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

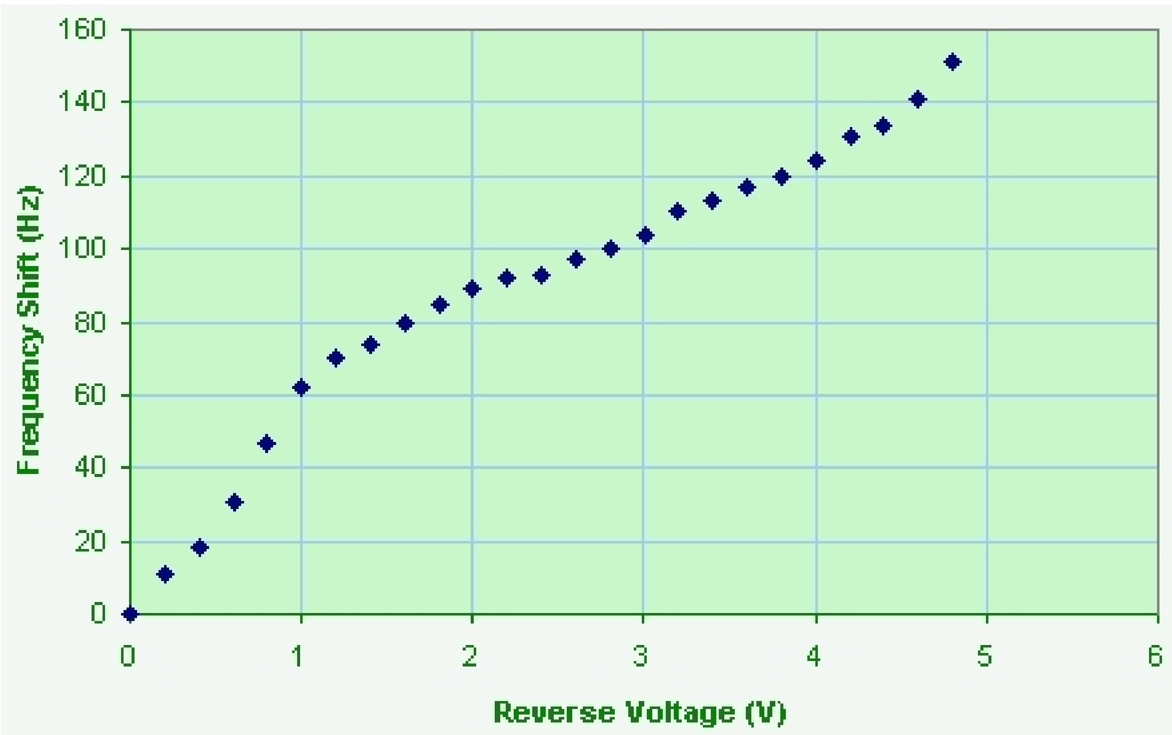
There are many circuits on the internet for 74HC240 transmitter circuits [Testes com 74HC240](), a page in Portuguese

{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 cir

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

Frequency Shift



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.