

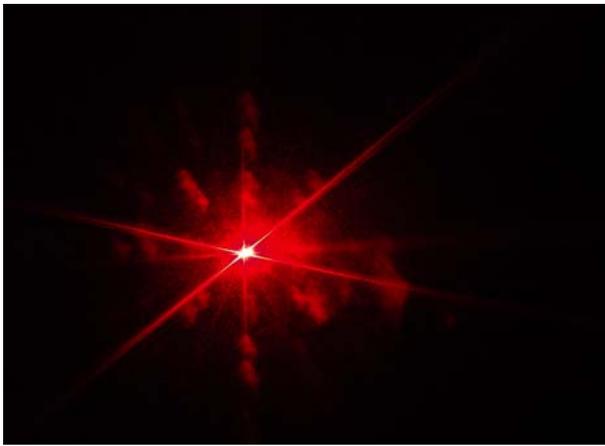
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The Laser Listener - Espionage Technology for \$3

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Hundreds of yards away, in the dark of night, behind elaborate security and a pane of glass, a conversation ensues which will determine your future. (Just humor). Suppose you wanted to hear what was going on. What you need is a laser window-bounce sound reconstitution device. You could spend thousands of dollars on one, *or* you could head to radio shack with a couple \$1 bills. This is how it works: In a microphone, sound waves (differences in the pressure of air) cause a diaphragm to vibrate back and forth, altering its resistance to an electric current. When an electric current passes through said diaphragm, the output forms a complex signal which can then be reinterpreted by speakers or a recording device as sound. The device shown here works in a very similar way. Sound bounces off of a window, causing miniscule vibrations (acting like the microphone's diaphragm). [Click for Crude Diagram](#) When a laser is trained on the window, its reflection will vibrate with the sound. The laser's reflection, if converted to an electrical signal can now be recorded as sound. I will outline how I made my own (cost me \$3, hope yours is the same or less) - the technically savvy among you will spot the countless variations possible on this basic idea.



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You need:

- ~1 Pair of old headphones
- ~A laptop or other device capable of recording sound from a 1/8" jack
- ~1 package of Cadmium Sulfide Photocells from Radioshack
- ~Soldering Equipment
- ~Laser Pointer (red or green is fine, infrared would be extremely difficult to detect by the surveiled yet would also be

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difficult to use, at first)

~Tripod or two

~Room with window and a conversation

How To:

- 1) Cut the wire free from the old pair of headphones.
- 2) Solder a cadmium sulfide cell onto the headphones to form a circuit where the cell acts as a resistor.
- 3) Aim the (stabilized) laser at (the center of a large) window, and position the reflected dot onto the (stabilized) photo cell. Using a (stabilized) lens, focus the laser's beam onto the cell. If during the day, shade the photo cell from sunlight by placing it at the back end of a dark tube, so that only the laser will reach it.

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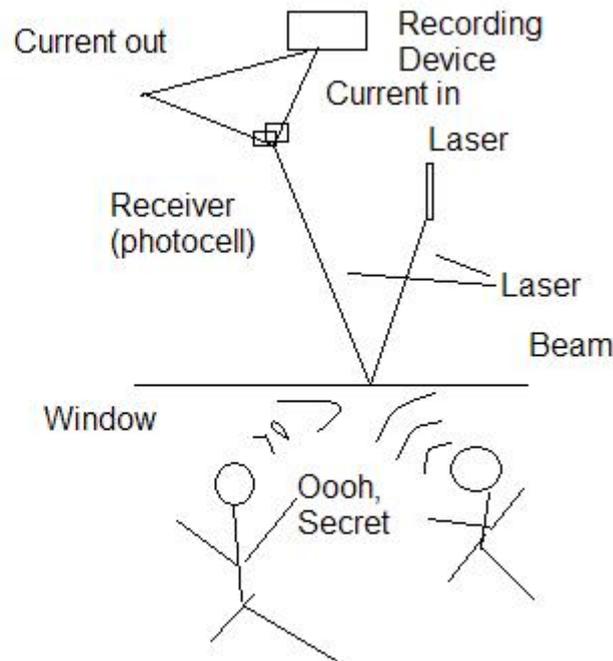
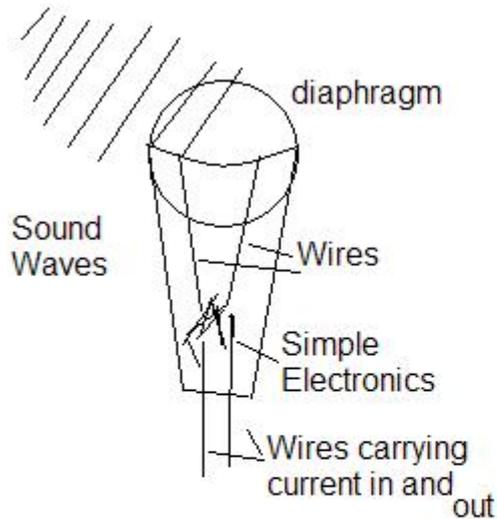
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- 4) Plug the headphone wire into your recording device, make sure there's some action inside the room, and begin recording.
- 5) Post editing: grab your favorite sound editing software, and play around with it, until through "denoising", "dehissing", and boosting the volume up, the conversation becomes clear. Alternatively, a circuit can be constructed to do this analog, before the signal reaches the recorder (which may be helpful for real-time listening).



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