CWSprintLite

Net-Trekking Limited

Version 0.4 Rev D

http://www.Net-Trekking.co.uk

"Every Geek should have one!"

Simple, easy build kits following a brutalist style that every geek should have.

CWSprintLite

Note

All callsigns generated by CWSprintLite are fictitious and have no relation to any matching real callsigns.

Contents

CWSprintLite

1. Introduction

Learning Morse code is never easy; you really must surround yourself in a World of Dits and Dahs. CWSprintLite can help with that. On the pressing of a single button, you can get a quick burst of CW at any complexity level you desire – simple groups, callsigns, words, quotes, and QSO overs. A little and often is the way to go.

2. Assembly

Assembly is relatively easy and should take no more than an hour.

2.1. Required Tools

To assemble the kit, you will require the following tools:

Tool	Comment
Small soldering iron	
Solder	See safety notes above.
Wire cutters	
Small cross head screwdriver	

2.2. Parts List

Part	Quantity	Comment
Bolt M3 12mm	4	
Capacitor 100nf	2	C1, C2
DIP Switch 8 way	1	DIP1
ESP32 C3 SuperMini	1	U1
LED WS2812B APA-106	3	LED1, LED2, LED3
Nut M3	4	
PCB	1	
Resistor 470 Ohms ¼ Watt	1	R1
Speaker 8 Ohms	1	SP1
Stand – Left hand side	1	
Stand – Right hand side	1	
Switch - Tactile	1	SW1
Transistor BC639	1	T1
USB Cable	1	
Variable Resistors – 10K Ohms	3	VR1, VR2, VR3

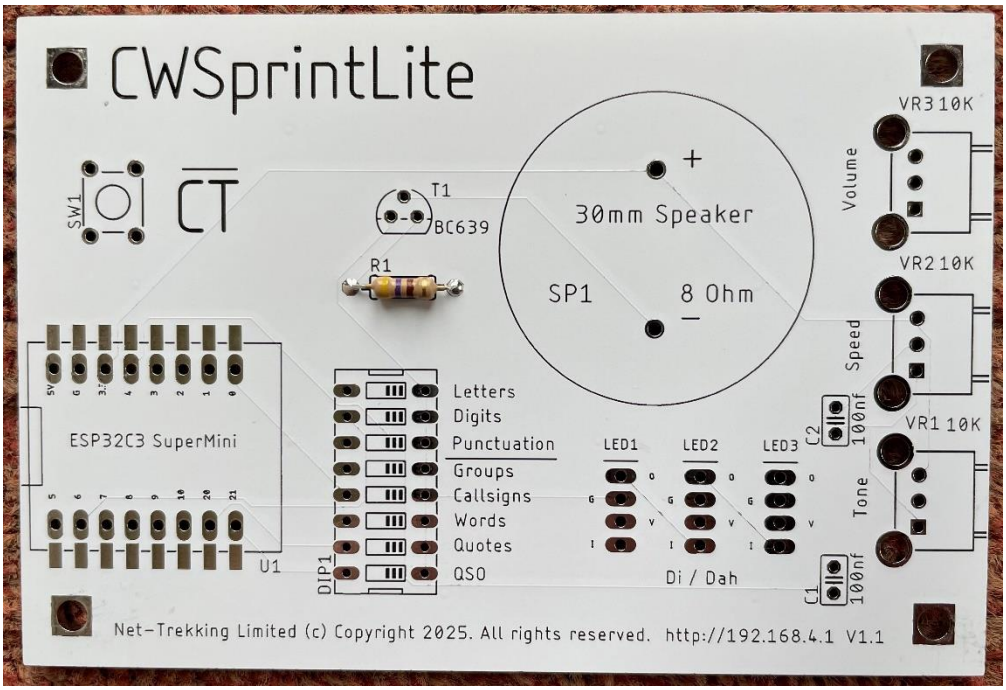
2.3. Assembly Steps

Assembly is sometimes easier working from the lowest profile components to the highest. With that in mind the suggested order of assembly is given below.

The speaker is quite magnetic. It's worth keeping this away from offcuts off other components; if they pulled in through the grill they can be very difficult to get out!

