

A decorative graphic on the left side of the slide consisting of two overlapping parallelograms. The front one is blue and the back one is a light greenish-blue. They are positioned diagonally, with the blue one in front of the green one.

Developing Free Space Optical Communication Link for Adverse Weather Conditions

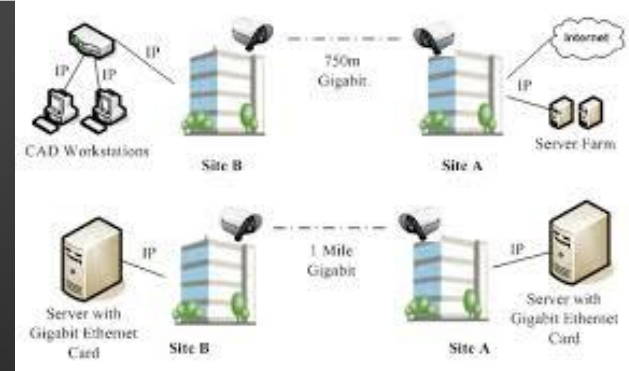
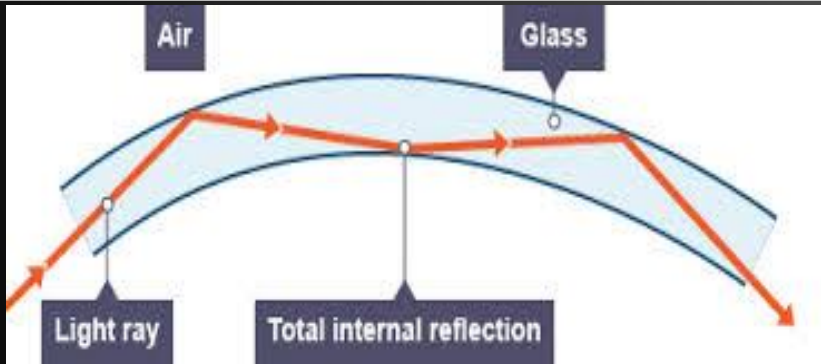
OPTICAL COMMUNICATION

Optical Fiber Communication (OFC)

1. Cable based stationary network
2. Takes many months to setup a network
3. Require digging channels in ground for cabling

Free Space Optical Communication (FSO)

1. Space based mobile platform
2. Easy and rapid setup
3. Environment friendly



ELEMENTS OF COMMUNICATION

TRANSMITTER

CHANNEL

RECEIVER

Custom made LASER driver and
Transceiver circuit

Semiconductor LASER

Custom made LASER driver
and Transceiver circuit

TRANSMITTER UNIT

- input signal: **Any text or image file**
- Modulation: **Intensity Modulation**
- Laser driver circuitry: **Constant current source**

