



Puffin Quick Start

- Connect the music source, like a turntable or CD player, to the Puffin's input.
- Then connect the Puffin's output to your main stereo device, like an integrated amp or active speakers.
- The Puffin has three controls: the Standby button, the Knob, and the Select (arrow) button. The Standby turns the Puffin on and off. The Knob quickly rotates through settings. The Select button chooses the function or setting.
- With your main system volume adjusted low, turn on the Puffin (allow 4 to 5 seconds after initially plugging in the DC adapter). If using a turntable, you can start playing music as the default gain setting is for typical vinyl usage.
- If you are using a CD player or other line output music device, scroll to the 'Set?' control on the Puffin and adjust to the 'CD' preset for the correct amplification. Otherwise you will have a very loud output, as the Puffin amplifies an otherwise already large audio signal.
- Always have your system's master volume control adjusted low when changing the 'Gain' setting or loading presets on the Puffin to prevent loud surprises. The Standby button is also a great emergency mute button in an unexpected "loud music" event.
- Other than some care with gain changes, just have fun with the Puffin. You can't break anything and can always revert to a default preset with the 'Set?' function. So feel free to experiment.

1. Volume

Typically the Volume will be left at 100% and a system master volume control will be used elsewhere. But it can be used as a cue mute when changing records and cleaning the stylus. Select and rotate the knob CW (clockwise) one click for Mute. Rotating CCW (counterclockwise) will attenuate the signal and lets the Puffin be used with systems lacking a volume control. Another method is keeping the Volume set to 50%, which then permits fast adjustment of volume depending on mood or source material.

CCW: Muted,1%,2%,4%,7%,10%,14%,20%,25%,32%,40%,50%,60%,70%,85%,100%,Muted :CW

2. Tilt

Tilt may be the most useful of the four tone controls. Like a seesaw, it pivots the frequency response at 900Hz, the fulcrum frequency. This quickly adjusts toward either a warmer or brighter sound character. Go higher for more detail or lower for more warmth. When switching cartridges on your turntable or even changing records, the Tilt may be the easiest way to get the 'right' sound to your ear.

CCW [warmer]: -6,-5,-4,-3,-2,-1,+0,+1,+2,+3,+4,+5,+6 :[brighter] CW

3. Bass

This is a bass shelving control with a corner frequency of 300Hz. It adjusts in 1dB steps.

CCW [less bass]: -6,-5,-4,-3,-2,-1,+0,+1,+2,+3,+4,+5,+6 :[more bass] CW

4. Treble

This is a treble shelving control with a corner frequency of 3kHz. It adjusts in 1dB steps.

CCW [less treble]: -6,-5,-4,-3,-2,-1,+0,+1,+2,+3,+4,+5,+6 :[more treble] CW

5. Air

Air is a higher frequency treble control (above 8kHz) that is intended as a cartridge loading adjustment. This will help extend frequency response of high inductance moving magnet cartridges, but can also tame other overly bright cartridges or other sources. It is a substitute for capacitive loading techniques.

CCW [less air]: -6,-5,-4,-3,-2,-1,+0,+1,+2,+3,+4,+5,+6 :[more air] CW

6. Hi (High Frequency Filter)

This is a 4th order Butterworth filter to attenuate higher frequencies. It is extremely flexible at reducing surface noise on old LPs and 78s. It is also useful at adjusting the frequency response combined with the previous tone controls, Treble and Air. Adjust by taste and give your ears a break from unnecessary fatigue. You can even recreate the moving magnet resonance happening between 9kHz to 11kHz which can add life to the sound. To experiment, try Air +3 and Hi 11kHz with any type of input—even moving coils or CDs.

CCW: 5kHz,7kHz,8kHz,9kHz,10kHz,11kHz,12kHz,13kHz,14kHz,15kHz,20kHz,30kHz,48kHz :CW

7. Lo (Low Frequency Filter)

This is a 4th order Butterworth filter to attenuate lower frequencies. While mainly it is used to eliminate vinyl rumble and tonearm resonances, it can be adjusted higher for use with old LPs and 78s. It can also be adjusted to 68Hz or higher to reduce mains hum which may be present on many older recordings.

CCW: 5Hz,10Hz,15Hz,20Hz,30Hz,45Hz,68Hz,100Hz,150Hz,220Hz :CW

8. Mode

There is one stereo mode and three monaural modes. The monaural modes are either: Mono, Left, or Right. Mono sums both the left and right channels. This can lower noise by summing out of phase pops and clicks. Sometimes previous groove damage to one channel or the other means that using the Left or Right modes may provide superior sound. You can quickly rotate through these three settings to determine the best setting, particularly for a noisy recording. You can also use Left and Right modes for a fresh album experience with a stereo recording. You'll hear things otherwise hidden in a stereo mix. Classic stereo recordings like Beatles and Hendrix are recommended.

CCW: Stereo,Mono,Left,Right :CW (360 mode)

9. TF (Transfer Functions)

Use nonlinear transfer functions of classic analog sounds. 'Tube' has very dominant 2nd harmonic distortion like a 300B triode vacuum tube. 'Tape' has a dominant 3rd harmonic distortion like classic Amperex tape machines. Amazingly, the high levels of distortion may not be noticeable to many listeners. A key benefit of the 'Tape' setting

is additional clipping headroom.

CCW: OFF,Tube 2H,Tape 3H,2H & 3H :CW

10. Gain

Get your sound source well matched to your stereo system with the Puffin's wide range of gain settings: from -4dB for high level inputs (CDs, DACs) to 72dB gain (low output moving coils). 40dB is a typical gain setting for most phono setups. Remember to always turn down the main system volume when adjusting the gain to prevent loud surprises.

