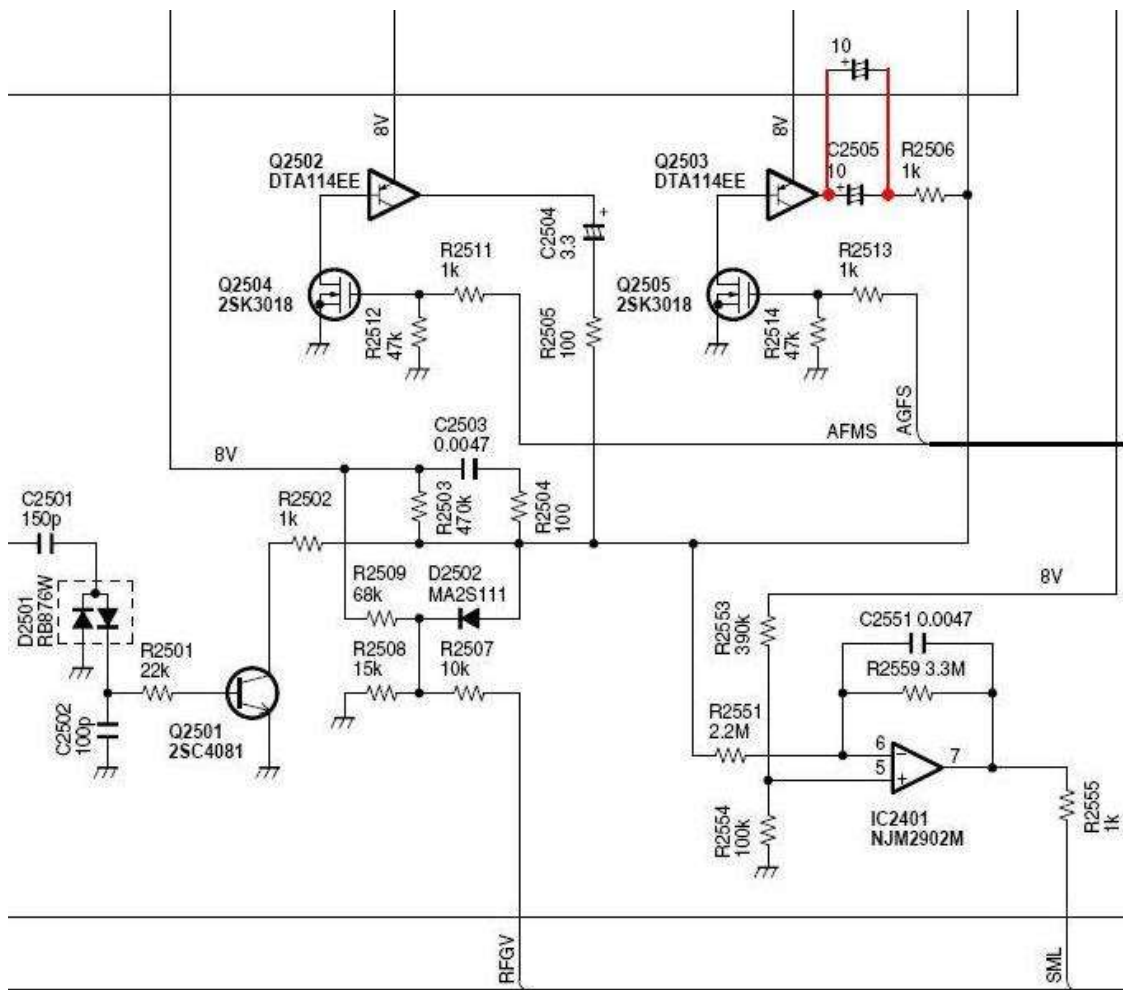




I was surprised when I noticed the IC-703 SLOW AGC release time was considerably faster than 2.0 seconds, which I consider to be more or less optimal for a slow release time. Without actually measuring it, I estimated that the IC-703 SLOW AGC release time was about 1.0 seconds. I examined the ICOM documentation for the 703 AGC, but found contradictory schematics. So I did not attempt to derive a mathematical formula for the 703 FAST and SLOW release times. I guessed that C2505 determined, in part, the SLOW release time. Assuming that the SLOW time constant, whatever it might be, was linear in C2505, obtaining a 2.0 second release time was simple: double the C2505 capacitance to 20 mF. But that was easier said than done. One of the surface mount leads of C2505 was inaccessible, between C2505 and C2301. Clearly I was not going to be able to remove C2505 and replace it with a 20 mF capacitor. My only option was to use a leaded 10 mF electrolytic (note the polarities above) and attach the leads directly to the appropriate surface mount pads. The attachment of the + lead of the added 10 mF (35 volt) capacitor to the C2505 pad was routine hair-raiser work, having done similar pad attachments while doing the MW and LW attenuator removal mod (form a solder blob on the C2505 pad, tin the end of the + lead, press the end of the + lead into the solder blob while applying the hot iron tip to the lead, and remove the iron tip after the solder blob melted and the end of the lead slid into the solder blob). There was, however, one new twist: I wrapped C2502 with thick plumbers Teflon tape (a narrow strip, cut with scissors, wrapped on the butt of an appropriate drill bit, and slipped over C2505) to prevent soldering iron damage to C2502 and/or solder bridges between the + lead and C2505. The connection of the negative lead to the pad of R2506 required yet another "trick." The diameter of the negative lead of the added 10 mF capacitor was too large... or you might also say the excess amount of pad of R2506 available for soldering to was too small. So I used flat jaw surface needle nose pliers to flatten the end of the 10 mF negative lead. The flattening was done in two stages, flat/thin and flatter/thinner, with the end of the thinner part trimmed so that it was about the length of the thickness of R2506. A solder blob was formed on the appropriate pad of R2506, the flattened end of the lead was tinned, and pressed onto the solder blob while heating the lead with a hot iron. When the solder on the end of the lead flowed and the flatter part slid into the the solder blob and flowed it, the flatter part was pressed snug against the end of R2506, the iron was removed, and the result was a good solder