



## Nagra Melody preamplifier Development review

January 2013



## 1. GENERAL OVERVIEW

### 1.1 Incremental evolution

There have been some major technological developments in the area of hi-fi innovation over the years, such as the arrival of transistors or digital. But mainly, the industry evolves little by little as improvements to electronic components are successively introduced and as circuits and their implementation are constantly optimised.

It is in the extreme attention to detail and mastery of manufacturing techniques that current engineering often finds its biggest potential for improvement. In order for a new generation of machines to do better than its predecessor, existing boundaries have to be rolled back on every front and often in tiny proportions.

This incremental improvement is something that Nagra has always espoused from its very beginnings. It makes an essential contribution to the longevity of the brand's equipment, as it means that new products are launched with parsimony: a new model only replaces an existing one when it can bring an appreciable benefit to the user.

This is the path that has been followed by the new Nagra Melody preamplifier, which continues in the footsteps of the Nagra Jazz. The Nagra Melody has been developed in parallel to the Nagra Melody and they share a lot of common parts. The idea behind the Nagra Melody is to complement Nagra's range with a more affordable preamplifier to match with its entry level amplifiers such as the MSA without compromising on quality. This approach was possible using solid state technology and benefitting from the Nagra Jazz development synergy. Its name "Melody" breaks with the Nagra tradition of calling its machines after acronyms (for example, the PL-P for *Préamplificateur à Lampes – Phono*, or in English, Valve Preamplifier – Phono). Melody will appeal to everyone and mean something different for all of us, but will also remind us that we are designing top products for the sole interest of the music, hence the word Melody.

## 2. DEVELOPMENT OBJECTIVES

### 2.1 Offering excellent performance choosing simple solutions

The main objective in designing the Nagra Melody was to offer the most of its prestigious predecessors, PL-L, PL-P and Jazz for a real different price point. The first decision was to use transistors instead of valves. Nagra engineers went back to their roots and very much like with the PL-P, went back to the schematics of the Nagra IV-S and Nagra 4.2 mythical recorders. The circuit topology itself is very similar to the one of the Nagra Jazz, the main idea is keep it straight and simple to offer the most transparent result.

The other way to reduce the cost of the Nagra Melody was to include a power supply inside the casing instead of using an external power supply such as the Nagra ACPS II that equips the Nagra Jazz. This solution was technically pushed as far as Nagra always go by encapsulating the power supply in an annealed Mu-metal shield to prevent interferences inside the unit.

Nagra engineers have also included a Lemo 12 V DC input for connecting the Nagra Melody to an external Nagra power supply. This means pushing the performance further, but this step can be made as an upgrade later one, the unit performs extremely well with the built-in power supply.



## **2.2 Simplification and rationalisation wherever technology allows**

The progress achieved in electronics increases not only performance potential but also contributes to a general reduction in complexity and the size of the circuitry. The engineer makes the most of this to create solutions which are increasingly stripped down and simplified, in order to benefit from all the advantages that this implies, such as the reduction of the noise threshold, the heat generated, the power consumption and the risk of breakdowns.

The circuits have been designed with the shortest possible paths which bolsters their immunity to disturbances and radiation.

The increased compactness of the circuits has also allowed new features to be incorporated, such as the motorisation of the volume and balance potentiometers which can now be controlled remotely.

All the connectors are now mounted on the back plate rather than on the sides of the machine which was the tradition on the earlier models. The older location of the connectors, which was taken from the Nagra tape recorders, was particularly suitable for a professional usage where it is often necessary to access the connections. The new location is more in keeping with criteria which suit home use.

## **2.3 Suitability for multiple sources**

All sorts of sources, both digital and analogical, which are likely to be hooked up to a preamplifier these days, deliver a signal which may vary notably. Too weak a signal and the preamplifier will not allow to exploit all the power of the amplifier. Should the signal be too strong, the amplifier will be pushed into saturation before the volume even attains its maximum level.

Like the Nagra Jazz, the Nagra Melody brings a solution to this problem by offering two distinct gain levels which can be switched via a selector. In the "0 dB" position, the machine adds no gain at all and acts like almost a passive preamplifier. In the "12 dB" position, maximum gain is provided, which is suitable for low level source inputs.