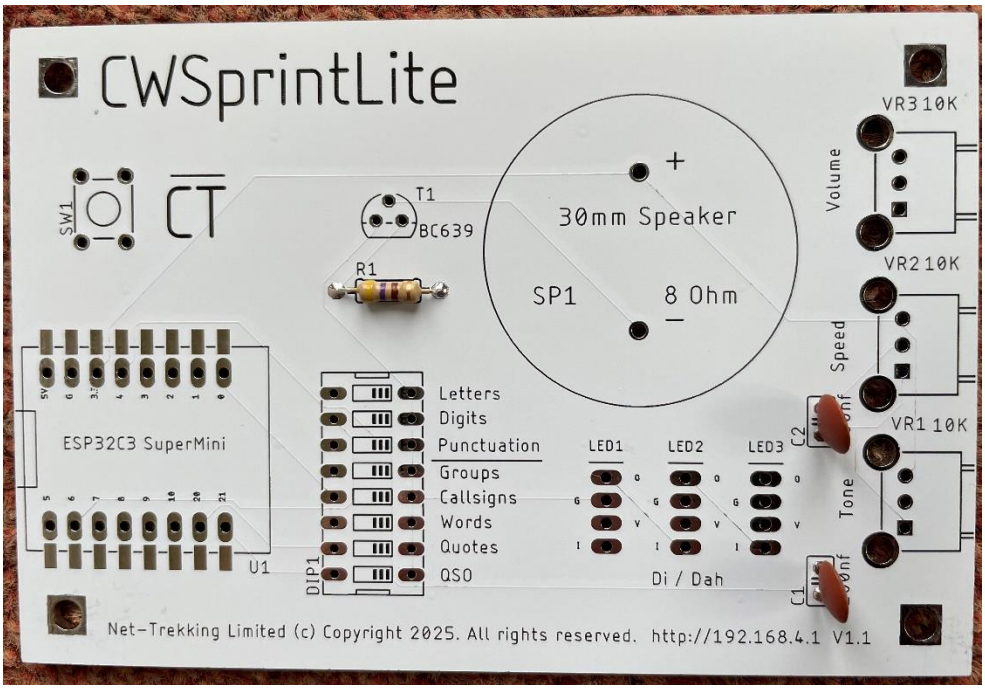
2.3.1. Resistor - R1

Start with resistor R1. Mount it flush to the PCB with the gold band to the right. It can be orientated either way but with the gold band to the right then the value of the resistor reads left to right as expected. Once complete the PCB will look like:



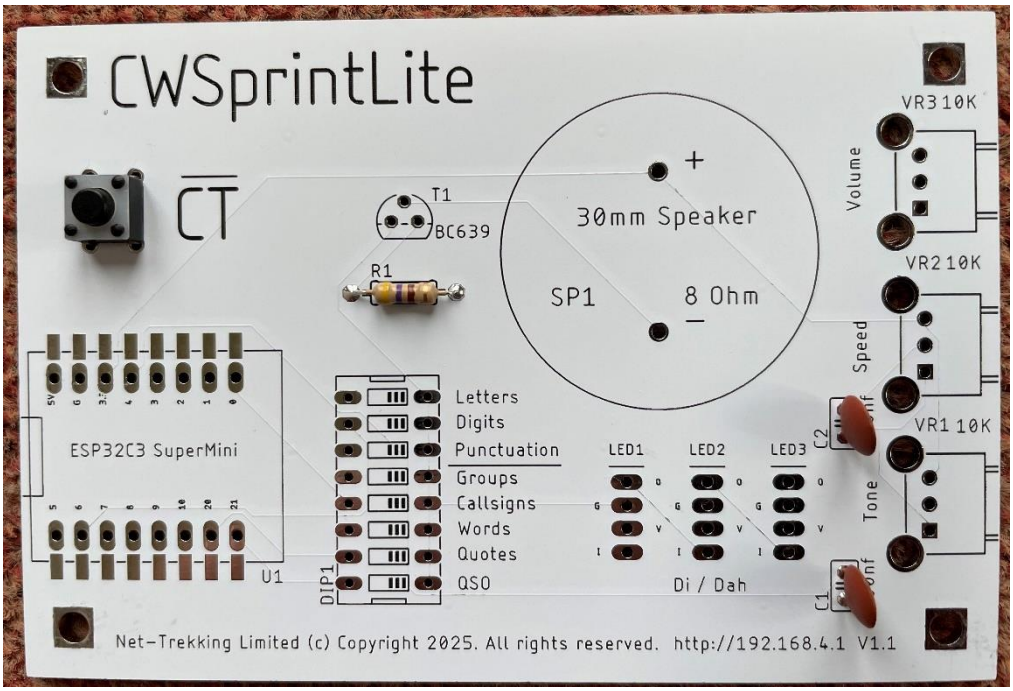
2.3.2. Capacitors - C1 & C2

Next insert the two capacitors C1 and C2. Mount them flush to the PCB with the label on the left-hand side. Again, this can be mounted either way around, but the value is easier to read looking left to right. Once complete the PCB will look like:



