

The Kenwood MC-60A Desk Microphone Rebuild



The whole purpose of this page is to share what I learned to rebuild the Kenwood MC-60 Desk Microphone due to hours of search engine hunting turning up nothing.

Background:

Recently I purchased a used Kenwood TS-940S AT from an add located on the [ARRL website](#) and after a little haggling over the price, it arrived at my door with a Kenwood MC-60 Desk Mic included. On the exterior, both pieces of equipment were like new, however once I finally got them hooked up and pushed the PTT for that first call, the meter on the rig pegged to the Right for a moment, and then fell right on it's face. Nothing... No signal. Didn't matter whether or not the pre-amp switch on the mic was "in" or "out". So, I disconnected the base portion of the mic and plugged the cable directly into the mic itself (the mic has it's own "on-off" switch). Ok... now I had some signal, but that first contact told me that I definitely had some noise in the signal, and described it to me by thumping his finger on his mic while he was talking to me. Got me wondering about whether or not I made a poor purchase or not, but, like anything else most things can be fixed and all the reviews I'd ever read about either piece of equipment were good.

Like a lot of people, if something isn't working like it should, I have no problem diving in with the tools and taking it apart until I either figure out how it's supposed to be working or what's gone wrong in the equation. Give me a repair manual, and I'll make it work for sure. However, I am by no means an electronics wiz-kid, and learned just enough to get by the test for my General license back in the middle 90's. Even with the amazing medium for information that the internet is, I was unable to locate anything repair manual wise, or schematic wise (other than the two page information sheet that came with the mic from Kenwood) that was going to allow me to have an understanding of the MC-60 before I started dissecting it.

Here goes nothing:

Opening up the base of the microphone reveals the battery holder for the 2 "AA" batteries which power the pre-amp unit located in the base of the mic, a small printed circuit board which has the "in-out" switch for the pre-amp, and then the main circuit board which is mounted in the top of the base assembly and has the P.T.T. switches, and the up-down frequency selection switches as well as the pre-amp circuitry. Hmmm... capacitors, resistors, diode, transistors.. stuff I know a little bit about to become a 'ham' but otherwise am quite ignorant. So off I go to learn a bit more, and came across the following sites which helped a great deal with learning about the proper way to test these components, and read their encrypted markings...

<http://xtronics.com/kits/rcode.htm>

<http://www.uoguelph.ca/~antoon/gadgets/caps/caps.html>

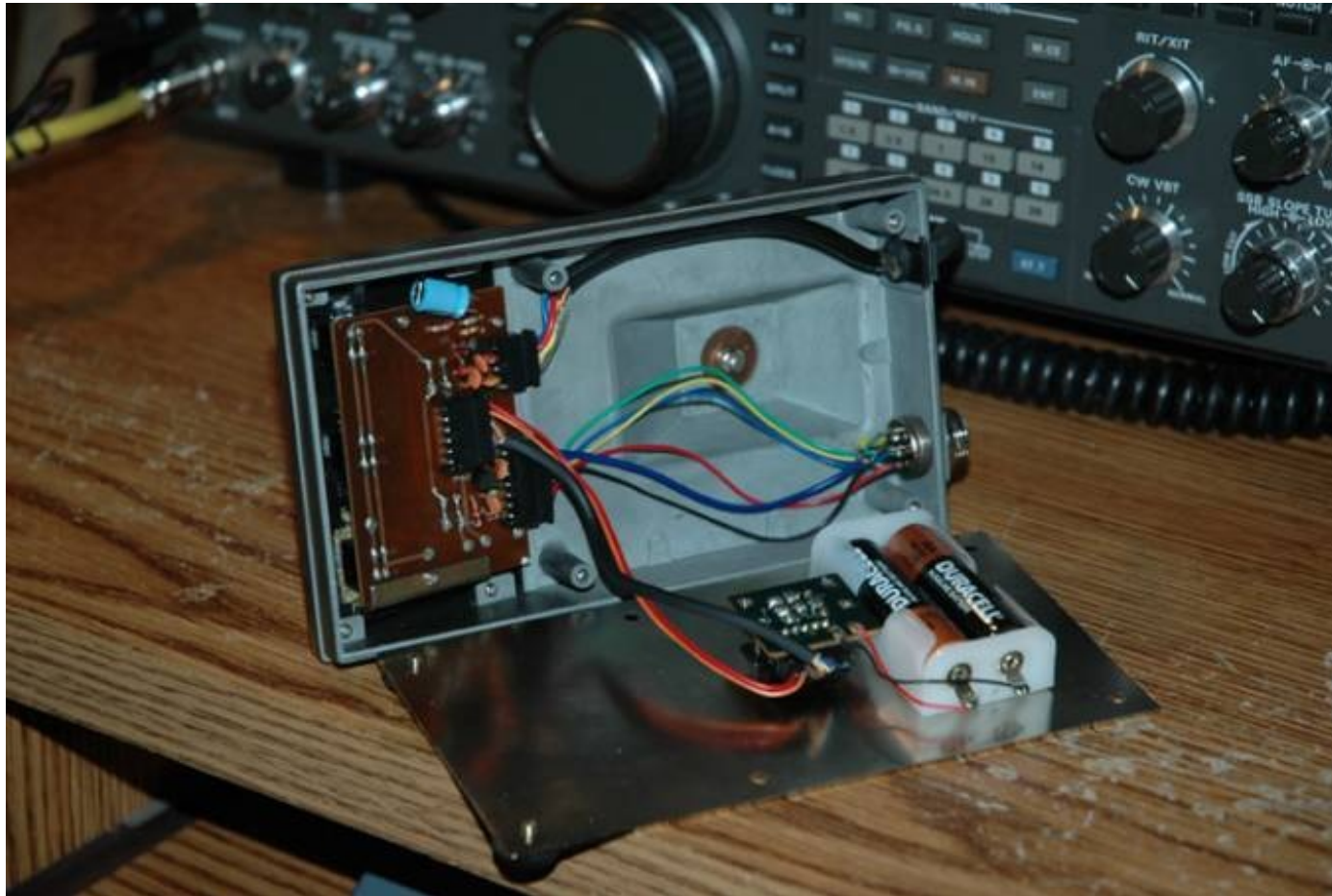
<http://users.pandora.be/educypedia/electronics/datacomponent.htm>