joint. Note that all the preparations, the flattening, solder blob formation, tinning of leads, and so on were done before positioning the 10 mF capacitor and applying the hot soldering iron to the leads. Also, the leads of the added 10 mF electrolytic were bent at right angles where they exited the capacitor body before installation to provide clearance for the speaker (in the top of the case above it when the case top was replaced) and to make it feasible to use automotive grade silicone adhesive to affix the added capacitor to the surface mount capacitors underneath it for mechanical rigidity (because the solder pads and adjacent traces are quite delicate and could easily be torn loose or off by rough or not so rough handling of the added 10 mF capacitor after it has been soldered in place).

After completing the AGC slow release mod the slow release time was measured. The time for the AGC line voltage to change by 66% of the total from a large signal to no signal (the standard definition of release time) was about 2.0 seconds as measured with a Tektronix 2465B scope. Curiously, as I used my new mod I did not observe as much audio quality improvement when switching from FAST to SLOW as I expected to hear for strongly fading AM signals. This observation was explained when I compared the IC-703 to my standard, an R-390A, and found that audio quality for the IC-703 FAST AGC on strongly fading AM signals was much better than for the R-390A FAST AGC, while the audio quality for the IC-703 SLOW release on strongly fading AM signals was merely better, not much better, than for the R-390A SLOW AGC. It was quite a surprise, and perhaps explains why ICOM chose to make the 703 slow release time a rather fast 1.0 second. For the 703 AGC, slowing the AGC SLOW release time

from 1.0 to 2.0 seconds does not improve recovered audio on strongly fading AM signals as much as it would for the usual AGC system. On the other hand, I will gladly take even small improvements in audio quality. Of course, the really interesting question is what did ICOM do to the 703 to make the AM mode recovered audio so good for strongly fading AM signals. I took a look at the 703 schematic and found what seemed to be a conventional diode AM detector followed by a 33.863 kHz low pass filter (two cascaded 1K 0.0046 mF RC sections) with the diode pointed to ground and biased at +2.9 volts by a 100K + 56K voltage divider connected to the 8 volt DC line, with the +2.9 volts applied at the junction of the first 1K and 0.0047 mF RC filter. I don't recall seeing an AM diode detector biased in this (or any other) way before. Maybe this partly explains the excellent audio recovery in AM mode for strongly fading signals.

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