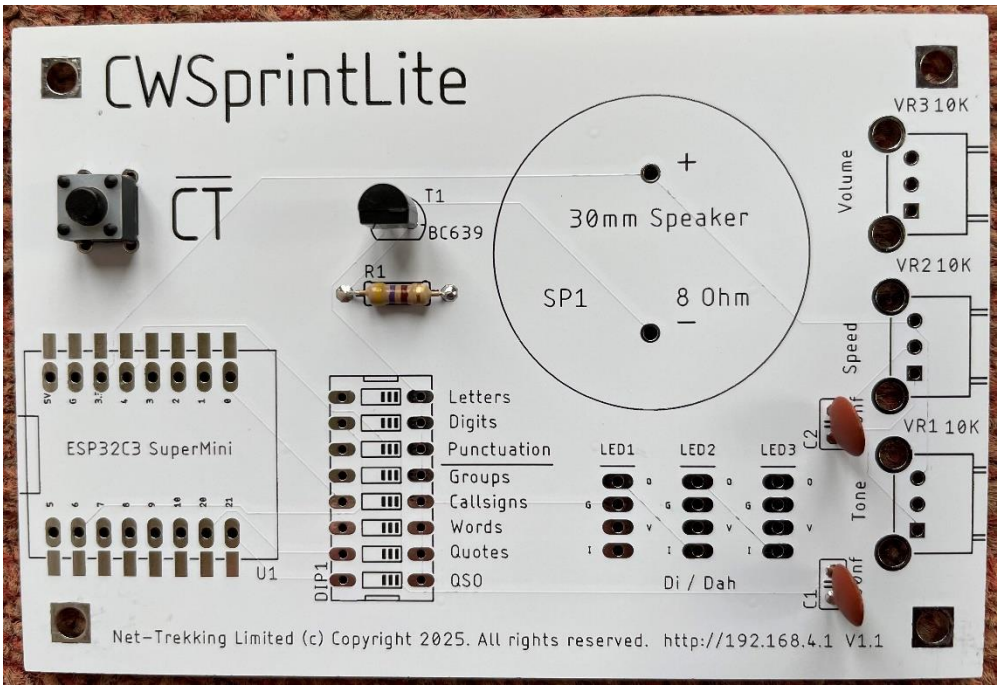
2.3.3. Tactile Switch – SW1

Next insert the tactile switch. Once complete the PCB will look like:



2.3.4. Transistor – T1

Next insert the transistor T1. Mount it flush to the PCB in the orientation shown on the PCB. Once complete the PCB will look like:

