Move it Carefully

The instructions for making these kits are not as extensive and clear as the other kits aimed at youth members assembling them.

These instructions assume that the assembler has quite an extensive knowledge of electronics and experience in building kits, and can work out the finer details.

Any questions then email me - Michael venturers@cobargoscouts.org.au

How it works

Move It Carefully is designed as a whole patrol activity. It has 6 switches, 3 that need to be pushed in, and three toggle switches that need to be held down. It also needs to be kept level.

Remove the start plug (6.35mm audio plug), and the 7 segment display counts down in minutes and seconds (adjustable from 1 to 15 Minutes).

It also "Ticks' and Beeps continuously if you let a switch go or tilt it, and the display will show the error.
t- Tilt - its no longer level
s-Switch has been let go
b- a switch has been let go and it has been tilted

The Youth members then have to move the box to another location (setup an obstacle course), all while holding the switches in and keeping it all level.

They then need to plug in another plug (XLR plug) at the end before the timer expires. They will get a Pass (before timer expires) or Fail (timer expired), and a score cycling as follows

Pass or Fail
t-XX
s-XX

Cycle
Repeats

xx is a value 0-99) , will show “Hi” if above 99
t- indicating the number of seconds it was not level
s - indicating the number of seconds one or more switches were let go.

You can strap out some of the switches or even the tilt sensor, to make it easier for younger members..

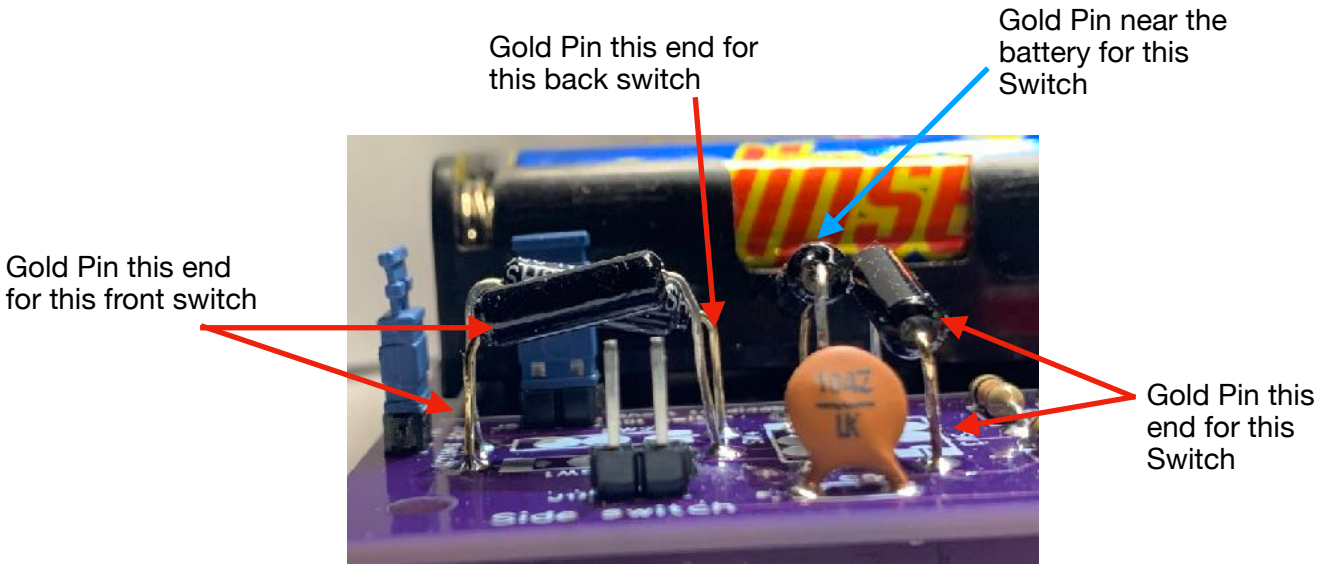
Plugs and Switches.

The plugs used - 6.35mm and XLR were chosen as they are tough plugs and hard for Scouts to break

- The 6.35mm plug is only used to turn the power on/off and just moves the switch within the socket, so does not need to be wired at all.
- 2 pins (GND and RE1) connected to the XLR need to be connected together to trigger the finish cycle RE0 is connected to a spare port on the Pic, so that it can be programmed as an output or input if necessary to interface to something external.
- The switches are strong metal toggle and pushbutton switches that will take a fair amount of punishment. - They can be strapped out to make it simpler for younger youth members.

