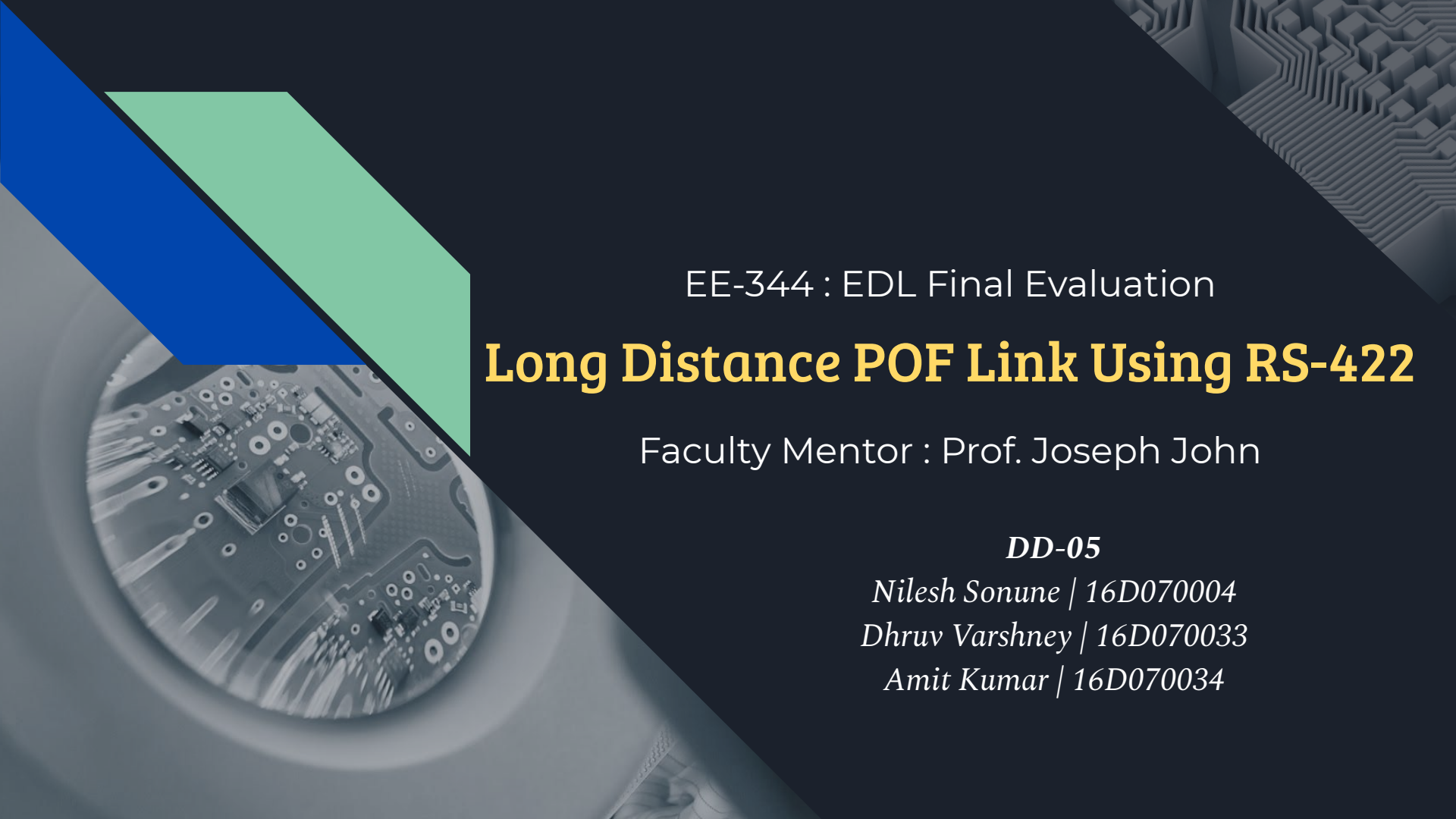

EE-344 : EDL Final Evaluation

# Long Distance POF Link Using RS-422

Faculty Mentor : Prof. Joseph John


***DD-05***

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# Project Objectives and Deliverables

