

## R-390A - AGC troubleshooting procedure

A common problem with R-390A's is the AGC system can malfunction. This can be caused by many different problems and can sometimes be difficult to fix. To aid in diagnosing these problems, Charles Steinmetz wrote a terrific procedure many years ago and has updated it a few times since then, with the last one on 2/17/20.

Because his procedure is very beneficial, I thought it was important to make it easy to find. It is in our 'Pearls' (in the 'IF Deck' section) and the R-390 List Forum archives, but I think it would be much easier to find on our website. I've copied his most recent post of it here. Larry Haney 1-6-2023

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Subject: R390A AGC troubleshooting procedure (revised 2/17/20)

R390A -- AGC troubleshooting procedure (revised 2/17/2020):

Throughout this entire procedure, the "FUNCTION" switch should be set to "AGC."

First, make sure there is a jumper installed between TB102, Terminals 3 and 4. If not, install one and see how the radio works now.

Set the AGC time constant to "MED" and tune the radio to a good, strong, local signal (like a strong AM broadcast station). Measure the DC voltage at TB102, Terminals 3 and 4 with a high impedance meter (VTVM, DVM, or scope, with an input resistance of  $\geq 1\text{M}$  ohm; \*not\* a VOM). It should be significantly negative, -10v or more. If it is, you have no gross AGC problem and the fault lies elsewhere. But if the voltage is only weakly negative, or zero, you have an AGC problem. In that case: Turn off the radio, and disconnect the power plug from the AC mains. Set the AGC time constant to "MED." Remove the jumper between TB102, Terminals 3 and 4. Measure the resistance to ground from each of these terminals. Terminal 3 looks back into the AGC detector, and should read in the neighborhood of 500k ohms due to R545, R546, and R547. Terminal 4 is the AGC line feeding the RF and IF circuits and should read approximately 1.8M ohms due to R201 and R234. If you unplug P108 from the RF deck, Terminal 4 should then read essentially infinite resistance ( $>10\text{M}$  ohm). [\*NOTE\* that some digital ohmmeters/multimeters do not work for this test. The best instrument to use is the ohmmeter function of a real VTVM (vacuum tube voltmeter).]

If you have gotten to this point, one or the other of these Terminals will probably show a much lower resistance to ground than this. Trace the circuit to find the leaky component(s).

If Terminal 3 reads less than  $\sim 500\text{k}$  ohms, the usual suspects are C551, C548, C547, C545, and C544.

If Terminal 4 reads significantly less than  $\sim 1.8\text{M}$  ohms, the usual suspects are any of the several dozen bypass caps on the AGC line in the IF and RF sections, or leakage to ground in one or more of the mechanical filters, or (much less likely) leakage to ground due to contamination of the fiber insulating washer on the shaft of the antenna trimmer capacitor. It is also possible that the sector of the "FUNCTION" switch that shorts Terminal 4 to ground when the switch is set to "MGC" or "STAND BY" is mis-timed, broken, or contaminated/dirty, but this is even more unlikely.

If, on the other hand, the resistance readings are OK, suspect V508, V509A, and associated circuitry (Z503 and C546, especially).

The R390 is very similar, although the part numbers are different.

Best regards,  
Charles