Tilt Switches

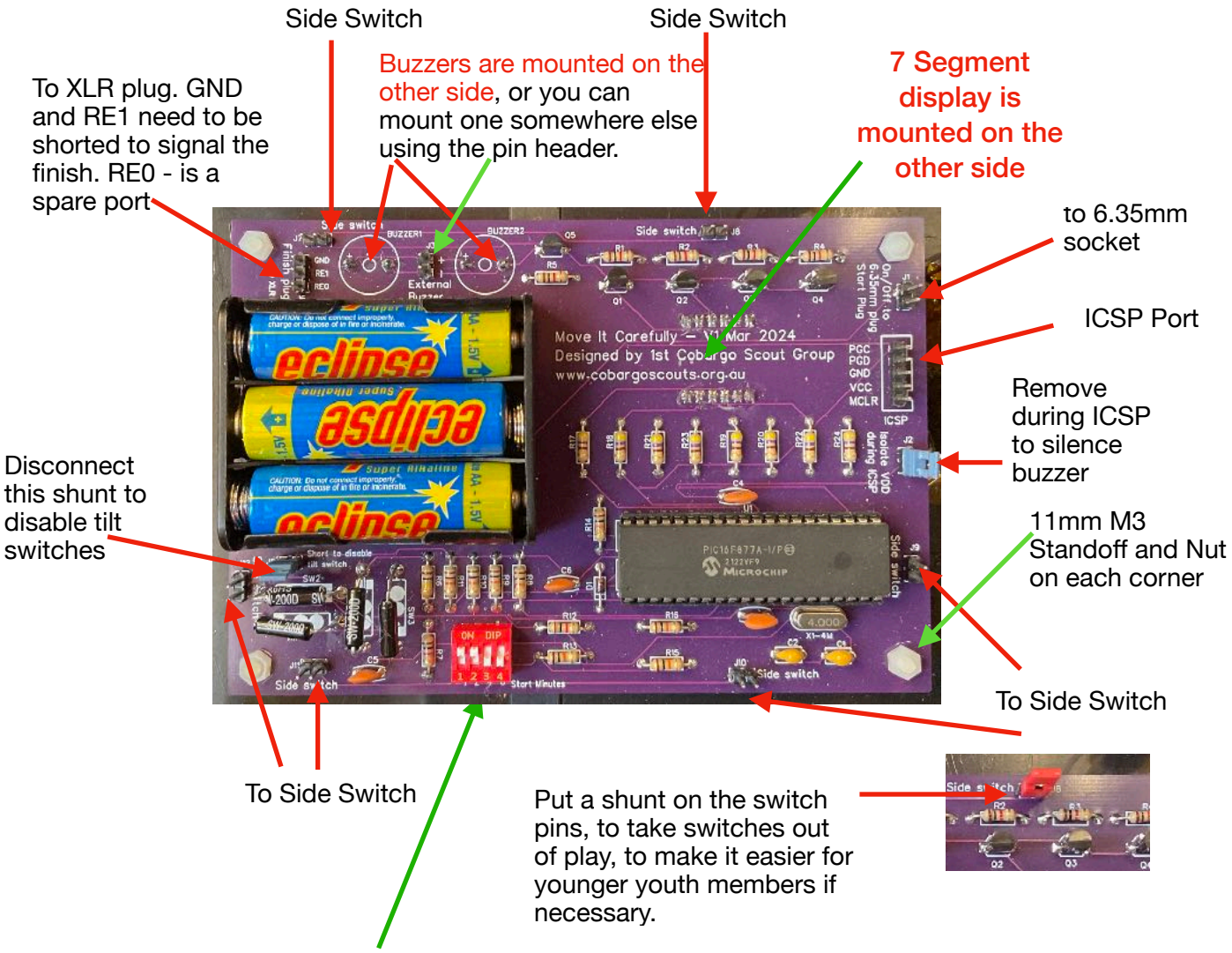
Tilt switches, need to be tilted slightly on the board. They will be upside down as the board is mounted underneath the top of the case. They are tilted slightly to ensure they only trigger at about 20 degrees tilt. The Gold pins are alternated - see below.



ICSP

This project is based on a PIC 16F877A Microcontroller..
I have added an ICSP plug to the board, If you do use this port, then i recommended that you remove J2 (labelled isolate VDD during ICSP). This disconnects VDD from the buzzers, so that they do not buzz continuously when you are programming it.

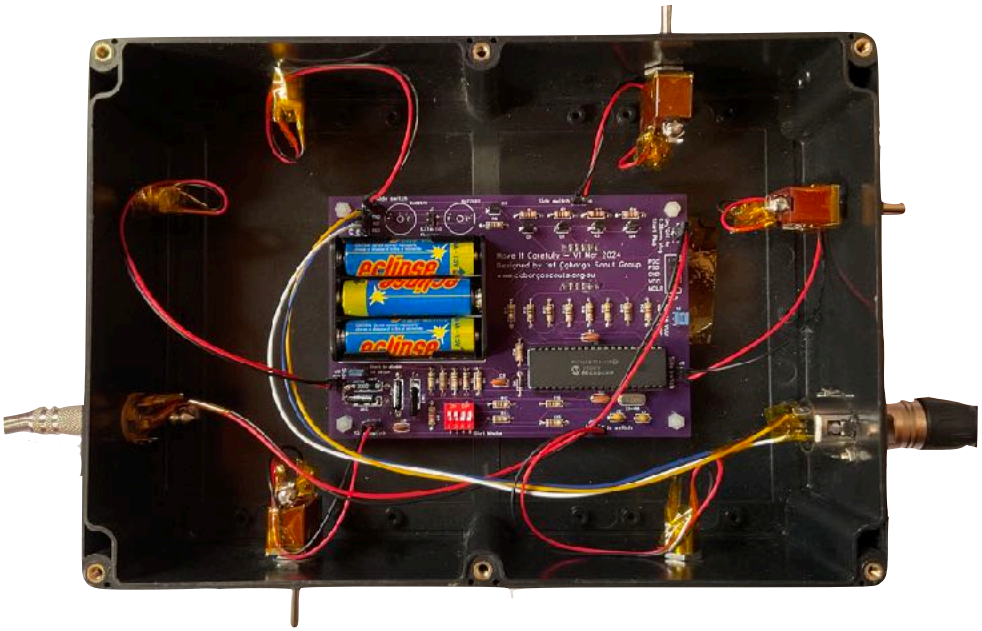
Board Layout



Time Adjustment

The countdown timer can be adjusted to start from 1 to 15 minutes. This is done in Binary on the Dip Switches. If you accidentally set it to 0, it will start at 1 minute.

Board in the Box



Exterior View

Paracord to tie up the plugs, so they don't get lost