Little Dot MK II

Little Dot MK II Headphone Amplifier/Pre-Amplifier

Reference Guide

Version 1.18

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The latest version of this Reference Guide can always be found here

⚠ Safety Notice ⚠

1. Risk of electric shock - do not open chassis during operation.
2. Do not use inside poorly ventilated areas with restricted airflow (such as within cabinet).
3. Do not use near heat sources, or any other apparatus that produces heat.
4. Clean only with a dry cloth, and do not use near water or moisture.
5. Unplug during lightening storms or when unused for long periods.
6. For best protection from power spikes/brown outs, use with a battery backup and/or surge protector.
7. Amplifier may be hot during operation. Do not touch vacuum tubes or chassis during operation or immediately after operation.
8. Keep away from small children and/or pets.
9. In case of damage or malfunction, suspend usage immediately, unplug the power source, and refer all servicing to qualified personnel. Please contact Little Dot for assistance.

Basic Troubleshooting

- **Ground Loops**: In systems where the components have multiple paths to ground, you may notice a 60 Hz hum on the Little Dot output. Please only use a cheater plug power-cord as the last resort, as this can be a safety hazard. To resolve ground loop issues, the better method would be to use a ground loop isolator. The ideal method would be to solve the ground loop at its source by connecting all components to common ground and/or have your electrical wiring checked by a professional electrician.

- **Swapping Tubes and other changes:** To minimize chances of damaging your Little Dot, make sure to power off, disconnect the power cable, and wait at least 5-10 minutes before attempting swapping tubes, changing gain settings, or capping/uncapping the jumper switches. This allows the capacitors to fully discharge.

- **Plugging/Unplugging Headphones:** It is recommended to only plug/unplug your headphones while your Little Dot is powered off.

- **Channel Imbalance:** Try swapping the left and right side tubes to see if the channel imbalance moves. If so, continue swapping the tubes as needed to isolate the particular tube that's causing the issue. Also verify the gain settings are set the same way for both channels.

- **Static/Noise in one or both channels:** Try cleaning the tube pins to free them of oxidation. Also check for sources of interference nearby such as wireless routers, telephone base stations, and other RF emitting devices. Check the fuse and re-seat it so that it makes good electrical contact. Move all switches back and forth several times to "loosen" them, and then set them securely into position. Both the switches and fuse can shift during transit. Lastly, try a different power cord than the one included.

- **Loudness is constant, and volume control does not work for one or both channels:** You likely have your source hooked up to Little Dot pre-amp outputs instead of the inputs. Verify your RCA cables are connected to the INPUT and try again.

- **Little Dot does not power on:** If you are using the stock power cord, try another. Check the condition of the fuse located beside the power cord plug and replace if necessary.

- **General:** For general strange behavior (noise, non-functioning channels, etc) please check and re-seat the fuse. **The fact that the amplifier powers on does not necessarily mean the fuse is making optimal contact**. When new, the gain switches can be tight. Move each switch back and forth several times and then securely set them into position. Swapping the power cord is also a recommended troubleshooting step

Vacuum Tube Troubleshooting

- **Noisy Tubes:** Since the tubes used in Little Dot amplifiers can be very old, there is a distinct possibility the pins have oxidized and therefore can cause hissing, crackling, buzzing, and various other noises during operation. This is common with vacuum tubes and is nothing to worry about, as there is an easy remedy. There exists de-oxidizing electronics cleaner (for example Caig deoxIT) which will remove all hissing and noises in 95% of such cases. It is also good tube practice to regularly clean tube pins with such de-oxidizing cleaners.

- **Interference:** Interference can be picked up by the tubes and cause odd noises. To minimize interference, keep your Little Dot isolated from wireless routers, cell phones, telephone base stations, and other common sources of RF or EMI noise. Generally speaking, the M8161 and other mil-spec tubes will reject much more interference than the 5654/M8100s.

- **Isolating Tube Noise:** To isolate tube noise, first note which channel the noise appears in, and then power off the amplifier and wait 5-10 minutes before swapping the front driver tubes. Listen again to check if the noise has traveled to the other channel. If so, you have isolated the problematic tube. If not, repeat for the rear power tubes. Problematic tubes may need cleaning/de-oxidizing or replacement.

- **Signs of Failing Vacuum Tubes:**

    - Whooshing noise (likely a faulty driver tube)
    - Glow changes to purple (not blue) color
    - Tube once had a mirrored or silver tip, but now is white or clear (lost vacuum)
    - Scratching/high frequency distortion
    - Gain has decreased significantly

First Time Use

Before powering on your Little Dot for the first time, please make sure the tubes are all securely inserted into their sockets as they can become loose during transit. It is also recommend to first clean the tube pins with electronics or de-oxidizing cleaner to remove any grime or oxidation that may have occurred. While the tubes are cleaned in the factory with isopropyl alcohol, a de-oxidizing agent is not used since we do not have access to such compounds in China at the current time.

