

ShippingForecastLite

Net-Trekking Limited

Version 0.0 Rev A

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

"Every Geek should have one!"

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



Net-Trekking Limited - ShippingForecastLite

ShippingForecastLite

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ShippingForecastLite

1. Introduction

The UK shipping forecast is one of those uniquely British fixtures that feels both calming and essential. It's a short, rhythmic rundown of sea conditions — wind, visibility, weather — broadcast on BBC Radio 4 for anyone heading out onto the water. Even if you're nowhere near a boat, there's something reassuring about hearing places like Dogger, Fisher, and German Bight read out with that steady, measured tone. Behind the charm, though, it's serious business: it's a lifeline for mariners, built from real-time Met Office data to keep people safe at sea.

ShippingForecastLite brings the shipping forecast to life. Contained within the map are 31 multi colour LEDs. These LEDs are painted with a colour to reflect the current wind conditions. The actual area forecasts are scrolled, in turn, on the display along with the forecast date and general synopsis.

2. Warnings

2.1. *Running Temperature*

The ESP32-S3 SuperMini may feel warm to the touch. A temperature between 50°C and 60°C is usual and to be expected.

2.2. *Data Quality*

The code scrapes the shipping forecast from the Met Office website, on particular the printable forecasts page found here:

<https://weather.metoffice.gov.uk/specialist-forecasts/coast-and-sea/print/shipping-forecast>

This page is published by the Met Office and may be subject to change by the Met Office. If this occurs it may impact the functionality of ShippingForecastLite. If this happens then every attempt will be made to publish new software as soon as possible.

3. Assembly

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

3.3. *Required Tools*

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

Tool	Comment
Small soldering iron	
Solder	See safety notes above.

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Wire cutters	
Small cross head screwdriver	

3.4. Parts List

Part	Quantity	Comment
Bolt M3 12mm (for the two stands)	4	
Capacitor 0.01uf 100nf 104 - C1	1	
DIL 14 Pin Socket	1	
Double Row Socket 8+8 Way	1	
ESP32 S3 SuperMini – Ready Programmed – U2	1	
IC 74LS14 – U3	1	
LED Insertion Tool	1	
LED WS2812B APA-106	31	
Nut M3	4	
Nylon Bolt M3 8mm	4	
Nylon Nut M3	4	
Nylon PCB Spacer M3 12mm	4	
OLED Display 256x64 3.12” – U1	1	
PCB ShippingForecastLite V0.2	1	
Single Row Socket 9 Way	2	
Switch – Tactile – SW1	1	
Stand – Left hand side	1	
Stand – Right hand side	1	
USB Cable	1	

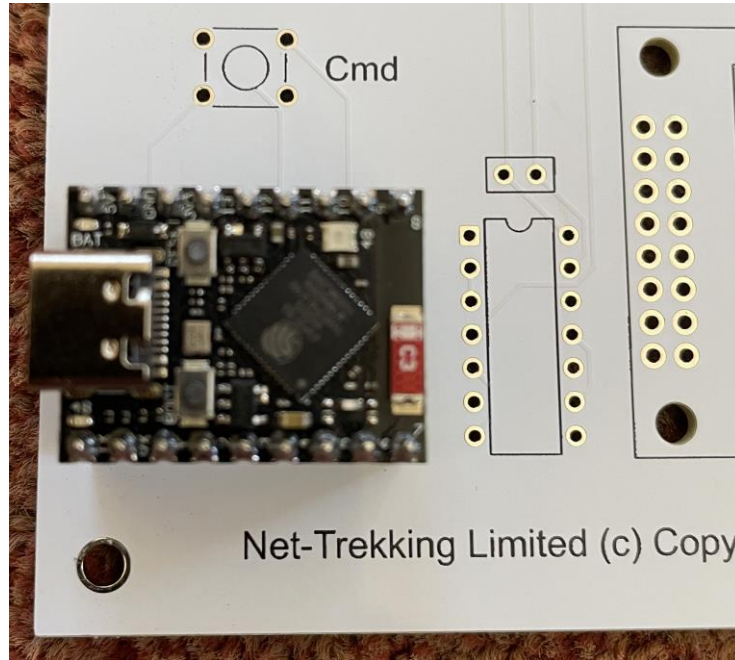
3.5. Assembly Steps

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.