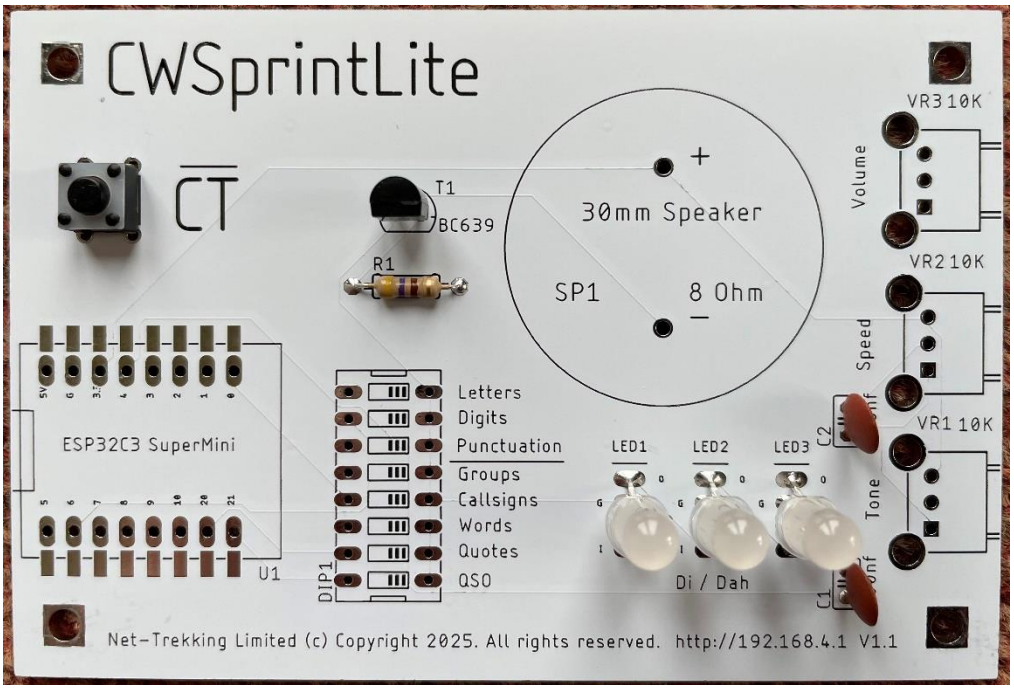


2.3.5. LED Array

Next insert the LED array. The LED array needs to look smart; all the LEDs need to be set at the same hight to form a pleasing when viewed from the side. To achieve this, it is recommended to insert all LEDs into the PCB. The flat edge of each LED should be at the top paired with the small horizonal line on the PCB. Then solder the top pin of each LED. Once complete recheck the LED hights and alignment. Make any required adjustments and then solder the bottom pin of each LED. Check the alignments and make any adjustments before finally soldering all the LED pins.

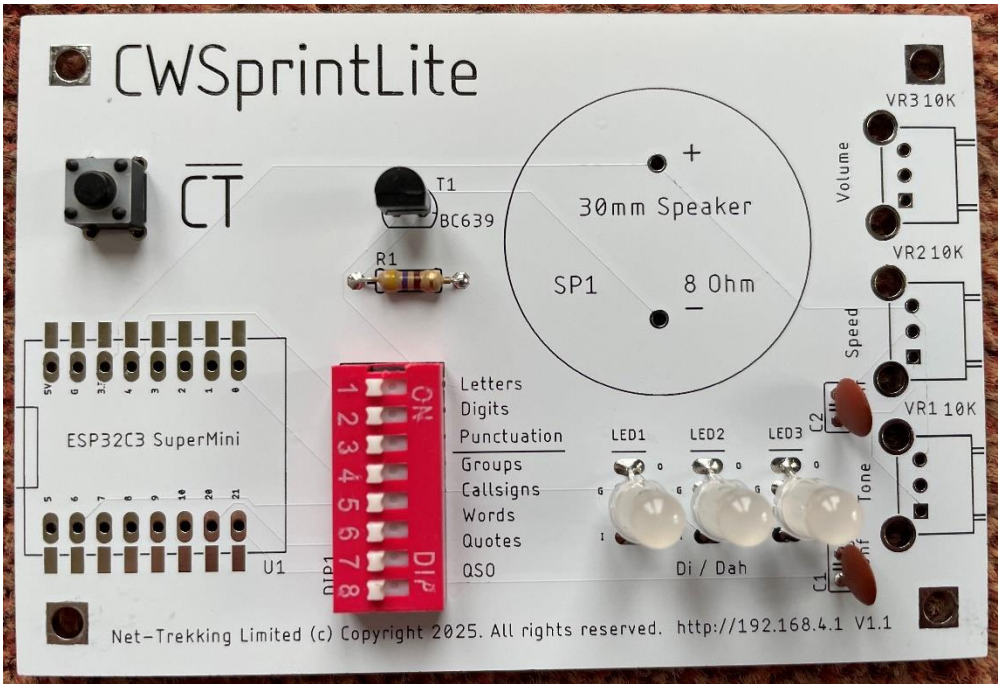
The LEDs may also be orientated by the length of the legs. Please ensure that the long legs are inserted at the top.

Once complete the PCB will look like:



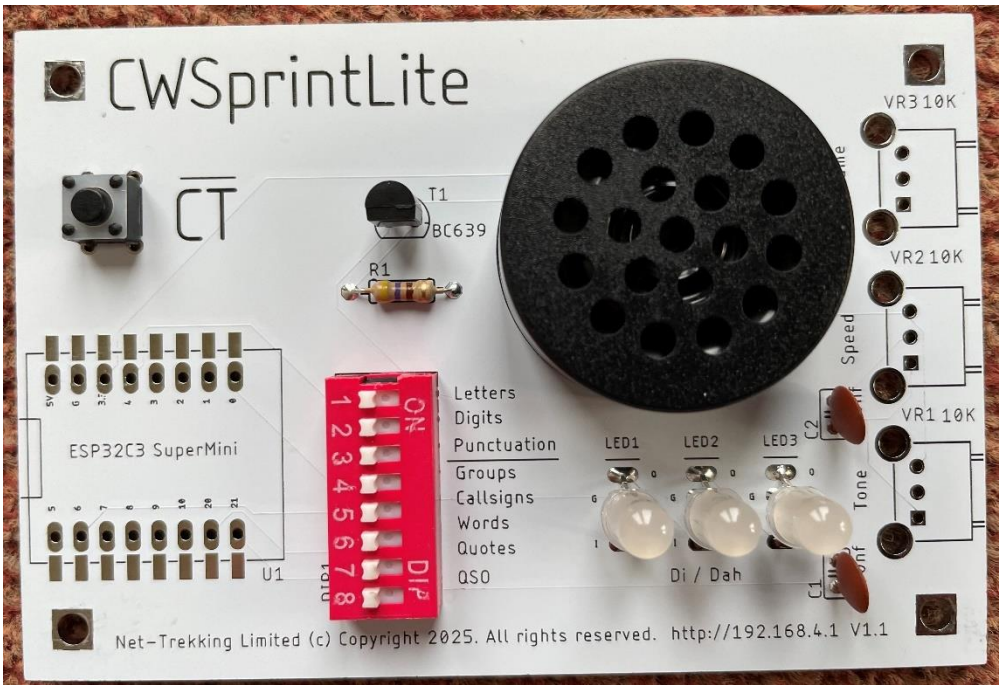
2.3.6. DIL Switch – DIP1

Next insert the 8-way DIP switch. This should be orientated so that the word “ON” printed on the switch it top right adjected to the word “Letters” on the PCB. The easiest way to do this is to solder two pins at opposite ends of the switch, make sure it sits flush, and then complete the soldering of the remaining pins. Once complete the PCB will look like:



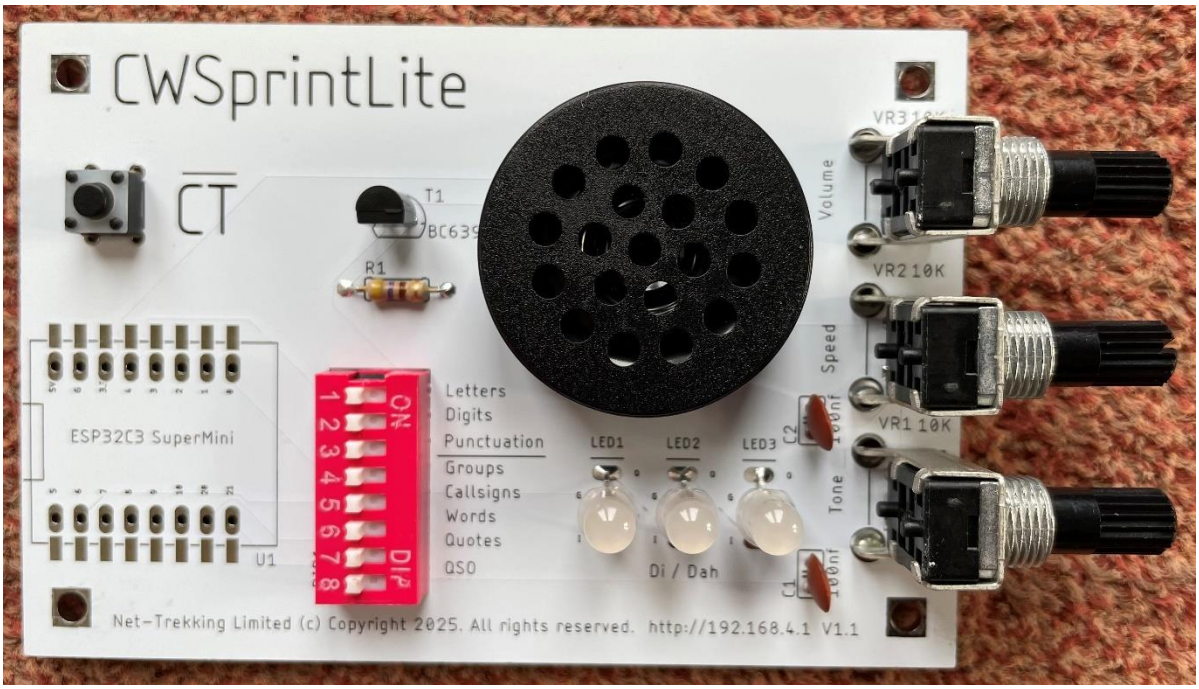
2.3.7. Speaker - SP1

Next insert the speaker. Ensure that the orientation is correct the of pin marked "+" being at the top. Once complete the PCB will look like:



