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DATA TRANSMISSION THROUGH LASERS

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Abstract

In the current era technology in science has recently attracted owing the advancement of applications in lasers. A project on the applications of the laser introduced. The application part of the laser has been applied by simple laser communication system which evolved in its working with the support of solar panel, differential grating. It also provides the information how the data is transmitted through lasers.

1. Introduction

In this study the input data from mobile phone with low signal mp3 song sent through amplifier using transmitter and receiver as laser and solar panel respectively. The input signal amplified by amplifier and the generation of high input signal observed [1-2]. Also observed by introducing diffraction grating in front of the receiver solar panel.

2. Experimental technique:

The modulation process involved as demodulator and modulator. This paper deals with the fabrication of modulator and demodulator circuits which uses microphone as an input and loudspeaker as an output. The high input signal generated by the amplifier is then transmitted by a Laser Diode. This Laser Beam is given as input to the Sensor (Solar

Panel) which is amplified by an amplifier so that a high signal is being generated. A 9v DC Power Supply is given to the Amplifier by a battery. The generated high output signal is given to the loud speaker.

2.1. Components Used:

Solar Panel- 6-7 volts,. Laser module, Resistor- 100, Battery- 9 volts, 9 volt Battery connector, Connecting wires, Aux jack, Aux socket.

Some basic tools are also required for this experiment are Soldering Iron and Hot glue gun (Not necessary super glue gun will also work)

2.2. Construction:

First we are using the pre-soldered on the jack. Now we are going to build the Transmitter whichwill emit the Light Signals

2.2.1. Steps for building the Transmitter are given below:

- Connect the Negative (-ve) Terminal of your Laser Module with the GROUND terminal of the Headphone Jack.
- Now, Connect the Resistor to the Positive (+ve) Terminal of the Laser Module Connect thePositive (+ve) Terminal of your 9 Volt Battery with the100 ohms Resistor

Now at last connect the Negative (-ve) Terminal of the Battery with the common wireof LEFT and RIGHT Terminals from the Jack to Complete the Circuit.

2.2.2. The Steps for making the Receiver are given below :

- Solder the wires to the Positive (+ve) and Negative (-ve) Terminals of the Solar Panel.
- Now, Connect the Negative (-ve) Terminal to the GROUND Terminal of the other Jack.

The Positive (+ve) Terminal is left so connect the Positive (+ve) Terminal of the Solar Panel to the Common wire of LEFT and RIGHT Terminals from the jack to complete the Circuit. We have completed the Circuits of the Transmitter and Receiver.

2.2.3. Transmitter Case:

- Cut out the pieces of Cardboard as it will be easier to work on.

- Glue Gun ready
- Prepare a L shape with the 2 bigger pieces of Cardboard
- To make stable attach the Cardboard Supports on both sides of the L joint.
- Keep the Battery near the inside of joint
- Make a hole in the center on one of the big cardboard pieces.
- Glue the LASER after passing through the hole.
- Glue the wires and resistor where the empty space left
- Glue the Jack wire at the end of the Lower cardboard. So that the transmitter is ready to go.

2.3. Testing Time:

All of our Setup is done and now we are going to test it.

- Take the Transmitter Jack and Connect it with your Phone through the 3.5 mm Female Jack
- Take the Receiver Jack and Connect it with a Pre-Amplified Speaker in the AUX Input Port
- Place the Transmitter and Receiver Face to Face with each other with a Distance of about 5cm (or 2 inches) between them.
- Connect the Battery to the 9 Volt Battery Connector in the LiFi Transmitter
- The LASER will Light up
- Play any song on the Connected Phone.

2.4. Results and Discussions:

We observed the song start to play on the speaker too! This happens because The Transmitter will transmit the audio signals from your Phone through Light from the LASER to The Receiver that is the Solar Panel. The Solar Panel will collect these Light Signals and send them to the Speaker. Then the Speaker will amplify these Light Signals and convert them to Audio Signals again as shown in fig.1. As introducing diffraction grating in front of Solar panel the audio signal is low.

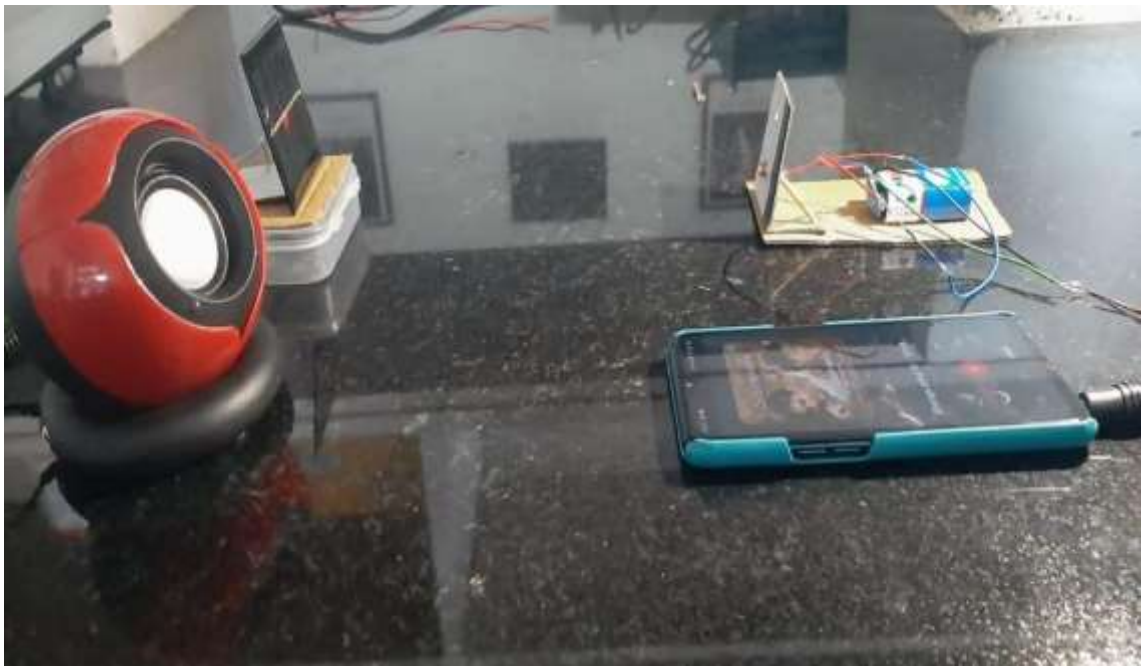

Fig.1. Real time photograph in Lab- Complete view of the Data of transmission through lasers

2.5. Problems:

This may happen that some Problems occur with your setup. I've listed some reasons below whythis must be happening -

- Your Connections are wrong or are not soldered properly Your Components are damaged.
- Your Phone's Headphone Jack may be damaged.
- Distance between the Transmitter and Receiver is large
- Volume of the Speaker or the Phone is low
- Other Lights are causing interference, try covering the setup or switch off the Light of the room.

3. Conclusion:

In this study the output form the solar panel is high. Low by introducing the diffraction grating. Owing to the influence of wavelength on diffraction of sound waves. The diffraction of sound wave decreases as its wavelength decreases and increase in speed. The waves of sound with longer wavelengths and low speed are diffract around objects.

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