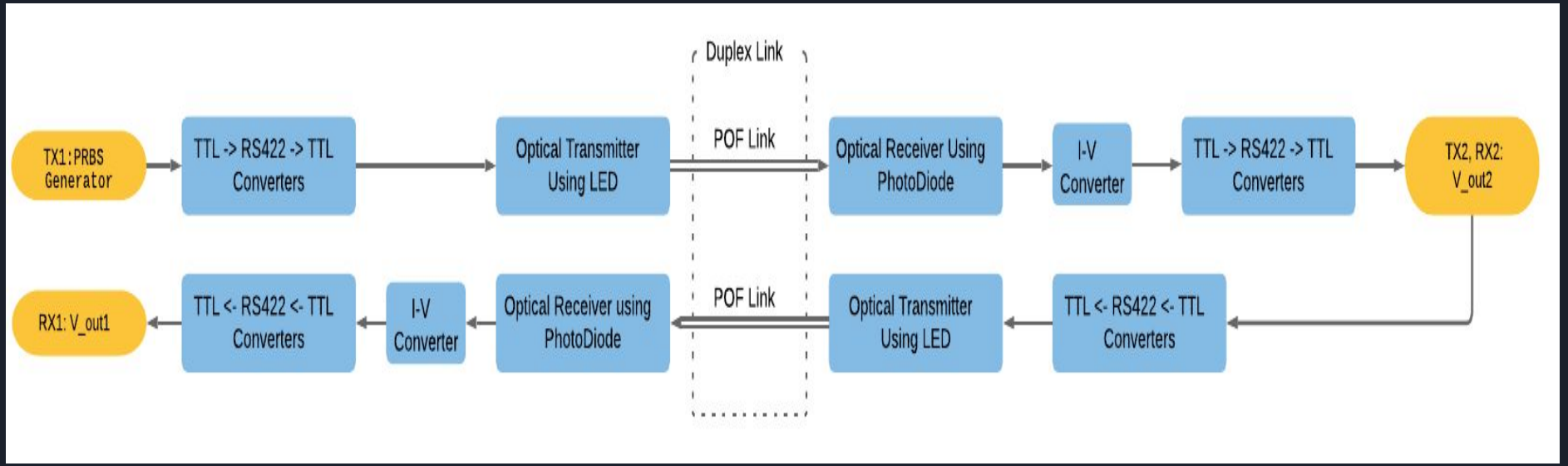
## Project Objective :

Long distance data transmission using RS-422 protocol via POF link

## Project Deliverables :

1. A Duplex communication link of length 15m using optical fibre
2. Data Rate Capability up to 1 Mbps

# Block Diagram of the System



# Work Done Between Evaluations

## Work Done Till Evaluation I:

1. Long distance data transmission using RS-422 via  Ethernet Cable at 1Mbps
2. Pseudo Random Bit Sequence (PRBS) Generator as TTL Source
3. LED-Photodiode Link for receiver circuit (till 80 kHz)

## Work Done Till Evaluation II:

1. Made a RS422 link using optical fiber with data rate of 2Mbps and fiber length of 5m
2. Integration of all the subsystems to form a complete  communication link system
3. Designed  the whole system on a PCB board

# Work Done After Evaluation 2

- PCB design and soldering of power supply and 2 transceiver circuits
- A duplex link for reliable communication between 2 users
- Communication using optical fiber of length 15m
- Wrote a VHDL code to send a fixed bitstring for a particular text and observe the received bitstring