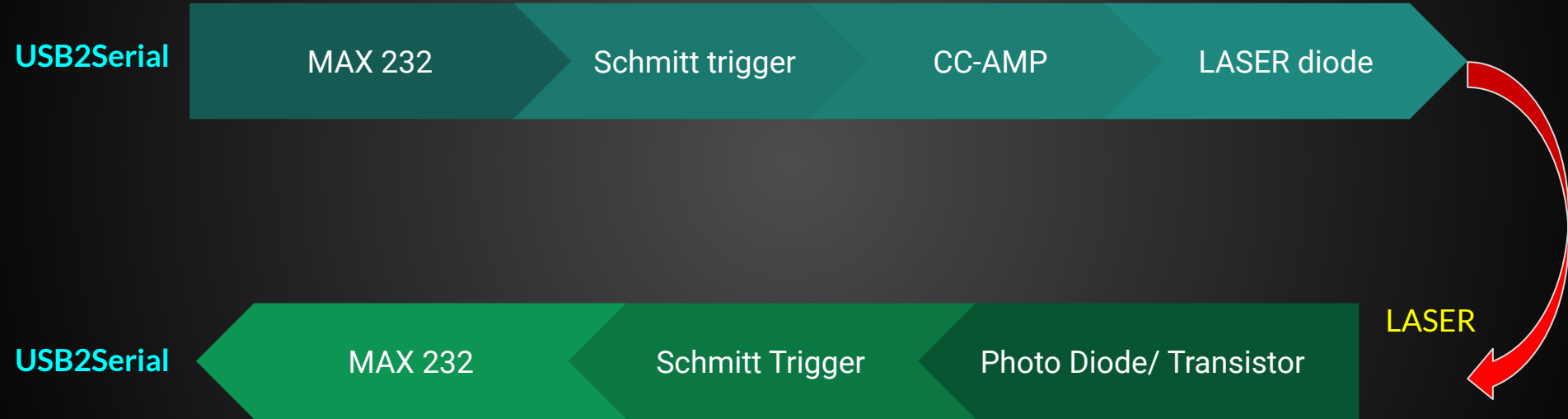
CHANNEL

Laser diode used: **LD-OR-05 (Red laser diode- 650nm)**

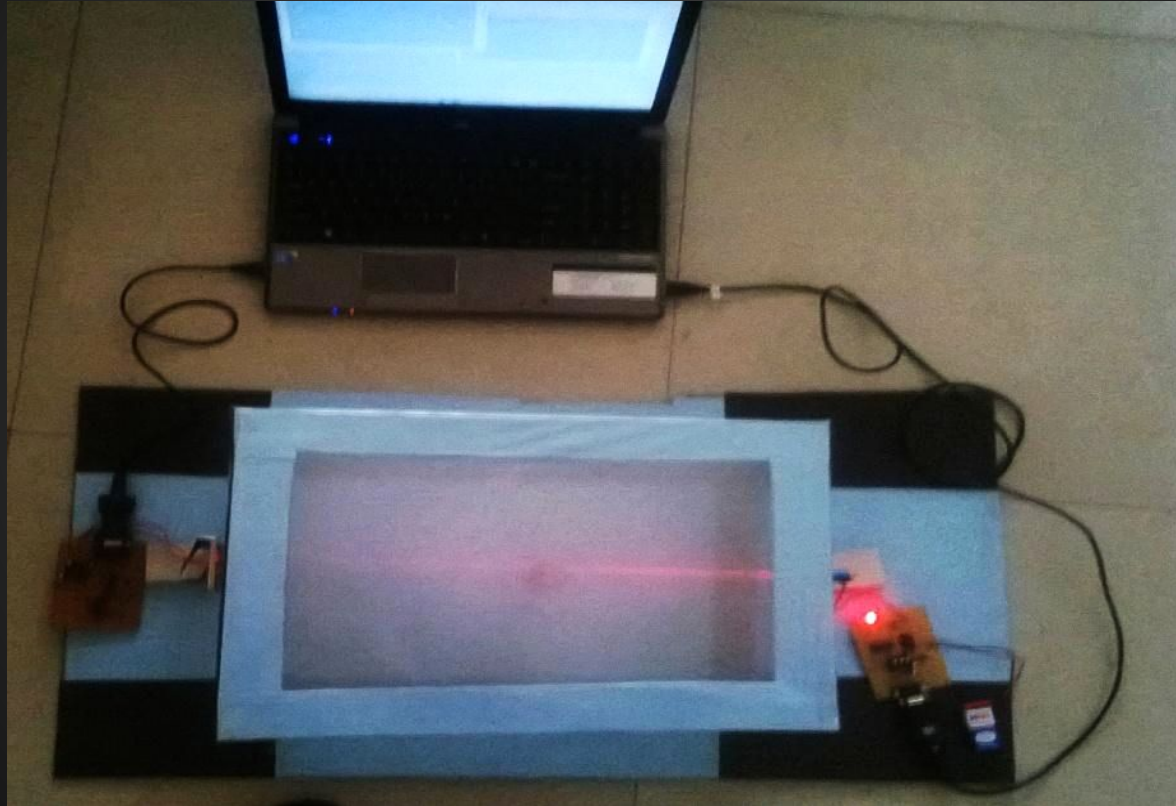
RECEIVER UNIT

- Optical detector
- Demodulator
- Amplifier and signal recovery
- Signal output

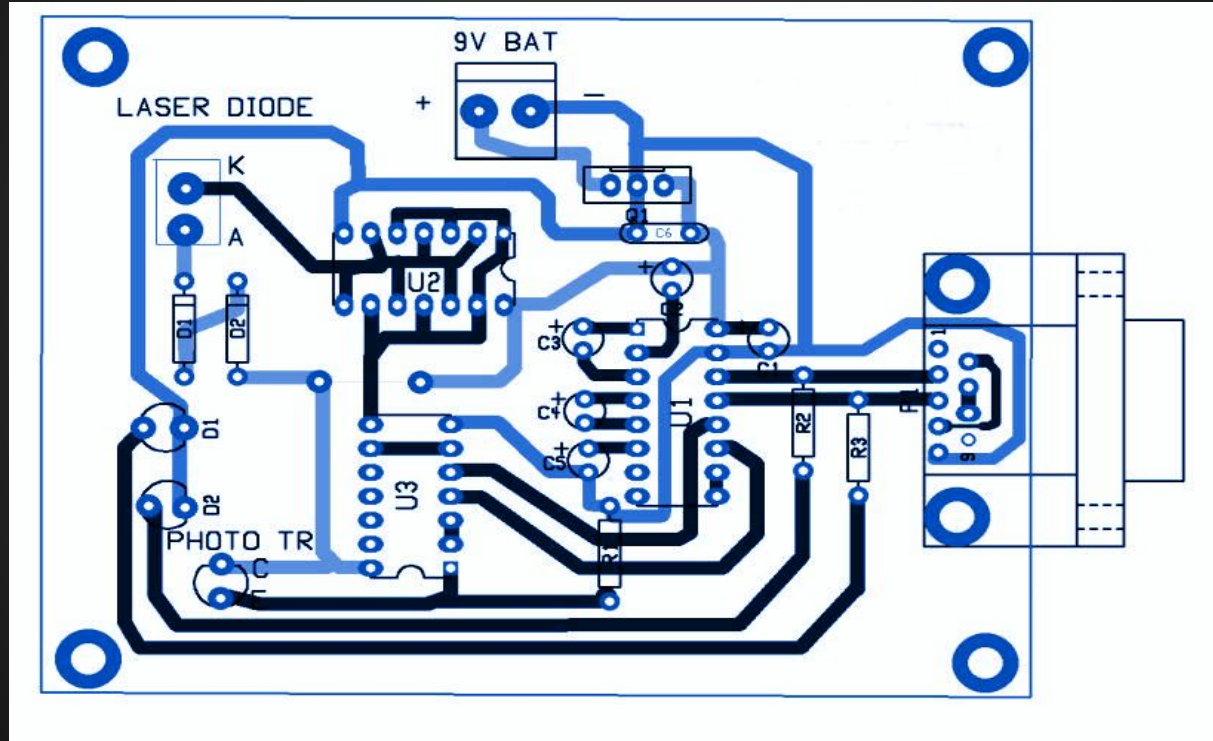
BLOCK DIAGRAM OF TRANSMITTER



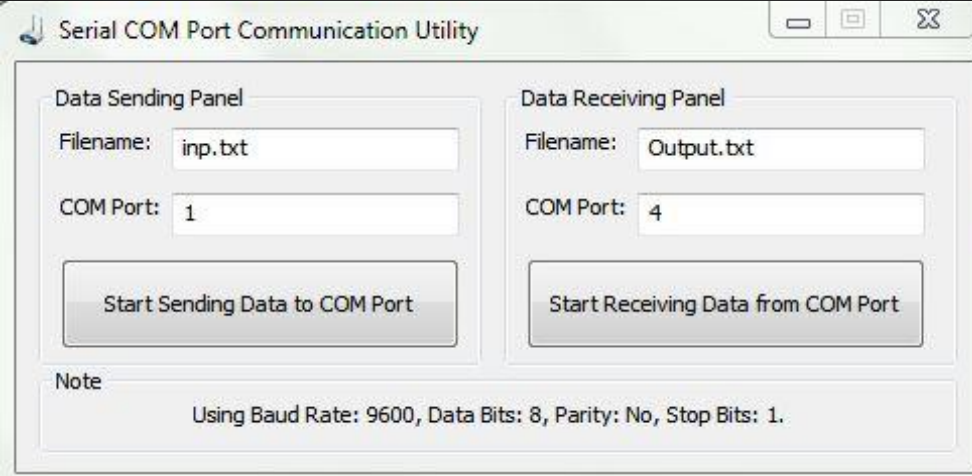
PROTOTYPE



TRANSCEIVER PCB LAYOUT



Communication Interface



The image shows a Windows application window titled "Serial COM Port Communication Utility". It features two main panels: "Data Sending Panel" on the left and "Data Receiving Panel" on the right. The "Data Sending Panel" has a "Filename:" field with "inp.txt" and a "COM Port:" field with "1". Below these is a button labeled "Start Sending Data to COM Port". The "Data Receiving Panel" has a "Filename:" field with "Output.txt" and a "COM Port:" field with "4". Below