



**MIDDLE EAST TECHNICAL UNIVERSITY**

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**DEPARTMENT OF ELECTRICAL AND ELECTRONICS  
ENGINEERING**

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**EE 494-DESIGN STUDIO 1  
WEEKLY REPORT III**

**revolu*****sys***

**Company Name: Revolutionary Systems Inc.**

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**Group Members: Onur Akdeniz**

**Doğukan Atik**

**Ozan Berk Boyraz**

**Ahmet Demirdağ**

**Mert Eyüboğlu**

## 1. Summary Of This Week's Progress

In this period of four day, communication subsystem receiver circuit is improved which is explained in the following section in detail. Along with this, work on the software part of the image acquisition and image reconstruction subsystem continued.

## 2. Improvements in the Receiver Circuitry

The previous receiver circuitry was constructed with a transresistance amplifier with LM 741 transresistance amplifier. The output of LM 741 was coming with 2 V DC due to fact that negative bias of the LM 741 opamp was connected to ground. The company planned to use one power source which was used as  $V_s$  as seen in Figure 1. The serial connected diodes were used to provide voltage drop  $\approx 2V$  so that voltage output of receiver circuit can have high and low level voltages which can be read by Arduino or Raspberry.

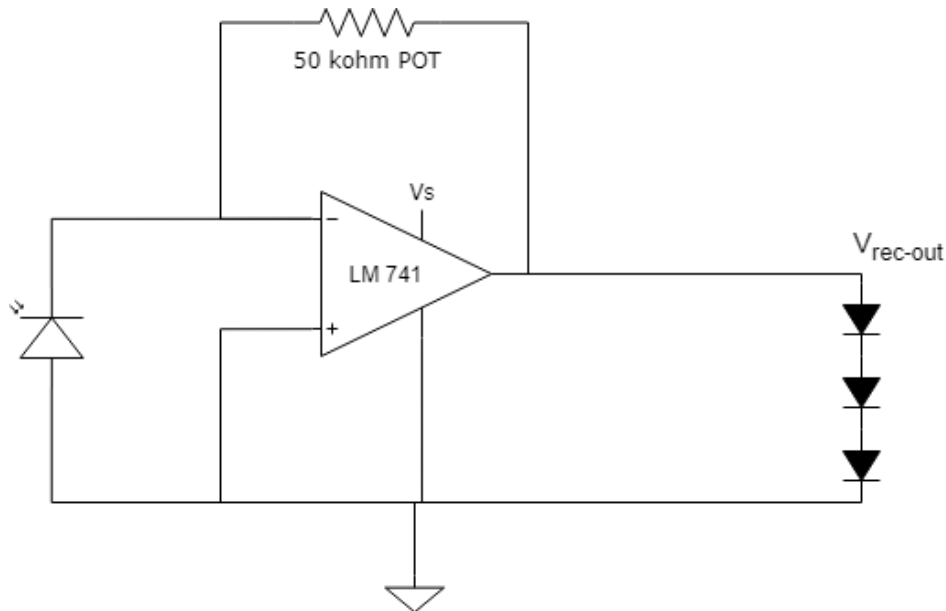


Figure 1: Previous receiver circuit.

The circuit was operating in 5-10 cm range and output was very sensitive to external intense light sources. These problems are solved in the improved version of the receiver circuit which is seen in Figure 2.

A high pass filter is connected next to transresistance amplifier. It filtrates the DC part of the output of transresistance and an AC signal which oscillates around zero is obtained. This signal is inputted to comparator where the reference voltage is 0V.

The resultant circuitry has better distance and external light insensitivity.