3.5.1. ESP32-S3, Header Pins, and Single Row Sockets – U2

Start by inserting the two header row pins into the ESP32-S3 SuperMini. Solder one pin of each strip and make sure the pins are flat against the PCB before completing all the soldering. Insert the header pins into the two 9-way single row sockets and insert them into the main PCB. The USB socket of the ESP32-S3 SuperMini should be on the left-hand side aligned with the outline on the PCB. Again, solder one pin of each strip and make sure the pins are flat and the ESP32-S3 SuperMini looks correctly placed before completing the soldering of all the pins. Once complete the PCB will look like:

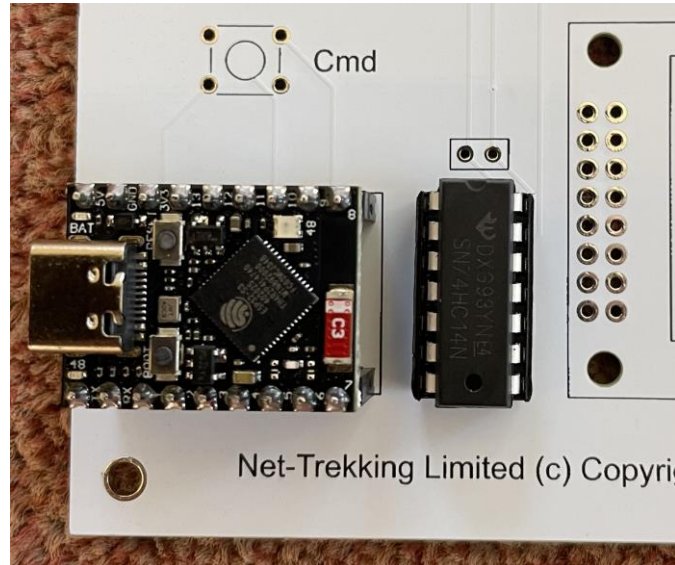
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3.5.2. DIL Socket a & IC 74LS14 – U3

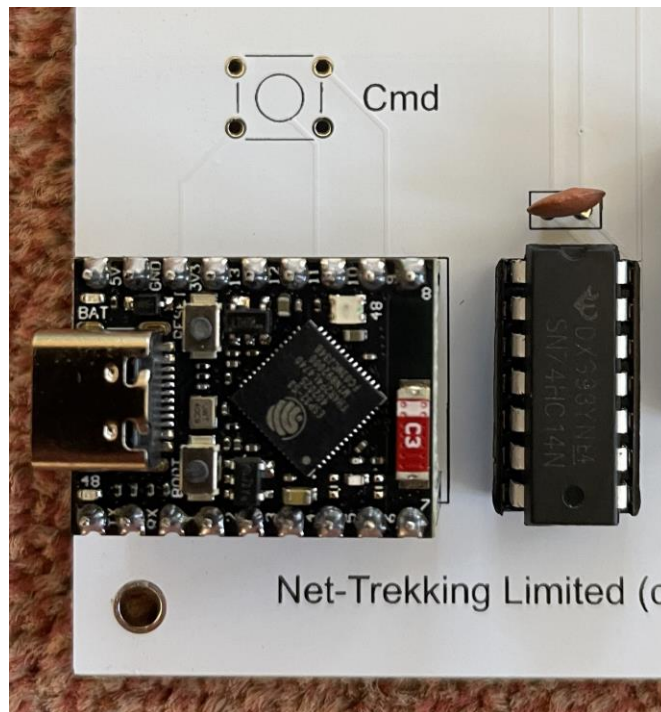
Insert the DIL 14 pin socket in the PCB. Ensure that the small notch is at the top. Solder one pin and then ensure that the socket is aligned nicely with the outline on the PCB. When happy solder the remaining pins. Take the 74LS14 IC and insert it into the socket. Ensure that the notch on the IC is at the top. You may need to straighten the pins of the IC. This is best done by holding the IC at either end, align it so the length of the pins is against a hard surface and push the against the hard surface. Repeat for the other side of the IC. Once complete the PCB will look like:

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3.5.3. Capacitors - C1

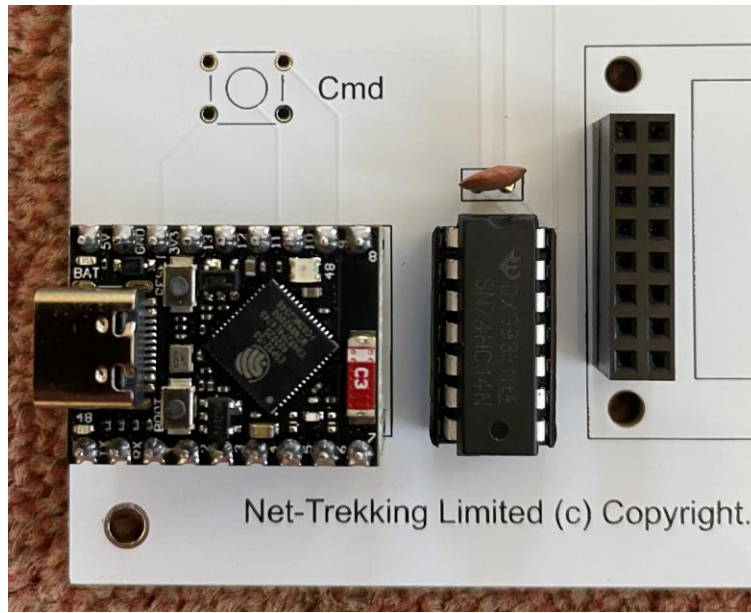
Next insert the capacitors C1 – marked 104. Mount it flush to the PCB with the label on the top side. Once complete the PCB will look like:



3.5.4. Double Row Socket 8+8 Way

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Next insert the double row socket. Solder one pin and ensure that the socket is aligned with the outline on the PCB and sitting parallel with the outline of the display. When happy solder the remaining pins. Once complete the PCB will look like:



3.5.5. Mount the Display – U1

The display is held in place by four Nylon 12mm M3 PCB Spacers. Start by pushing the threaded end of each spacer through the PCB and add an M4 nut on the bottom side of the PCB. Insert the header pins of the display into the double row socket. Ensure that the header pins are correctly aligned with the socket. The holes in the four corners of the display should align with the four nylon spacers. Screw one nylon bolt into each of the four holes to secure the display to the PCB. Once complete the PCB will look like:



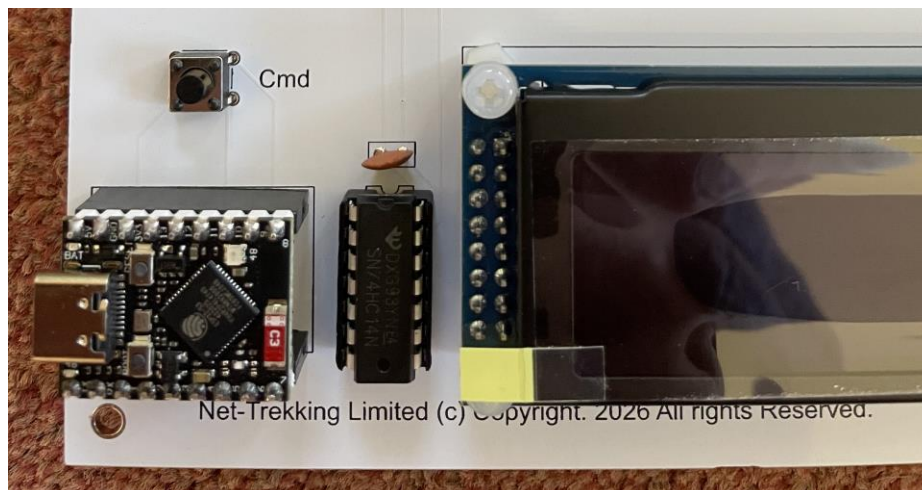
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At this point progress may be tested. Apply power to the ESP32-S3 SuperMini through the supplied UCB Cable. Only apply 5 volts. There may be a small delay and then the display should show a splash screen containing the text “ShippingForecastLite”.

