

Getting started

All of the 858 chassis rigs are the same, with the exception of the Realistics. For some reason or another Radio Shack decided to use a different (less powerful) transformer in their base station's power supplies than the ones available from other marketers. There are also some component differences. These will be explained later. If you can get a factory service manual, do so as it contains a wealth of information and is very well written. Copies of the Realistic manuals are available from Radio Shack. You can download a copy of the TRC449 factory manual here:

http://www.cbtricks.com/radios/reali...trc_449_sm.pdf

The following changes are very important (especially the installation of mica insulators), and should be done to any 858 chassis rig to eliminate shortcomings and improve overall performance .

The first thing to do is to replace all of the thick white insulators from between the power transistors and the heat sinks. Use mica insulators and a liberal amount of heat sink compound. On base stations, remove TR401 and remount it using a liberal amount of heat sink compound.

Make sure that L6 and FT2 are installed in your unit. In some sets (TRC449, Cobra 138/139XLR) they were omitted and replaced by a jumper (JP-37). These parts are absolutely necessary for best adjacent channel rejection. They are still available from Uniden America: L6 - Uniden part # 2200-029, FT2 - #2100-002. Order an additional FT2 filter to use in the adjacent channel rejection mod shown later.

Change C304 to a 10,000uf/50volt computer grade electrolytic (Base stations). Change C107 to a 3300uf/35volt. Change C102 to 1000uf/35volts.

Realistic sets only

Locate D23 (next to VR7). In the Realistic sets (TRC449, 457, 458) a 220 ohm resistor is installed in the D23 location. Replace this resistor with a 1N914 diode (observe polarity). Replace C87 with a 15uf/16volt electrolytic. This will make the Realistic modulation limiter circuit the same as on all of the other 858SSB sets. Do not attempt to modify or defeat the AM modulation limiter, as this will degrade performance.

Replace VR9, VR15, and VR16 with Cermet (or equiv.) multi-turn pc-mount variable resistors of the same values. This will allow more accurate setting of the transmit frequency (VR9), and of the driver and final bias (VR15/16)

Replace D10 and D11 with 1N6263 schottky diodes. DO NOT REPLACE TR5 WITH A 2SC2999 TRANSISTOR. The original equipment transistor (2SC1730L) has a much higher AC current gain than the 2SC2999, and replacing it will degrade receive performance.

If your rig does not have a front panel mike gain control, install one. See SECRET CB Vol. 8 page 39 (on CBTRICKS website) to see how to do it.

Many techs recommend replacing all of the electrolytic capacitors in these sets due to their age. I think this is a good idea. If you don't feel like replacing them all, at least replace all of the 2.2uf tantalum capacitors (C55, 68, 87, 179, 211) because when they were made tantalum capacitor technology was in its infancy and they are more prone to failure. These same techs also recommend upgrading all of the 2SC1419 transistors (2SD325E in the Realistics). I believe that this is a waste of time, as their high initial failure rate was due to the insufficient heat transfer capability of the thick white ceramic insulators and insufficient heat sink compound. I've only had two of these transistors fail, and, in both cases, the cause was a defective mica insulator (my fault).

Do a complete alignment per the factory manual/Sams. Adjust VR7 for maximum AM modulation. Set the AM and SSB outputs to your preference, but do not exceed 4 watts deadkey on AM or 12 watts pep on ssb. You will now have a rig that will kick ass on-the-air, and be as reliable as the day is long.

There has been a lot of confusion concerning the bias settings for the driver and final in the 858 sets. The Sams and the factory service manuals for all of the 858 chassis rigs (except the Realistics) specify driver and final bias as 40ma and 70ma respectively. Sams for the Realistics and the Realistic service manuals call for 40ma and 15ma. The Realistics' schematics also show many different component values in their driver/final circuits.

