

## Modifications for the Icom IC-718 Transceiver

by Chris Jackson, W2JBL

The IC-718 transceiver is Icom's entry level rig. It's very capable of high quality AM with just a few minor adjustments and modifications. A critical point is the internal ALC. The ALC will limit the percent of modulation to well less than 100 percent and also induce distortion if the audio level is too high. An external voltage will allow the ALC to be set such that more than 100 percent modulation is achieved on positive peaks without distortion.

### Alignment for Optimum AM Operation

Turn off the external ALC controller if you have one (S1 open in **Figure 1**). Connect the unit to a 50 ohm dummy load and wattmeter. Set the radio power in the menu to "H". Set the band to 80 meters and mode to CW. Key the radio and adjust the TX power adj. R1707 for 150 watts output. Unkey the radio, set the mode to AM, and key the radio. With no modulation applied, set the AM Tx carrier adj. R1730 to maximum power. Unkey the radio.

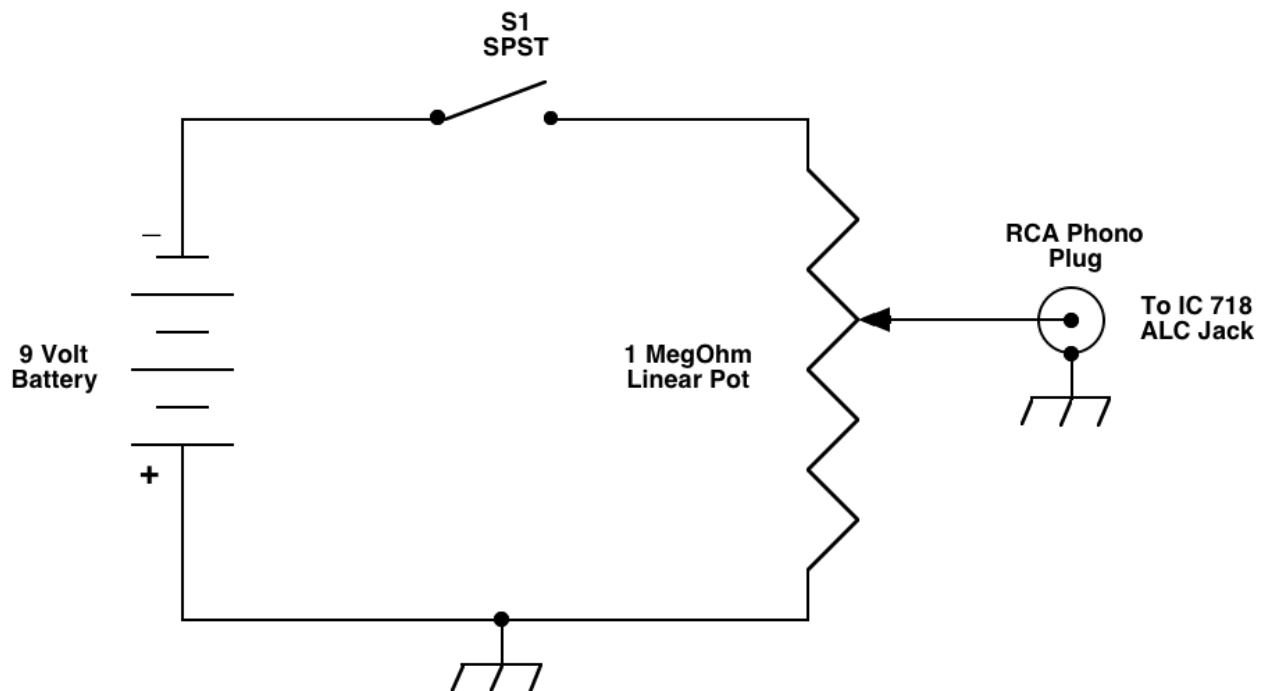


Figure 1 - ALC Controller

With the external ALC controller enabled (S1 closed in **Figure 1**), key the radio on AM and set the power to about 25 watts by adjusting the 1 Meg pot in **Figure 1**. This is the level for best performance running barefoot. You can set it to 40 watts, but you will be limited to 100% positive modulation. At lower power, the radio is capable of over 300% positive for 100% negative. Only use the ALC Controller 1 Meg pot to adjust the power in the AM mode.

When driving an amplifier such as L-4B or SB220 you will typically set the radio for 10-12 watts. This should give 200 watts carrier and near 200% positive and 100% negative modulation. The L-4B will run near continuous duty on AM at that power level. Turn off the external ALC controller when running CW/SSB. You may also want to lower the menu setting for power on CW/SSB but you will not hurt the final at 150 watts, as the final transistors are good to 200. DO NOT SET THE POWER TO 200 WATTS!

The processor (really an audio compressor) may be cleaned up quite a bit by adjusting R-2220 for less gain. If you set it so that the modulation only increases slightly when turned on, the resulting audio is much better. This is optional as the compressor removes all the lows from the audio and is crappy sounding on AM anyway. Still it goes a long way to cleaning the audio up when used on SSB.

Use of externally processed (compressed) audio is strongly recommended in order to keep the positive peaks from flat topping or the audio going into "double sideband". Adjust the modulation using a scope if you have one or so the wattmeter needle just kicks slightly upward on peaks. If the carrier level drops on peaks (it still can) you have too much audio.

