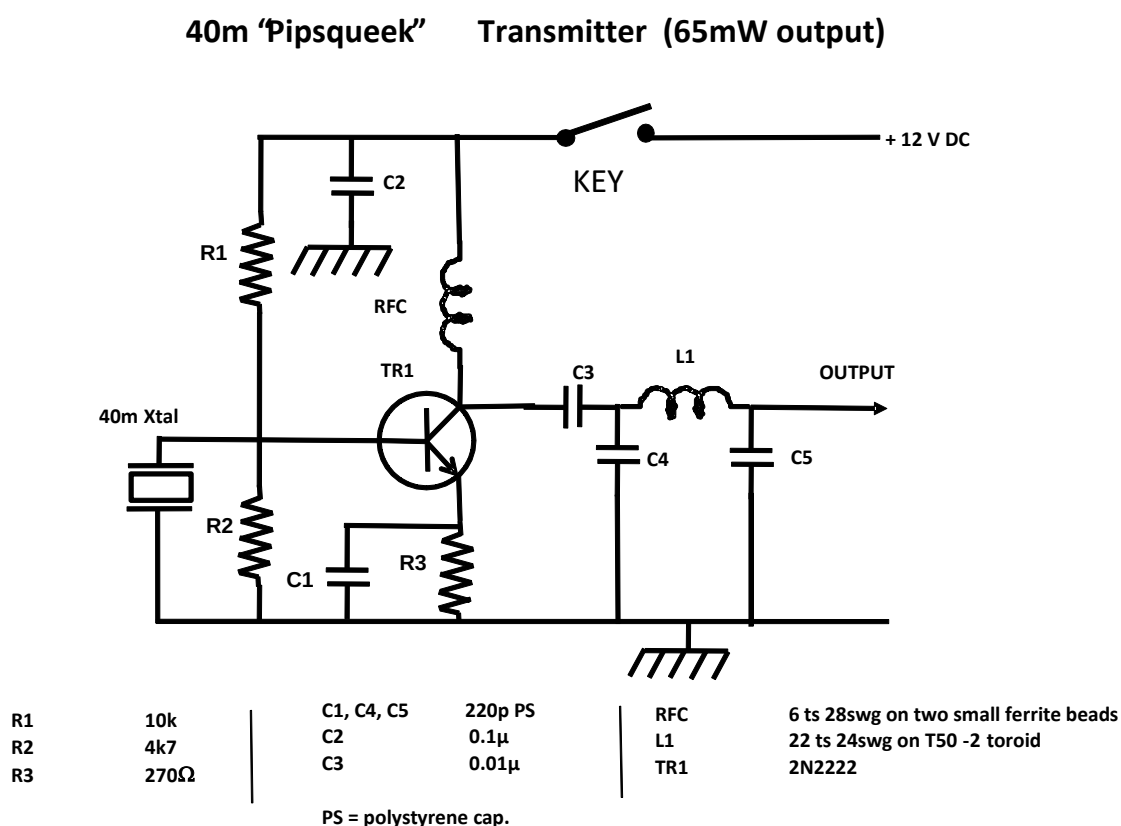


The “Pipsqueek” QRP_P Transmitter

This really low power 40m transmitter, running a mighty 65mW output, was designed and constructed as a bit of fun and to see how effective it could be when coupled to a reasonable antenna (end-fed long wire approximately a half-wave long at 80m coupled to the transmitter via an “L-match”). The incentive to build this rig was the result of seeing how effective the 1W output of Dave’s (ZS6AAW) QRP transmitter has been during the early morning QRP CW nets. If Dave was S9 + to me with 1W, I wondered how successful 65mW would be to him, given that the distance between the two of us is only about 2km.

The circuit diagram of the little rig that resulted is shown in Figure 1.

Figure 1



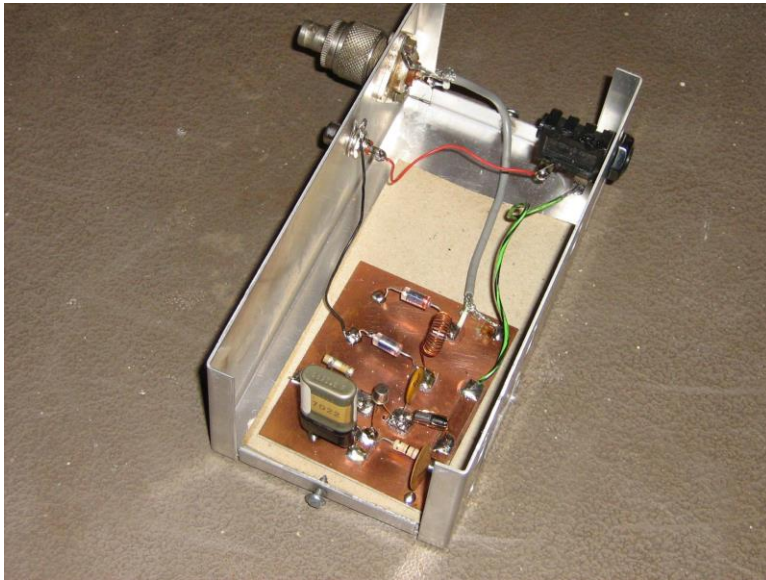
The basic design is that of a crystal controlled Colpitts oscillator. This is connected to the input of the “L-match” via a “halfwave” low-pass filter, comprising L1, C4 and C5, which matches the approximately 200Ω output impedance of the transistor stage to the 50Ω input impedance presented by the “L-match”, as well as providing attenuation of any harmonics generated.

The filter design impedance is given by the square-root of the product of the transistor output impedance (approximately 200Ω) and the 50Ω input impedance of the “L-match”. The resultant is of the order of 100Ω. The beauty of this type of matching low-pass filter is that the reactive components all have the same impedance as the filter design impedance. As readily available 220pF capacitors (103Ω at 7020kHz) are a reasonable choice for C4 and C5, these were selected, with a consequence that L1 would have to be 2.3μH. Using a T50-

2 toroid with a inductance value of 5nH per turn squared, it can be shown that 21.6 turns would be required. As fractions of a turn cannot be made on a toroidal former (counts 1 turn every time the wire passes through the hole in the middle) 22 turns were used.

Picture 1 shows the resultant transmitter, constructed using the “Manhattan” technique (stick small squares of PC board off-cuts, where required for component connection points, onto a blank piece of PC board which provides the ground plane).

Picture 1 – View of completed “Pipsqueek”



The proof of the pudding is in the eating, or so they say – does it work?. The answer is an unequivocal “yes” – the first time I put it on the air I received a 589 report from Dave! Given the noise level on 40m at the moment due to serious QRN from thunder storms, the “Pipsqueek” has not yet been used on the air in anger, but certainly will be put into service when things quieten down – I hope you will be listening out for the two of us when I do pluck up the courage to put it on the air again in the new year!

ZS6AZP
26 December 2011