Converting a DB6NT 3456 MHz transverter to 3400 MHz

With the announced demise of 3456 MHz in April, I decided I best figure out what I needed to do to my DB6NT transverters to get them to work at 3400 MHz. Since International Crystal is no longer in operation and with just about all deliveries lengthened by COVID, I decided to look at alternatives. I happen to have an extra Leo Bodner Mini GPDSO laying around so I decided to use it for the LO.

I first wanted to get a reference of what the performance was with the original crystal oscillator so I injected -134dBm and got about 1-2 s-units above the noise on my IC-705 IF rig. So now that I had a reference, I dove in.

Instead of using an injection frequency of 135.6667, which is the required oscillator, I decided to just drive the base of the first tripler with 407 MHz making it just a straight amplifier. I happened to have a 120 pf chip cap laying on the bench so I used it to couple the output of the GPDSO to the base of the BFR92A. And as I suspected, nothing. All the tuned circuits were way off so I started back at 414 MHz which is where the LO is for 3456 and dropped one MHz which meant my sig gen needed to be at 3448 and there it was! After tuning the pipe cap filter at the mixer and then adjusting F1, F2 and F3, I was back to my S1-2 reading. Next I got brave and injected 411 MHz and found the signal at 3432 as expected, again after adjusting the pipe cap filer on the mixer, I hit F1, F2 and F3 and everything was back to normal. I then went to 409, repeated all the steps and finished at 407 Mhz which set 3400 MHz at 144 MHz. Last I adjusted the TX pipe cap to get my full tx output.

My DigiLO which is supposed to have a 407 MHz output at index 184 doesn't work so I'll try that when I figure out why it's not working. The Leo Bodner GPDSO was nice because it's completely programmable on the fly with a USB cable to my computer. I'm not sure I could have "found" the signal by jumping directly to 407 from 414. Yes, I could have used my spectrum analyzer to look at each stage and tune them but this was the easiest for me. Plus, with the Mini GPDSO, the GPS is built in, you just use one of the "hockey puck" antennas for the GPS receiver whereas the DigiLO requires an external 10 MHz signal to lock it – it does have an internal oscillator which is good enough except for the "frequency cops" !

One note on tuning the filters, you first have to break the glue loose on the tuning screws, be VERY CAREFUL so you don't damage the filters! I used a ceramic tuning tool and after I was done, I dropped a little bit of candle wax in each to hold them in place.

That's it, see you all on 3400.1 MHz in June !!