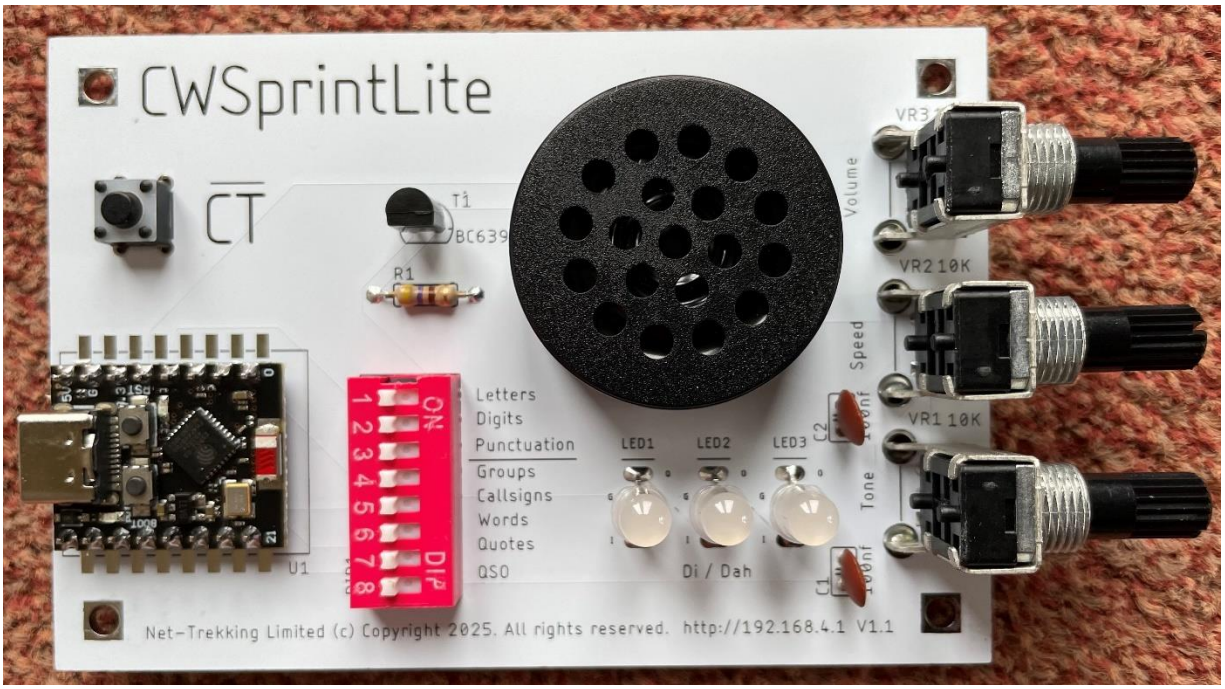
2.3.8. Variable Resistors – VR1, VR2, & VR3

Next insert the variable resistors. Again, solder one pin of each and check the alignment and ensure that they sit flush to the PCB. Once happy, solder the remaining pins and lugs. Once complete the PCB will look like:



2.3.9. ESP32 C3 Header Pins and ESP32 – U1

Next insert the two rows of header pins for the ESP32 C3 and solder them home. Solder one pin of each strip and make sure the pins are flat against the PCB before completing all the soldering. The long pins go through the PCB. Place the ESP32 C3 on the pins and apply solder. Once complete the PCB will look like:



2.3.10. Attach the Stand

Each side of the stand is attached with two 12mm bolts. Before attaching to the PCB put each bolt in a hole, apply the nut, and tighten up. This should pull the nut into the leg so that it sits flush with the leg surface. The right-hand side has the cutout / cable restraint in the lower limb.

3. Functionality

At this point power may be applied. At start up the three LEDs will flash a simple pattern, solid white, red, green, and finally blue. Once complete it will announce the device name and version in Morse code. The three potentiometers can be used to adjust the volume, speed, and tone. It will then fall silent.

The functionality is then driven by the 8-way DIL switch and the tactile switch labelled CT.

There are five distinct modes of output.

- Groups
- Callsigns
- Words
- Quotes
- QSO

Output starts when the CT button is pressed. The CT button can also be used to stop any output currently being generated.

If multiple modes are selected, then a random mode from the selection will be generated.

If no modes are selected then it will simply send out a question mark.

3.4. Groups

In this mode groups of random characters will be generated. The characters generate are controlled by the top three switched labelled “Letters”, “Digits”, and “punctuation”. Any combination of these switches can be turned on to generate any required combination of characters. If only “Letters” is turned on, then only letters will be generated. If “Letter” and “Digits” are both turned on then letters or digits will be generated, etc. By default, each group will be built from five random characters, and five groups will be generated.

3.5. Callsigns

In this mode random callsigns will be generated. By default, five callsigns will be generated.

