

Kenwood Microphone MC60A Modification - Another use for the SSM2165

The Kenwood MC60A with preamp, suffers from RF feedback, a search on the web reveals the extent of the problem. the many looking for solutions to this problem.

There exists an error on the user documentation, that shows the microphone audio wiring as reversed from one socket to the other, the Ground system is poorly implemented in the layout on the switch board, further the use of a single transistor as an amplifier is not a great idea, there is no common mode rejection, further adding to the problem.

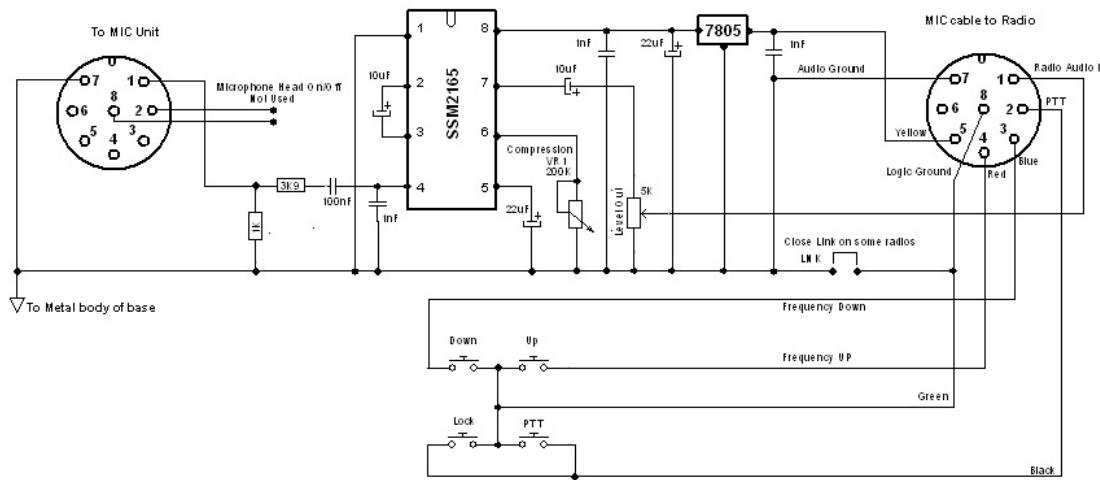
To address the above issues, one IN3ILX tackled the problem by the way of extensive modification to the Ground in both the microphone head, the base and the addition of ferrites on some of the wires.

<https://www.youtube.com/watch?v=Vk7Ak549IsA>

I chose different approach, that to use an IC, the differential input will provide common mode rejection keeping the offending RF out of the audio path, plus the ease of impedance matching, with this I also considered the use of the SSM2165 providing all the features of levels conditioning that this IC provides.

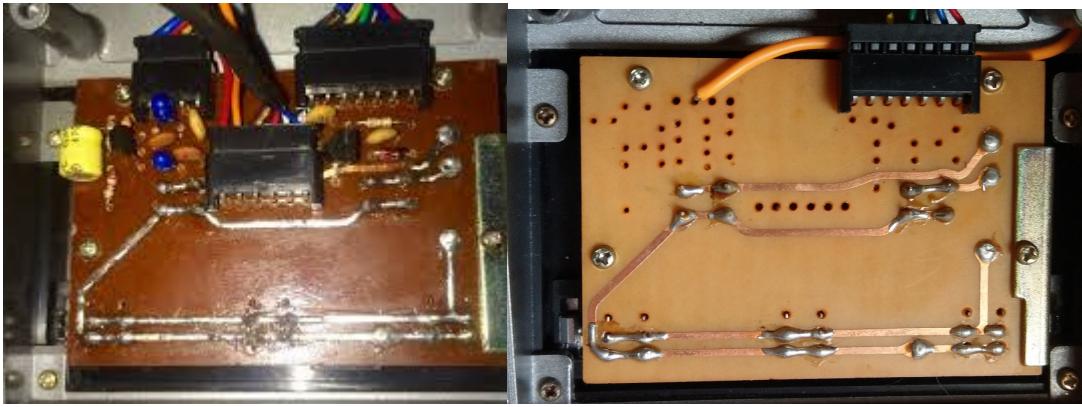
The microphone after the mod has a dynamic adjustable range of over 38dbm with variable compression, in addition of peak limiting,

