Sound Modulated Light from Light Emitting Diode

This project can amplitude modulate the light being emitted from an LED using the 8 ohm earphone output from a small radio or amplifier. For demonstrating, it is very convenient to use a small radio to supply the audio signal. A small hand held audio amplifier from Radio Shack can be used to drive the LED if you are using a microphone.

The receiver is simply a photocell connected to the input of a tiny hand held audio amplifier from Radio Shack. Since the light intensity is varying according to the original modulating audio signal, the photocell will put out an audio voltage that is like the original signal and will be heard in the pickup amplifier.

The range of transmission can be greatly increased by:

- Putting a convex lens in front of the LED and focusing the light into a narrow beam.
- Putting a lens in front of the photocell and focusing (concentrating) the light beam on to it.
- Using a Super Bright LED; the kind that say something like 2000 mc at 30 ma. Most LED's put out typically 300 mc.
- All of the above will give the maximum range and performance but the focusing with the lenses requires careful adjustment.



It is very fascinating to carry around just the photocell and the small hand held amp and listen to various light sources. We put the photocell in front of a headlight of a parked truck with the engine idling. We could hear noises from the engine. We even were able to hear an occasional buzz as a bugs would fly through the headlight beam. Some flashlights will make a "ding" sound if they are tapped while shining on the photocell.

If a fast rotating shaft is marked with a black marker, and the photocell is placed near it, a tone will be heard in the amp and the rpm can be determined by comparing the musical pitch with a pitch chart. If you don't have a chart you can determine a pitch frequency by starting at A 440 hz and multiplying by 1.059463 each time to go up the chromatic scale or dividing by the same number each time to go down the chromatic scale. To check if you are doing it right, you should arrive at 880 hz after multiplying 12 times. You can go down the scale by dividing by the same number above. After 12 divisions, you should arrive at 220 hz. A is the only note of the scale that has a good even number as a frequency value. Each octave is exactly half or double a given frequency.

Anything that emmits light can be a possibility for discovering something exciting.