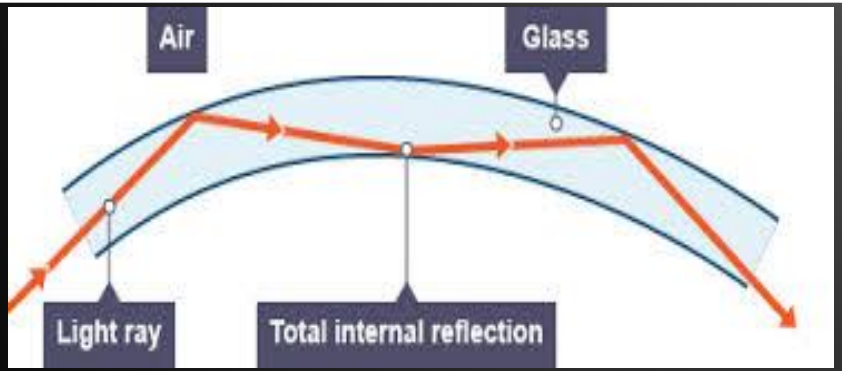
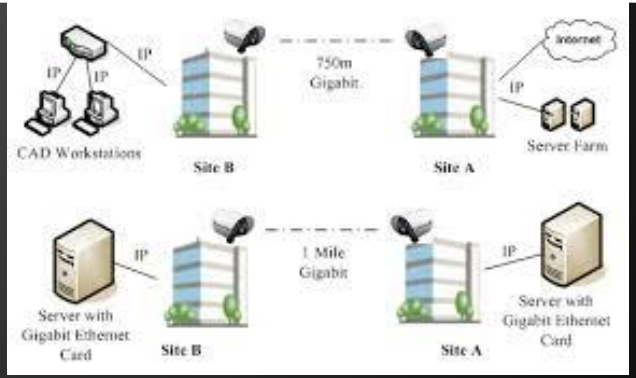
Developing Free Space Optical Communication Link for Adverse Weather Conditions

OPTICAL COMMUNICATION

Optical Fiber Communication (OFC)	Free Space Optical Communication (FSO)
1. Cable based stationary network	1. Space based mobile platform
2. Takes many months to setup a network	2. Easy and rapid setup
3. Require digging channels in ground for cabling	3. Environment friendly





ELEMENTS OF COMMUNICATION

TRANSMITTER → CHANNEL → RECEIVER

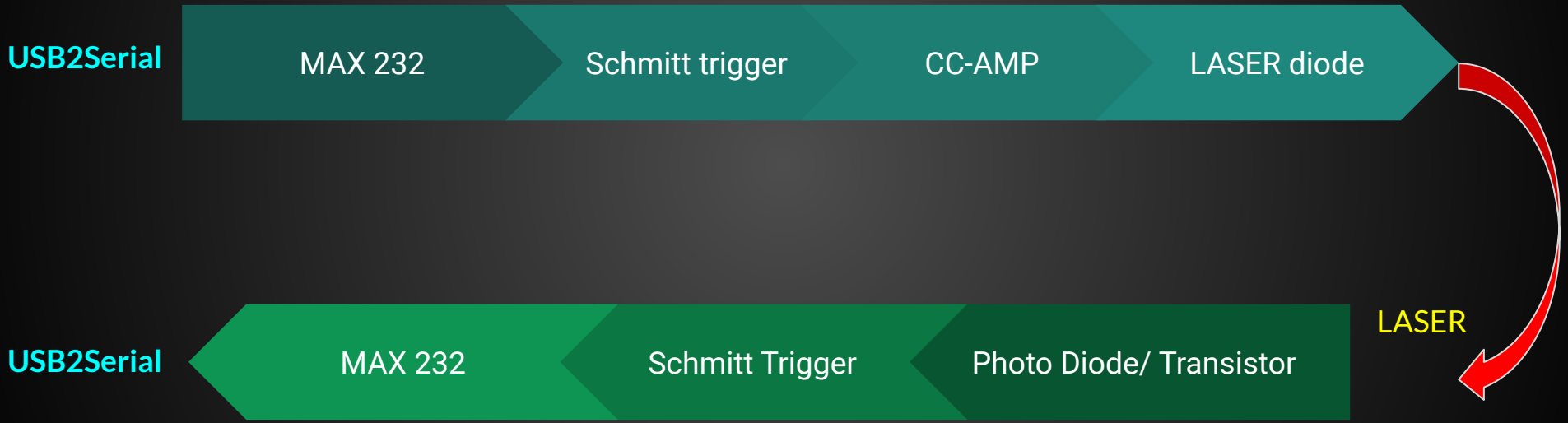
Custom made LASER driver and Transceiver circuit