Compare this diagram with that of the Original Kenwood Wiring



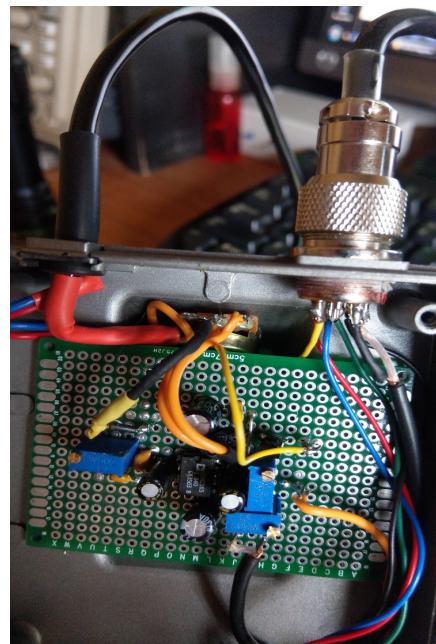
Preparation

My preparation for this mod, was to remove the 3 Volt regulator, plus the single transistor amplifier and associated components and sockets no longer required.



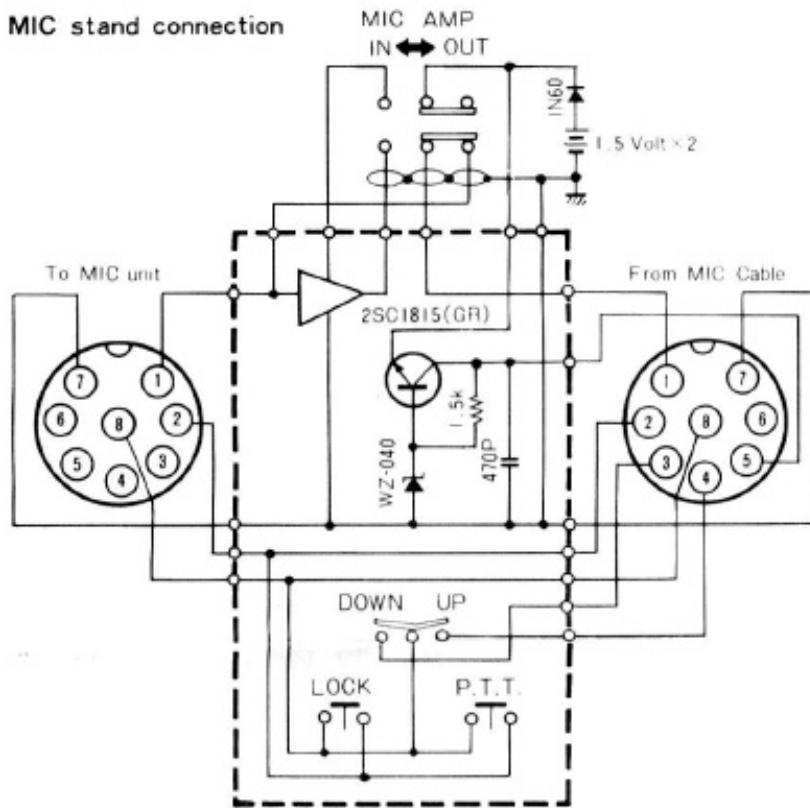
Only the socket for the Ch Up/Down and PTT is retained. The Black, Red, Blue and Green wires remain attached to plug, the rest can be cut at the plug end. Dont cut them at the MIC cable end.

The Amp conditioner, can be constructed on any prototype board available to you. This is what I did.



The image shows a trim pot to the left that is now replaced with fixed value resistors. The position of the components will depend on your construction.

Original Microphone base wiring



The above diagram shows that the microphone has two ground systems, one on Pin 8 and one on Pin 7 of the MIC Cable Socket

Pin 7 is the Audio ground and Pin 8 is the logic ground, it so happens that the Logic ground is also the chassis ground (RF ground) on my radio a Kenwood TS590S, there is no physical ground for the microphone base, the microphone itself is insulated from the base by the plastic holder, this is a path for any RF to enter the audio path.

The first thing was to ground the base to the RF ground of the radio, it so happens that its Pin 8, also known as the logic ground, to this I combined the audio ground with a wire to ground the base and the shaft holding the microphone bracket using the link (LNK) Pin 7 and 8 are joined, both the microphone ground and Logic ground become one, With some radios the joining of these grounds may not be desirable, for instance if the audio uses balanced input.

