Repairing the Yaesu MH-27 microphone to correct low audio

Part Needed:
1 ea. 0.1 uF cap @ at least 10-12 volts (C5).

Suggestion:
Radio Shack #272-1069 0.1 uF Polyester Film @ 50 volts

KC2RDX, who has successfully completed the repair, wrote to say that he used a Radio Shack cap with total success and provided the above part number. I checked the Radio Shack website and it appears to be available at most stores. Now, on to the good part…

Yaesu apparently used some 0.1uF caps during manufacture of the MH-27 microphone that lose capacitance as they age. C5 is used as a DC block/audio pass cap from the electret mic circuit into the audio stages of the radio. As C5 gradually loses capacitance over time, it continues to block DC but passes less and less audio from the electret mic into the radio.

You will be working with Surface Mount Technology here, but the cap that needs replacement is fairly large in size. Open the mic by removing the three external screws; there's one in the hangup button and two in the black plastic case. Gently unplug the mic cord and set it aside. Remove the three smaller screws in the PC board "sandwich". The "on air" LED, the electret element and the UP/DOWN switches are not physically attached to the case so they may be pulled from their locations. You can now remove the PC boards leaving the rubber keypad membrane in the case.

The boards are held together by headers at each end - a 2 pin header at the top and a much larger one at the bottom near the mic cord plug. Use a solder sucker or solder wick to free these. You may now separate the two boards. On the inside surface of the back board, you will see 4 black cubes approximately 3/16 inch on all sides. The two that are right next to each other are the audio coupling caps. With the mic cord connector facing downward, the one for the mic audio (C5) is on the right and is nearest the edge of the board.

Simultaneously heat both terminals on the end of C5, the outboard cap, and remove it. Replace it with the new 0.1 uF cap, observing polarity if applicable. Tack solder. Neatness counts! Spaghetti helps!

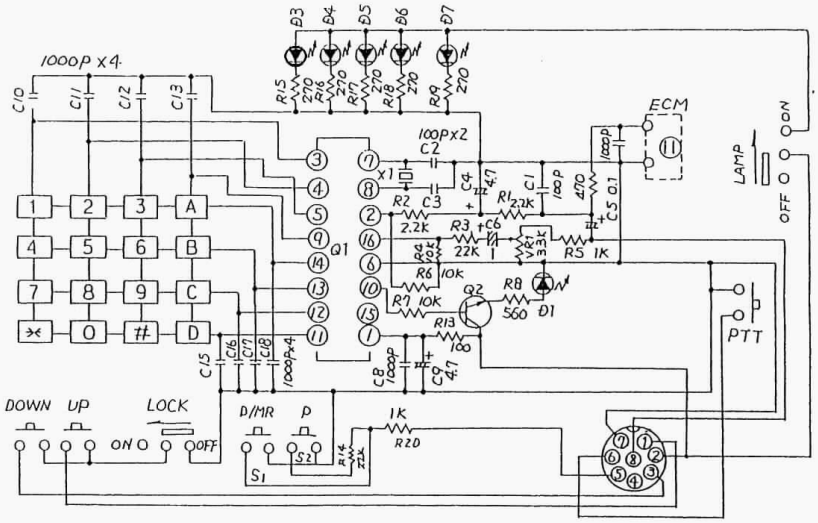
Make sure nothing is shorted and solder the two boards back together. Screw the boards back into the mic. Re-install the electret element, the "on air" LED and the UP/DOWN switches. The pot you can see after re-assembly is for Touch-Tone audio only. There is no pot in the mic for voice audio. Re-install the mic cord and test it. See note below. If all is well, close it up.

NOTE: Although not likely just because of the cap replacement, audio levels may need adjustment. There is a pot internal to the radio that controls ALL audio coming from the mic. Adjust the internal radio pot for voice level first, then adjust the pot in the mic for TT level. Since the MH-27 was used on more than one model of radio, you're on your own in locating the internal radio pot. If you can't find it, just adjust the pot in the mic for TT levels. Again, level adjustments due just to cap replacement will not likely be needed. But, if like me, the first thing you did to try and get your voice audio back was to adjust the pot in the mic, you may have changed the TT levels.

I cannot take credit for discovering this repair as I collected the information from several sources on eHam.com and thought I would write it up so others could benefit from having it all in one place. The following Hams contributed to this article: WA0ROX, K8UV, N0NB, K6QD, N7FM and LU8EYW. Thanks guys and thanks eHam.com!

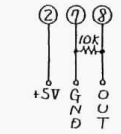
Allan, N4NLQ
Dec. 5, 2007

Rev. 2/24/09



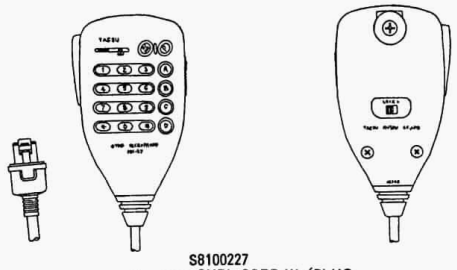
X1：CSAC 3.58MGCM (村田) 相当
D1：SEL1123R (サンケン) 相当
D2：1SS307 (東芝) 相当
D3~7：SLM-13DW (ローム) 相当
Q1：LR40872 (シャープ) 相当
Q2~4：2SC2412KR (ローム) 相当

測定用負荷回路



1 - UP
2 - +5v DC
3 - DOWN
4 - N.C.
5 - D/MR & P
6 - PTT
7 - GND
8 - AUDIO OUT

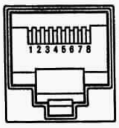
MH-27$_{A8J}$ Microphone (accessory)



S8100227
CURL CORD W/PLUG

Specifications

Micropone Impedance: 1.5kΩ
Operating Temperature Range: −10℃~+60℃
Voltage Requirement: 4.8V~5.2V



1. D/MR & P Button
2. N.C.
3. PTT Button
4. MicTx Audio
5. GND
6. +5V DC
7. Up Button
8. Down Button

Diagrams courtesy of N7FM