Fixing Audio Distortion with the Mark V and MD 200 Microphone

Courtesy of Mike Schatzberg, W2AJI Administrator: 1000MP Reflector

Hello MP Fans:

Over the years my Mark V has suffered on and off with RF distorting my audio. Certain positions of my yagi could occasionally result in audio distortion during transmissions. I normally use my MD 200 microphone to drive some outboard compressor/limiter with a downward expander to control noise. As you know, this microphone was developed to work with the Mark V specifically. I have previously needed to use ferrite snap-ons to control the problem. The problem is especially pronounced when running higher power with an amplifier.

Recently, I realized that the RF was entering the audio chain via the MD 200 microphone. I started to examine the microphone carefully, and here is what I discovered:

1. The element housing is floating, and not connected to chassis ground. It seems to act as an antenna, and picks up RF.
2. The powder coating on the housing does not permit continuity between the upper and lower portions of the housing.
3. The vibration damping mounting bracket is not grounded to the base either.
4. No chassis ground is carried in the cables to the microphone board, which is grounded to the floating housing.
5. The base of the microphone and its switching board are indeed chassis grounded.

Here's how you fix the problem:

1. At the point of attachment of the mounting bracket to the housing, remove a small amount of the housing powder coating around the holes which are used by the gold plated retaining pivot screws. This will permit the mated upper and lower housing halves to be electrically connected. ONLY REMOVE the coating from the small area around the screws, from the surfaces where the upper and lower housings meet. When the housings are reassembled, these contact points will not be visible

2. Remove the coating from the mounting bracket, at the very bottom, ONLY FROM the surface that mounts onto the post which extends from the microphone base. The post is at chassis ground already, and this change will ground the mounting bracket also.

3. Next, the MD 200 can accept a second cartridge, there is a switch in the base to select either the stock variable pressure element, or the optional cartridge which you can install. This means there are two extra wires in the microphone housing cable, which are not being used if you DID NOT INSTALL THE ADDITIONAL CARTRIDGE. Remove the top housing and examine the microphone board. You will see the two small pads, next to the microphone element connector, which is white. One pad is marked, GRD 2, this is the unused microphone ground for the optional cartridge. Solder a small gage wire to this pad, it will connect to the internal wiring, which is connected to the base. The other end of the small wire can be connected to the board ground, which can be obtained at the near by pad with the mounting screw which attaches the board to the housing. Providing this link will ground both the board to the housing, and the housing to the base, once the other end of the cable is grounded. Reassemble the housing.

4. Remove the base cover, you will see the small slide switch which selects the microphone cartridge. In front of this is a row of pads which appears to be the termination of the cable conductors. The 4th pad from the right is the 2nd cartridge microphone ground, you can confirm this fact now, by using your VOM to see that the cartridge housing is common now to this pad (make sure that the upper housing is plugged into the base of course). Tack solder another short wire to this pad, and solder the other end to the board ground, also at the point that the board is retained by the screw at the lower left hand corner. This board is already at chassis ground, so completing the wiring to the housing, makes everything common. Reassemble the base cover, and install the cartridge mounting bracket, and the cartridge housing into the bracket.

I made some measurements and found that the housing screens are common to the housing itself, so grounding the housing grounds the large screens.

In my case, the RF distortion was eliminated completely, and the audio quality was greatly improved. It is surprising that Yaesu produced a microphone without grounded shielding for the element, with as large a screen area as this microphone has. Obviously, take care not to damage your microphone either electrically or mechanically during this modification, which does require moderate experience to complete. This modification is done at your own risk, and no liability is assumed by the author for errors or damage. Check your work carefully, it should work well for you.

I will eventually take some pictures of the mods on the two boards and place them on my website. If you have any questions, please let me know.

73 and Happy DXing,

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