3.6. Words

In this mode random words will be generated. By default, five words will be generated.

3.7. Quotes

In this mode a single quote will be generated.

3.8. QSO

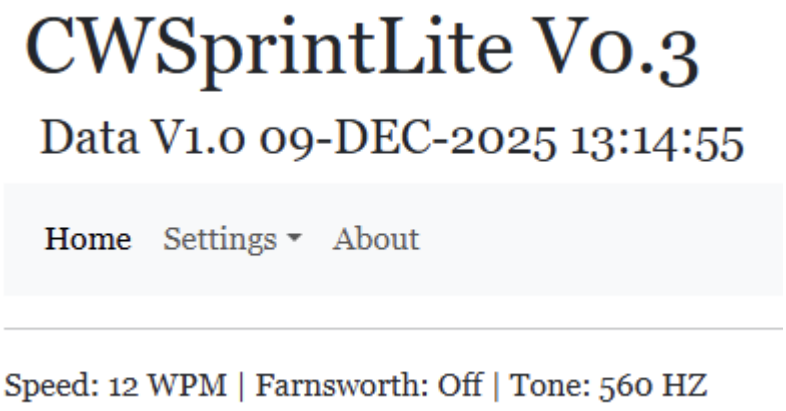
In this mode a single qso over will be generated.

4. Browser Interface

Further settings and output can be viewed through a Web interface hosted by the device itself. By default, an access point called CWSprintLite should be visible to a phone or Wi-Fi enabled personal computer. Connect to the access point and browse to:

http://192.168.4.1

A page like that below will be display:



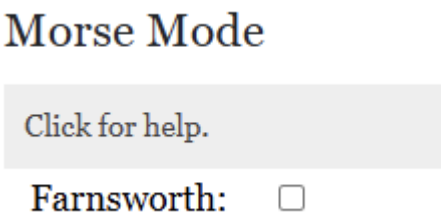
This gives the version number of the code and the version number and build data, of the data used to generate output.

When the CT button is pressed, assuming the QSO switch is on, the output generated can be seen on the home page. For example:

4.9. CW Settings

The CW Settings are access via the Settings menu dropdown. Once settings have been changed be sure to press the update button.

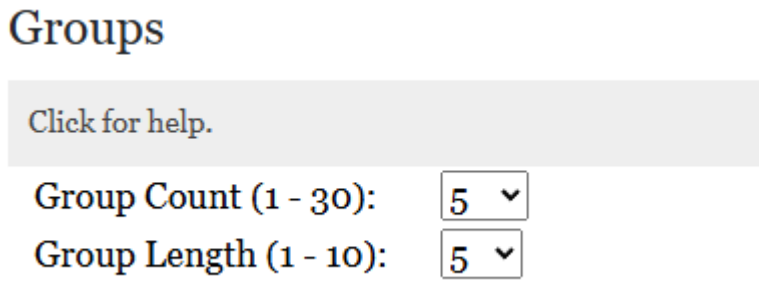
4.9.1. Morse Mode



The Morse Mode related controls can be used to control the following:

- Farnsworth - This controls whether Morse is genereted using the Farnsworth technique. For more details see https://www.arrl.org/files/file/Technology/x9004008.pdf

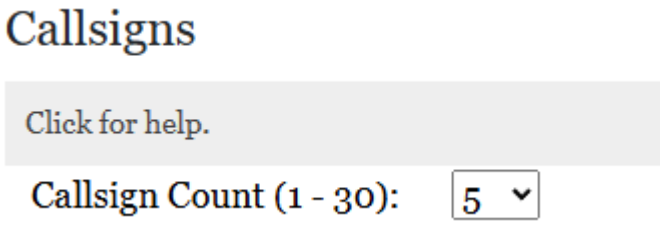
4.9.2. Groups



The Groups related controls can be used to control the following:

- Group Count - This controls the number of groups generated. This ranges from 1 to 30 with 5 being the default.
- Group Length - This controls the number of characters in each group. This ranges from 1 to 10 with 5 being the default.

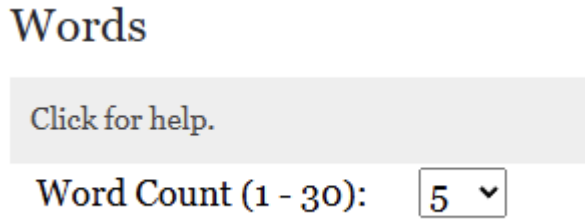
4.9.3. Callsigns



The Callsigns related controls can be used to control the following:

- Callsign Count - This controls the number of callsigns generated. This ranges from 1 to 30 with 5 being the default.