If this fails check the orientation of the IC, if this is correct and it still fails email the support desk at Support@Net-Trekking.co.uk.

3.5.6. Tactile Switch – SW1

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



3.5.7. LED Array

There are 31 LEDs to be inserted. Care needs to be taken to ensure that all LEDs are at the same height and vertical. To assist with this the kit contains a small tool. Start by inserting an LED into the tool as shown below.

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Note the flat side of the LED (and the long legs) are at the top. All LEDs need to be inserted with the flat side at the top. Next insert the LED into the holes just above 14.100 MHz on the PCB and push home as shown below.

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Turn the PCB over, solder the pins, and remove the excess.

At this point power may be applied to the board and the LED should run through a test sequence changing colour from White, Red, Green, and then Blue.

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Remove the power and proceed with the remaining LEDs. It may be necessary to spin the LED on the tool where LEDs are physically close together. It is recommended to install the LEDs in the following order:

TRAFALGAR, FITZROY, BISCAY, PLYMOUTH, SOLE, SHANNON, FASTNET,
LUNDY, IRISHSEA, MALIN, HEBRIDES, ROCKALL, BAILEY, SOUTHEASTICELAND,
FAEROES, FAIRISLE, CROMARTY, FORTH, TYNE, HUMBER, DOGGER, FORTIES,
VIKING, NORTHUTSIRE, SOUTHUTSIRE, FISHER, GERMANBIGHT, THAMES,
DOVER, WIGHT, PORTLAND

After inserting each LED apply power to ensure that the LED follows the test sequence. If it doesn't cheque for shorts between pins. Do not proceed until any problems are resolved.

The LEDs may also be orientated by the length of the legs. Please ensure that the long legs are inserted in the hole with the square solder mask.

3.5.8. 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 but 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.

Once complete the PCB will look like:

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4. Settings

4.6. Basic Settings

Settings are changed via a simple webpage served up by the ESP32 S3. Insert the USB cable and plug the device into a power source. The LEDs will cycle through a power up sequence and the display will scroll the message:

ShippingForecastLite

"Please connect to the access point ShippingForecastLite browse to <http://192.168.4.1>, select Wi-Fi Settings from the menu to provide Wi-Fi credentials."

At this point, an access point called ShippingForecastLite 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>

You will see the following page:

ShippingForecastLite Vo.4
Up Time: 0 00:04:32

Home Settings ▾ Help About

Select the Menu option Settings | WiFi Settings, this will take the page:

ShippingForecastLite

ShippingForecastLite Vo.4

[Home](#) [Settings ▾](#) [Help](#) [About](#)

Wi-Fi

Click for help.

Hostname:	ShippingForecastLite
Wi-Fi SSID:	32 characters maximum
	Refresh Available SSIDs
Wi-Fi Password:	64 characters maximum

[Update](#)

The main fields of interest here are the Wi-Fi SSID and Wi-Fi Passwords fields. These must be populated to allow the device to connect to a Wi-Fi connected to the Internet.

When complete, hit the update button located at the bottom of the screen.

There may be a short delay after which the device will fetch the latest shipping forecast, illuminate the LEDs, and start cycling through the forecasts.

The board should now be on your Wi-Fi network so you should be able to simply browse to <http://ShippingForecastLite> without having to connect to the ShippingForecastLite access point. Your Wi-Fi router may take a few minutes to acknowledge the ShippingForecastLite device so please be patient. If router is being slow then simply reconnect to the ShippingForecastLite Access Point and carry on.

