

## 30m QRSS beacon: Transmitter

Written by Hans Summers

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At the heart of the beacon is the 30m transmitter itself. It uses a 74HC240 octal inverter IC as a power

There are many circuits [Test the circuit 74HC240](#), [240 gains](#), [Potters circuits](#)

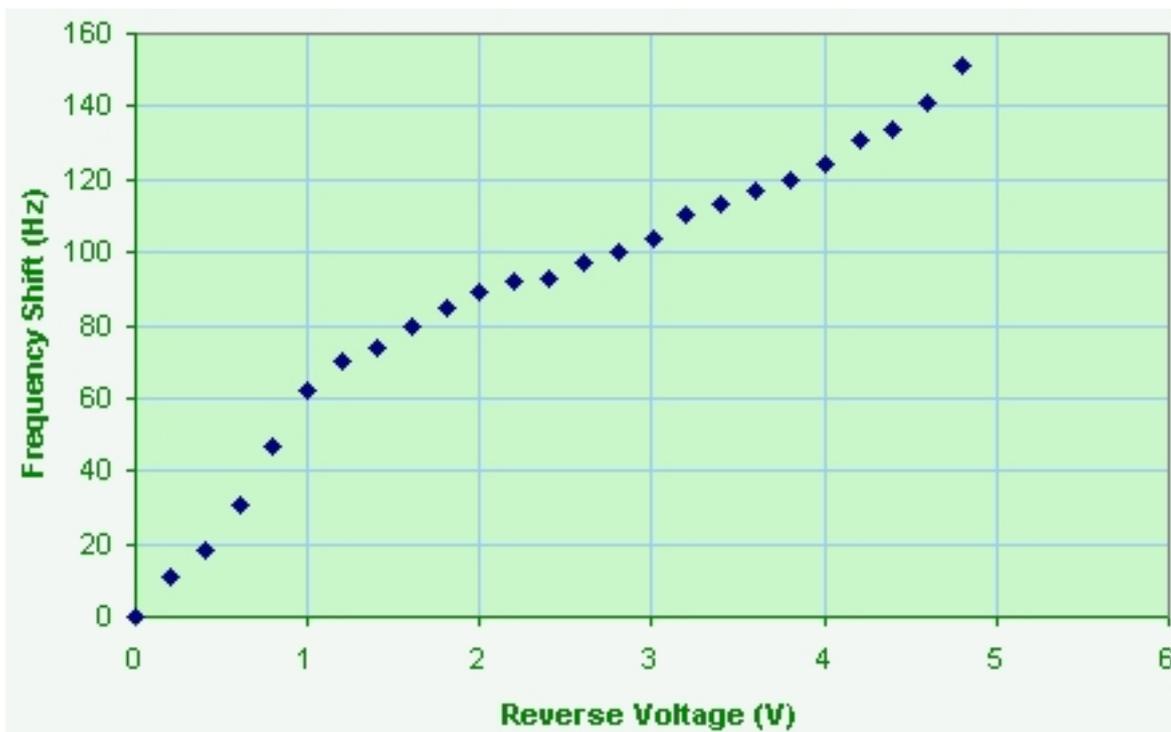


{gallery}qrsstx/circuit{/gallery}

In the circuit (left) I have used is a combination of the VXO from one of those links, with the push pull circuit

A BC109 transistor inverter was necessary to control the inverted control inputs of the 74HC240 since I

## Frequency Shift



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Notice in the top left of the circuit diagram that frequency shift is provided by a strange type of varicap! It is simply an ordinary 5mm LED. See my [Common Diodes as Varicap Diodes](#) for detailed experiments on this topic. Having played with this idea in the past the LED in this application seemed ideal. Why use an expensive varicap for such a simple application?

In order to validate the idea I performed a simple experiment to chart the frequency shift in this VXO against LED reverse voltage (see right). Whilst I am not entirely convinced of the accuracy of these results, due to drift and instability troubles with the [frequency counter](#), it does reassuringly show a reasonable degree of linearity and plenty of shift for this application. I only want to be able to shift 15Hz (0-15Hz in 16 1Hz steps).

The most significant 4 bits of each control byte (D3-D6, since D7 is unused) are applied to the diode via a simple digital to analogue converter consisting simply of weighted averaging the 4 digital signals using 10K, 20K, 40K and 80K resistors. A further resistor network (hopefully!) reduces the shift range to approximately 0-15Hz as required.