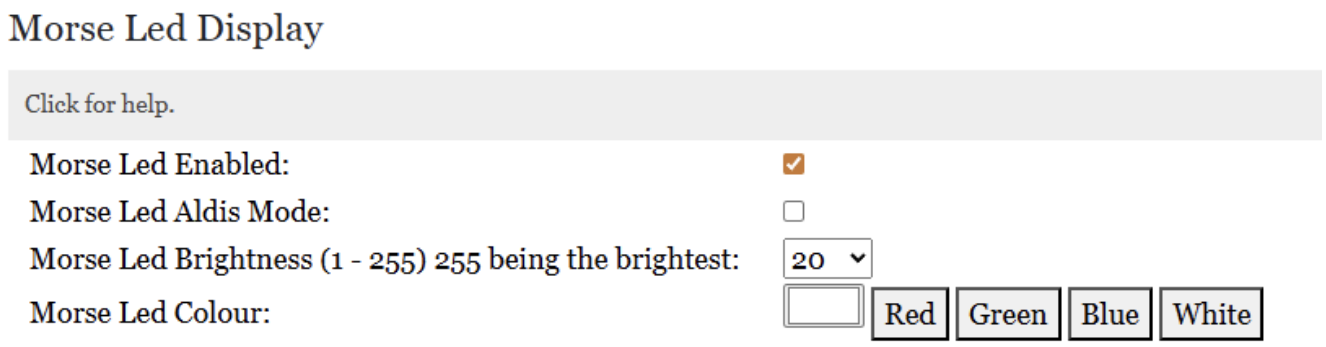
4.9.4. Words



The Words related controls can be used to control the following:

- Word Count - This controls the number of words generated. This ranges from 1 to 30 with 5 being the default.

4.9.5. Morse Led Display



The More Led Display related controls can be used to control the following:

- Morse Led Enabled - This controls the whether the Morse led display is enabled. The default is enabled.
- Morse Led Aldis Mode - This controls the whether the Morse led display operates in Aldis mode. In this mode only one LED is used. If you want the LED and no sound, then simply turn the volume down. The default is disabled.

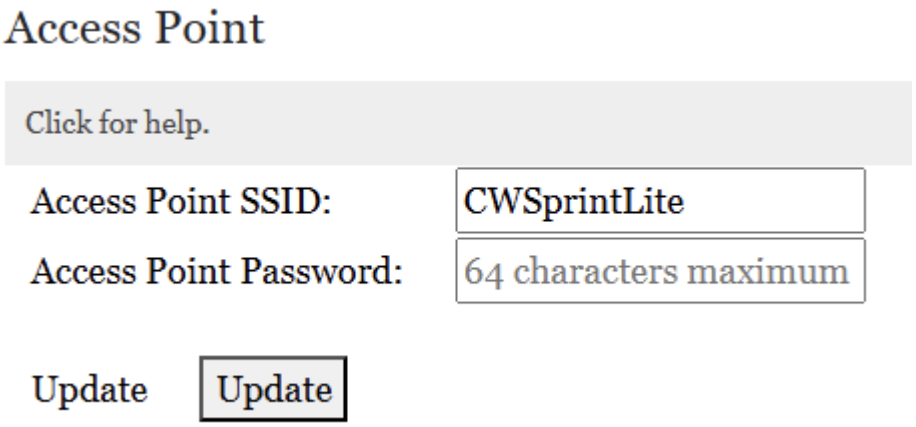
- Morse Led Brightness - This controls the brightness of the Morse led display. This ranges from 1 to 255 with 255 being the brightest.

- Morse Led Colour - controls the colour of the LED's used to display the Morse code. The default is white. Simple colours red, green, blue, or white can be selected by simply clicking on the button. The chosen colour will be displayed in the box at the start of the line. If the box is clicked on, then the browser built-in colour picker will be displayed to allow any desired colour to be chosen.

4.10. Wi-Fi Settings

The Wi-Fi Settings are access via the Settings menu dropdown.

4.10.1. Access Point



The access point related controls can be used to control the following:

- Access Point SSID - The SSID associated with this device. If multiple CWSprintLite devices exists on the same network, then it be necessary to give each device a unique name.
- Access Point Password - The password associated with the device SSID. The field can be left blank if password access is not required.

Once changes have been made the Update button must be pressed.

5. Factory Reset

If the CT button is pressed when power is applied then this will force a factory reset and all setting will return to the default values.

6. Software Updates

Software updates are made available via the website http://www.Net-Trekking.co.uk