RA6790/GM AGC Mod

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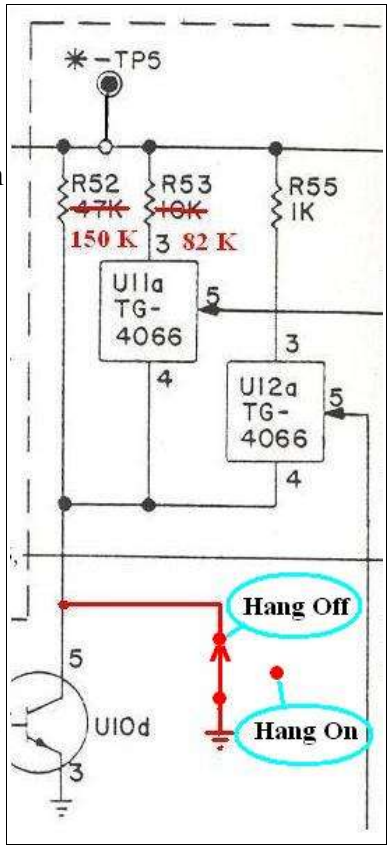
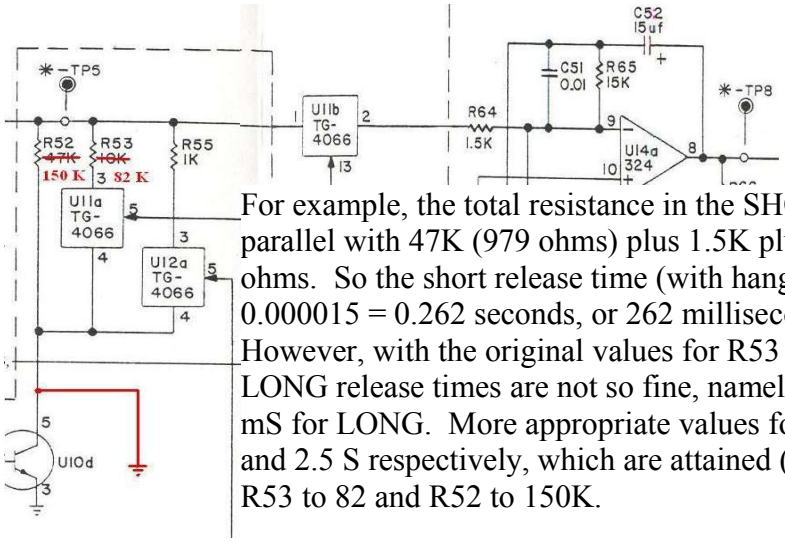


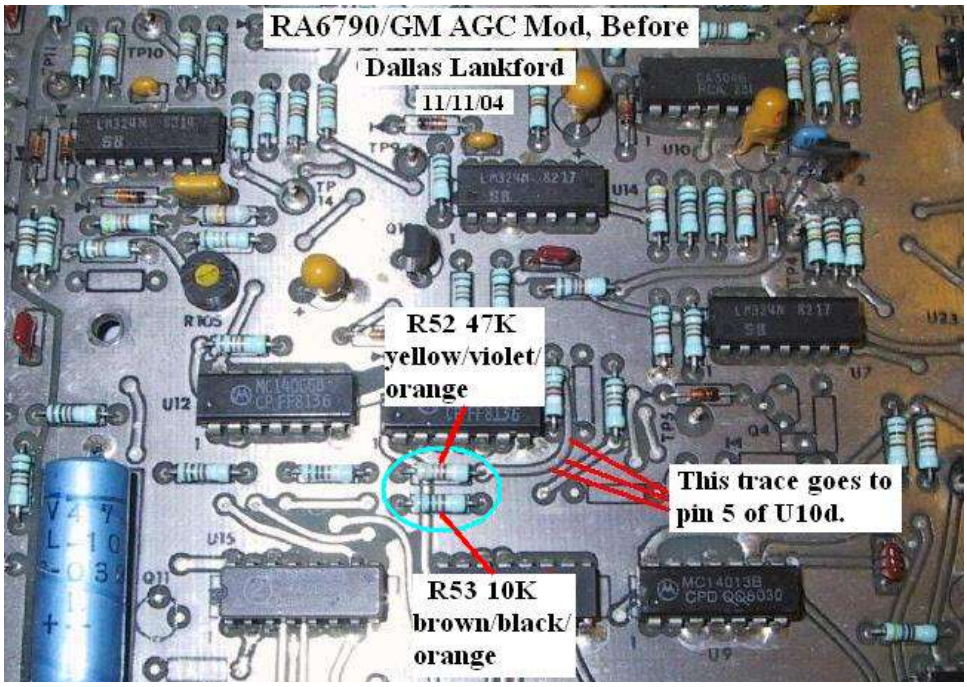
The 6790 hang AGC (for MED and LONG [SLOW]) is fine for SSB and CW, but not always so fine for AM.. er, rather, in the case of the 6790 synchronous AM. For AM and SAM a conventional RC time constant release is a better AGC for DXing. It so happens that a 6790 AGC can be easily converted to a conventional AGC as shown here.

