

Update – Phase Noise and MDS (Sept 2009)

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I've been thinking about a new 10 GHz transverter. After talking to Steve, N2CEI, again, I decided to try one with the A32 synthesizer for the local oscillator and see how it works in the field. Of course, I have my old transverter as backup, on a smaller dish with 24 GHz and the dual-band feed.

Steve promised to have a transverter to me in time for the September weekend of the 10 GHz contest – it arrived about 10 days before. I usually figure three weeks to put a system together properly. However, I ended up with some extra time. My 6 and 2 meter antennas were bent up by the ice storm last December, and we planned to finish the repairs on Saturday morning before the September VHF Contest started at 2 PM. But it rained all day Saturday, so I was off the air and worked on the transverter. The antenna repairs were completed Sunday so I was on the air about 4 PM.

My plan was to integrate the DEMI transverter with two of the eight-watt amplifiers in parallel for some decent power, and to use my new “Even More Fool-Resistant Sequencer” for switching. The amplifiers work fine in parallel, but the transverter doesn't provide enough drive for two, so the pair only put out about 11 watts – not enough to justify the extra 25 watts of DC (2 amps at 12 volts for each amplifier) in a portable station.

Anyway, metalwork takes time, and the sequencer took a little debugging, so I finished up the transverter Thursday night as I was loading the truck for the September weekend on Block Island. As a result, I didn't have time to get the GPS-locked oscillator included, just the 10 MHz TCXO used for the MDS tests.

The TCXO was very stable during tests, but much less stable in the field. I had the worst of both worlds – synthesizer phase noise without accurate frequency control. A few contacts took longer or needed retries as a result, but I did pretty well anyway.

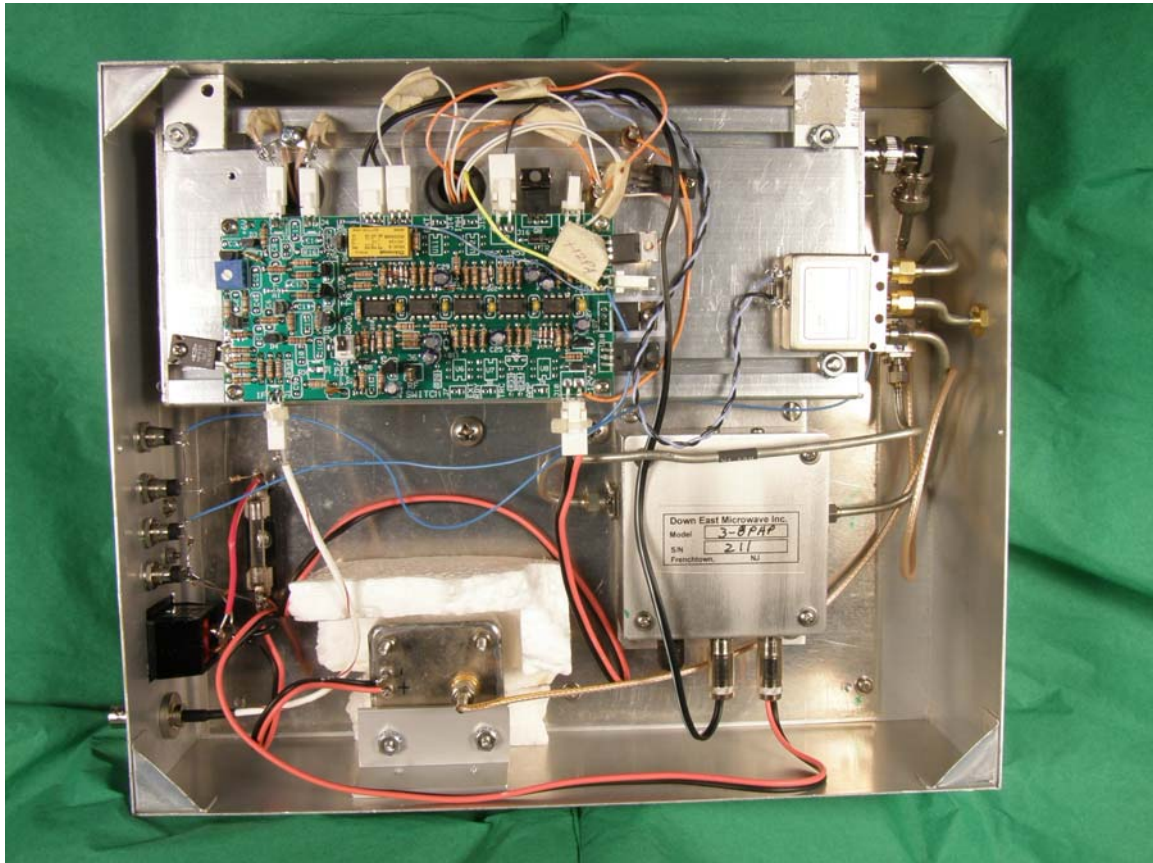
GOOD – I was hearing better than the other two guys on Block Island, one with an identical dish. Made several very weak contacts that they couldn't pull out.

BAD – definite phase noise, especially for each other, making spotting difficult. At times, AF1T, 80 km away, caused spurs near our frequency (we try to stay ~30 KHz apart). Enough birdies to make tuning for stations an adventure.

TBD – when we started out Saturday, my frequency seemed to be significantly off and drifting, slowly settling down. Sometime in the afternoon, I tripped over the power cord and dislodged it. When it came back up, my frequency was closer and drifting less.

Conclusion so far – with the GPS lock, it should make contacts much easier with stations that have good frequency control. The other half will still take lots of tuning.

P.S. – conditions got really good Sunday night, after all the roving stations had gone home. We worked a few DX home stations, then tore down. Early Monday morning, my phone rang – K1MAP in North Carolina was hearing beacons near us. We quickly set up again and worked him twice, two new grids at 800 km.



New 10 GHz Transverter with “Even More Fool-resistant Sequencer”

And the new “Even More Fool-resistant Sequencer” worked flawlessly – see www.w1ghz.org for details.