Note: you may need to reconnect to ShippingForecastLite the access point.

4.7. **Advanced Settings**

Further settings can be found below the Settings | Access Point menu option and Settings | Shipping Forecast Settings menu option.

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4.7.1. Access Point

By default, the Access Point settings are set to:

ShippingForecastLite Vo.4

[Home](#) [Settings ▾](#) [Help](#) [About](#)

Access Point Settings

[Click for help.](#)

Access Point SSID:

ShippingForecastLite

Access Point Password:

64 characters maximum

[Update](#)

[Update](#)

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

- Access Point SSID - The SSID associated with this device. If multiple ShippingForecastLite devices exists on the same network, then it may 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.

4.7.2. Shipping Forecast Settings

By default, the Shipping Forecast Settings are:

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Settings

Forecast Areas To Show

Click for help.

Bailey ☒	Biscay ☒	Cromarty ☒	Dogger ☒	Dover ☒	Faeroes ☒
Fair Isle ☒	Fastnet ☒	Fisher ☒	Fitzroy ☒	Forth ☒	Forties ☒
German Bight ☒	Hebrides ☒	Humber ☒	Irish Sea ☒	Lundy ☒	Malin ☒
North Utsire ☒	Plymouth ☒	Portland ☒	Rockall ☒	Shannon ☒	Sole ☒
Southeast Iceland ☒	South Utsire ☒	Thames ☒	Trafalgar ☒	Tyne ☒	Viking ☒
Wight ☒					

When cycling through the forecasts only the selected forecasts are shown. If all forecast areas are deselected, then it will default to all.

Display

Click for help.

LED Brightness (1 - 255) 255 being the brightest:

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

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

5. Command Button (Cmd)

The command button can be used to gain access to extra functionality. It responds to single clicks, double clicks, and long clicks. The displays accessed via these clicks do not timeout. To move the display on simply click again as required.

5.8. Single Click

A single click will step the display into the next screen. The order is:

Sea Areas – Sea Area LEDs are flashed and the corresponding forecast scrolled in the display. Once the scrolling is complete it will move on to the next sea area. The sea area order is that used by the official shipping forecast.

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Forecast Details – the date and time information associated with the forecast will be scrolled in the display.

General Synopsis – The forecast general synopsis will be scrolled in the display.

Gale Warnings – All the areas for which gales have been forecast will be scrolled in the display.

5.9. Double Click

This provides access to the software version and uptime of ShippingForecastLite.

5.10. Long Click

A long click over 4 seconds will force a factory reset and subsequent reboot of ShippingForecastLite. All configuration values will be reset to their default values.

6. LED Colours

The LED colours reflect the maximum predicted windspeed for the given shipping area. If the forecast is:

“3 becoming 5 later”

Then the LED is coloured again the 5.

The colours used are:

Description	Colour
Gale warning issued	Red
Beaufort scale possibly 8	Purple
Beaufort scale 6 to 8	Yellow
Beaufort scale 4 to 6	Blue
Beaufort scale 2 to 4	Green
Beaufort scale 2 or less	LED is turned off

These colours were chosen based on text found within the document:

<https://www.hse.gov.uk/pubns/priced/l64.pdf>

7. iPhone Personal Hotspot

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The iPhone supports a personal hotspot where the iPhone supports an access point that allows users to connect to and then provides internet access via 4G / 5G etc. ShippingForecastLite can make use of these hotspots, but some iPhone configuration is required.

By default, the hotspot name associated with an iPhone will typically look like:

Martin's iPhone

The apostrophe causes an issue, and it is recommended to remove it. This can be done by navigating to:

Settings | General | About | Name

There you can simply either remove the single quote or give the device a whole new name.

Next navigate to:

Settings | Personal Hotspot

Where you will need to "Allow Others to Join", provide a "Wi-Fi Password", and "Maximise Compatibility".

Once done ShippingForecastLite should be able to connect to the internet via your phone.

8. Software Updates

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