

## Boe-Bot Robot Safety



**WARNING: The Boe-Bot Robot is an electronics prototyping kit with exposed circuits, not a toy enclosed in a plastic case. Improper use can result in property damage or personal injury. Read and follow all the information in this document.**

- Small parts in the kit can pose a choking hazard. Keep out of reach of small children.
- Recommended for ages 14 and up with adult supervision strongly recommended.
- Read and follow all precautions listed here as well as in the *Robotics with the Boe-Bot* text.
- Exercise common sense, and if in doubt, contact Parallax Tech Support (above).

### Always...

- Always use the white plastic flat-head screws instead of the metal ones to attach the battery pack to the chassis.



- Always use a non-conductive work surface, such as plastic, wood, laminate, ceramic tile, or fiberglass. Antistatic mats are also acceptable.
- Always be precise as you follow the instructions in the accompanying *Robotics with the Boe-Bot* text. When building circuits, insert wires into the socket shown. Do not insert wires into sockets randomly, which could create a short circuit. See Short Circuit Symptoms, p2.
- Always keep wires and other electronic components parts off to the side in a small container while building circuits.

### Never....

- Never construct or build circuits on your robot on a conductive (metal) work surface.
- Never work on top of scattered wires, resistors or other electronic parts.
- Never intentionally short-circuit the Board of Education power supply terminals.
- Never press live (powered) circuits against your skin. Exception: it is okay to press the robot touch-whisker sensors to their posts on the breadboard.
- Never put circuits, batteries, or other Boe-Bot robot parts in your mouth.

**OVER**

- Never leave a robot unattended while power is connected.
- Never store or transport your robot in the same container with loose parts.
- Never store or transport robots on top of or against each other if batteries are installed.
- Never store robots with potential fuel, including papers, sticky notes, flammable materials, or corrosive materials.

## Practice Battery Safety

- Unplug the battery pack from the Board of Education board when not in use.
- Do not use a metal tool to pry batteries out of the Battery Pack.
- Remove batteries when storing, shipping, or checking your robot into travel luggage. Consult shipping and transport carriers for additional requirements.
- Never put batteries in your pocket or store batteries with other electrical or metal parts.
- Do not recharge non-rechargeable batteries.
- Remove dead or exhausted batteries from the robot.
- Insert batteries correctly; match positive and negative symbols on the batteries with the positive and negative symbols inside the pack.
- Use only 1.5 V alkaline or 1.2 V rechargeable AA batteries.
- Do not place anything across the battery terminals, except the appropriate batteries.
- Do not mix different types of batteries.
- Do not mix old and new batteries.
- Dispose of batteries safely. Do not dispose batteries in a fire; they may explode.

## Know Short Circuit Symptoms — Detect and Disconnect Immediately!



**Circuit mistakes are common while learning electronic prototyping. Short circuits can have DANGEROUS consequences. Know and watch for the symptoms of short circuits, and take action immediately if you suspect one has occurred.**

### Short Circuit Symptoms

- The Board of Education's power light does not turn on even though the battery pack is connected and the power switch is turned on.
- The power light turns on but only dimly.
- You hear a crackle or sudden pop when turning on the power to a circuit you just built.
- You see a tiny puff of smoke from your robot.
- You notice a melting plastic or "something's hot" smell.

### Think you've got a short circuit?

- **DISCONNECT POWER IMMEDIATELY!** Unplug the battery pack (or battery or wall-mount power supply) from the Board of Education.
- Turn the 3-position power switch off (to position-0).
- Batteries may be hot after a short circuit. Do not attempt to remove batteries from the pack until you have checked if they are hot by putting your hand near, but not on, them. If they are hot, let them cool before handling.
- After disconnecting power, carefully double-check the circuit you have built to make sure it matches the diagram in the *Robotics with the Boe-Bot* text, and correct any wiring errors.
- If your batteries got hot, do not re-use them. Replace them with fresh batteries.
- After you have found all errors and double-checked your circuits against the diagram, try reconnecting power but be watchful of short-circuit symptoms.
- If you have a short circuit and cannot find the cause, contact Parallax Tech Support.