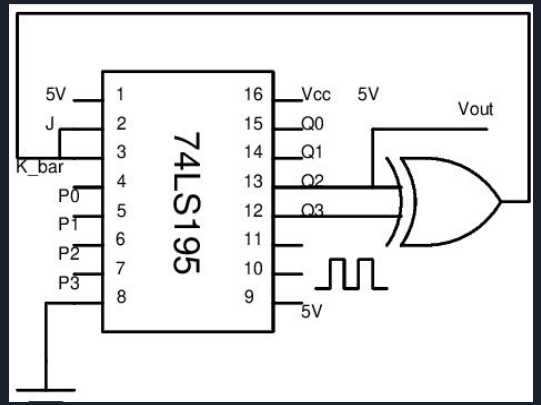
# Plans for the final demo

1. Working duplex link with reliable communication between 2 users

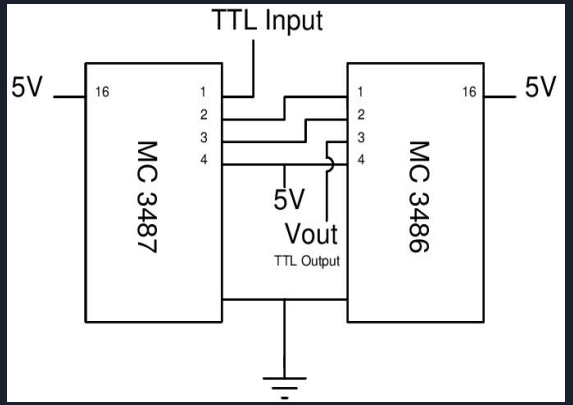
2. Send a short text file using Krypton from one end to another end and recover it back at an optimal data rate

