

EELE 250: Circuits, Devices, and Motors

Putting Pieces Together

Last week of class!

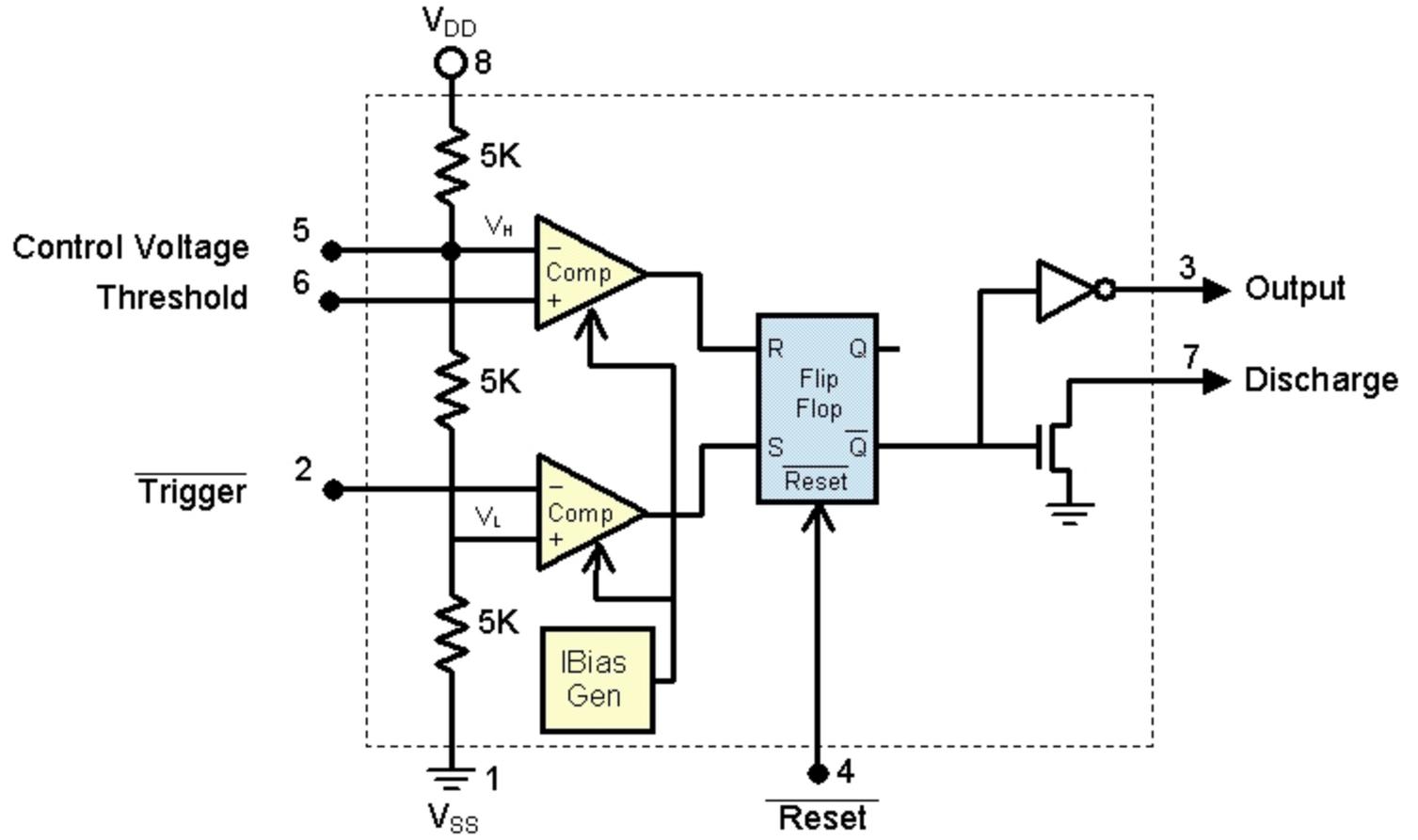
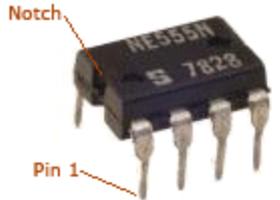
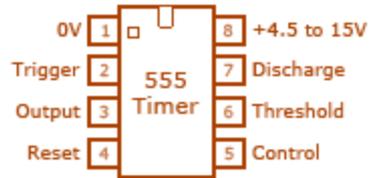
- Reminder: Lab #9 will be done this week. Meet directly in EPS 119, and don't forget to do the pre-lab.
- Wednesday and Friday this week will be review and problem sessions.
- Final exam is Tuesday morning, 8AM. The final will be comprehensive. You may bring up to 3 handwritten sheets of notes, a calculator, and pen/pencil.

