



Royal Rangers

Merit Requirements: Silver-Bordered Merit

ELECTRONICS MERIT

1. Define the following terms:

- a. Resistor
- b. Capacitor
- c. Transistor
- d. Electrical circuit
- e. Series circuit
- f. Parallel circuit
- g. Series-parallel circuit
- h. Integrated circuit
- i. Printed circuit board

2. Illustrate the schematic symbol of each of the following parts:

- a. Resistor
- b. Capacitor
- c. Transistor
- d. Diode

3. Present to your commander actual samples you have done for the following:

- a. Solder two wires together using rosin core solder. The solder splice should show the proper technique, not too much or too little heat.
- b. Solder two wires together and show the effects of a “cold” solder splice. Explain in writing what can happen with a cold solder splice.
- c. Insulate a soldered splice using two techniques.

4. Explain in writing how to avoid heat damage to components such as a transistor. Also explain how to avoid damage to a circuit board while soldering.

5. Build an electronic project that has some kind of output, e.g., mechanical, audio, etc. You may purchase a kit from an electronics supply store and assemble it for this purpose. Show your intended project to your commander before purchasing the kit. The project should include a resistor(s), capacitor(s), and transistor(s). As part of the project, complete the following:

- a. Make a schematic drawing of the project. Be ready to read and interpret the schematic diagram for your commander.
- b. Show how the project works and explain how it operates to the best of your ability.
- c. Apply Ohm’s Law to at least one part of a circuit in this project.

6. List the type of meters or Multimeter settings you would use for the following electrical measurements:

- a. Voltage
- b. Amperage
- c. Resistance

Then using a Multimeter, demonstrate how to make the above electrical measurements on the electronic project built in Requirement 5.

7. Write a five hundred to a thousand-word report on some type of a digitalized electronic control device. Focus your research on the components in a chip or circuit needed to make this device function. Report your findings about the device, indicating its purpose, a summary of how it works, and some of its major components. Cite your sources at the conclusion of the report.

1. Describe in writing a control device that has not been invented. Explain its purpose and who would benefit from this invention.
2. List some of the careers available in the electronics field. Select a profession that most interests you in this field and research the high school classes that could prepare you to work in this field. Write a short report of your findings.