Magnetic loop revisited.

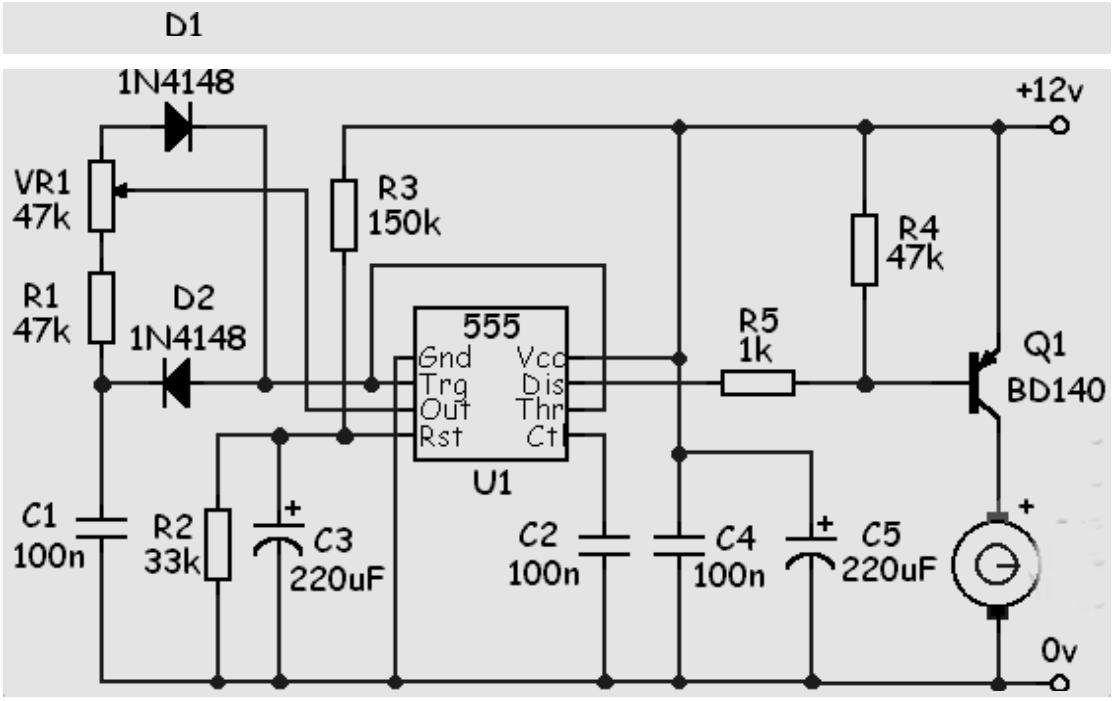
After writing about the construction of my magnetic loop antennas in the last "Mercury", I finally finished the 6'6" one for 80/40 meters and moved it from the club house where I built it and installed it in my loft. Disaster ! I could not get the SWR down at all. I tried quite a few things, including cleaning the variable capacitor thinking I may have got some bits in and shorted the plates out. Nothing I did made any difference so what had I done to it between the club and my loft. All I had done was to add a small electric motor to remotely tune it from the shack, at the club it had just been tuned by hand. The answer turned out to be very simple, all I did was to move the motor feedline. On my hf magnetic loop and all the ones I had seen the motor feedline comes straight down from the motor to the bottom of the loop and then into the shack along side the coax feed. Instead I brought the feed away from the motor and the loop at a right angle and the problem was solved. The magnetic loop tuned perfectly with a low SWR of less than 1.3:1 or less across 80/40 mtrs.

Further investigation shows that the feedline could probably be brought straight down if it was twin screened with 0.1uf caps to decouple the line at the motor case and earth the screens of the feedline at the other end where the coax screen is earthed.

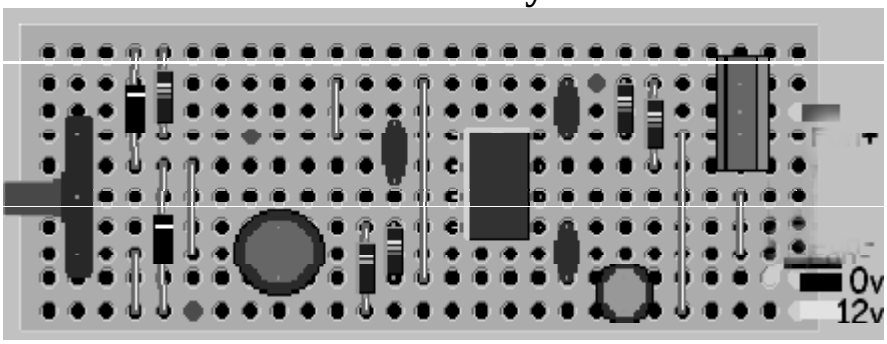
Performance of the 80/40 magloop

I managed to work 45 stations with it on 40 mtrs during the May test. I was still limited to about 30 watts because the variable capacitor I was using was just a receiver type. Then a couple of weeks ago I found a nice 1500pf transmitting type variable capacitor for £20 on eBay.
I fitted it to the loop and made new brackets for the 6:1 slowmotion drive and the electric motor and put it back in the loft. It now tunes the whole of 160-80-40 mtrs, it falls just a few Khz short of 10.1mhz this is due to the minimum capacitance which is about 40pf. The power it will handle is

still not 100 watts like on my hf magnetic loop but it will handle between 60-70 watts.
It works very well on 160 for local qso's and I have worked into EI with it on cw getting a 599 report. On ssb I have worked local stations upto 20 miles away with 59 reports. On 80 and 40 mtrs it has been just great with all the UK and Europe being worked on cw. During the May Test I worked Les EA5AVL on 40 mtrs quite a few times and he was 599 plus 20 –30 db here giving me 599 on most occaisions.
555 ic Motor control I have also been playing with a 555 ic pulsed motor speed control. The supply to the motor is a pulse of 12v, to vary the speed the pulse width is varied. Small pulses make it slow while wide pulses make it run faster. I give you the circuit for which I claim no origianality.
So there it is, you can take a look at my magnetic loops on my website not good pictures and the final magnetic loop with the 1500pf cap is not yet on there. It will however show you roughly what they look like.
http://homepage.ntlworld.com/g4kki.bill/radio.html



Veroboard layout



The magnetic loop under construction , the hf loop in place and the lash up magnetic loop fixed on 3558khz.