When switching between gain settings there's a half second delay, in which the Puffin mutes the output and allows settling to occur to prevent any thumps. Normally it is suggested to use the presets in 'Set?': MM, MC, CD, or PC, and then adjust the 'Gain' from there.

CCW: -4dB,0dB,4dB,8dB,12dB,16dB,20dB,24dB,28dB,32dB,
36dB,40dB,44dB,48dB,52dB,56dB,60dB,64dB,68dB,72dB :CW

11. Load

This is the Puffin's input impedance and will almost always be left at 47k. For moving coil users, the 200 ohms setting will provide a very good load for a wide range of moving coils (though HOMCs should use 47k). 200 ohms can also be used to attenuate the input when the -4dB gain setting has level clipping due to a source with non-standard line levels (some DACs or proaudio devices). But it is suggested to lower the output on the source device if possible for best fidelity.

Select: 47k or 200 ohms

12. Balance

This provides balance control between the left and right channel in 2dB steps.

CCW: L15,L14,L13,L12,L11,L10,L09,L08,L07,L06,L05,L04,L03,L02,L01,**+00**,

R01,R02,R03,R04,R05,R06,R07,R08,R09,R10,R11,R12,R13,R14,R15 :CW

13. Fine Balance

Adjusts the left channel in +/- 0.3dB steps to match the right channel. This can be done by monitoring the average signal levels. Using a mono record in Mode:Stereo you can see the difference in levels at the left & right inputs (ADC) and then you can adjust the Fine Balance to make the outputs (at the DAC) the same. Another balancing method requires: a mono record, Mode:Mono, Phase:Mixed, and then the Fine Balance function selected (blinking cursor). With the following settings the channels are nulled and you can adjust the Fine Balance for maximum cancellation. Note: some high frequency content will remain and is normal, due to slight phase differences in the higher frequencies.

CCW: -L9,-L8,-L7,-L6,-L5,-L4,-L3,-L2,-L1,**+00**,+L1,+L2,+L3,+L4,+L5,+L6,+L7,+L8,+L9 :CW

14. Phase

This has three settings: Normal, Invert, and Mixed. Normal has the phase the same as the incoming signal while the Invert mode has the phase reversed. Mixed phase has the two channels 180 degrees out of phase. It can be used to troubleshoot speaker wiring, adjust the fine balance, or for an interesting stereo effect.

CCW: **Normal**,Invert,Mixed :CW (360 mode)

15. EQ

These are different record equalizations that have been used over the last seventy years for 78s and LPs. It will be turned off for non-vinyl sources like CDs or digital music. For most vinyl users, the 'RIAA LP' will be the only setting ever used. For enthusiasts with older LPs and 78s, the other EQ settings will provide a proper equalization for best sound from these records.

CCW: OFF,RIAA LP,Teldec LP,London LP,AES LP,NAB LP,Columbia LP,
IEC 78,CCIR 78,Columbia 78,500N-0 78,300N-0 78,250N-0 78 :CW

16. Set?

You can load four factory default presets and save four of your own. To save a User setting, choose the User slot and press the Puffin's Standby (on/off) button. Note that the gain setting can be drastically changed (76dB dynamic range), so make sure you have your system volume turned very low when loading presets. After a load or save, this function will default to OFF again. Settings are saved to Flash (non-volatile) when you turn the Puffin off, load a preset, or save a preset. You can cycle power (press Standby button twice) for a Flash save at anytime.

CCW: OFF,MM 40dB,MC 56dB,PC 16dB,CD -4dB,
User 01,User 02,User 03,User 04 :CW (360 mode)

Signal Levels

The Puffin signal levels can be monitored between Set? and Volume. These show a dB full scale (dBFS) value, so +00dBFS is the max signal the Puffin can handle at that stage in the Puffin, and this is normally a negative value. The more negative, the smaller it is.

The Puffin routes the signal in the follow way:

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Input -> Adjustable Analog Gain -> ADC (Analog-Digital Converter) ->  
DSP (Digital Signal Processing) -> DAC (Digital-Analog Converter) -> Output
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- If +00dBFS peak signals regularly occur at either the left or right ADC, lower the Puffin's Gain.
- If +00dBFS peak signals regularly occur at either the left or right DAC, lower the Puffin's Gain or Volume.

The Select button can change between the Average and Peak signal mode. Peaks can easily happen with vinyl pops, and these clip events don't harm the Puffin and are handled gracefully and not set downstream. Any DAC clipping is handled in the DSP floating point math and causes no issues other than small amounts of higher order distortion. The main goal is to avoid distortion caused from constant clipping. For reference, -20dBFS to -10dBFS is a typical Average signal level range at the DAC.

Specifications

- Works with all record players and cartridges. Suitable gain settings (-4dB to 72dB) for moving coil carts (0.25mV), HOMCs (2mV), standard MM (4mV), all the way to CDs and DACs (2V).
- Max input and output: 2Vrms
- Input impedance: 47k ohms (50pF) selectable to 200 ohms (1nF) for moving coils
- Output impedance: 1k loads and up, but will drive some sensitive headphones
- Analog gain stage: NJM2122M
- ADC: Texas Instruments PCM1808
- DAC: Texas Instruments PCM5102A
- DSP: ARM Cortex M4 80MHz with 32-bit FPU
- Digital conversion done with 24 bit resolution at 96kHz sampling rate

User 1 Settings Notes

User 2 Settings Notes

User 3 Settings Notes

User 4 Settings Notes