## **2.4 Phono preamplifier option**

From an early development stage, it was decided to include a phono preamplifier inside the Nagra Melody. This option is directly inspired by the renowned Nagra BPS and uses the same topology as well as Nagra custom handmade transformers. The circuit can be factory supplied or fitted subsequently, which means that the machine can be upgraded at any time.

This phono option offers the exact same features as the BPS, it can accommodate MM or MC cartridges and also offer a lot of fine tuning like custom loading for instance.

## **2.5 Taking its place in the range**

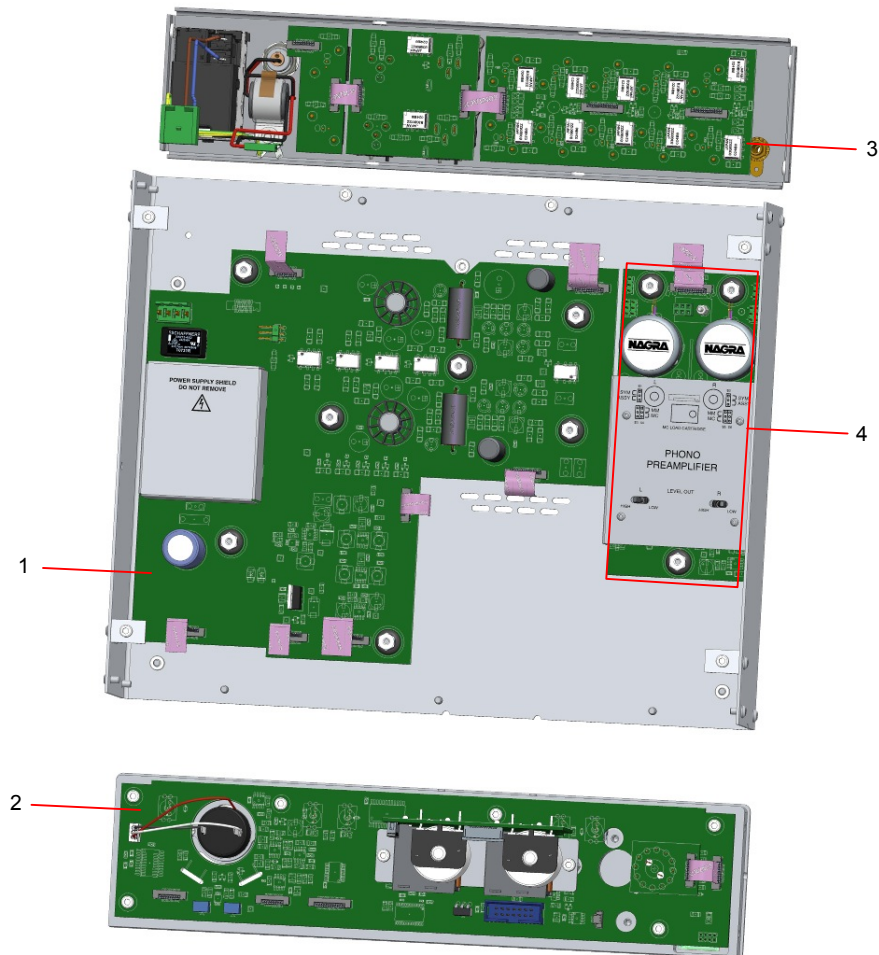
Nagra Melody preamplifiers respect the aesthetics of the brand in terms of format, ergonomics and finish. They are designed by the same engineers and made by the same team as the professional recorders, according to the same peerless standards.



### 3. DESCRIPTION OF THE ELECTRONICS

The Nagra Melody preamplifier is built around three groups of printed circuits, as well as a fourth one for the optional phono option.

These four-layered, gold-plated, epoxy glass circuits are of military grade. They form the basis for the machine's components which have been chosen according to the most rigorous criteria in terms of tolerances, durability and listening performance. It includes a ground layer which screens out disturbances and radiation and stops static loops which might give rise to hum. They are linked together with ribbon cables which ensure that the paths between them are as short as possible. The motherboard is mounted on elastomer silent blocks which filter out vibrations.