3. Extend the length of the link and increase the data rate for more efficient communication

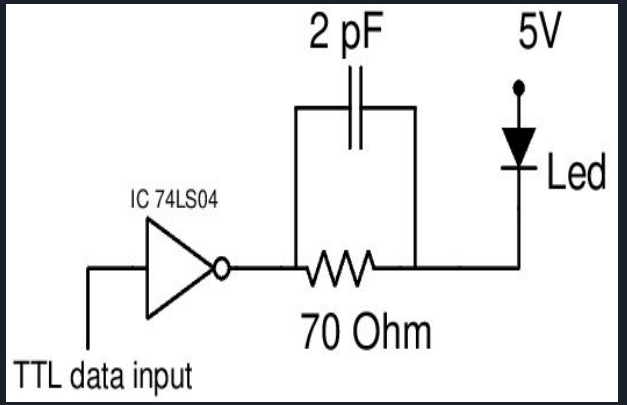
# Transmitter Circuit




PRBS Generator

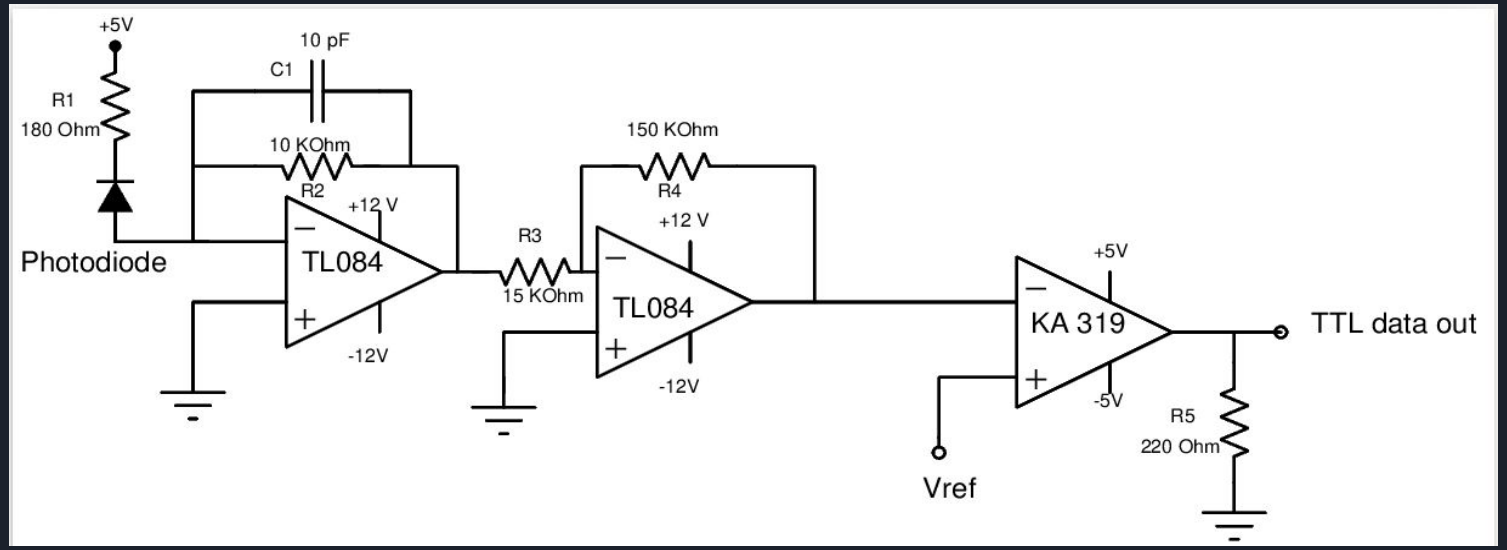



TTL-RS422-TTL Converter




Transmitter circuit using LED

# Receiver Circuit




Receiver circuit consisting of I to V converter, Inverting Amplifier, Comparator

# Testing of the Link

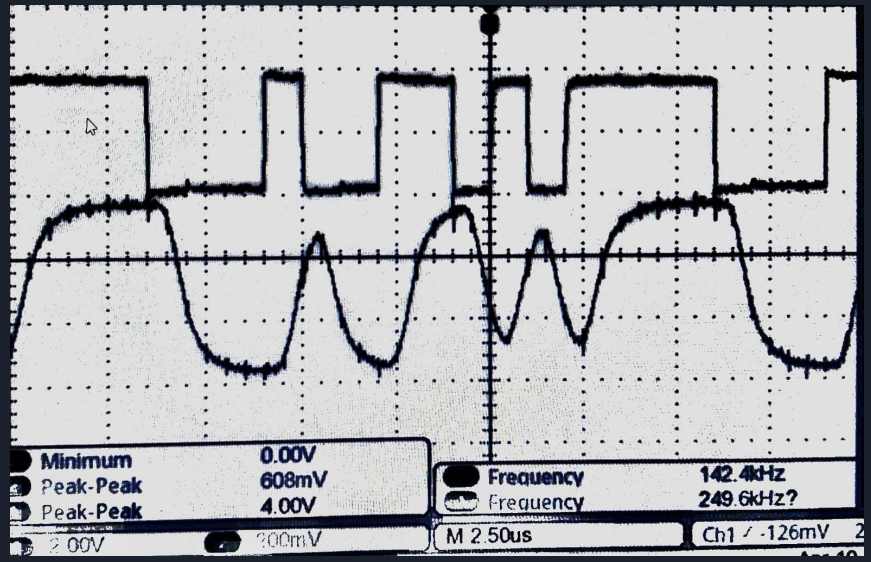
1.We used a Krypton (Altera Max V) Board for testing the link by using it for Transmission and Receiving data at 1 Mbps .

2. Wrote a VHDL code to transmit a finite(128 bit) bitstring at rate of 1 Mbps (rate is adjustable).

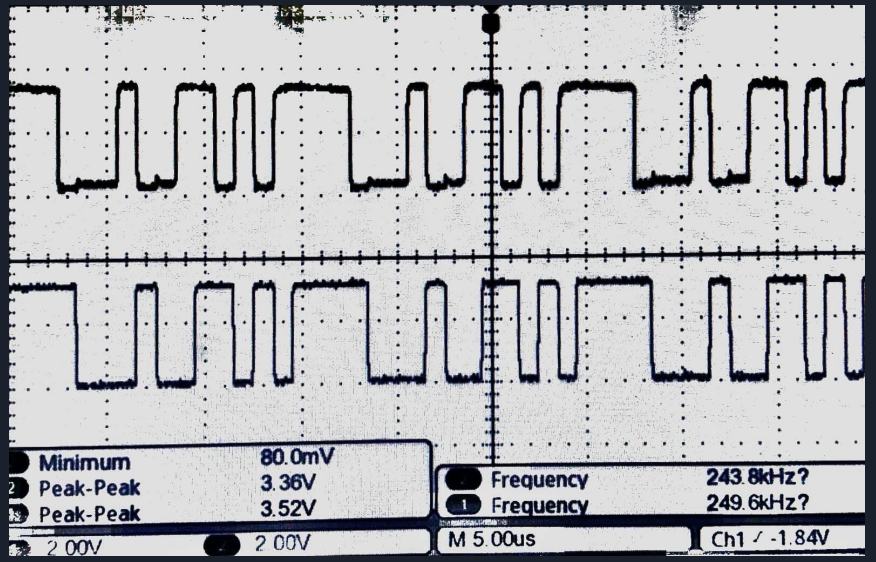
3. The code for the receiving end aims to start storing the received data when it receives a logic and then, displays the received data on a LCD screen (after packing bits to form a character)