Semiconductor LASER

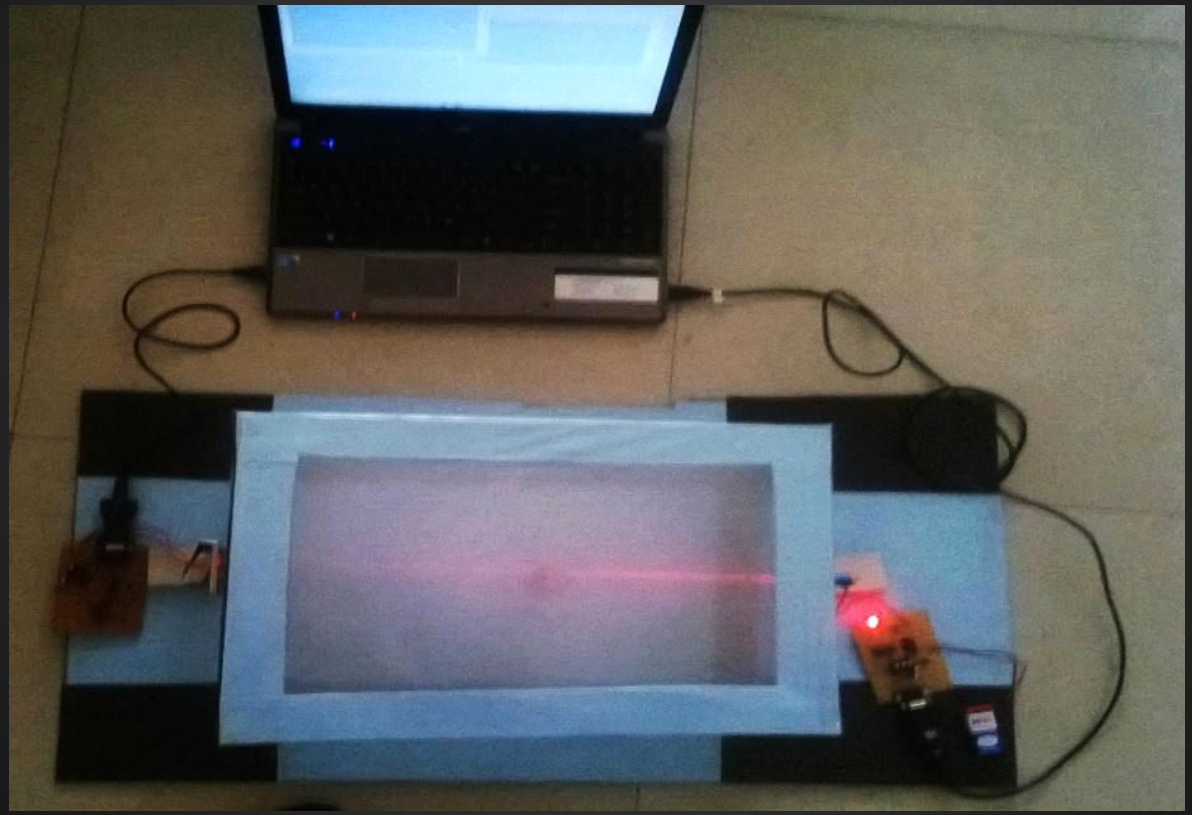
Custom made LASER driver and Transceiver circuit

TRANSMITTER UNIT	CHANNEL	RECEIVER UNIT
• input signal: Any **text or image file** • Modulation: **Intensity Modulation** • Laser driver circuitry: **Constant current source**	Laser diode used: **LD-OR-05 (Red laser diode- 650nm)**	• Optical detector • Demodulator • Amplifier and signal recovery • Signal output