- 1. Motherboard
- 2. User-controlled circuits on the front panel
- 3. Input/output connector circuits
- 4. Optional phono preamplifier



### **3.1 Input/output selector circuits**

The circuits mounted on the back panel, to which the connectors are directly soldered so as to avoid any wiring, carry the input and output selector switches. They are made up of three boards featuring the different connector types.

The Nagra Melody has five Cinch inputs, simply named A to E. All the inputs use the floating system which allows the signal to be managed pseudo-symmetrically until it reaches the amplification circuit. Each is filtered to eliminate radio-magnetic interference (RMI) by a combination of selfs/condensors. The input switching is handled by tandems of high-quality relays. Only the earth of the active input is connected, all the others being removed from the circuit so that no static loops are created with and between the inactive sources. A sixth XLR input connection is destined for a bypass mode which allows the connected source to be diverted directly to the XLR output when the machine is not working and even if it is disconnected.

The machine has two outputs which are relay-switchable. Both are unbalanced, one of these is on XLR and the other is on Cinch connectors.

### **3.2 Switch circuits**

The main switch circuit is mounted behind the front panel which also carries two sub-circuits which control the motorised volume, balance and input selection.

The main circuit includes a microprocessor which controls all the management functions. It is responsible for input selection, the remote-controlled functions, the muting of the amplification stages and the display of the output signal level via a modulometer.

The motorised Blue Velvet volume and balance potentiometers are manufactured by Alps. These components are renowned for their precision in pairing tracks and their reliability over time.

### **3.3 Motherboard**

The large board located on the bottom of the machine houses the power supply and the amplification electronics.

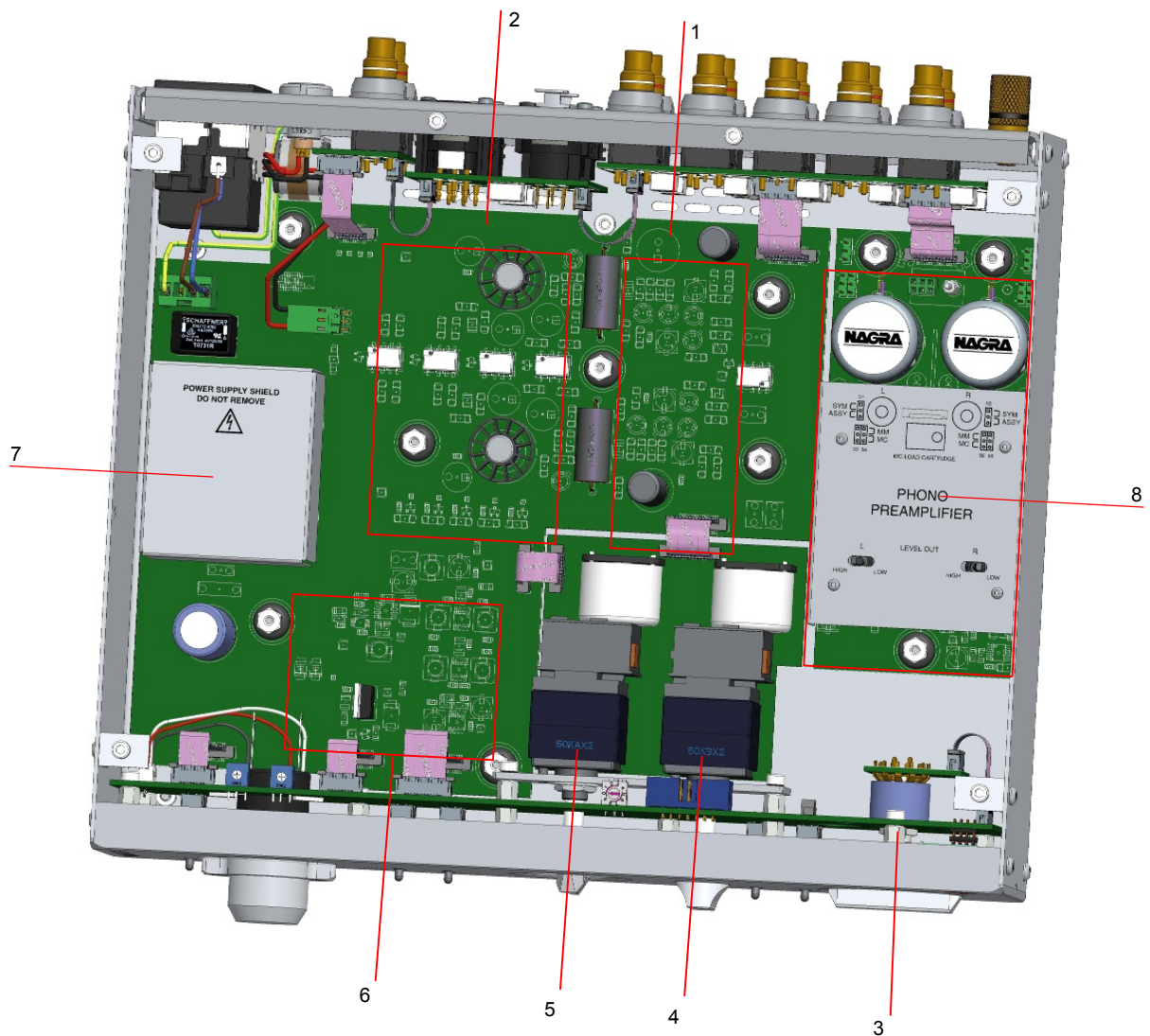
The first stage of the circuit is built around a differential pair, a second stage accommodates the 0 / 12 dB gain selection, and the last stage offers an extremely low output impedance to allow a wide array of amplifiers to be connected.