Simple Electronic Projects

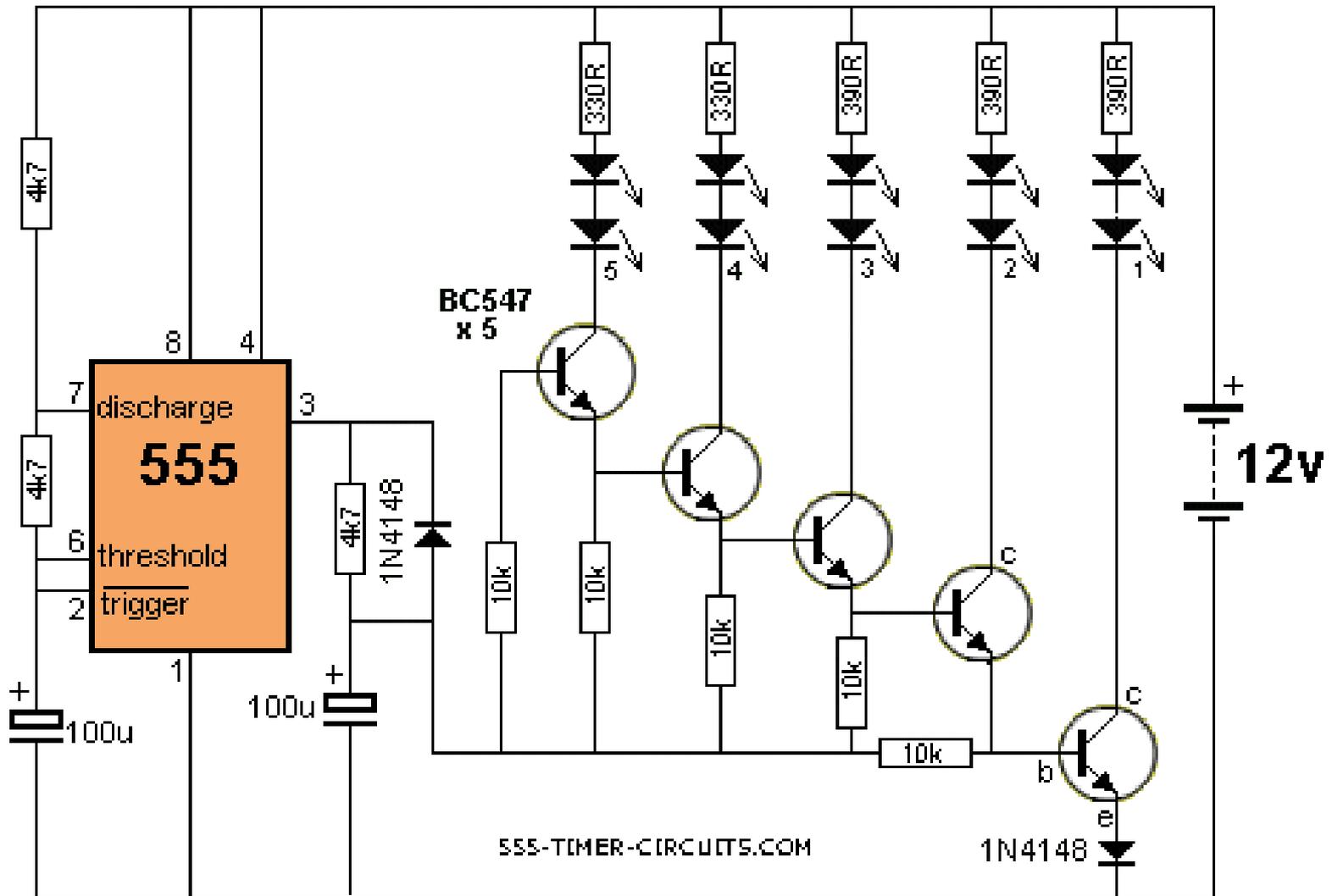
- EELE 250 has introduced many of the basic principles of electrical engineering.
- Even if you are not an EE major you can still use the basic knowledge as part of your professional “toolbox.”
- Many electrical and electronic projects involve simple building blocks: power supplies, switches, batteries, op amps, transistors, motors, etc.

