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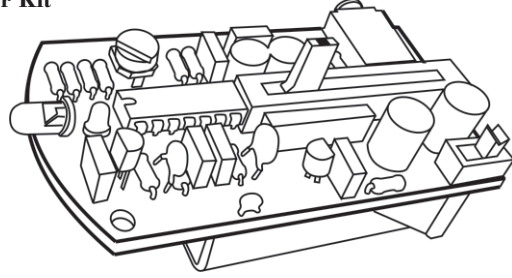


LITE2SOUND PX

from Rare Waves / Eric Archer
Auto-gain Photodiode Amplifier Kit
v1.2

PCB + all parts included
Requires 9V battery, headphones

MIND-EXPANDING!



LITE2SOUND is a portable sensing device that extracts audio from ambient light. Not a synthesizer at all, it is more like a microphone that detects a hidden layer of your environment.

LITE2SOUND reveals unusual sounds by responding to rapid but invisible changes in brightness. A sensitive amplifier boosts this information to audio level and delivers it to your headphones or line input, and can drive a speaker directly with its built-in 1-watt amp.

Beyond the ubiquitous mains hum transmitted by lighting, and the static hiss of sunlight, you can find many sounds of different character being produced by high technology.

In technology-saturated spaces, musical chords emerge and fade as luminous sources harmonize together into unintended soundscapes.

Suggested listening: metro commute... arcade... carnival midway... highway at night... high street... anywhere you find bold, bright electronic lighting! Results are usually best at night.

Even nature creates content for LITE2SOUND's reception, if one looks in the right places. Its purpose is to reward your curiosity.

INSTRUCTIONS



The battery holder goes on the bottom side. Inspect all of B+ and B-. Test its fit before soldering and trim any leads underneath it that interfere. Use the screws and nuts included to fasten the battery holder to the PCB securely. Clamping the board will make installing the screws easier.

12. Battery Holder
A speaker can be connected directly to the board. Connect its leads to the pads labeled SPK. The speaker must be mounted in an enclosure to perform well. Devising the enclosure is left up to you.

Testing and calibration
Install a 9V battery and verify the LED comes on when the power switch is actuated. Set the volume control to its lowest position (slider near power switch). Plug in headphones and listen while turning up the volume slowly. A background hiss should be audible.

You must calibrate the automatic gain control (AGC) circuit by adjusting the TRIM potentiometer. Aim the unit at a bright lamp (fluorescent, CFL, or incandescent) about 3 inches away, and set the volume slider to about 10 percent of its maximum. Now rotate TRIM so the audio is at its loudest point without being distorted. Move the unit repeatedly near and far from the lamp while listening. The audio should get louder when the unit is near the lamp, but it cannot be calibrated properly, check to be sure the photodiode is installed in the proper orientation.

If the circuit does not work properly, inspect all the solder joints and be sure there is no solder bridging adjacent points. You may need to de-solder the battery holder to access all areas. Re-heat any suspicious connections with the soldering iron until you see the solder liquefy and become shiny all over. You can add a little bit of fresh solder here for the benefit of fresh rosin flux.

Touching the solder points on the underside of the board can cause unwanted noises. You can use hot glue to insulate the solder points near the sensor to remedy this.

FAQ
Q What does the sun sound like?
A Sunlight is a faint, hissing, pink noise type sound. If it reflects off a vibrating object, it can carry audible modulation to LITE2SOUND.

Q Do different colors make different sounds?
A No, but it can seem that way. LITE2SOUND is color-blind by nature. Different colored lights can still produce different tones however, depending on the nature of the light source technology.

Q Do brighter lights always make louder sound?
A Not necessarily true. The loudness you hear is related to how strongly the light source is modulated. Some lights are very bright but not modulated; for example, the sun or an LED running on DC power. Other lights are invisible but highly modulated, like infrared remote control signals.

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1. Resistors (13)
Bend the leads at a 90-degree angle to the resistor's body, then slip them into the holes on the board. Both legs are equivalent so it doesn't matter which way they go in.

2. Diode
Bend the leads at a 90-degree angle. Be sure the striped end of the diode matches the printing on the board.

3. Non-polarized Capacitors (10)
Mount the polyester and ceramic capacitor. Both legs are equivalent so it doesn't matter which way they go in.

4. Chips (3)
Sockets are unnecessary. The TLC2264 is a 14-pin DIP type. Rotate it so its printed markings match the orientation of the text on the board where it will sit. In fitting it to the board, it helps to bend both rows of leads inward slightly. The NJM386BL is an 8-pin SIP type. It has a stripe on one end by pin 1. Orient it so the stripe matches the printing on the board. The TLE2426 is next. Do not confuse it with the J113! Consult the Identification Guide to be sure you read the markings correctly. Mount the TLE2426 with its flat edge matching the outline on the board.

5. LED
Orient the LED so its short leg goes in the hole with the white bar printed next to it.

6. Photodiode
The flat edge of the photodiode must face the white bar printed on the board. Its round end must face outward away from the board. Identify the proper orientation, then bend both leads of the QSD030 photodiode at a right angle to its body, insert it, and solder in place

7. Output Jack
Solder the output jack to the top of the board.

8. Electrolytic Capacitors (3)
The long lead must go in the hole marked with a plus sign.

9. Switch
Solder the switch to the top of the board.

10. Potentiometers (2)
Solder the small TRIM potentiometer and the larger VOLUME slider to the top of the board.

11. JFET
The J113 JFET is static-sensitive so do not handle it unnecessarily. Orient it so its flat edge matches the printing on the board, solder it in place, and trim its leads.



