

30m QRSS junkbox tx: construction

Written by Hans Summers

Monday, 15 June 2009 22:54 - Last Updated Tuesday, 23 June 2009 17:55

Here's a 30m QRSS beacon whose main objective is low cost and simplicity. I built this project entirely from junk box parts: the only component purchased specifically for this project was the 10,140kHz crystal I bought from Peter DL6NL for 10 Euros (Thanks OM!). Everything else is from my junk box, either leftovers from previous projects, or from dismantled consumer electronics equipment. For example the transistors used are 2N3904, these came from a broken DVD player. Instead of a real varicap (varactor) diode to provide some frequency shift, I use an ordinary 5mm red LED. See my [Varicap Diodes](#) page for measurements of LED's and other common diodes used as varicaps. This project follows from my previous

[30m QRSS beacon](#)

project. The circuit is based closely on that used by

[Colin G6AVK](#)

and Peter DL6NL (thanks for both your advice etc.).

Click photos and diagrams for the large scale images!

[Oscillator circuit](#): The oscillator is a single 2N2904 transistor. I had to pu
[Oscillator](#) : I built a polystyrene box to provide some protection ag
[PA circuit](#) : The power supply is an old laptop power supply, it prov
[PA board](#) : Here's the main driver and power amplifier board. The
[bleat sink](#) : In this view from above, you get a good chance to see
[Output](#) : Nice clean output on my [HP1741A osc](#)illoscope. When
[frequency counter](#) in my

[Polyphase HF Receiver](#)

[experimental DDS generator](#)

[50 ohm dummy load](#) : I built a simple dummy load specially for this project. It
[Side view](#) : From the side you get a good idea of how I the polysty

By the way, the knob on the left hand side sets the amount of frequency shift that is available to the mo

[Lowpass filter](#) : The lowpass output filter is a 7 pole Butterworth filter design at

[Pattern generator circuit](#) : A standard astable multivibrator provides a simple patt

[Pattern generator](#) : This is built on a small board which plugs into the main

Bill Of Materials

OSCILLATOR

1x 78L09 : 9V, 100mA voltage regulator

1x 2N2904 Transistor

1x 470uF capacitor

1x 33nF capacitor

2x 12pF capacitor

2x 220pF capacitor

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- 1x 39pF capacitor
- 1x 0-150pF "polyvaricon" AM radio variable capacitor
- 1x 3.5uH inductor (T50-2 toroid with 27 turns)
- 1x ordinary 5mm red LED
- 1x 10,140kHz quartz crystal
- 1x 220K resistor
- 1x 10K resistor
- 1x 3K3 resistor
- 1x 150 ohm resistor
- 1x 180 ohm resistor
- 1x scrap of matrix board
- 1x piece of packaging polystyrene to make an insulated box
- 3x rubber bands to hold the box together and to the PA

POWER AMPLIFIER & LOW PASS FILTER

- 1x TIP146 Darlington Pair
- 1x 2N2904 Transistor
- 1x 2N2219 Transistor
- 1x 2-inch square brass shim to make a 2N2219 heatsink 2x RFC (I used T50-6 toroid with 30 turns)
- 2x T37-6 toroid with 19 turns
- 1x T37-6 toroid with 20 turns
- 2x 10nF capacitor
- 2x 33nF capacitor
- 1x 100nF capacitor
- 1x 4.7pF capacitor
- 2x 270pF capacitor (I used three 90pF in parallel)
- 2x 560pF capacitor (I used some caps in parallel, total 590pF)
- 1x 4K7 potentiometer
- 2x 4K7 resistor
- 2x 10K resistor
- 1x 220 ohm resistor
- 4x 348 ohm 1/4 watt resistor
- 1x 6K8 resistor
- 1x 1K resistor
- 1x 22K resistor
- 1x 6-way header socket
- 1x scrap of matrix board etc

PATTERN GENERATOR

- 2x 2N3904 transistors
- 2x 470uF capacitors
- 1x 100uF capacitors
- 2x 1K resistors

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2x 22K resistors

1x 6K8 resistor

1x scrap of matrix board

1x 6-way header plug