Mounting the Compression Control

The 200K Ohm Pot is mounted as per the picture



Dress the cable coming from the Microphone head by cutting off the connector, then strip back the wires, the only ones you require are the shielded one. (Ground and Shield)

Don't cut the other two, just insulate them with heat shrink, could later be used to turn the preamp on or off, using the microphone head on off switch.

Wire the 200 K pot so that when the control is fully anti clockwise (Looking from the rear of the MIC you have 0 resistance (This is the 1:1 compression point)

The idea is that when facing the microphone, you turn the knob clockwise to increase compression.

Setting UP the levels

The best way is to use your ALC indication on your radio.

Turn the radio TX power as low as it can go.

Transmit in a dummy load

Set the compression control for 1:1

Now whistle or call out the word Five as loud as you can,

Adjust the Level out control for the allowed maximum ALC on your radio

Note that the ALC is a mechanism that reduces the audio level, so if your radio has a processor, turn it on and off and compare the obtained ALC levels.

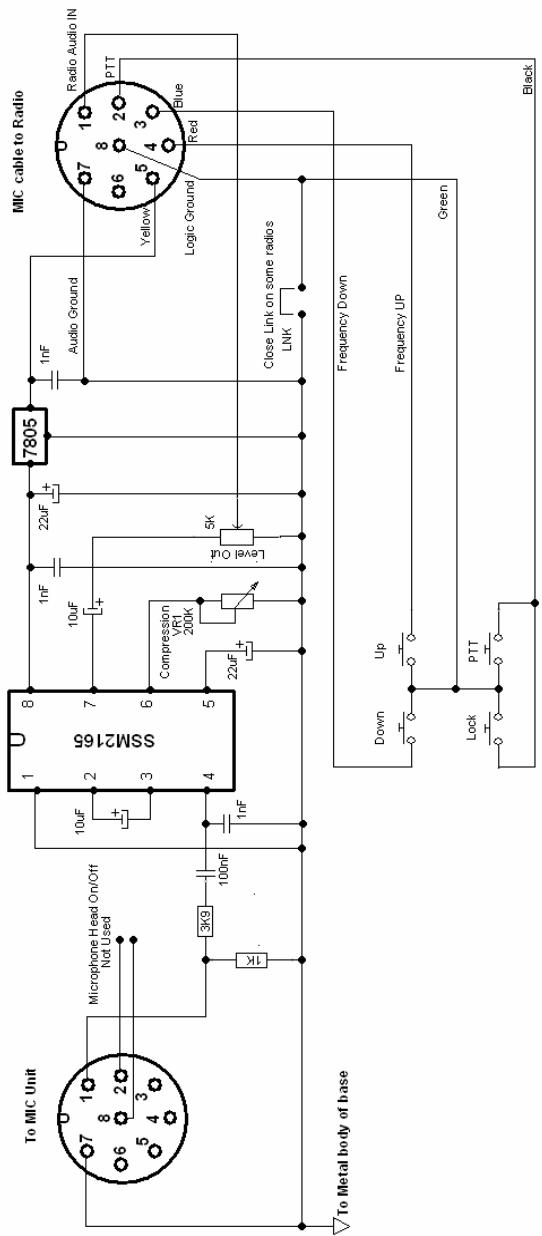
If you see that in the processor mode the ALC is reduced, this is normal, you can slightly increase the level out from the microphone. On my Radio this was 100mV RMS

Now with a normal voice look at the ALC then increase the Compressor level all the way to 15 to one, you will note that you can move back from the microphone and the ALC will remain very close to when you spoke close to the head of the microphone.

The circuit is lifting the level (Expansion) to just before the compression point, reducing compression also reduces the expansion level range.

Resist the temptation to drive more audio into the rig, all you will achieve is clipping and distortion. This mod works well, I have run 400 Watts with no hint of RF feedback, the Audio reports are good, the SSB signal produced has more punch, with no negative reports.

73's VK2YMU



Title	MC60A Modification
Author	Robert Campiciano
File	dsn Diagrams\Kenwood 60 Compressor Mod dsn
Revision	Date
1.0	Sheets 1 of 1