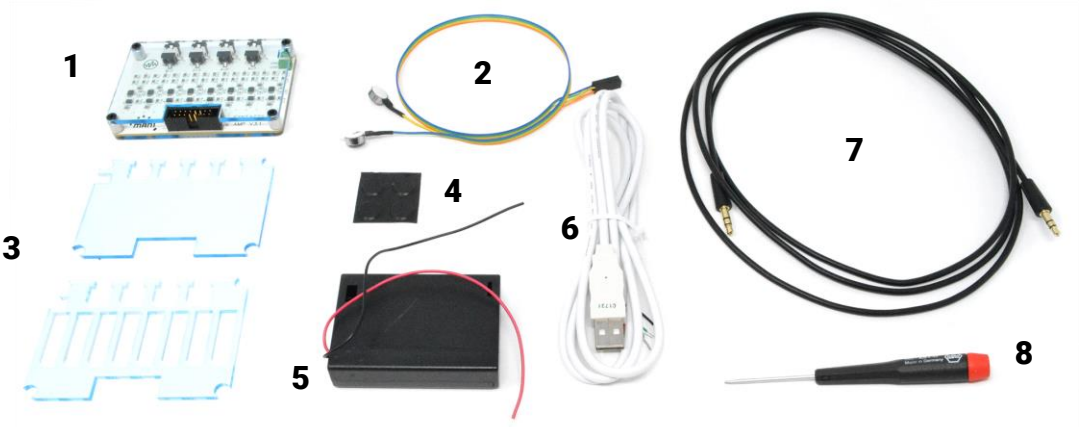
Syntacts Amplifier Kit

The kit you have received includes an 8-channel Syntacts amplifier. When combined with Syntacts software, the amplifier enables vibrotactile control through audio interfaces. This kit includes everything you need to demo Syntacts using your computer headphone output. Please visit syntacts.org for complete information and tutorials.

Disclaimer

Although the Syntacts amplifier has been used in many projects to date and operates at voltages generally considered safe, we must warn you that the hardware in this kit is experimental and has *not* underdone the testing required of commercial devices. *By using this kit you agree that we are not responsible or liable for any damage or harm it may cause to you or your equipment.* The Syntacts Amplifier is licensed under the TAPR Open Hardware License. For more information, visit: tapr.org/the-tapr-open-hardware-license.

