

NO ALC IN TUNE

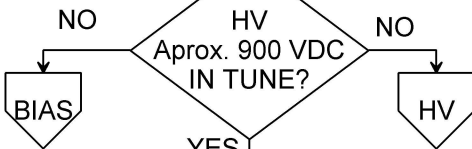
ALC

NO ALC IN TUNE

- 1) Connect 50 ohm dummy load
- 2) Power switch = ON
- 3) Heater Switch = ON
- 5) MODE switch to TUNE
- 6) Meter Switch to ALC
- 7) Carrier Control = CW
- 8) STAND-BY switch = SEND
- 9) Adjust BIAS (60ma resting current) with BIAS control on rear to 60ma

Mandatory Reading:
TS-830 Survival Guide, edited by DL9AI
www.wb4hfn.com/kenwood/articles

CAUTION !!! HIGH VOLTAGE...

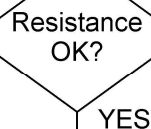


- 1) Mode Switch = CW
- 2) STAND-BY Switch = SEND

- 1) Peak Drive
- 2) Tune tank to resonance (DIP IP)



TS-830 - Check R15 & R16 resistance.
TS-520 - Check R8 & R7 resistance.



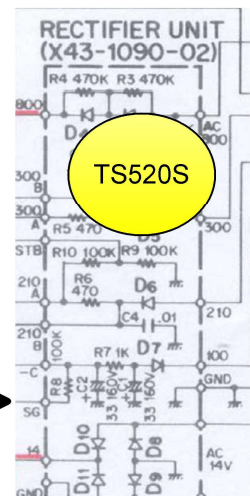
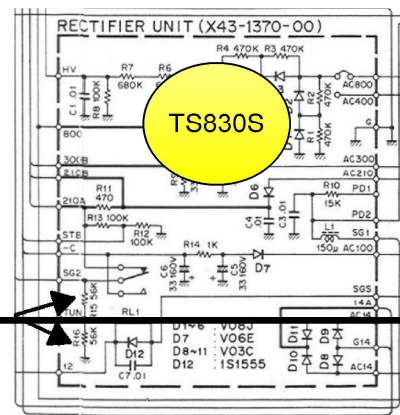
REPLACE BOTH RESISTERS EVEN IF ONLY ONE IS BAD.

TS530 & 830, Check Rectifier Board RL1 relay contacts.

K9TW - DRIVER STAGE TESTING DOCUMENT.
www.k9tw.com/how-to-guides

RF

HAVE FUN



BASIC TROUBLE SHOOTING

No requirement to have SG switch on to have RF drive. Common test for the Driver stage is to test in CW mode with the SG switch off.

However, do need cathode emission from the Final tubes so your advice to check the cathode resistors is good. Easy to measure resistance at the cathode tube socket solder lug on the Final board to see if have approx 5.0 ohms.

For ALC indication when peaking the Drive control need the following:

1. Good Driver tube
2. Heaters turned on
3. CAR level pot advanced
4. Switch from cutoff bias to operating bias voltage level at Final tube control grids when flip to send (approx -60vdc).
5. Sufficient RF drive voltage level at Final tube control grids to overcome the dc bias offset level to cause the control grids to become positive with respect to the cathode (greater than 42rms RF volts). This results in microampere grid current flow which turns on ALC amp transistor and bucks the ALC buss voltage and reduces the servo/control voltage to the TIF amp and drives the ALC meter indication up scale.
6. Good ALC amp circuit and metering circuit.

When simple common problems exhausted time to reach for RF voltage measuring test gear and run the TX Level Diagram to see where losing the RF drive or where it is low. Can then focus troubleshooting efforts at that point.

I forgot to mention that don't need the cathode resistors to measure at 5 ohms. Just need to make sure not in meg ohm values or infinite (open). If you can set the zero signal or idling plate current to 60ma then you know the cathode resistors are not open. Must have cathode emission, but don't need precise cathode meter shunt values to produce ALC indication when peaking the Drive control.

Terry K9TW

" can set the correct bias but that is all."

The normal operating position of the rear panel SG switch is "ON". The SG switch, when set to OFF, applies a "negative" DC voltage to the final tube screens in transmit. When this occurs, the screen are negative in respects to the plate, blocking any current flowing to the plate, hence no IP meter indication in any TX mode. Setting the SG switch to "ON", applies a "Positive" DC voltage to the final tube screens allowing current to flow to the plate in TX modes, hence normal IP meter indications. Since Jim can adjust the bias pot for a normal 60ma idling current in TX then I do not suspect the SG switch is the source of the problem.

