UPDATE 1 The GNE VFO - the updated EWV

I am very pleased to release the latest update of the EWV – now called the GNE – to reflect the work that **G**ary ZL2AH and **N**eville ZL2BNE have done in helping **E**ric to achieve what he was working towards.
This may not be the final update – but in its present form it is very useful and useable.

Overview
Basically Gary has taken Nevilles code and added some further features.
It now has the following :

1. A startup frequency (which is memory 1)

2. Another 14 memories

3. USB and LSB BFO frequencies

4.Calibration for the Si5351

5. A battery voltage reading – can be calibrated in the menu.

6. Four possible outputs VFO, VFO+BFO, VFO-BFO, BFO-VFO.

7. The two outputs of BFO and VFO can be interchanged by a switch to ground.
   - This enables the T/R switching for the ZL2BMI SSB transceiver.

8. LSB and USB toggled by a long press on a switch (the encoder switch).

These are accessed or defined in the menu.

Further Ahead

Although I very rarely use **RIT**, it seems that some would like it, especially for CW.
We hope it will be possible to add this feature.

Another feature which is useful to me is two buttons to step the frequency. This enables even more miniature building (without an encoder). I have a very small rig which uses this with the Sugar Cube VFO. We hope to add it here.

Basically the schematic used is as for the EWV with some additions, but we will post this when it is complete.

At present the wanted frequency also appears on the third output when the BFO and VFO are present at the other two outputs. We are working at a way to turn this off – though at this stage it does not appear to be a problem. For CW it seems some need the three frequencies – for use with a superhet receiver.

As with previous programmes, we will not be releasing the source code, but you will be able to download the hex file to upload to the Atmega328 (Arduino) via the ISP port.
We will call this first release GNEver1.

Read on for further details:

Using the Encoder.

Pushing the encoder while rotating it changes the step rate. Locate the cursor under the number you wish to change. Release it and turn to change the number. (this switch on the encoder is S1 on the schematic).

Switches (the naming of these is just how they were added).

Switch 2 enters the menu and steps through the screens

Switch 4 enables the setting and recall of memory frequencies while in the first menu screen.

Using the Menu.

Press S2 to enter the menu. It will show 0000500.
The first choice is the *startup frequency.* Alter to your desired frequency using the encoder as above.
If you need *memory frequencies* you can add them now or at a later stage.
Press S4 to add them as for the startup frequency.
When finished, press S2 to return to the next item on the menu.

Press S2 - Set LSB filter frequency

Press S2 - Set USB filter frequency

Press S2 - Calibrate Si5351. Listen to a known frequency and adjust while monitoring it with a receiver or frequency counter. You may need to move the cursor to make this adjustment.

Press S2 – Adjust until battery voltage reads correctly. (could be used for some other function – even a basic reading of signal strength if you choose). It is just an analogue to digital interpretation of the voltage. Do not exceed 3.3v on the pin.

Press S2- Rotate the encoder to choose one of four options.
Note – VFO means the actual frequency put out by that output. BFO usually means the output needed by your i.f. or crystal filter. The wanted frequency is your operating or working frequency.

For example - If you want to work on a frequency of 3.7Mhz and your filter for USB was at exactly 9.00Mhz then you would probably choose VFO – BFO.
The working frequency would then be 12.7 – 9.00 = 3.7mhz. This arrangement would give sideband inversion - resulting in a LSB signal.

If you chose BFO – VFO, then the result would be 9.00 – 5.3 = 3.7Mhz. In this case there would not be inversion, so USB would be produced.

The VFO will adapt its output to the mixing regime chosen.
VFO + BFO is not possible in this case, as then the i.f. frequency would need to be below the operating frequency.

Press S2 – and you leave the menu. Note that the frequency displayed at this point is the LAST ONE you left from setting the memories.
If you now switch off the vfo and on again, it will come up in the startup frequency.

Allternatively you can Press S1, then step through all the menu items without entering the memory screen. When you exit, it will be on the startup frequency.

To choose a memory at any time :

Press S2
Press S4
Step to the memory you want using S4
Press S2 six times to exit.

Whenever the vfo is switched off it will always come back on the Startup Frequency

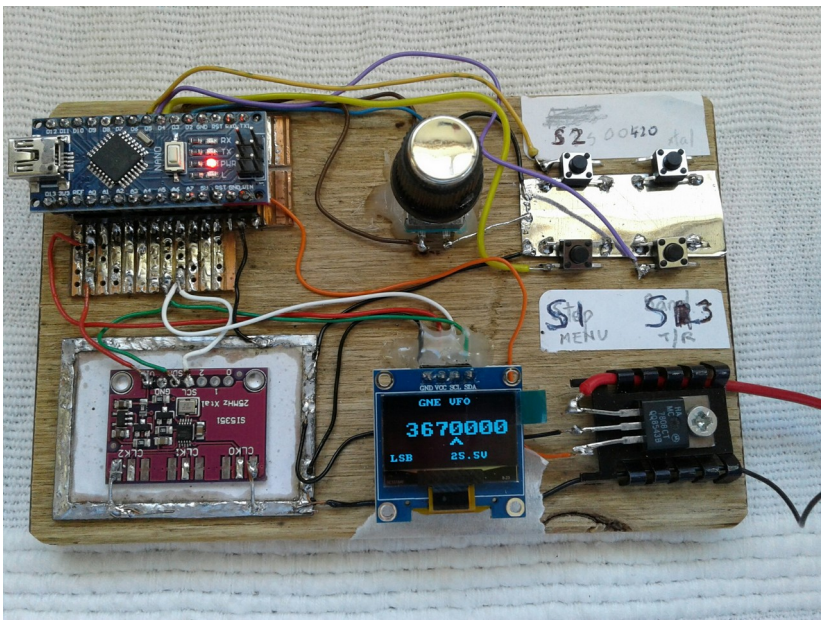
SWITCH 3 (the one connected to D6)

This would normally be a transistor switch for T/R switching – though something like a reed relay might also be suitable. It will not be normally be needed for DSB – though eventually it may be used in conjuction with an RIT function.

Finally - You will need to read other pages on this website to find out how to put the programme on the Arduino you choose.
You can use a Pro Mini for a smaller package – but you will need to wire a 6-pin header temporarily on a cable to do the programming. That's what I did.

All best wishes with the building.

Eric ZL2BMI



One version of the GNE VFO on a breadboard.
The strange battery voltage is because the voltage divider network is missing.