<http://www.kpsec.freeuk.com/index.htm>

<http://www.datasheetcatalog.com/>

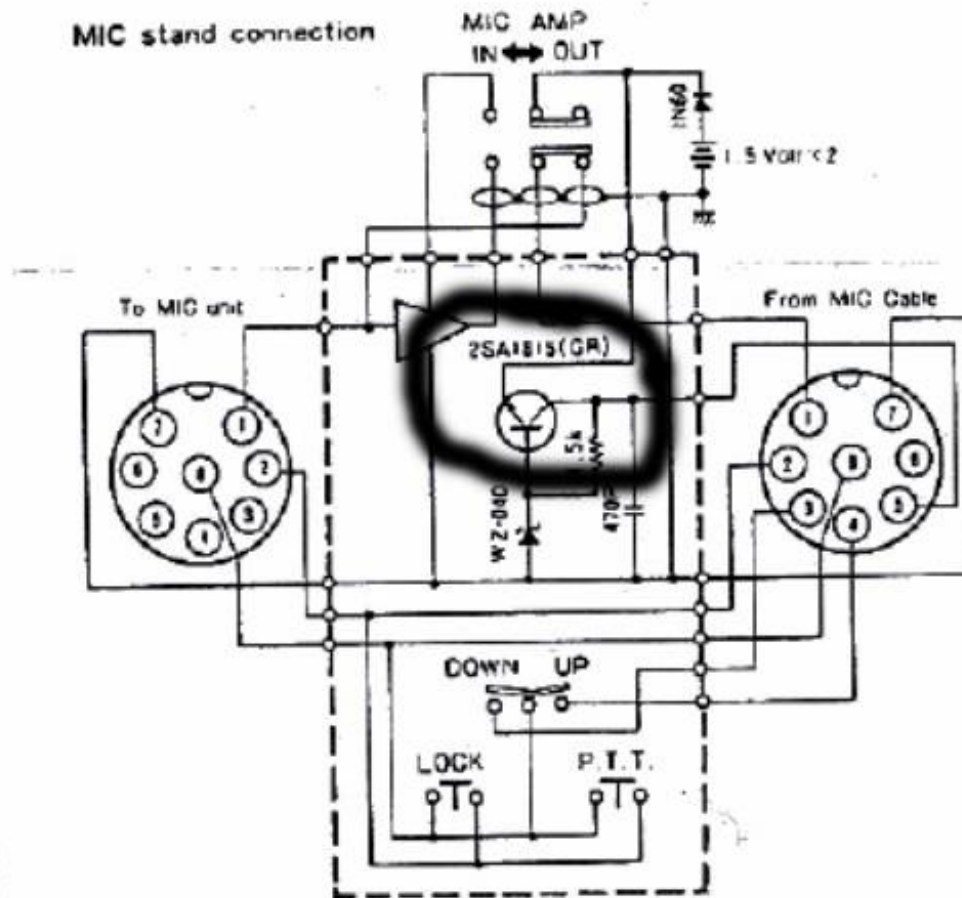


Bottom View- Shows Pre_amp “In/Out” switch



Open base- This is an after-repair photo- The electrolytic Capacitor here is rated at a higher voltage than the factory One, hence it's larger size