The hang part of the 6790 AGC is disabled by grounding pin 5 of U10d. The grounding can be done at any point on the PC board trace connecting pin 5 of U10d and the "lower" (as seen on the schematic) lead of R52. I wanted the hang AGC to be switchable. so I added a toggle switch to the rear panel as shown on the partial schematic at right.

After this is done the, the AGC release is purely RC, and the release time constant is determined by the discharge path from C52 through R65, R64, U11b (a switch), and finally through (1) R52 (LONG[SLOW]), or (2) R52 in parallel with R53 (MED), or (3) R52 in parallel with R55 (SHORT [FAST]); see below. The release time constant T in seconds (the time required for 66% discharge of C52) is given by T = RC where C = 0.000015 and R is the total resistance in ohms of the discharge path resistance.



For example, the total resistance in the SHORT discharge path is 1K in parallel with 47K (979 ohms) plus 1.5K plus 15K for a total of 17,479 ohms. So the short release time (with hang disabled) is 17,479 x 0.000015 = 0.262 seconds, or 262 milliseconds (mS). This is fine. However, with the original values for R53 and R52 the MED and LONG release times are not so fine, namely 388 mS for MED and 952 mS for LONG. More appropriate values for MED and LONG are 1 S and 2.5 S respectively, which are attained (approximately) by changing R53 to 82 and R52 to 150K.



This mod would appear to be a picnic, and it would be if the plate throughs on Racal PC boards had reasonably large diameters. But Racal used plate throughs barely large enough to clear the leads, and sometimes crimped the ends of the leads so that they cannot be removed easily. Use desoldering braid to remove enough solder on one of the leads to see if the end is crimped (use a magnifier if necessary).

If the end of one of the leads is crimped, they probably all are. So in that case cut the leads flush at the resistors R52 and R53, bend the leads on the component side of the PC board into vertical position. Use the tip of your hot soldering iron to push most of a lead through the PC board plate through. Then grab the crimped end of the lead on the other side of the PC board with a hemostat and again apply the hot tip of your soldering iron to whatever remains of the lead (or to the plate through hole) on the component side of the PC board. You should be able to gently pull the lead through the plate throgh. But be careful. You don't want to pull off a pad or pull out a plate through. Repeat these steps for the other three leads. Use desoldering braid to try to remove all solder from the plate throughs. If any solder remains in any of the plate throughs, I remove it by passing a soldering-iron-heated #22 or #24 solid tinned copper wire through the plate through without applying the hot iron tip to the pad or plate through. If necessary, remove remaining solder with desoldering braid.

If the ends of the leads are not crimped, use diagonal cutters to cut R52 and R53 in half. Bend the halves vertically. Attach a hemostat to one of the resistor halves, turn the PC board over, place desoldering braid on the pad for that lead, and apply your hot soldering iron tip. After a few seconds the resistor half and lead with hemostat attached should fall onto the floor. And the plate through should be solder free. If not, remove residual plate

through solder as described in the paragraph above.

Replace R52 and R53 with 150K and 82K resistors respectively.

Install jumper to ground at "bottom" end of R52; see photo below. Or add a rear panel mounted toggle switch to switch between grounded ("hang off") and not grounded ("hang on"). In that case you can have your cake and eat it too.