

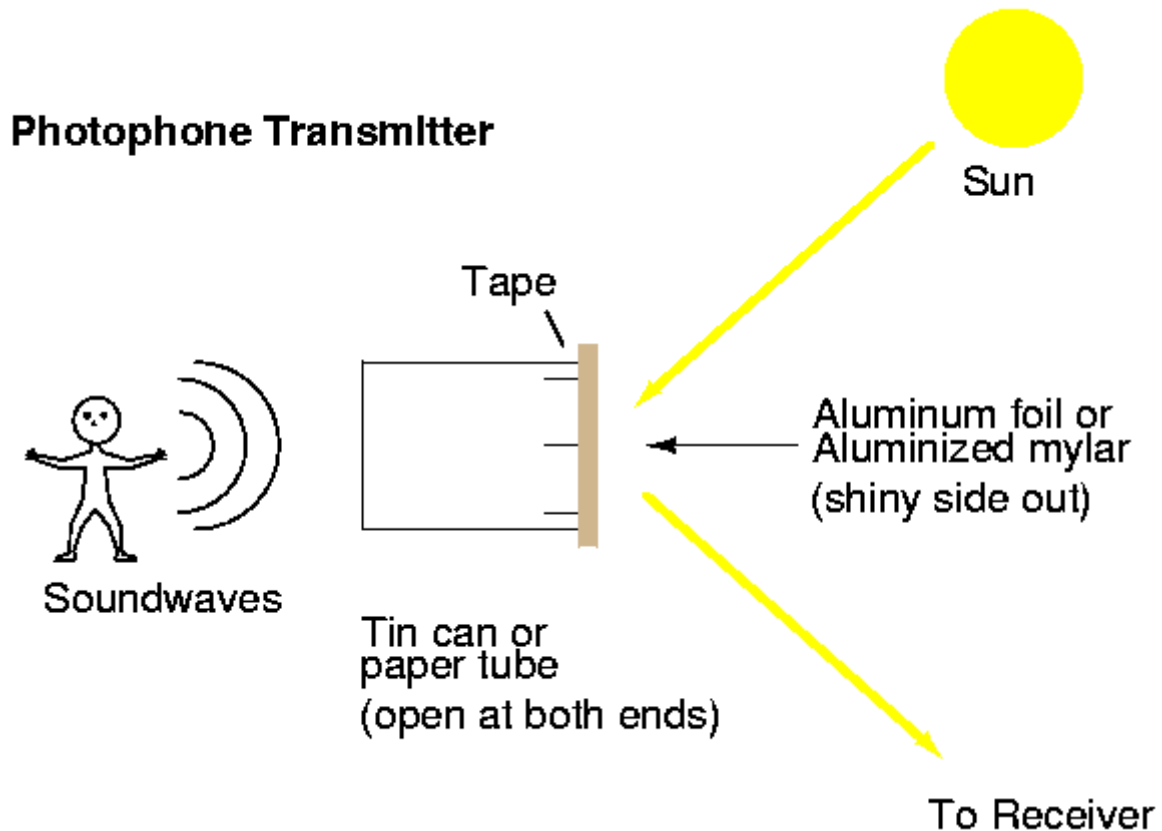
Using Sunlight to Intercept Audio

Adapted from the Forrest M. Mims III project book

The Photophon

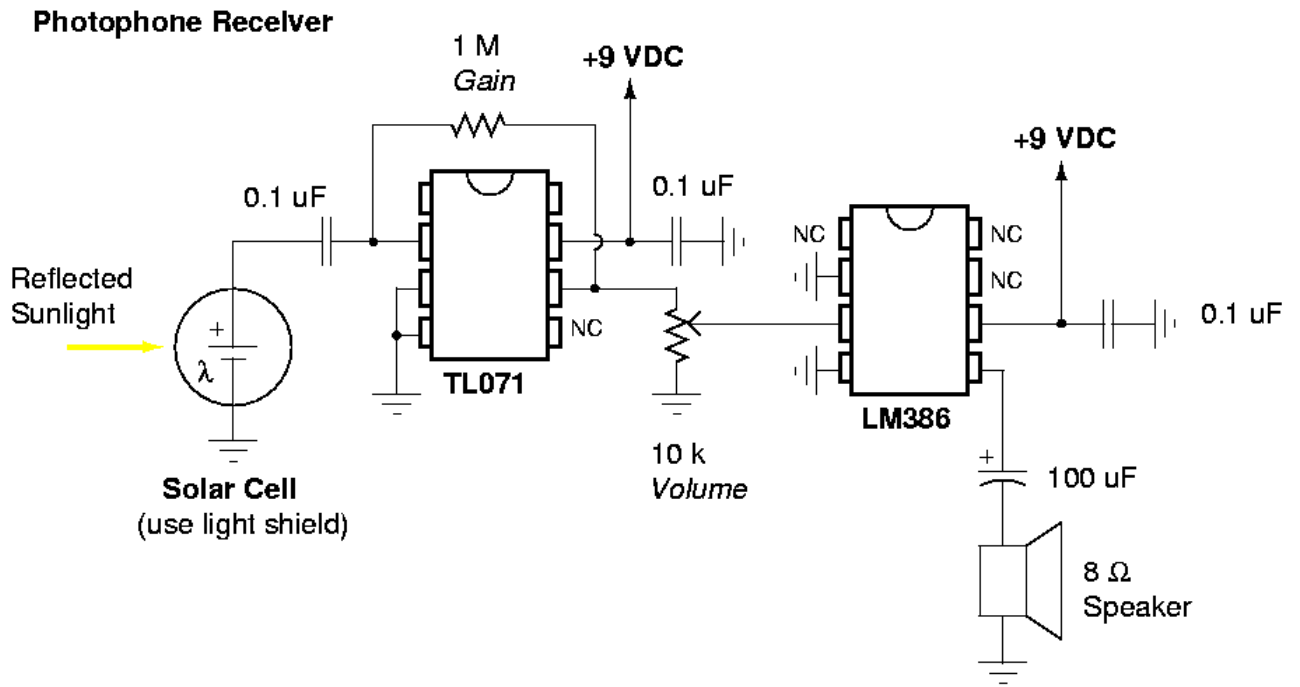
On February 19, 1880, Alexander Graham Bell and Sumner Tainter, Professor Bell's laboratory assistant, became the first people to transmit their voices over a beam of electromagnetic radiation. Bell called his invention the "photophone" and said it was fundamentally a greater invention than the telephone.

Photophone Transmitter



The aluminum foil or aluminized film should be stretched *tight* over one end of the can or tube and held in place with tape or a rubber band. Be sure the shiny side of the foil or film faces outward. Test the transmitter by reflecting sunlight from it to a wall some distance away. The reflected sunlight should form a distinct spot. If not, the foil or film is not tight enough. For best results, mount the transmitter on a photographer's tripod to simplify aiming the beam.

Photophone Receiver



Bell's photophones used a selenium detector in series with a battery and telephone receiver.

This photophone receiver uses a silicon solar cell so no lens is necessary.

Use a high quality, low-leakage $0.1 \mu\text{F}$ polystyrene DC blocking capacitor from the solar cell. It is also possible to make the 1 M ohm resistor a potentiometer to vary the receiver's gain.

It is even possible to use passive receivers, that is, receivers with no active electronics. These receivers require no source of power beyond the lightwave signal they receive. They will transform an audio frequency modulated light beam directly into sound.

Passive Photophone Receivers