Now the last link for the datasheetcatalog.com site, brings up an important discrepancy that I noted in the almost worthless schematic that Kenwood included with the microphone directions/specifications sheet. If you take a look at the below snapshot from the .pdf file I found on the web (sorry the quality is poor)

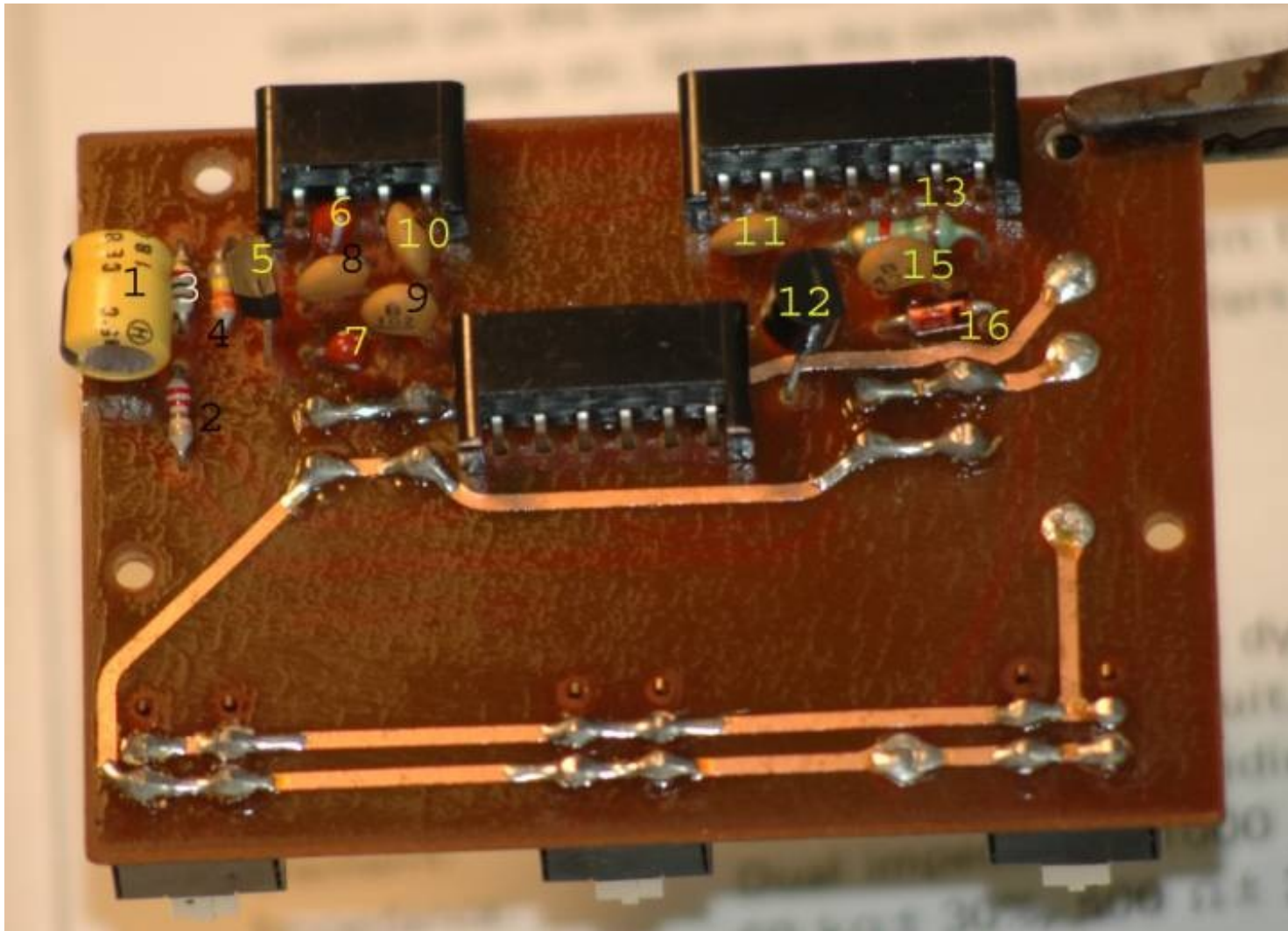


you will see that the area I have circled shows a transistor with the symbol for a NPN type transistor, and the transistor part number listed as a “2SA1815(GR)”. Now, the information that I find on the datasheet site shows that part number is actually a PNP type transistor. Looking at the transistor (one of 2 different transistors in the circuit- the schematic doesn’t show the second- or a lot of other things for that matter) it is marked with a “C1815”. So, after removing the transistor from the circuit and testing it based on the instructions I found on the web, it tested good and appeared to actually be a NPN type transistor as the schematic symbol showed.