The components installed in the signal path have been carefully selected based on their sonic qualities. High-end polypropylene capacitors are mostly used. As far as the transistors are concerned, they are subject to the most rigorous testing. They are of military grade and used in the professional recorders such as Nagra 4.2 and Nagra IV-S. Later on they were used in the Nagra BPS, Nagra first transistor phono stage. They go through a selection process by Nagra Laboratory in which each one is measured, selected and then paired. On the most sensitive part of the circuit, less than 30% of the transistors will be selected.

A switching system directs the signal to the type of output that has been selected: XLR or Cinch.



Inside view of the Nagra Melody preamplifier



- 1. First stage
- 2. Second stage with settable gain
- 3. Input selector
- 4. Motorised balance potentiometer
- 5. Motorised volume potentiometer
- 6. Voltage regulators
- 7. Power supply under mu-metal shield
- 8. Optional high performance phono circuit



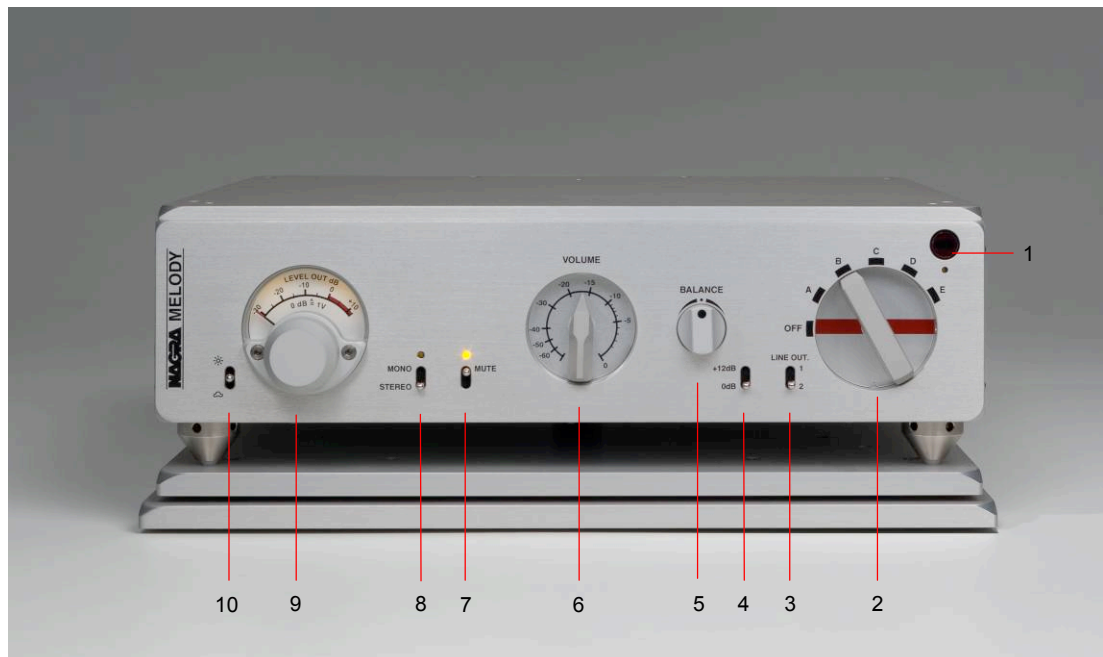
