

ARB-704 Modification Mutes Amplifier when used with the MFJ-994B Auto-Tuner Phil Salas – AD5X

Since I only occasionally use an HF amplifier (usually when trying to snag that elusive DX station), my HF amplifier set-up needed to be simple to use and couldn't rely on a good memory or frequent use in order to operate properly. So, I put together an ALMOST "not having to think" set-up consisting of an Ameritron ALS-600 no-tune amplifier and ARB-704 amplifier interface, and an MFJ-994B high power auto-tuner. The MFJ-994B is nice in that you can initiate a tune cycle by manually pushing the TUNE button, or the tuner can start tuning automatically when the SWR exceeds a pre-determined value when the auto-tune mode is selected. There is also a sticky-tune mode whereby the MFJ-994B tunes the first time you transmit, regardless of SWR. Further, I purchased an MFJ transceiver interface cable which lets the MFJ-994B automatically put my transceiver into a low-power CW tune mode during the tuning process. However, even in the low-power CW tune mode, the amplifier must still be manually bypassed before tuning starts. This is because tuning at reduced drive levels still results in relatively high power output from the amplifier, which is not good for either the amplifier or the auto-tuner. So I really couldn't use the MFJ-994B auto-tune or sticky-tune modes – and I had to remember to bypass the amplifier before pressing TUNE on the MFJ-994B.

To get around this, I added circuitry to the ARB-704 to permit the MFJ-994B radio interface open collector output (which saturates during tuning) to disable the amplifier when tuning by disabling the amplifier relay driver transistor in the ARB-704. The schematic (Figure 1) shows how I modified the ARB-704. Q1 buffers and inverts the MFJ-994B transceiver control output. Q2 and Q3 are in parallel, and both invert the signal again. Q2 shorts the drive signal to the output driver transistor in the ARB-704, which then disables the amplifier. Q3 passes the transceiver interface signal on to your transceiver to put it into the low power CW tune mode.

I built the necessary circuitry on a little piece of perf-board and attached this board-assembly to the inside of the ARB-704 with a few layers of double-sided sticky tape (see Photo A). I used 1/8" stereo phone jacks to pass both the tip and ring of the interconnect cable through the ARB-704 (see Photo B). This way all the available MFJ radio interface cables will continue to work properly.

At any time, I can now push the TUNE button on the MFJ-994B, or let the MFJ-994B start tuning automatically when either (or both) the auto-tune or sticky-tune modes are enabled. In all cases the amplifier is automatically bypassed, the transceiver is put into a low power CW tune mode, the MFJ-994B tunes, and then everything reverts to normal operation. Now my amplifier set-up is truly stupid-proof!

Phil Salas AD5X is a retired engineer and ARRL Life Member. Licensed since 1964, Phil spent 33 years in microwave and lightwave product development. He enjoys retirement by tinkering with electronics, rag-chewing and chasing DX. Phil can be reached at ad5x@arrl.net if you have any questions or comments.

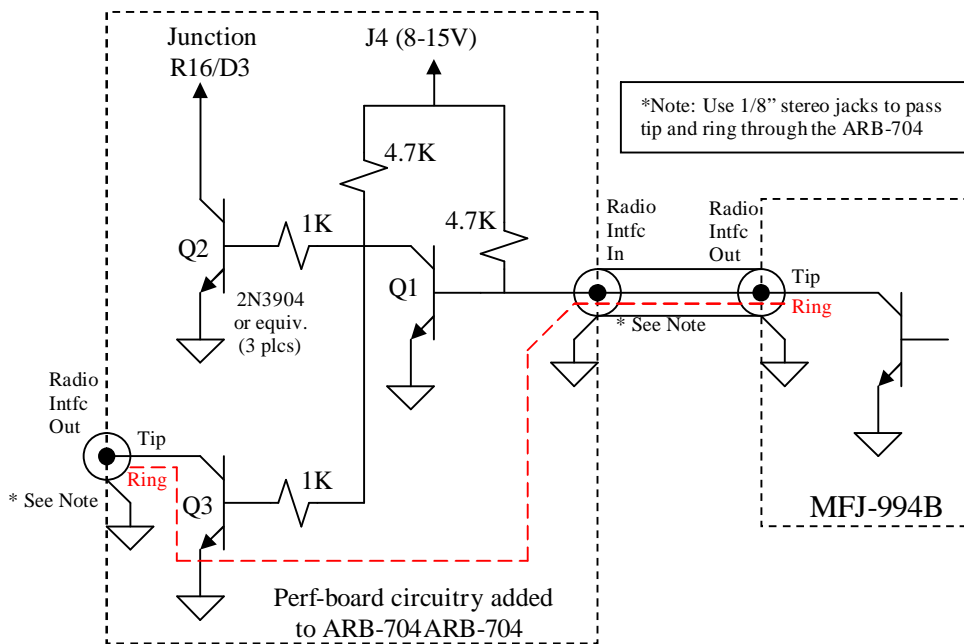


Figure 1: Schematic of ARB-704 modification circuitry

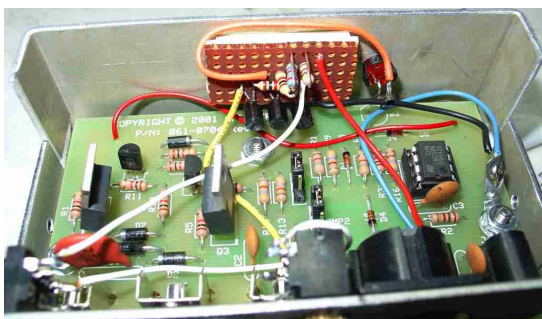


Photo A: ARB-704 disabling circuitry



Photo B: Auto-tuner pass-thru jacks