"Burn-In"

While it's OK and even recommended to burn-in your Little Dot amplifier, it is not recommended to leave your Little Dot running 24 hours a day. We suggest for every 6-8 hours of burn-in, you allow your Little Dot to cool-down for 30 minutes to an hour. Please also refrain from burning-in your Little Dot in an area with little to no airflow, and can easily build up heat and/or when the ambient temperature reaches 27 degrees C (80F). Any music, sine sweeps, or pink noise is acceptable, and the volume should be just slightly higher than listening volume. Headphones should be plugged in during burn-in.

Little Dot MK II Introduction

Thank you for purchasing the Little Dot MK II vacuum tube headphone amplifier! Hope this manual can help you easily enjoy your Little Dot MK II's sonic capabilities.
Before you use Little Dot MK II, please read this manual carefully. If you have some other problem, please contact us or visit our website www.littledot.net, and we will answer all your questions as soon as possible.

The Little Dot MK II boasts a newly designed SEPP circuit (in similar vein to the rest of the MK-series tube amplifiers) greatly increases sound quality, dynamic range, output impedance, and harmonic distortion over the celebrated Little Dot II++. The Little Dot MK II now also provides gain control of 3, 5, and 10 via internal DIP switches for fine-tuning so you can maximize synergy with almost any headphone you have, whether it be 32 ohms or 600!

The Little Dot MK II also gains the driver tube-rolling options from the rest of the MK-series with the ability to roll 6JI, WE403A, GE5654, M8100, CV4010, EF95, etc at its factory jumper setting, and with jumper pins shorted, EF92, EF91, CV138, CV131, and all equivalents and drop-in replacements!

Little Dot MK II Technical Specifications

- **Input:** Gold-Plated Unbalanced Phono (RCA) Jacks
- **Output:** 1/4" Gold-Plated Stereo Headphone out, Gold-Planted RCA pre-amplifier out
- **Driver Tubes:** 6JI
- **Power Tubes:** 6N6
- A newly designed SEPP (single-ended push-pull) circuit, which improves the output dynamic range and sound quality far better than the old LD II++, which used a cathode, output circuit.
- High quality ALPS-16 Potentiometer provides far better tracking between channels, which translates into more precise sound imaging.
- Upgraded circuit components include high quality NICHICON and German WIMA/ERO capacitors.
- Improved Pre-amp functionality
- **Includes transient voltage suppression diode to shunt off voltage spikes.**
- **Frequency Response:**
- 20HZ - 50KHz (-1 dB)
- **THD+N:** 0.1% (50mW into 300 ohms)
- **Suitable Headphone Impedance:** 32 - 600 ohms
- **Input Impedance:** 50K ohms
- **Pre-Amplifier output impedance**: 600 ohms
- **Pre-Amplifier Gain:** 3-10x (also controlled via gain switches)
- **Pre-Amplifier Voltage:** 10V RMS
- Pre-Amplification circuit includes both driver and power tubes
- **Power Output:**
- 300mW @ 300/600 ohms
- 200mW @ 120 ohms
- 100mW @ 32 ohms
- **Power Consumption:** 28W (228V * 0.124A)
- **Measurements:**
- Metric: 210mm (L) by 110mm (W) by 130mm (H)
- English: 8.26 inches (L) by 4.33 inches (W) by 5.18 inches (H)
- **Weight:** 2.5 kg or 5.5 lbs.

Little Dot MK II Gain Control

The Little Dot MK II has two internal, red DIP gain switch boxes, which controls the gain of the amplifier. You can access the gain switches by removing the lower half of the chassis. Please power off the amplifier, and unplug it for at least 10 minutes before attempting to change the gain settings (to ensure capacitors have fully discharged).

Each red box (that has two switches on it) controls the gain for its particular channel. Under most normal circumstances, you would want the same gain in both channels so please remember to configure the switches on each red box identically with respect to the other:

Switch 1 Position	**Switch 2 Position**	**Gain**	**Recommendation**
OFF	OFF	10	Low impedance and/or low sensitivity headphones
ON	OFF	5	Medium impedance/sensitivity
OFF	ON	4	Medium impedance/sensitivity
ON	ON	3	High impedance and/or high sensitivity

Note: The gain settings also affect the pre-amplifier output.

These gain settings are recommendations only and there is no “correct” gain for any particular headphone. You are encouraged to test each setting out with your headphone(s) to determine which setting sounds best for you.

Little Dot MK II Pre-Amplifier Use

The Little Dot MK II is not recommended for use with a direct or DC coupled power amplifier.

The pre-amplification signal in the Little Dot MK II includes both the driver and power tubes for better compatibility with power amplifiers with low input impedance (for example, transistor-based power amps).