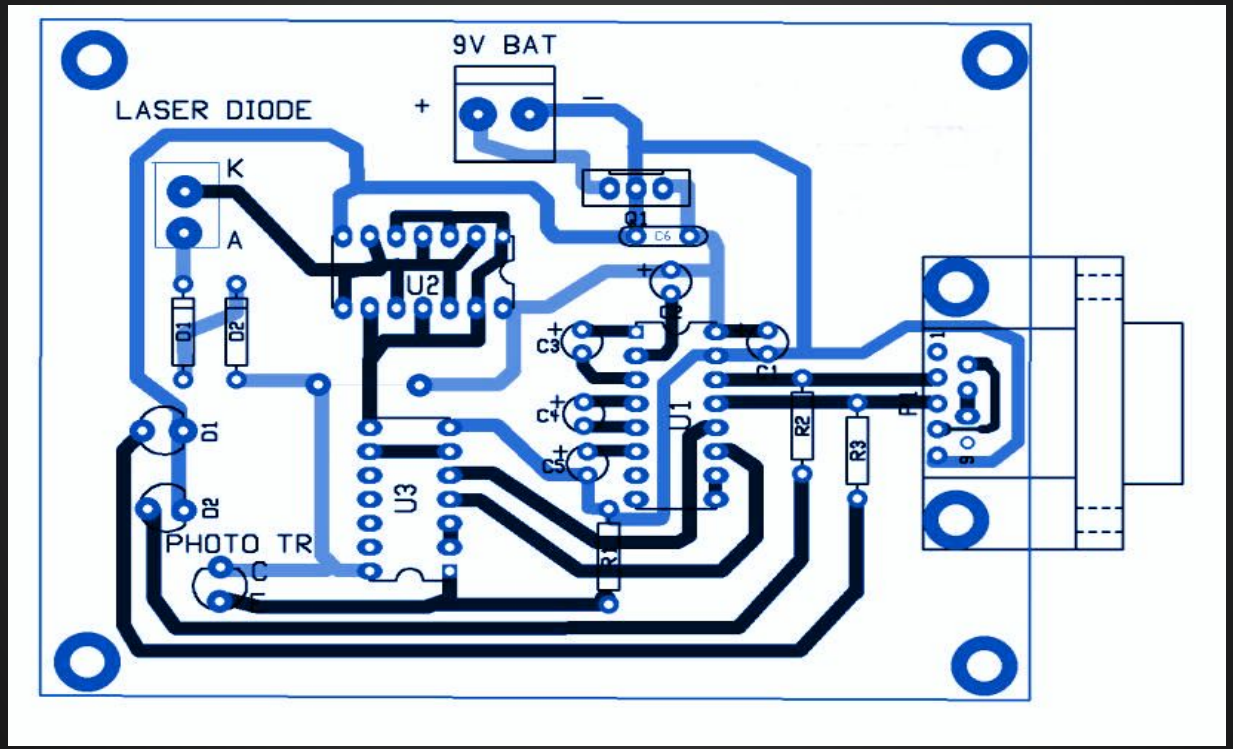
BLOCK DIAGRAM OF TRANSMITTER



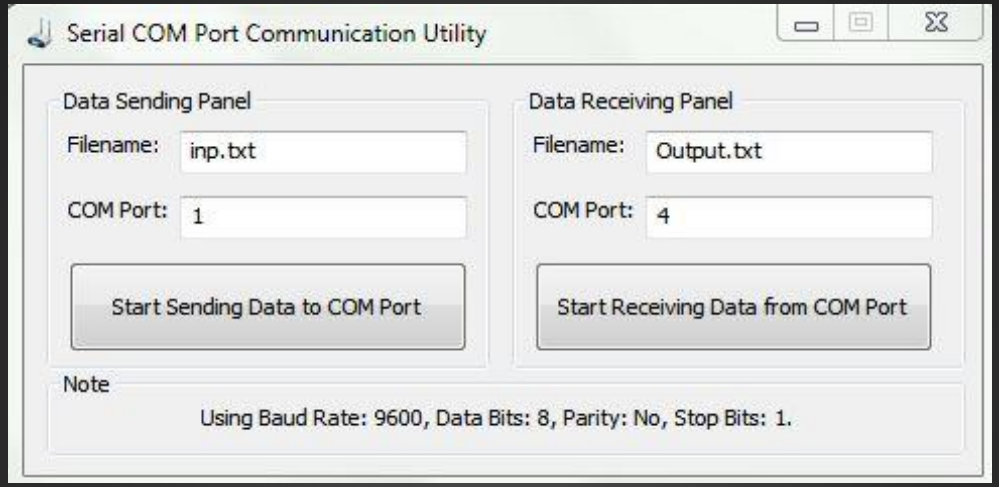
PROTOTYPE

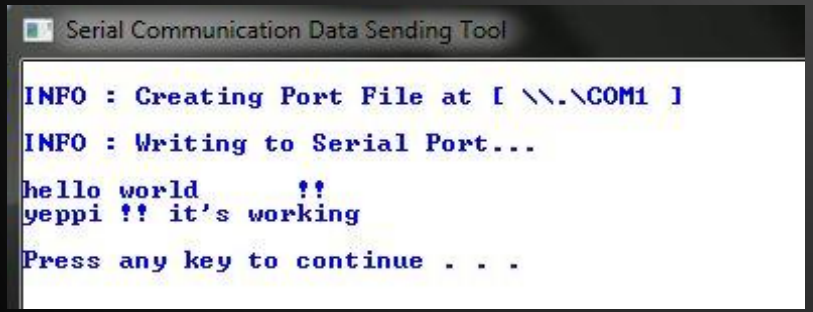


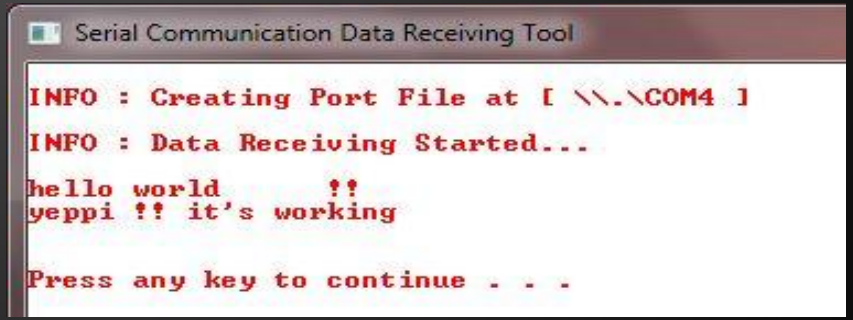
TRANSCEIVER PCB LAYOUT



Communication Interface







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