Armed with a little more knowledge on the components involved in my circuit, a good meter capable of measuring

capacitance from Radio-Shack, digital camera and soldering iron I was on my way.

First I photographed the circuit boards on both sides so that I wouldn't have to take the time to draw it out by hand:



Legend: (1) 6.3V 100microF* electrolytic capacitor (2) 220 Ohm resistor (3) 1 Kohm resistor (4) 330 Kohm resistor (5) Transistor C2458 GR 1K (6)and(7) 1 microF Tantalum Capacitor* (8)and(9) 1000 picoF ceramic disc capacitors (10)and(11) 100 picoF ceramic disc capacitor (12) transistor C1815 GR 20 (13) 1.5 Kohm resistor (15) 470picoF ceramic

disc capacitor (16) WZ-040 zener diode (14 accidentally omitted while labeling the photo- wasn't going to go back and fix it)

NOTE: All these values come from either reading the color bands, markings on the components, or meter reading values however I take no responsibility for errors.. so double check them yourself.

(make note of the polarity markings and their orientation!!!!)*

Anyone that finds any errors that they would like to have me correct, please feel free to email me.

The first step was to check the continuity of all the switches involved- P.T.T., Lock, and pre-amp “in/out”. The only one I found bad was the DPDT slider for the pre-amp “in/out”. Then I began to carefully unsolder all the components, except the resistors and the zener diode, which can be accurately checked while still soldered to the board. Use great care not to overheat as many of these components can be damaged by heat. Use of a heat-sink is a good idea.

While I found that the tantalum capacitors, diode, transistors and resistors were all fine, I did have a couple bad disc capacitors and electrolytic capacitor. These were easily obtained at Radio-Shack, however the only 100microF electrolytic they had was rated at a higher voltage than the factory one, so it is a little larger, but didn't really pose a problem for fit. I figured that the price was right, and the time was right to replace all the capacitors except for the tantalum ones, and carefully, the components were all replaced into their respective positions on the boards. I say boards, because the pre-amp switch is soldered into the smaller board attached to the cover-plate.

Another thing that I took the time to do, while the base was apart, was to check the solder-joints and continuity of all the plugs, wires, and cables, and all were fine. While doing my research on the ‘net’, I ran across a recommendation that the cable either be replaced with a shielded cable, or to take the thin wire lead from a component such as a disc capacitor and solder it to the ‘mic’ wire shield pin on either end of the cable that runs between the rig and the mic base. This is then clamped under the connector cable clamp which is held on by two small screws, and if you want you can wrap the thin wire under the head of one of the screws. Use care though not to put too much twisting force as you tighten the screw, as the wire is fragile and will snap easily.

The last thing I took the time to do while checking all of the wiring was to disassemble the microphone itself. This takes a lot of heat from a blow dryer or heat-gun to soften the thread locker or whatever that the factory puts on the threads so that the mic doesn't come apart easily. Wrap the microphone in an old cotton shirt or towel before using a couple pairs of

channel locks to disassemble it (it gets very hot when heated, and isn't the easiest thing to grip). DO NOT squeeze the mic too hard with the pliers or you will dent/bend/mar the fins/grills. This is what it looks like:



Note the large size of the microphone element. All my connections were good here, so I did not take it apart any further. But I do know what it looks like if I ever want to replace the mic element with a Heil or something.

The moment of truth:

Now to find out whether I saved myself a lot of money by investing a little time and a few bucks, or if I still have a nice looking paper-weight on my hands.....

Putting it all back together, and plugging it in, I was ready to make the first call. First, as my rig has a switch to allow me to monitor the mic signal input, I activated that, power to minimum and key up the mic to announce my call. Clear and Strong! Turn on the pre-amp switch, still clear and even stronger! No signs of any rfi that I could detect, but the mic is so strong without the pre-amp, I decided to leave it off. The first contact with the rebuilt mic was the highlight of my day- 20db over 5x9, clear, clean, audio and an “if you didn’t tell me you were only running 100 watts, I’d think you were running a 1000” report. I’ve been getting great comments on the audio ever since. :)