## 4. DESCRIPTION OF THE MECHANICS

### 4.1 Case

Entirely constructed in finely brushed, anodised aluminium, the Nagra Melody preamplifier's case is faithful to the look and ergonomic criteria which characterise the brand. The case base adopts the same dimensions as the other Nagra products, such as the Nagra CD players. The width and depth are exactly the same (W x D: 275 x 230 mm excluding connectors).

The 14 mm thick front plate is machined out of solid billet, as well as the top. The back and the chassis are constructed out of folded sheet aluminium.

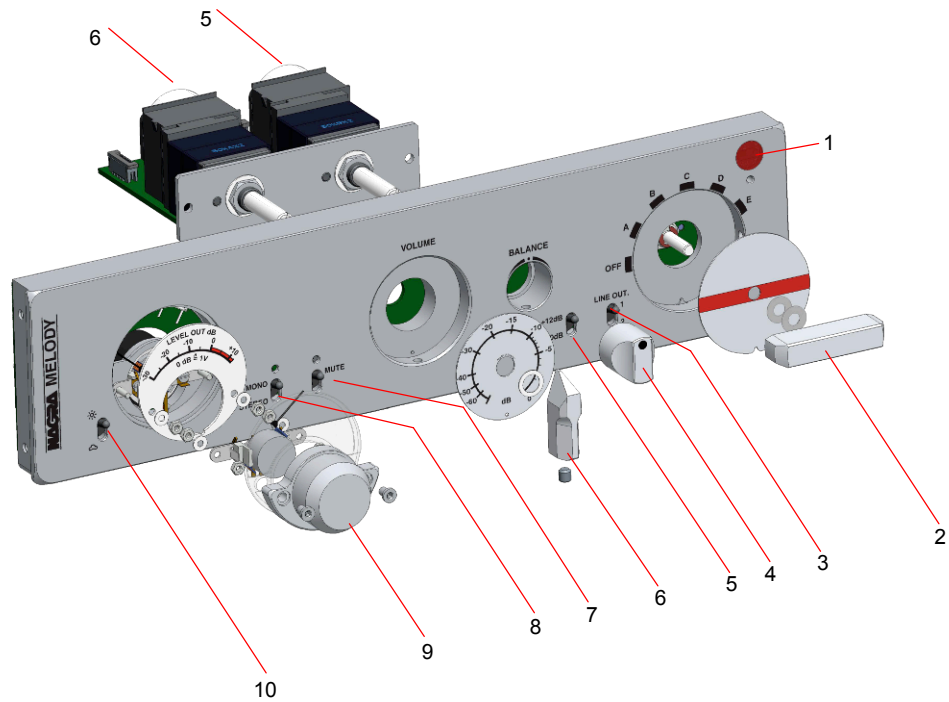
### 4.2 Front panel



1. Window for receiving the infrared signal from the remote control with a yellow LED indicator light below
2. On/off and input selector
3. Output selector for XLR or Cinch connectors
4. Selector for "0 dB" or "+12 dB" gain levels
5. Motorised balance potentiometer
6. Motorised volume potentiometer
7. Mute selector with yellow LED light (which when flashing indicates the soft start phase)
8. Mono/stereo selector
9. Modulometer indicating the output signal level
10. Dimming switch to adjust modulometer lighting level



