JustBoom Amp HAT - Product Description

The JustBoom Amp HAT is a high quality audio amplifier designed specifically for the Raspberry Pi. As well as an audio amplifier, digital to analogue conversion is also included so no external sound cards or DACs are required. Simply stack the plug-and-play add on board (HAT) onto your Raspberry Pi A+, B+, 2B or the new 3B and it will be ready to use immediately.

We've designed the JustBoom Amp HAT to be simple to install and use. With no soldering required and all the mounting hardware already provided this product is suitable for absolute beginners and seasoned professionals alike. Just connect your Amp HAT to a set of passive speakers and you can be up and running quickly, enjoying flawless high quality audio playback within minutes of setting up this Raspberry Pi HAT. We also include an optional IR receiver to allow remote control operation of your Raspberry Pi.

Includes a Class-D power amplifier chip with built in 192kHz/32bit DAC, for a peak power output of 2 x 55 Watts. The JustBoom Amp HAT outputs audio over two speaker cable connector blocks that accept anything up to 14 AWG cable and will provide crystal clear audio to either 4 or 8 Ohm passive speakers. The Amp HAT uses the I2S interface for its audio input which reduces CPU load on the Raspberry Pi compared to USB solutions. It is also designed to back-power the Raspberry Pi over the 40 pin GPIO header, meaning you only need a single power supply for the entire system.

Last but not least, all of the unused Raspberry Pi GPIO pins are still accessible on the Amp HAT for easy customisation of your project - add additional sensors, buttons, LEDs, rotary encoders or anything your heart desires.

Use cases

Pairing the Raspberry Pi with a high quality audio power amplifier provides the perfect solution for a number of exciting projects and applications where the standard on-board audio on the Raspberry Pi simply won't cut it. Here are some possible use cases for the JustBoom Amp HAT and your Raspberry Pi computer:

- Multi-room streaming/local audio player
- Interactive art projects with audio requirement
- Arcade table projects with high quality, immersive audio
- Streaming (either from cloud or network storage) high-definition audio player
- Internet radio player with high quality stereo audio
- Refit old radios and boomboxes (Roberts radios etc) with high quality streaming audio
- And many many more….

Features

- Full high quality audio - up to 192kHz / 32bit
- 2 x 55 Watt peak output at 8 ohms (2 x 30 Watt RMS)
- Includes both a DAC and power amplifier - just connect to your passive speakers
- Back-powers the Raspberry Pi over the GPIO (with full HAT compliant protection) at 2.5A so only one power supply required for the whole system.
- Plug and play compatibility for ease of use
- Hardware and software volume control from your Raspberry Pi
- Onboard, hardware jumpers for configuring mute and gain settings (jumpers could optionally be changed with switches)
- Mute/enable with GPIO22 (this can be overridden by using jumper J4)
- No soldering required
- Compatible with Raspberry Pi A+,B+, 2B and the new 3B (and also compatible with the Raspberry Pi Zero, but we would recommend the JustBoom Amp Zero for this purpose)
- Mounting hardware included
- Optional IR receiver included in package
- Unused GPIO pins still accessible via unpopulated extension header
- Fully HAT compliant
- Full driver support in Raspbian / NOOBS
- Compatible with OSMC / RuneAudio / Volumio / Moode / PiCorePlayer / PiMusicBox / OpenELEC and others

Technical Information

- Texas Instruments TAS5756M Amp / DAC chip - 192kHz / 32 bit.
- Maximum power output of 2 x 55 W (2 x 30 W RMS).
- This board powers both the amplifier and Raspberry Pi from a single 2.1mm DC jack power supply. For 8 Ohm speakers, we recommend a 24 volt power supply with at least 75 Watt output power (POWERPAX SW4527 or similar plus C5 cable). For 4 Ohm speakers we recommend a 15 to 19 volt power supply with at least 58 Watt output power (POWERPAX SW4520 or similar). These power supply guidelines will ensure maximum output performance of the amplifier. However there are other options which can be found in our power supply recommendation document. (Please note: it is highly recommended to use an external power supply. If you power the Amp HAT over the GPIO pins and do not use one of the recommended power supplies, the maximum output power will be 2 x 3 Watts)
- Advanced ESD protection
- Dual inductors on board for footprint efficiency
- Fully integrated hardware volume mixing via "alsamixer" or any ALSA compatible application
- Integrated EEPROM for automatic Raspberry Pi devicetree driver configuration and fully HAT compatible
- Optional Vishay TSOP4838 IR receiver included in package (solder yourself if required)

- Total harmonic distortion (THD+N) of 0.006 % at 1 W, 1 kHz. Signal to noise ratio (SNR) of 104 dB A-Wtd (Ref. to THD+N = 1%)
- Ultra low noise voltage regulator for the best audio output (LDO 10uVrms)
- Fully digital sound path for optimal audio performance
- Mute/enable via GPIO22 and also there is jumper J4 for enable, that overrides software enable