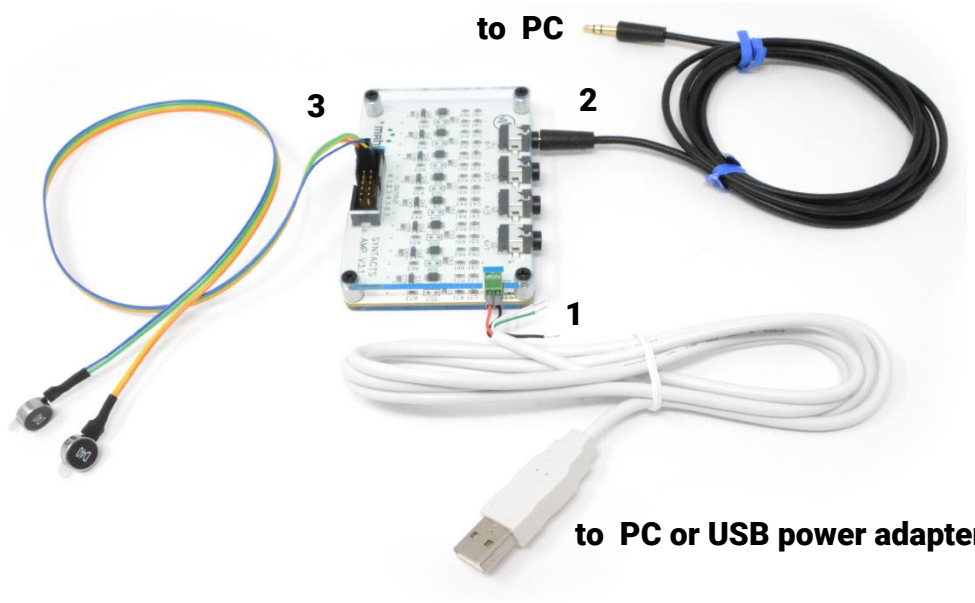
Kit Contents



Item #	Description	Quantity	Vendor	Part Number
1	Syntacts Amplifier + Case	1	MAHI Lab	v3.1
2	2x Vibrotactor Assembly	1	Digi-Key	1670-1089-ND
3	Optional Case Inserts	2	MAHI Lab	N/A
4	Adhesive Feet for Case	4	McMaster-Carr	95495K18
5	3x AA Battery Holder	1	McMaster-Carr	7712K141
6	USB Power Cable	1	Digi-Key	WM14086-ND
7	3.5mm Stereo Cable	1	Digi-Key	TL633-ND
8	Wiha 260 Screw Driver	1	McMaster-Carr	52985A12

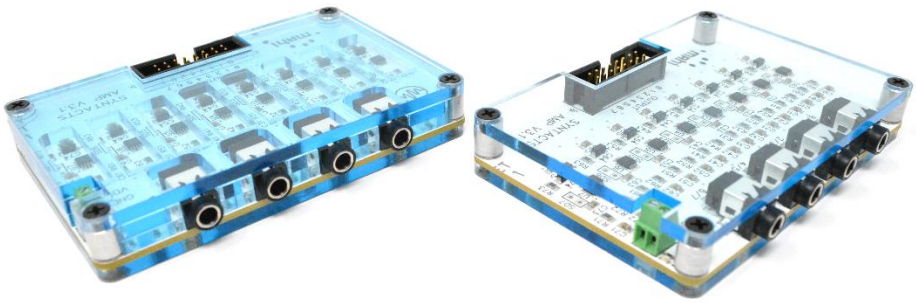
Quick Start

1. **Power** the amplifier with **5V**
    - *Option 1*: Use the included **USB Power Cable**. Connect the black crimped cable to amplifier GND and the red crimped cable to amplifier VDD. Connect the USB A side to a desktop, laptop, or generic USB wall charger.
    - *Option 2*: Use the included **3x AA Battery Holder**. Connect the black cable amplifier GND and the red cable to amplifier VDD.
2. Connect the included **3.5 mm Stereo Cable** to amplifier input channels 0/1 and your computer headphone output.
3. Connect the vibrotactor assembly to amplifier output channels 0 and 1. *Ensure that the connector triangle marker is on channel 0+*
4. Visit syntacts.org/tutorials to get started with the **Syntacts APIs** and **GUI**



Customize

- You can use the included case inserts to fully enclose the case if desired
    - Remove the top face *and four washers under each post*
    - Stack the inserts and top face and refasten the posts *without washers*



FAQ

Q: Do I have to send the kit back?
A: No, it is yours to keep! Forever! Take care of it :)

Q: How can I utilize all 8 channels if my headphone output only provides 2?
A: You will need a 7.1 surround sound card. They're cheap! (see syntacts.org/hardware)

Q: What types of vibrotactors are compatible with the amplifier?
A: LRA and voice coil actuators above 3 Ω impedance requiring less than 3W each.

Q: What connector should I buy for the output?
A: Pretty much anything that has a 0.1" pitch. Molex SL connectors or insulation displacing connectors for ribbon cable are good options.

Q: Where can I get more Syntacts amplifiers or replacement parts?
A: CAD/BOM files for Syntacts Amplifiers are available at syntacts.org/hardware

Q: Can I use the Syntacts amplifier and software in my research?
A: Absolutely! Please consider citing our IEEE Transactions on Haptics paper:

> E Pezent, B. Cambio, M. K. O'Malley. *"Syntacts: Open-Source Software and Hardware for Audio-Controlled Haptics*," IEEE Transactions on Haptics, 2020.

Q: I'm having a technical issue with hardware and/or software! Help!
A: Submit an issue on the GitHub repository: github.com/mahilab/Syntacts/issues or email us at info@syntacts.org.

Q: Syntacts is really cool, and I want to leave feedback or get involved!
A: Great! Please share your ideas by submitting issues on GitHub or emailing info@syntacts.org. We are looking for contributions to Syntacts software, hardware, and website tutorial content.

Contact Us

Support/Feedback	info@syntacts.org
Evan Pezent	epezent@rice.edu
Marcia O'Malley	omalleym@rice.edu