### Exploded view of the front panel



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### 4.3 Back panel

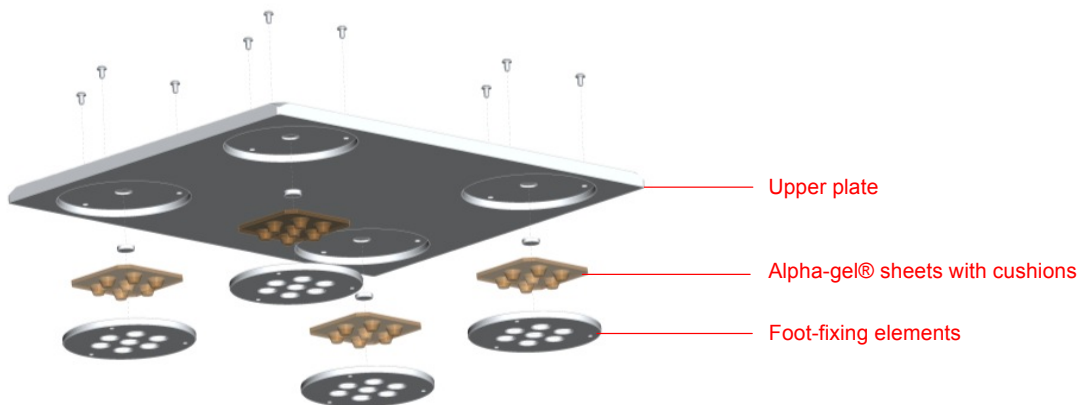


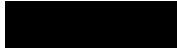
1. Gold-plated ground connector
2. Input block
3. "Bypass" input with bridge to the XLR output
4. XLR output
5. Cinch output
6. Connector for external Nagra power supply (option)
7. Mains connector and switch
8. Optional VFS platform and spikes

### 4.4 Shock-absorbing VFS support (optional)

The Nagra Melody preamplifier can be delivered with an optional shock-absorbing Nagra VFS double-plate support. This solid aluminium support equipped with special Alpha-gel® feet is designed to isolate the machines from vibratory disturbances efficiently. Though it is especially appropriate for valve-based equipment which is more sensitive to this sort of vibration, it fits very well the Nagra Melody.

The shock absorber is finished off with three little conical feet which are screwed into the case of the preamplifier itself. These feet are made out of Arcap with points in Delrin® resin which locate precisely in little holes that are machined into the upper plate.





## 5. TECHNICAL SPECIFICATIONS

Input impedance	> 75k Ohms
Output impedance	47 Ohms (Cinch) 100 Ohms (XLR)
Frequency response	10 Hz to 50 kHz, +0/-1 dB
Signal to noise ratio	100 dB (ASA-A weighting, ref. 1 V)
Dynamic range	>110 dB, gain at +12 dB
Minimum input level to achieve 0 dB	0.25 V rms, gain at +12 dB
Maximum input level to achieve 0 dB	>0.25 V rms, gain at 0 dB
Total harmonic distortion (THD)	>0.02% (1 kHz, 1 V rms without load)
Crosstalk	>75 dB
Power supply	100, 115 or 230 V, 50 and 60 Hz
Dimensions (excluding connectors)	310 x 254 x 76 mm (12.2 x 10.0 x 3.0 inches)
Weight	3 kg (7.1 lbs)
<b>Phono option</b>	
Input sensitivity (for 1 V output level)	MC 670 uV or 4.4 mV MM 2.2 mV or 16 mV
Frequency response	20 Hz (+1dB) - 50 kHz (0dB)
Signal to noise ratio	> 75 dB (ASA-A weighted, ref. 1 V)
Crosstalk	> 70 dB (1 kHz)
Total harmonic distortion (THD)	< 0.02 % (1 kHz, 1 V rms without load)

Specifications may change without notice