasonable output voltage for a phono stage, which ranges between 500mV and 1V. This is enough to allow the line preamplifier to drive the power amp into clipping even with low level recordings, but causes a step level change between the phono input and a line input to which a CD player or similar is connected, which

usually delivers 2V or even 2.5V. This force the user to always adjust volume when changing source.

To avoid this, M2Tech designers have conceived a very low noise, discrete components circuit which uses multiple low-noise FET's in its input stage, to obtain and incredibly silent amplifier with high gain. The same base circuit was used in the MC preamplifier, in the first MM amplifier (before the passive RIAA equalizer) and in the second MM amplifier, with slight changes to adapt it to the specific functions.

To ensure the best noise performance, low-noise regulator were used throughout, with the MC preamplifier powered by a proprietary discrete components ultra-low noise dual regulator.

Thanks to these low-noise amplifiers, the NASH can deliver at least 2.5V at its output with every cartridge model, with great noise performance. This means that the NASH has an output value which is aligned to that of digital sources like DAC's, CD/DVD players and streamers. Therefore, the user doesn't need to adjust volume when switching from the NASH to her/his streamer or DAC and vice versa.

12. Specifications

MM gain:..55dB, 60dB, 65dB
MC preamp gain:...............................3dB to 30dB
MC total gain:.....................................58dB to 95dB
MM input resistance:........................15 kOhms or 47 kOhms
MM input capacitance:.....................0, 100, 220, 320, 470, 570, 690, 790 (pF)
MC input resistance:.........................10 Ohms to 1000 Ohms
Output level:.......................................2,5Vrms (MM, 5mVrms in, 55dB gain)
SNR:...90dBA (MM, 5mVrms in, 55dB gain)
                          80dBA (MC, 0,48Vrms, 75dB gain)
THD+N:...0.005% (2.8Vrms out)
Frequency response:........................RIAA +/- 0.5dB (20Hz-20kHz)
Supply voltage:.................................15V$_{DC}$
Power consumption:..........................5W
Input:..5.5/2.1mm barrel jack with positive on internal
External supply voltage:....................+15V/-15V/+5V
Size:...200x50x200mm (w x h x d)
Weight..2.0kg (device and ancillaries)
                          2.4kg (packed)