these is a button labeled "Start Receiving Data from COM Port". At the bottom of the window, there is a "Note" section stating "Using Baud Rate: 9600, Data Bits: 8, Parity: No, Stop Bits: 1.".

Serial COM Port Communication Utility

Data Sending Panel

Filename: inp.txt

COM Port: 1

Start Sending Data to COM Port

Data Receiving Panel

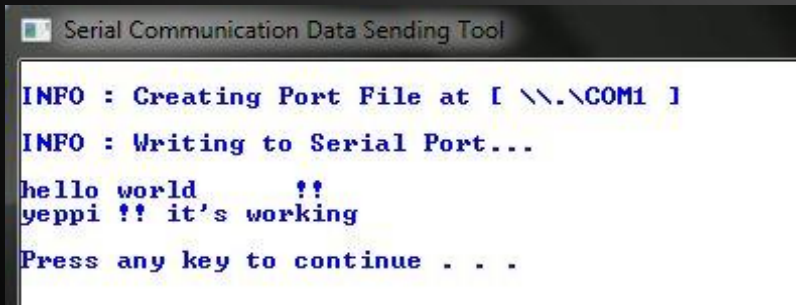
Filename: Output.txt

COM Port: 4

Start Receiving Data from COM Port

Note

Using Baud Rate: 9600, Data Bits: 8, Parity: No, Stop Bits: 1.



The image shows a Windows application window titled "Serial Communication Data Sending Tool". It displays a text-based interface with the following text: "INFO : Creating Port File at [\\.\COM1]", "INFO : Writing to Serial Port...", "hello world !!", "yeppi !! it's working", and "Press any key to continue . . .".

Serial Communication Data Sending Tool

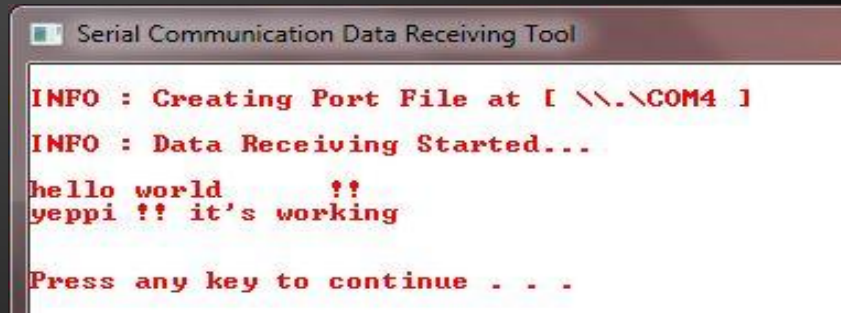
INFO : Creating Port File at [\\.\COM1]

INFO : Writing to Serial Port...

hello world !!

yeppi !! it's working

Press any key to continue . . .



The image shows a Windows application window titled "Serial Communication Data Receiving Tool". It displays a text-based interface with the following text: "INFO : Creating Port File at [\\.\COM4]", "INFO : Data Receiving Started...", "hello world !!", "yeppi !! it's working", and "Press any key to continue . . .".

Serial Communication Data Receiving Tool

INFO : Creating Port File at [\\.\COM4]

INFO : Data Receiving Started...

hello world !!

yeppi !! it's working

Press any key to continue . . .

CHALLENGES

- Heat sink problem
- Interfacing issues due to bios.h header file
- Impedance matching
- Noise / distortion due to electronic components
- Dark current in phototransistor
- Biasing problem in ICs



thank you