4. The logic was first tested by just connecting the transmitting and receiving ends by a loop back wire.

# DSO Screenshots

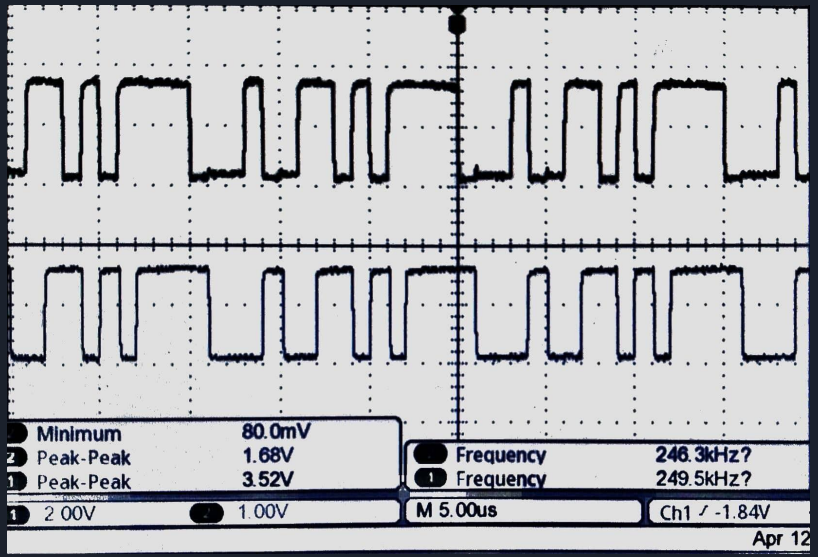



Output after Amplifier

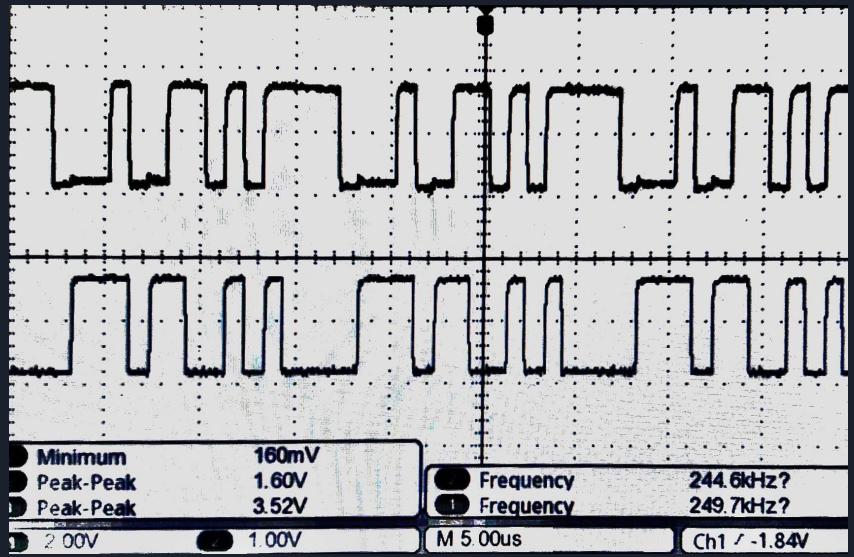



Output after the comparator

# DSO Screenshots




Inverting RS422 Output




Non Inverting RS422 Output

**Output after passing the TTL_out through a TTL-RS422 Converter**