

# FUNDEMENTALS OF VINTAGE TRANSCIEVER REPAIR

“Is there a right way to approach vintage radio repair?” I get this question more often than you may think. The answer is a definite yes. Over the last 58 years (at the time of this writing 2019) I have evolved a process that never fails me.

The first rule is, never remove the case before you have the manual with alignment instructions, block diagram and schematics. In this age of the internet, manuals for most Amateur radio equipment are but a few clicks away. Take a few minutes and follow the alignment procedure through the block diagram and the schematic. This simple task will save you hours of misdirection.

Once you are familiar with the rig at the subsystem level there is a definite order of function to follow.

1, Clean the rig, go to <https://wd0gof.files.wordpress.com/2019/02/rig-cleaning.pdf>

A, Clean the chassis.

B, Clean the switches.

C, Clean the relay contacts

D, Clean and lube mechanical drives.

2, Visual inspection. Look for damaged or burned components, broken wires and mechanical issues.

A, Replace any damaged parts.

B, Test and replace bad or weak tubes.

C, Recap as required.

D, Check and adjust any and all mechanical stops and drive train adjustments.

3, Power up and check the power supply.

A, Are all the voltages correct at the source?

B, Is the ripple on each voltage in spec.?

4, Verify all the oscillators, frequency, stability and output level.

NOTE: Nothing in a receiver or transmitter is going to work properly if the oscillators are not on frequency and their outputs are the proper amplitude. The original manuals were written to the test equipment available at the time. Items such as frequency counters were expensive and not often found on the Ham bench. Often times critical adjustments were considered to be “factory adjustments” only. Consequently, when field adjustments were allowed the procedures quit often relied upon a zero-beat processes with external and internal receivers. These processes more often than not compounded errors through the synthesis chain. I recommend that you include a frequency counter as a basic necessity on your repair bench. Be very precise in setting the frequency of all oscillators.

5, Trouble shoot and repair the receiver section.

A, In most cases once the power supply and the receiver are working to spec 85 to 90 percent of the rig is proven.

B, As a general rule start at the audio output stage.

Inject signals and back up toward the antenna following the path as indicated by the block diagram.

C, When signal tracing through the receiver, remember the AGC or AVC systems are closed loop circuits.

AGC or AVC actions will mask loss of gain in the receiver train. It is best to disable these circuits and work at minimum input signal levels until you have proper function in the receiver. The same holds true for AALC circuits in the transmitter section. A search of the web will yield many useful documents on AGC, AVC and AALC circuits.

6, Trouble shoot and repair the transmitter section.

Given that you have the receiver working very close to spec., you should start at the microphone input. Trace the signal through the mic amps to the modulator. Once the audio train is proven proceed to the various mixers, then the driver and finally the power amplifiers.

7, Do a full and complete, by the book, alignment.

THIS IS A NO SHORTCUTS TASK, be very precise.

8, Get it on the air and have fun with it.

**Remember, if the rig has tubes it has voltages that can KILL YOU.**

**Observe the “free hand in the hip pocket rule”.**