

# **VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

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**A Project Report  
On**

## **“VOICE AND DATA COMMUNICATION USING LASER”**

Submitted in partial fulfillment of the requirement for the award of the degree of

### **BACHELOR OF ENGINEERING**

**In**

### **ELECTRONICS & COMMUNICATION ENGINEERING**

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# ABSTRACT

Light from a laser torch is used as the carrier in the circuit, instead of RF signals. The laser diode can transmit light up to a distance of about 500 meters. The phototransistor of the receiver must be accurately oriented towards the laser beam from the torch. If there is any obstruction in the path of the laser beam, no sound will be heard from the receiver. The transmitter circuit comprises condenser microphone, amplifier stage built around  $\mu A741$  followed by a transistor amplifier BC547. The gain of the op-amp can be controlled with the help of 1-mega-ohm potmeter VR1. The AF output from transistors is then directly given to diffusion capacitors, in turn modulates the laser beam.

The transmitter uses 9V power supply. However, the 3-volt laser diode (after removal of its battery) can be directly connected to the circuit—with the body of the torch connected to the emitter of BDC547 and the spring-loaded lead protruding from inside the torch to circuit ground. The receiver circuit uses an npn phototransistor as the light sensor that is followed by a two-stage transistor preamplifier and LM386-based audio power amplifier. The receiver does not need any complicated alignment. The phototransistor is oriented towards the remote transmitter's laser point and adjusted. The volume control is for a clear sound. To avoid 50 Hz hum noise in the speaker, keep the phototransistor away from AC light sources such as bulbs. The reflected sunlight, however, does not cause any problem. But the sensor should not directly face the sun.

To create a data communications system through Laser, utilizing a transmitter and receiver, we would require a Laser diode, similar to a standard LED, and a phototransistor receiver. While in the transmitter section data expected to be sent is inputted using keypad, data sent through Laser medium gets displayed on the LCD screen. Two switches would be used to change over data and voice signals at both transmitter and receiver sections.