

Photophone

Design Challenge

nPoints
BY NTS PRESS



Learn It!

Some of the greatest advancements in science and technology involve communication. From smoke signals and light reflected from mirrors to fiber optic networks, building a bigger better system to pass information between points will continue to demand attention and resources. A communication system is something that successfully transfers information through a medium from the information sender to the receiver; this includes things like cell phones, radios and the internet. Information can be transferred using radio frequencies, electricity and even light. Have you ever wondered how something like light could be used to transfer something like your voice? This is the concept behind the

photophone; the first photophone was invented in 1880 by Alexander Graham Bell and his assistant and was considered by him to be his greatest invention. Light reflected off of a flexible piece of glass was modulated by the speaker talking at the glass. The glass would vibrate from the persons voice and cause the light to scatter and condense.

The photophone laid the foundations for fiber optic communication which revolutionized modern telecommunications. Today we are optimizing the speed and size of data transfers but it is the fundamental concepts of the photophone that make it possible.

“Have you ever wondered how something like light could be used to transfer something like your voice?”

Build It!

Photophone Challenge

Build a transmitter circuit that can send an audio signal no less than one inch in distance using an LED or laser.

Build a receiver circuit that will pick up the signal from the LED transmitter and play back the sent audio.

Use LabVIEW to process the received audio and display the frequency spectrum of the received signal along with the peak frequencies found in the signal.

Block the light from the transmitter using both a gel filter that passes the frequency of light you are transmitting and one that blocks that frequency.

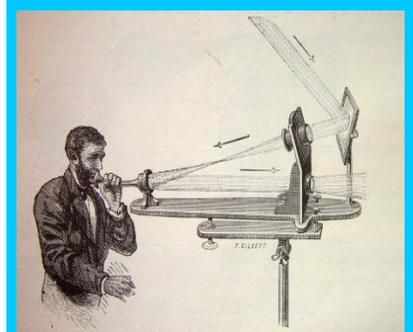


Figure 1 The first photophone was created by Alexander Graham Bell and his assistant Charles Tainter