

**Extra Credit**  
**Camera Shooter**

You can receive extra credit the first ¼ of the semester by building a shooter out of a disposable camera and an inductor coil. You can get extra credit on the first quiz, ONE of the experiments (1,2, or 3), OR the first project. The points available are as follows:

<u>Distance</u>	<u>Points on Experiment</u>	<u>Points on Project</u>	<u>Points on Quiz 1</u>
each meter	1	1/2	2
maximum	8	4	16
cutoff	50	25	100

For example, if your camera shoots 4 meters, you can get 4×1 points added on to an experiment grade. If the four points would make the experiment grade go above 50 points, however, your grade will be limited to 50 points. You can only apply all points to one project, one experiment, or the quiz. You cannot mix and match points. YOU MUST do the project as an individual. The points will be applied towards your grade on an individual basis.

How to build a paper clip shooter:

- 1) Make an inductor coil
- 2) Take a paper clip (or piece of paper clip) and place it inside the coil
- 3) Hook the coil to a specially prepared camera.
- 4) Charge the flash capacitor of the camera.
- 5) Release the charge in the capacitor through the coil. (Take a picture.) This will shoot the paper clip.
- 6) Measure the distance the paper clip went.
- 7) Have a staff member observe the shoot and fill out the attached sheet.
- 8) YOU MUST give your inductor to the staff after you have demonstrated that it works.
- 9) YOU MUST tell the staff member what you would like to apply the extra credit towards at the time s/he signs the sheet.

Some things to think about:

- 1) Be careful with the two leads to the camera flash. If it accidentally discharges into you and not the coil, it will give you a very bad burn.
- 2) The sample cameras and magnet wire in the studio cannot be taken home.
- 3) You must use the ARCOR magnet wire. One reason we are doing this particular project, is to use up this brand of wire because it does not work well for motor building.
- 4) This web site may help, but you do not need to shoot nearly as large a projectile for nearly as far: <http://www.electronics-lab.com/projects/science/017/>
- 5) If you cause major damage to the building or any equipment in the studio, you do not get the points. Major damage to be defined by the staff.

This extra credit has no write-up. You simply need to demonstrate how far your shooter shoots the paper clip to a staff member.

## Extra Credit

Names of Participant(s): \_\_\_\_\_

Section \_\_\_\_\_ Group \_\_\_\_\_

Distance \_\_\_\_\_

Apply Towards: \_\_\_\_\_

Points \_\_\_\_\_ (points per foot: Quiz=2, Experiment=1, Project=0.5)

Inductor given to staff \_\_\_\_\_

Staff Signature \_\_\_\_\_