Always power on your Little Dot MK II pre-amplifier before you power on your connected power amplifier as this is good practice for any pre-power combination. (i.e. power on components from upstream to downstream). It is also **highly recommended** to wait at least a minute after powering on your Little Dot before turning on your power amplifier so that the Little Dot has time to stabilize.

When powering your system off, **always** switch everything off from downstream to upstream, i.e. first turn off your power amplifier, then your pre-amp, and finally your source.

For best sound quality and lowest noise, first maximize your source's output level without introducing gain (i.e. to 0 dB), and then set your Little Dot MK II's volume to a relatively high level. Amplification done at the pre-amp stage will result in less noise than amplification done at the power amplifier stage (if the amplifier you are using as a power amp has volume control at all).

One last thing to remember is keep all your components connected to the same ground, as introducing another amplifier in a pre-power setup increases the likelihood of introducing a ground loop.

Little Dot MK II Switches for Driver Tube-Rolling

The Little Dot MK II has two switches or two sets of jumper pins (depending on your circuit version) that allow two different types of driver tubes. You can access the switches/jumper pins through the amplifier's bottom panel, and they are located to the sides of the pair of capacitors closest to the front of the amplifier. Please power off the amplifier, and unplug it for at least 10 minutes before attempting to change the switch/jumper settings.

For Switches:
If the switches are not toward the E92 label the following driver tubes may be used:

- **WE403A**
- **5654**, CK5654, GL5654, 5591, **CV4010**, CV5216, CV8246, 6069, CV10442
- **EF95F**, **M8100**, 6AK5W, CV10100, CV8159, CV8225, CV850
- **6J1**

If the switches are on the side of the E92 label, the following driver tubes may be used:

- **EF92**, **6CQ6**, CV2023, V884, VP6, **M8161**
- **EF91**, 6AM6, CV10327, **CV138**, CV1955, CV2195, Z77
- **CV131**, 9D6, W77

For Jumper Pins:
2-pin sets: If the jumper caps are removed, you can use the 5654/6JI driver tubes (default). If the jumper caps are placed over the pins, you can use EF92 type driver tubes.

3-pin sets: Place the jumper cap over the middle pin and the pin to the side of the "E95" text to use the default 6JI/5654 tubes. Place the jumper cap over the middle pin and the pin to the side of the E92 text to use EF92 type tubes.

Any other equivalents or drop-in replacements for the above-mentioned tubes (both sets) may also be used.

Important Note: While all of the above tubes should technically be equivalent or similar, only the tubes in **bold** have officially been tested to be compatible.

Added Note: Some users have reported distortion with the EF91 tube while others have not. We have been unable to reproduce distortion with Mullard branded EF91s; however this is something to keep in mind when considering tube-rolling EF91 tubes.

IMPORTANT: Please be careful when setting switches and jumper caps as these are circuit elements and will be fairly delicate. Using too much force may result in damage!

Little Dot MK II Power Tube Rolling

The Little Dot MK II uses 6n6 power tubes by default, and these can be replaced with 6H6PI, 6H6n, 6H6n-N, 6N6P, and 6N6P-I power tubes. If your circuit version is 2.0 or above, you can also use the 6H30 type power tubes (6H30EB, 6H30PI, 6H30P-DR, etc).

Little Dot MK II Warranty Information

30 day money back guarantee.
If you are not completely satisfied with your Little Dot amplifier, you can return it to us for a full refund of your purchase price. Please note the following stipulations for returns:

- Little Dot amplifier and all included accessories must be in like-new condition and included.
- Shipping insurance is not required; however, you are responsible for all costs in the case of damage during transit.
- Shipping costs are non-refundable.

Warranty
If your Little Dot amplifier does not work properly due to a defect in materials or workmanship, Little Dot (hereby known as the "warrantor") will, for the duration of your specific product's warranty period (1 Year), at its option either (a) repair your product with new or refurbished parts, or (b) replace it with a new or refurbished product. The decision to repair or replace is up to the warrantor.

This warranty does not cover any product subjected to misuse or accidental damage, and products that clearly been misused or abused will be subject to cost-based charges for repair.
This warranty only applies to Little Dot amplifiers sold through official channels. Warranties are transferable to second-hand users, however only labor and parts are covered. Proof of purchase will be required for all warranty claims.

Vacuum tubes are guaranteed not to DOA or fail within a three-month time-period after purchase. No additional warranty applies to vacuum tubes either sold by or included as stock through Little Dot.
Your Little Dot's warranty period is locked in at the time of purchase. If at a future date the warranty period for your product model changes, your warranty period will not change. In case of any changes to warranty period or warranty details, you will be grandfathered in at the warranty period and details specified when you made your purchase.

Except as provided above or in areas prohibiting thus, Little Dot makes no other warranties either expressed or implied.