As for the final tube cathode resistors being the source of the problem, again if the cathode resistors were burnt open then there would be no current, IP or grid (ALC) flowing in the final tubes. The cathodes of the final tubes is the "common current return path" for all currents, excluding the filament current, flowing in the final tubes. Therefore, if the cathode resistors were open then there would be no grid current (ALC) nor would there be any IP current indications on the meter in TX modes.

Jim did not say which Mode he has lost ALC in so I'm going to assume he loss ALC in "TUNE mode. I suggestion Jim check R15 and R16, both are 56K 1/2 watt reach. If either resistor has gone high in resistance then replace both resistors with new 56K 1/2 watt resistors and check for normal ALC in TUNE mode.

The TS-830 can also be tuned up in CW mode. If Jim can tune the 830 up in CW mode then R15 and R16 are more than likely the source of the problem.

73
Mike W5RKL

BASIC TROUBLE SHOOTING, Continued

Jim said he had no RF drive (ALC indication) and could not peak the ALC.

The Screen grid 56k divider resistors have nothing to do with low or no RF drive and no ALC indication.

Can cut them out and toss over your shoulder and still have good RF drive to peak in Tune or CW mode. Final tube Screen grid voltage not required for ALC indication in Tune mode. All you need the Finals for is Cathode emission.

You may be confusing RF output power and RF drive? If the screen grid dividers are very high or open then you will of course have no RF output in Tune mode and wont be able to tune the tank to resonance. You will of course have RF output in CW mode and can quickly tune the tank to resonance and load the radio.

I strongly recommend that the testing and troubleshooting of loss of RF drive be done with the SG switch in the OFF position. In my world that is the "Normal" position and represents good maintenance practice especially for newer folks. This eliminates any concern regards needlessly stressing the Final tubes with long key down times or keying the Finals with the tank not tuned to resonance. No need for any Final tube plate current for RF drive and peaking the ALC indication.

Still need to limit the key down time and rest between Driver stage testing on multiple bands as the Driver tube is running Class A at close to 25ma which is near max plate dissipation.

Terry K9TW

If it is doing this on all bands then couple of things come to mind:

1. Bad solder connection at the Driver tube socket solder lugs. Try gently pushing and pulling on the Driver tube shield (use glove or rag to avoid hot shield can). If this is problem will have to pull the RF board.
2. May have bad contact on RL-1 Aux Control Relay on the Audio Board. Monitor the operating bias voltage on Driver tube control grid Pin 2 (DRB).
3. Could have bad Molex Connector 6 at Audio Board. Try gently wiggling the connector and/or gently tugging and pushing on the DRB lead wire.
4. Could have bad solder connection at VC-2 or VC-3 air variable cap frame solder lugs. Can get a hold of VC-3 shaft bearing stanchion or pedestal and gently rock it back and forth. If this is the problem have to pull the RF board.

If doing it only on a couple of the bands then likely bad/dirty bandswitch contacts on RF board. Clean with artist brush. Try DeOxit D5 and if no go then try full strength D100L. Not easy to apply on bottom of the arc. Usually have to apply to the wiper and transfer to the bottom contacts.

Terry K9TW

Easy mistake to make.

If he had adjusted zero signal plate current in SSB mode as is the proper method and then moved meter selector switch to TUNE and peaked the Drive and then moved meter switch to I_p and flipped to Send to tune tank to resonance (dip I_p) and found that he had no I_p indication on the meter the first place to look would have been the Screen grid dividers resistors. Common problem as these old rigs age. Of course always should replace both resistors.

Before checking the resistors as you noted it is OK to place mode switch in CW and attempt to tune the tank to resonance (dip the plate current). Has to be done relatively quickly as plate current can initially be pretty high with full 250vdc screen grid voltage available. Can also load in CW mode until can obtain replacement resistors. Just have to make that initial plate current dip relatively quickly and best to preset the Plate Tune cap close to the white band indication on the arc.

Terry K9TW

MORE DETAILED TROUBLE SHOOTING

Look at Q30 and you will see it is a FET. Its Gate is hanging on the ALC bus. This bus is very high impedance power supply and cannot support any load current. Is just a dc control voltage that feeds Gate 2 of the TIF amp. A FET is used as its Gate offers very high input impedance so the ALC bus doesn't know it is there. If Q30 fails it will pull the bus down and your RF drive from the TIF amp will be reduced. Rare