

## SR SERIES AGC ZERO SIGNAL REFERENCE

The fun goes on. I have found that with the antenna grounded, if the agc in the SR-150 measures between 0 and +0.2vdc the radio works fine, meets all specs, the S-meter functions normally and it seldom has birdies.

If the agc measures in excess of -0.5vdc in the negative direction performance is degraded. Birdies start to show up, the agc figure of merit drops out of spec and the S-meter is totally bogus.

I had a 150 that was particularly bad. The agc, with the antenna grounded, was unstable and read from -1.95 to -2.35vdc. The s-meter was not even close. The figure of merit dropped out of spec with only a 20db over threshold signal increase and it was full of birdies. Spec states 50db over.

I had a hunch that the problem was some of the carrier oscillator was being fed directly into the I.F. I have seen this in the SR-400. I connected the spectrum analyzer to the agc detector (with the antenna grounded) and was surprised to find that there was no carrier osc signal at all. What I did find was VFO at -28db. It was everywhere back to the 2nd receiver mixer (V17A). I measured the VFO input to the 2nd receiver mixer which should be about 0.6vpp. It measured 1.8vpp. I quickly found the problem, C38 which should be a 39pf cap was 390pf. When I replaced the cap it became a different radio. It met all the specs. The S-meter was even dead on. There was still some VFO at the agc detector but was so far down in the noise I could not get a reliable measurement.

So in this case I had a wrong part, but it got me to thinking. I had two other 150's that meet the receiver gain and sensitivity specs. However the agc figure of merit which normally holds to about +70db did not quite meet the +50db spec and also had some receiver spurious response problems. So I benched and tested both and found that the VFO at the agc detector was around -35db. The VFO injection was 0.9vpp and 1.2vpp on the two. They did have the correct value for C38. In one R72 (680 ohm) measured 1.3k. I replaced it with a new 680 ohm and the drive to the second mixer settled down to 0.5vpp. A little lower than what I consider normal, but the radio worked fine and met all specs. In the other radio C86 and C88 were reversed, probably came from the factory that way. When I properly connected the caps the output settled to 0.6vpp and it too met spec.

So I have found a link between VFO injection levels and proper agc action. This does lead me to believe that testing the level of the agc with zero signal, antenna jack grounded, should be considered as an initial test when repairing or restoring the SR-150. This may also be something to consider in other SR series radio. The static level of the agc varies from model to model and I have not established the ideal level for the other models. More testing will need to be done.