

EE164 Laser Transmitter/Receiver Project

Laser Transmitter/Receiver Project Group Members:

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Purpose: The main objective of this lab was to modulate a signal using an audio transformer and pen laser pointer from a transistor radio using frequency modulation and intensity modulation to hit the Cadmium Sulfide phototransistor.

Parts Used:

<u>Units</u>	<u>Radio Shack Part #</u>	<u>Product</u>	<u>Cost/Unit</u>	
2	42-2434	6' Shielded Cable	\$2.99	
1	273-1380	Audio Output Transformer	\$2.99	
1	270-378	Mini Clip 1-1/4"	\$3.29	
1	277-1008	Mini Audio Amplifier	\$11.99	
1	270-334	Mini-Hook Adapters	\$3.29	
1	276-1657	CdS Photoresistor Multi-Pack	\$2.69	
2	(Fry's Electronics)	AAA Battery Pack	\$0.69	
1	(Fry's Electronics)	Laser Pointer	\$14.99	
			\$46.60	Total Budget

Procedure:

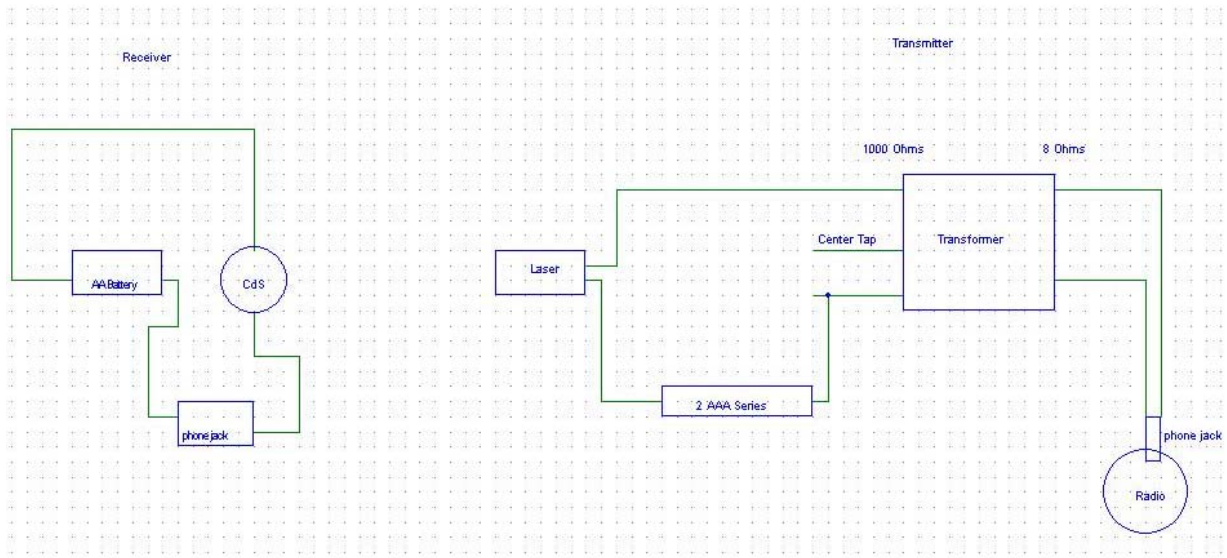
Transmitter:

We first hooked up the laser in series with two AAA batteries (1.5 V). We then connected a wire between the positive terminal of the laser to the green wire located on the 1000 Ohm Side of the Audio Output Transformer. The black wire (center tap) was not connected in this experiment. The remaining blue wire on the 1000 Ohm side of the Audio Output Transformer (RS#273-1380) was connected to the negative side of the two AAA batteries connected in series (total of approximately 3.0 V). On the 8 ohm side of the Audio Output Transformer, we connected the blue and red wire to the each of the stripped ends of the 6' shielded 1/8" audio phone jack. The other end of this phone jack went into our iRiver Radio/CD Player.

Receiver:

For the receiver, we used a CdS (Cadmium Sulfide) photocell and soldered one end of the CdS receiver to the positive side of an AA battery (1.5V) and soldered the other side to the stripped end of the 6' shielded 1/8" audio phone jack. The remaining stripped lead of the 6' shielded 1/8" audio phone jack was soldered to the negative end of the AA battery. We then connected the input of the 1/8" Audio jack into our Mini Audio Amplifier (RS# 277-1008) which completes the construction of the Receiver.

Schematic:



Conclusion: We tested the laser from large distance and we found that as we increased the distance between the Transmitter and Receiver, the signal gets attenuated and the light from the laser gets scattered. As the light gets dispersed, the attenuation can be detected from the significant decrease in sound from the audio amplifier as we increased the distance between the transmitter and the receiver.