

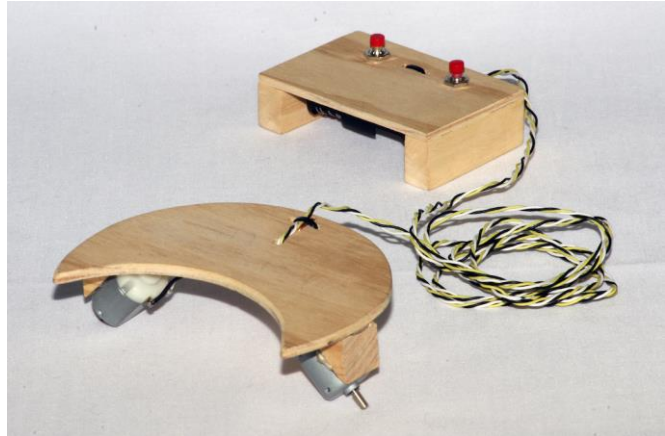


## SOCCKER 'BOT (Code: SOCCER)

### DESCRIPTION

The *SOCCKER 'BOT* is a simple electro-mechanical device that responds to a wired handheld controller. Two push button switches steer the device to move forwards, left or right.

The scoop at the front of the *SOCCKER 'BOT* can "capture" a tennis ball to play a game of soccer between two or more participants. The scoop is shallow enough to allow a competitor to knock the tennis ball out of control, then capture the ball and try to score.



**LEVEL:**

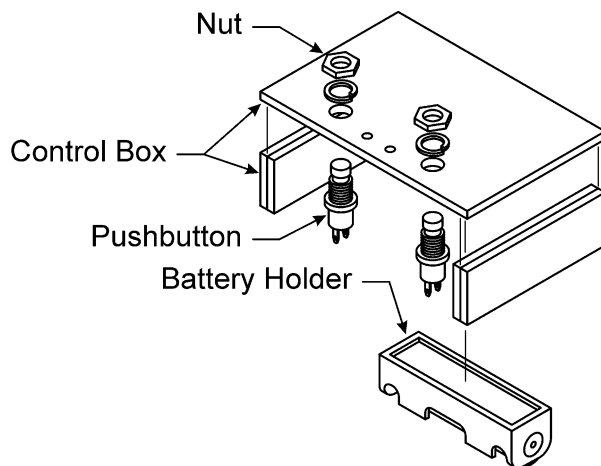
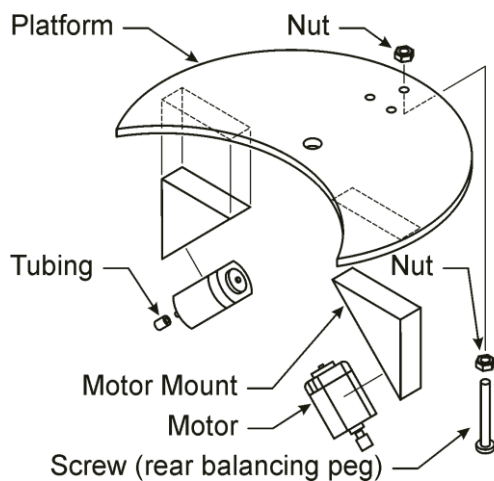
Introductory

**HOURS TO CONSTRUCT:**

7 hours

**SKILL DEVELOPMENT:**

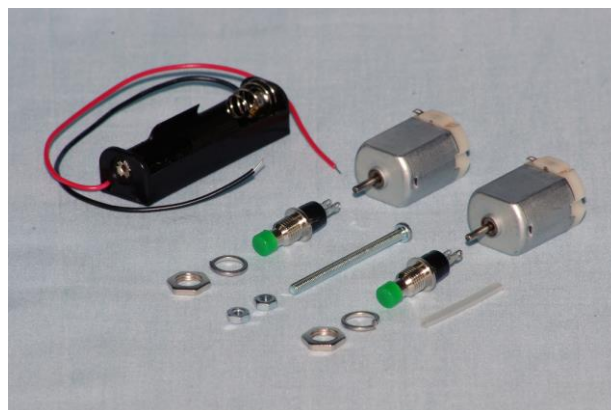
- Planning and Design
- Manufacturing
- Soldering
- Mechanical
- Electrical





## WHAT'S IN THE KIT?

- All the mechanical and electrical components required to make the *SOCCER 'BOT* work including the motors, battery holder and switches.
- A detailed teaching unit with a complete parts list, design suggestions, and general construction guidelines.



## WHAT ELSE IS NEEDED?

The following items are required and are available from Scorpio Technology, but need to be ordered separately:

- |  |   |
|--|---|
| <input type="checkbox"/> 1 x Battery – AA            | (BATTAA – 4 pack <b>or</b> BATTALK40 – 40 pack) |
| <input type="checkbox"/> Multi strand hook-up wire   | (WIREHU10)                                      |
| <input type="checkbox"/> Cable ties (150mm x 3.65mm) | (CABTIE100)                                     |
| <input type="checkbox"/> Double-sided adhesive tape  | (TAPEDS)  |
| <b>or</b> Hot Glue                                   | (GLUESTK)                                       |

The following material is to be supplied by the student / teacher:

- Material for the components (PVC or acrylic sheet, plywood, etc.)

## TOOLS REQUIRED

The following tools are required:

REQUIRED TOOLS	ORDERING CODE
Assorted hand tools – depending on the choice of materials to be used	-
Ruler and pen	-
Craft knife	CRKNF
Soldering Iron and Soldering iron stand: – a good quality soldering iron, with a fine tip <b>or</b>	SOLDIRN SOLDIRNSTD
Soldering station	SOLDSTN
Solder: – 0.71mm 60/40 solder is recommended	SOLD500
Wire strippers	WIRESTR
Drill Bit – 7.0mm	-
Drill Bit – 3.5mm	DB3.5



## ABOUT THE PROJECT

The major features of this project are the planning, design, construction and assembly stages of a simple wire controlled robotic device.

## DESIGN PHASE

- Create your own unique *SOCCER 'BOT* design based on our drawings which focus on component relationships, rather than dimensions. This provides scope for students to individualise their *SOCCER 'BOT* design and increase their engagement in the project.
- There are two parts of the *SOCCER 'BOT* to design:
  - the *SOCCER 'BOT* itself.
  - the handheld control unit.

During the **Design phase**, students will need to:

- Evaluate the suitability of various materials, such as PVC, acrylic, plywood or balsa wood
- Determine where to place the motors
- Determine what to use as the 3<sup>rd</sup> "leg" to support the 'Bot
- Evaluate the ergonomics of the handheld control unit
- Evaluate available technologies that can be used, for example:
  - 3D printer
  - laser cutter (which allows more interesting shapes than usual)
  - vacuum former
- Take into account weight distribution and ease of operation
- Consider the practical aspects of construction and assembly. For example, where to drill holes for the wires to the motors

## MAKING / CONSTRUCTION

Once the Design process has been completed, the students will be able to start **building their design**. They will:

- Make and assemble the *SOCCER 'BOT* platform and control unit that they have designed (platform, motor mounts and balancing peg, control unit)
- Mount the motors, axles, wheels and balancing 3<sup>rd</sup> leg on to the platform
- Mount the battery holder and switches to the control unit
- Wire up the switches, battery holder and motors
- Test and adjust the *SOCCER 'BOT*
- Troubleshoot any problems!

For more information and ideas, go to our website:

<https://www.scorpiotechnology.com.au/kits-in-action>

