

Some KWM-2/2A Tricks

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By Georges, F6CER – CCAE# 098



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Most of the KWM-2 transceivers that can be found in Europe belong to the first generation manufactured at the beginning of the sixties, are often in a bad shape, and are quite tricky to fix . Therefore I think that one must be conscious that repair can take time, money, and is not always successful but What a pleasure to rediscover almost 60 years later , that these guys from Collins were simply The best !

We actually can find at least 3 different schematics of the KWM-2 on the Collins Collector Association site, the very first one is contained in the book « Single sideband for the radio amateur » with its two diodes balanced modulator and first generation product detector and the two other in the archive documents .

One of these schematics will certainly be the right one for « Your » specific transceiver, nevertheless the differences are easy to find.

Before beginning, make sure that the equipment is complete, has been cleaned, that all tubes are in good shape and at the right place, that the ext. PTO 9 prong connector is present.

You shall also test continuity between J5 and J6, between J20 and J21, and between J22 and J23 and ... **BEWARE of the high voltages present on the equipment and his power supply, they can kill you.**

1- At Switch-on :

Some of the tube heaters glow-up, some others doesn't:

- Inside the 516F-2 chassis, inspect the power cable going to the KWM-2 and make sure that the cable shield and the big white wire are properly soldered together and are connected to the chassis ground.
- Have also a look on the other side of the power cable: gently discard the cover of the power plug to see if everything is still properly soldered
- Inside the KWM-2, under the chassis , near the power socket J13, make sure that the big white wire coming from J13 is still well soldered to the chassis ground lugs of J1 (RF-OUT) and J22(NB-ANT).



2- Wrong Start!:

Usually, at start, the meter needle goes full scale before gently going back to the left side, then the receiver comes alive and some noise can be heard in the loudspeaker but

- A) The needle never returns back to zero and stays full scale :
- Make sure that J20 and J21 are connected together
 - Switch-off the equipment, open the PA cage and have a look on the antenna relay K3 contacts, clean them if needed
 - Near K3, make sure that L32 is not open
- B) The meter takes a very long time to go back to zero :
- Make sure that R83 is not open-circuit (on E30 turret)
 - Make sure that the "RF-GAIN" control R84 is not open-circuit nor has erratic contacts while rotating

3- Panel-meter tricks:

- A) The «S» meter zero adjustment is impossible:
- Make sure of the health of V1 (6AZ8) , try to exchange it with V3 or V4 (some 6AZ8 even NOS tubes can develop enough grid current to forbid any adjustment)
 - Make sure that the "RCVR GAIN ADJ" R132 variable resistor is not open-circuited
- B) The "S" meter works properly but when going from receive to transmit , the needle stays to zero , no plate current nor grid-current nor ALC can be measured :

This is a classic of old KWM-2s equipped with open frame relays : The contacts 3,4,5 and 6,7,8 (the nearest to the chassis) of K4 are used to switch the meter between the transmit and receive circuitry . If these contacts are dirty or damaged, you have usually no more indication in transmit mode.

- C) You cannot adjust the "ALC zero" properly with the meter switch in the « ALC » position:
V4 (6AZ8) is prone to grid current and must be changed.



4- VOX and PTT commands have their own life! :

A) The PTT or VOX commands have no action:

- make sure that the coil of the relay K2 is not open-circuit
- suspect V4 (6AZ8) and try to exchange it by a new one if possible or to cross it with another 6AZ8 present in the set

B) You can go from receive to transmit but never back again!:

- There is a short in C225 (ceramic 0.1uF)
- R20 et R47 (the two 68K/2W on the top of E50) have drifted high

C) You can go from receive to transmit butthe relays start to rattle like a machine-gun:

- C225 is.... almost a short!
- The « Vox time constant » zero is drifting: turn the control slightly CW until the system becomes stable
- V14 is developing instability; try to turn the « VOX GAIN » control R39 to fix it

The most recent KWM-2/ 2A have two important factory mods :

- A 100 or 220K resistor (R201) is added between pin 8 of V14 (6BN8) and the red/white shielded wire going to the « VOX GAIN » control R39
- A 2.2 Meg. Resistor R199 has been added from pin 3 of V14 to the green/white wire going to the «Vox time constant » pot. R43

5- Audio Madness !

A) Audio signals are present only on the headphone jack connector on the front panel, nothing can be found on the "4 Ohms AUDIO" connector J10 at the rear:

- The "Phones" jack connector is faulty, The extra set of contacts switching off the loudspeaker have to be cleaned
- L27, the RFC soldered between J22 (NB-ANT) to J10 (4 OHMS AUDIO) has a short to the chassis ground.



B) No audio is present neither on the phone jack nor on the speaker connector J10 except when turning the mode switch to «CW»:

- The contacts 13 and 14 of the relay K2 which switch one side of the audio transformer T6 to the ground are dirty or have been damaged.

6- Audio take-off and motor- boating while pushing up the volume control:

C106 is defective! Some newly manufactured capacitors can be found on the web.

7- Permanent whistle in the speaker:

This whistle is generated by V2 (6U8): the tone is used to generate the CW signals and also as a side tone while transmitting CW. It is also used in the «Tune» and «Lock» position for transmitter adjustment.

The 6U8 tube V2 is extremely tedious and can take off easily if the contacts on the mode switch S9F are dirty, The side tone is thus permanently generated , runs through the wiring harness to the audio amplifier . The remedy is twice:

- Cleaning of S9F
- Solder a 47 or 100 Ohms 1/4W resistor between pin 3 of V2 (screen grid) and the 0.1uF decoupling capacitor C49

8- Transmitter take-off on 80m:

This is a classic in these old equipments with aluminum chassis, the same problem can also be found on 32S1-3 transmitters.

This happens mostly on the 80m band and can also affect the receiver. Set the band switch on «3.4», the VFO on «100» and «CAL» on

- While moving the “EXCITER TUNING” control, one can find two or three positions where the noise increases, but only one is giving a correct calibration point.



- While in the «Tune» position , the grid current goes full scale on two or three different “exciter tuning” knob settings, moreover in the «LOCK» position , the plate current reaches a high value and cannot be controlled anymore by the «Mic gain» control .
- While aging, the aluminum chassis has developed Alumina which is a very good insulator: the coil shielding does not make any more contact with the chassis ground and all of that gives instability.
To restore good shielding, you have to take apart all the coil shields as well as all the silvered finger-stock contacts, and gently clean all the surfaces which have to be in tight contact with fine steel-wool.
- Some bad guys have eventually cut a slice in the coil shields to allow quick and easy access to the tuned circuits without removing the fiber switch shaft: If this has been done, you are almost sure to have a completely unstable receiver and transmitter and that on all bands. You can only fix this problem by exchanging the coil shields for new ones, or by closing the slice with auto adhesive aluminum tape

To clean the chassis, and to gain access to some tight places, one can fasten some steel wool to the end of a pencil with some scotch tape.

Be very careful because the material used in the finger-stock contacts is very brittle and will break immediately if bended too much.

Then it is best to protect the future contact surfaces with a very light coating of conductive grease (this kind of grease can be found at antenna hardware stores or in automotive centers for exhaust pipes screws and nuts coating)

To finish, re-open the PA cage, remove V8 (6CL6) from his socket, unscrew and screw again two or three times the two screws retaining the tube socket to remove any trace of oxidation: these screws are used to fasten the socket, but also a shield under the chassis, and this shield is used to separate the input and output pins of the driver tube and has to be well grounded to avoid instability.

To be on the safe side, clean everything!

Good restoration and give a new life to these fantastic electronic equipments of the last century

Georges RICAUD, F6CER. - CCAE member #098