## Stock Mic Fix

This modification will get you a nice crisp high end out of the Icom HM-36 mic:

Replace the 0.33 uF cap (C-1) with a 33 uF cap. Install a 33K resistor in series with the negative end of C-1 and the board. Put the previously removed 0.33 uF cap in parallel with the 33 K resistor. Remove the felt "pill" from in front of the mic element and replace it with a piece of open cell foam from a microphone pop filter. The result is sibilants out to about 5000 Hz and very nice audio. I set the mic gain to about 30 to 50 on AM and hold the mic 4 inches from my mouth. You will lose some mic gain with this mod, but that's actually a good thing because the first mic preamp stage in the rig is easily overloaded and driven into distortion by the electret element. On SSB I run the mic gain up to about 70 or so. You will still have enough gain to make full output on SSB.

## External Audio

If you wish to use external audio processor gear and feed it to the 718, you have two options. Near line level audio can be fed into the data input via rear panel 13-pin DIN connector. Note that the audio will be heard over the speaker at a low volume on

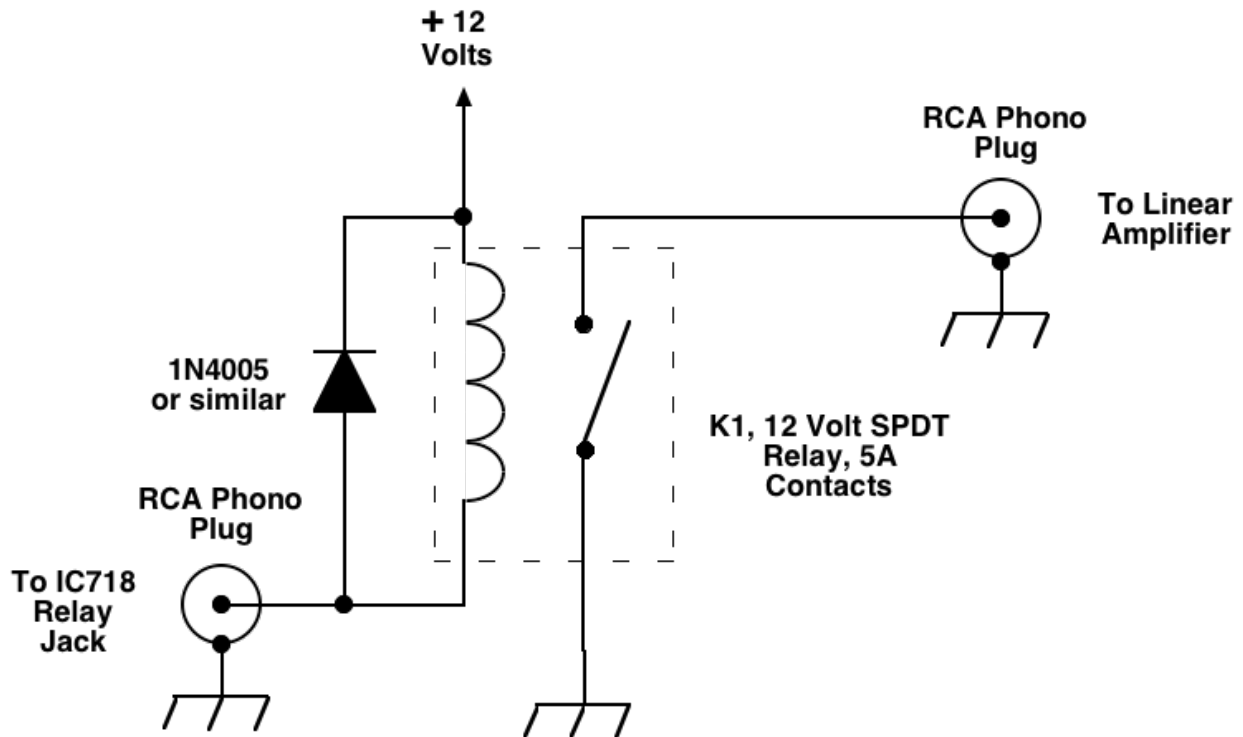
receive when this is done. You can use the mic input on the front panel, but will need serious attenuation and may lose some low end. There is mic bias voltage on the mic audio pin and a blocking cap **MUST** be used. Shorting the mic input can and often does blow an 8 volt regulator in the radio.

### External PTT

If you aren't using the mic jack on the front panel or have a mic with no PTT, you'll need to connect an external PTT switch (hand held or foot switch). You can use the external PTT input on the 13 pin data connector. However, this pin has no pull up resistor, and if keyed with a dry contact may "go to sleep" and you will have no PTT from the data input. Connect a 4.7K resistor from the +8 volt pin of the data connector to the external PTT line to pull it high when idle.

### Keying Relay Addition

If you want to use the IC 718 with some of the older amplifiers like the SB-220, you need to add an external amplifier keying relay as shown in **Figure 2**. The contacts on the relay internal to the IC 718 (connect via Amp Key jack on the rear of unit) will not handle the higher keying voltage/current of many of the older (60s, 70's and some 80s vintage) linear amplifier.



**Figure 2 - External Amplifier Keying Relay**

## Conclusion

After the alignment you only use the 1 Meg pot in **Figure 1** to control carrier level during AM operation. Note that it does NOT affect the PEP. It's pretty cool - as you go down in carrier level you can keep turning up the audio and get down to a few watts carrier and 150W PEP (If you are using the data input on the rear panel the menu setting of mic gain has no effect). Then you have very nice clean DSB suppressed carrier signal. The power setting in the menu stays at max at all times and you just dial the pot.

Please note that for the other modes you MUST turn the ALC Controller off (open S1 in **Figure 1**) and control power with the menu. This radio amazed me (and I HATE rice boxes) out of the box stock with a good receiver and "9"KC AM filter. Menu selection can give the option of using the crappy SSB filter on AM receive (it's about 3.5 kHz with poor shape factor). AM transmit is through the AM wide receiver filter. The IC-718 plays great barefoot at 30-40 watts carrier and good headroom.