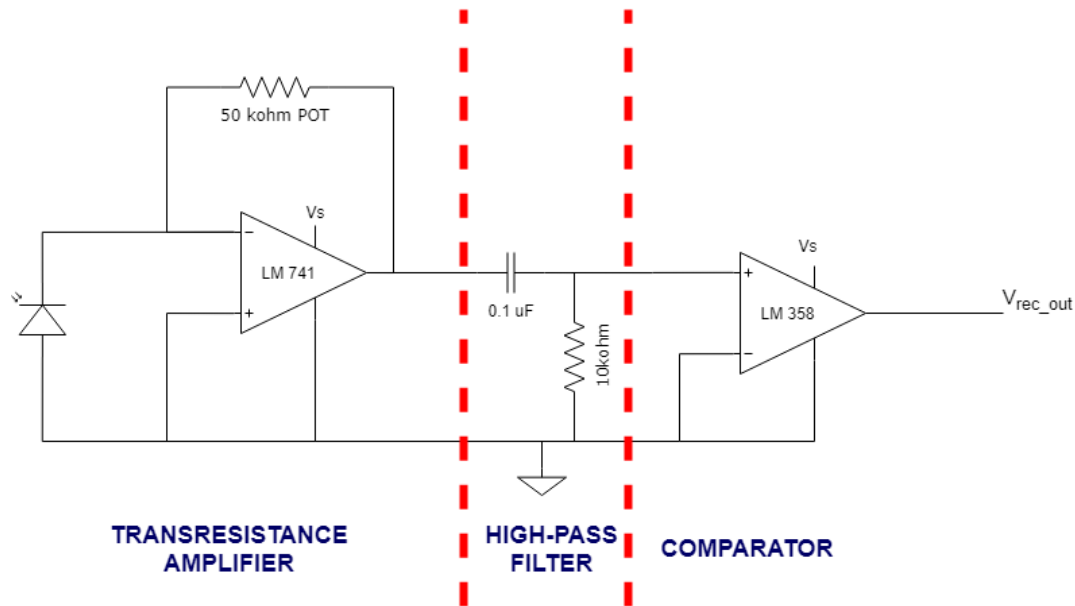


Figure 2: Improved receiver circuit.

An example output of the receiver circuit where receiver and transmitter distance is 30 cm, input is 10 kHz square and the photodiode is under intense light is seen in Figure 3.

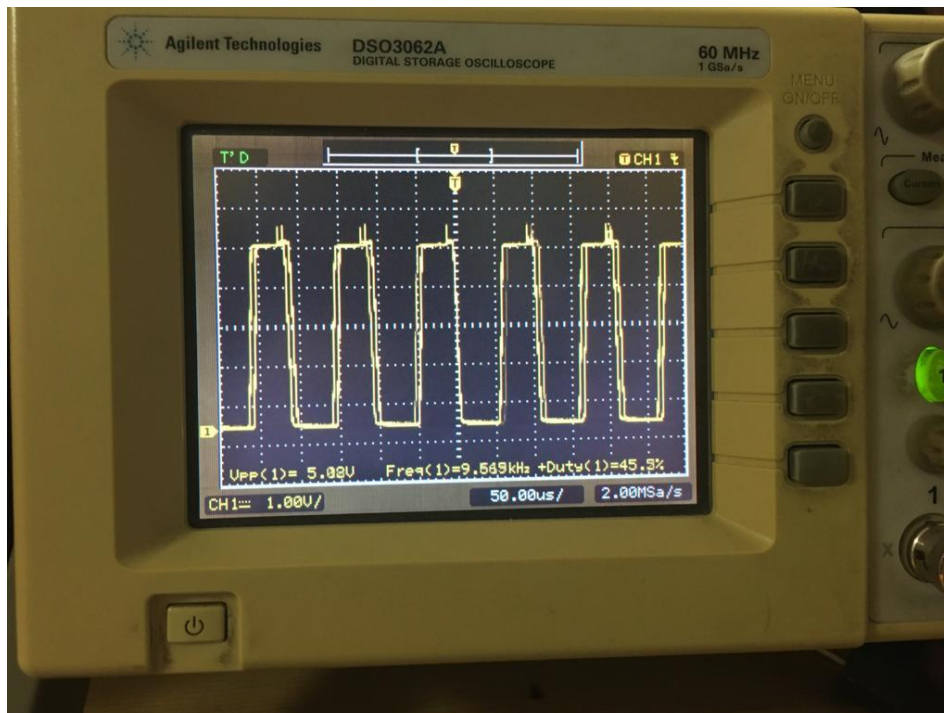


Figure 3: An example output of receiver circuit.

### 3. Conclusion

This week, progress is made in communication submodule. The test procedures of the completed parts of the subsystems are ongoing. The test results will be put together in the report which will be delivered in 3 days, CDR.