555 Timer

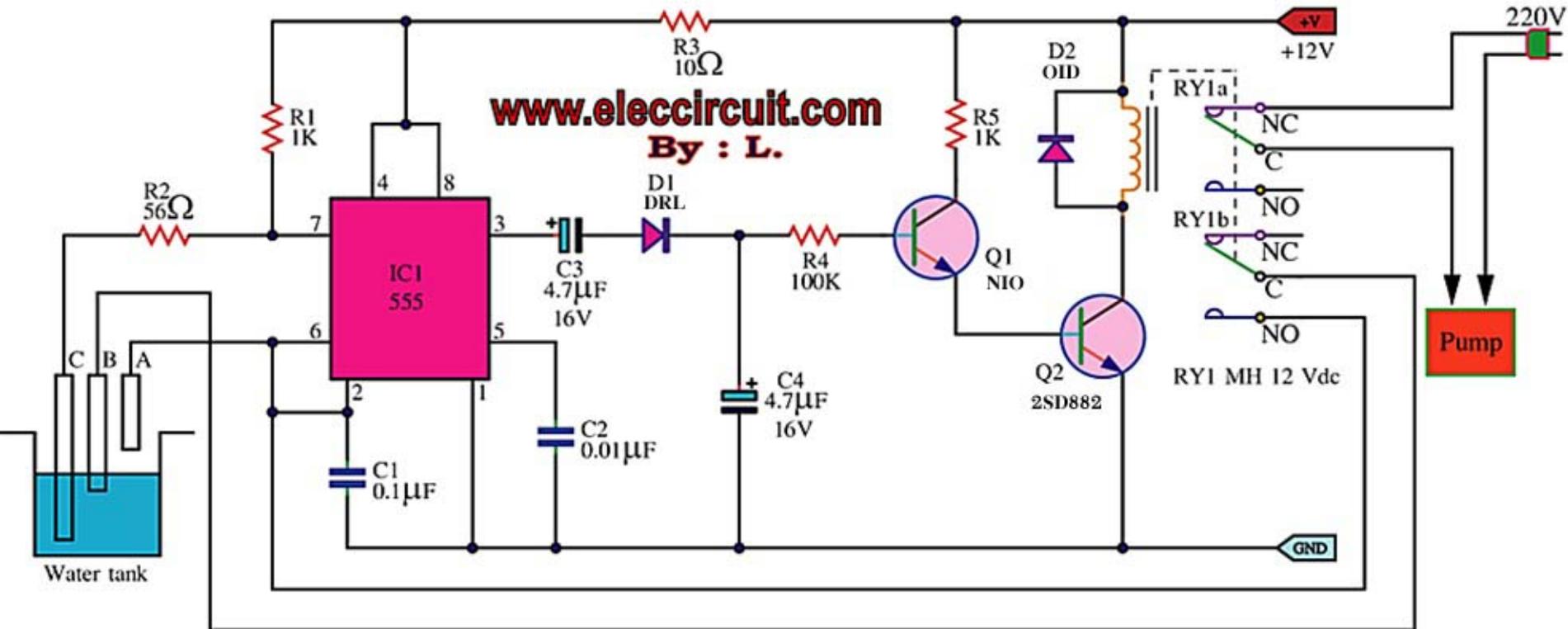
555-timer-circuits.com



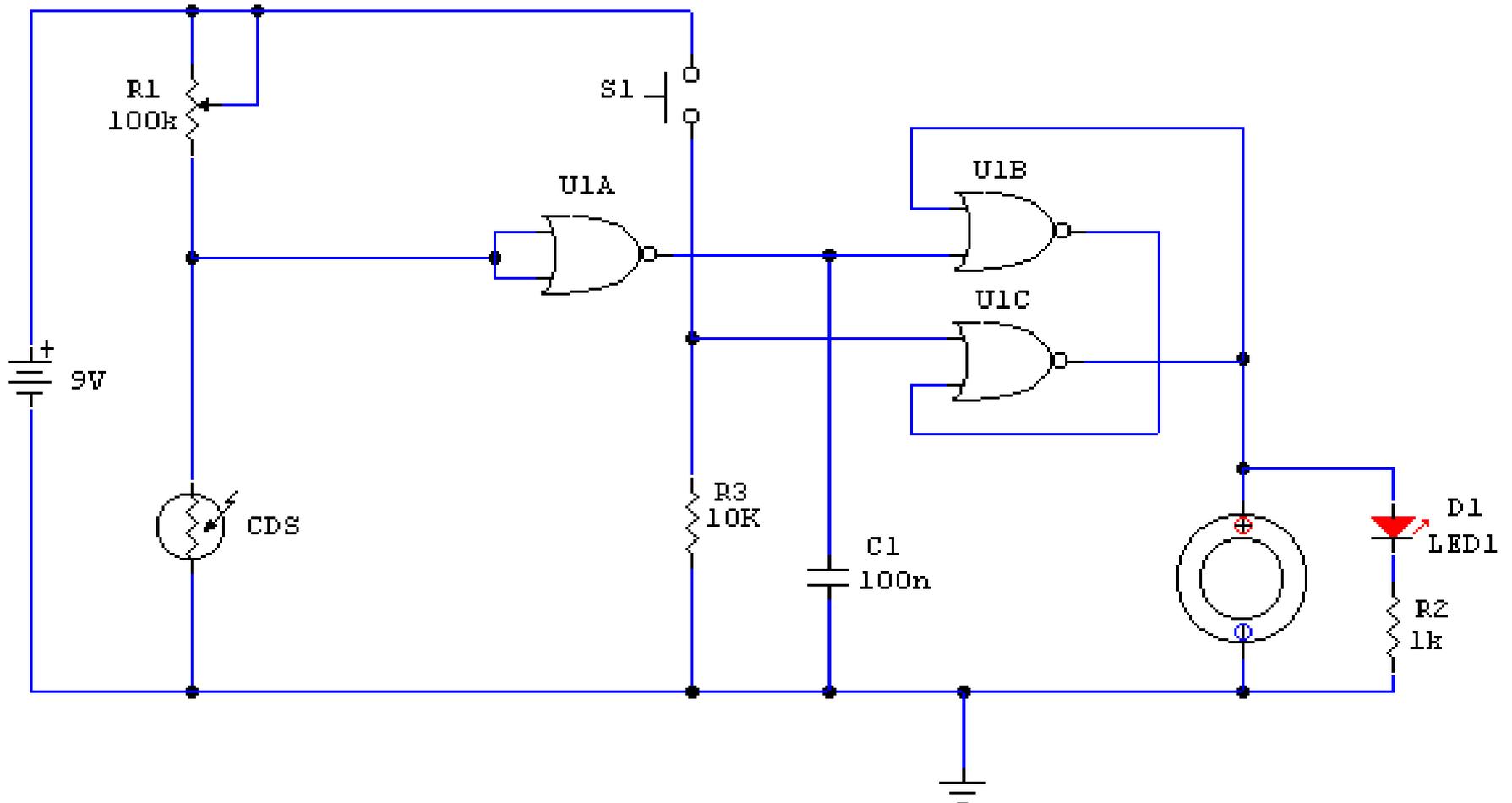
Timer circuit: sequential flasher



Timer circuit: tank & pump control



Light detector



Battery and power consumption

- Batteries are often rated in “Amp-Hours” or “milliamp-Hours”, giving a rough estimate of how long they will last at a given rate of discharge.
- Ex: A 2500 mA-H 1.5V AA battery could deliver 100 mA for 25 hours.

Total energy (J) = $V \times I \times \text{time}$ ($J/C \times C/s \times s$),
so AA battery = $1.5 \times 2500\text{m} \times 3600 = 13.5 \text{ kJ}$

Battery and power consumption (cont.)

- 1 dietetic calorie = 1 kilocalorie = 4187 joules
- 1 AA battery: 13,500 joules = 3.2 calories
- Recommended daily allowance = 2000 calories
- = 625 AA batteries (about 33 pounds)