The reason for this is that Radio Shack had a large inventory of existing AM\SSB models, and wanted to give their dealers a chance to sell them out before putting any new models on the shelves. As a result, RS placed their order with Uniden almost three months after Cobra, President, Robyn, etal. In the intervening time, Cobra and the others were overwhelmed with warranty repairs for blown drivers and finals. Uniden responded by changing the driver/final circuit components, and specified a new final bias of 15ma. They

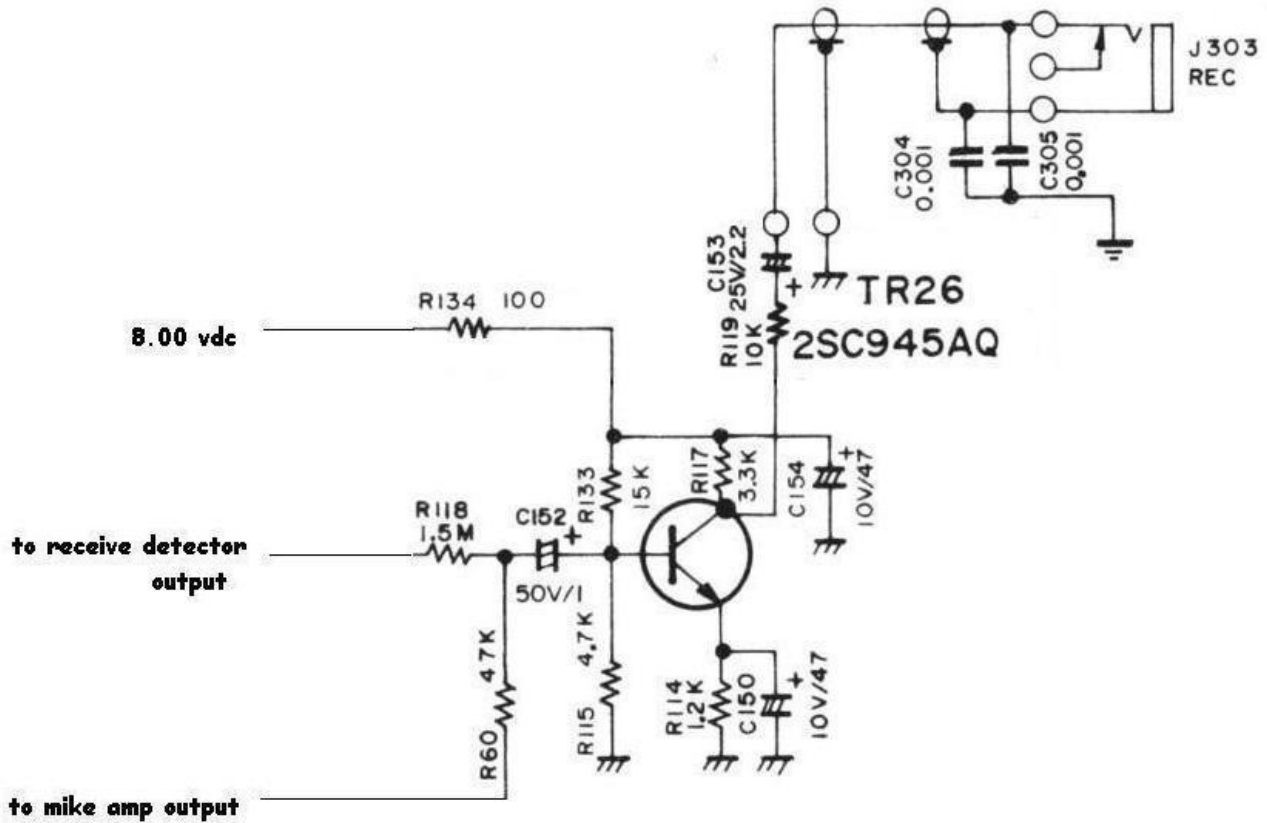
issued production change bulletin (PCB) # 1208 and 1208A which were sent to their authorized service centers. The Sams for the cobra 138xlr, 139 xlr, and President Grant and Washington models (#s 126, 127, & 128) were published before the service bulletin, and show the original circuitry, and the 70ma bias spec. On the other hand (because of RS's late order), the Sams for the Realistic sets (TRC449 - #200, 457,458 - #207) were published after the service bulletin was released, and show the revised driver/final circuit and the new 15ma bias. BTW, the service bulletin is shown on page 5 of Sams # 135. Most techs today are totally unaware of the service bulletin, and have been setting the bias wrong. A word to the wise.

What follows are modifications designed to increase convenience, reliability, and/or performance.

MODIFICATION # 1

RECORD OUT CIRCUIT

A Record (line level) output is a useful addition to any radio, as it offers an easy way to connect recording or audio equipment to the transceiver. The following is the circuit used in the Cobra 1000/2000 models.

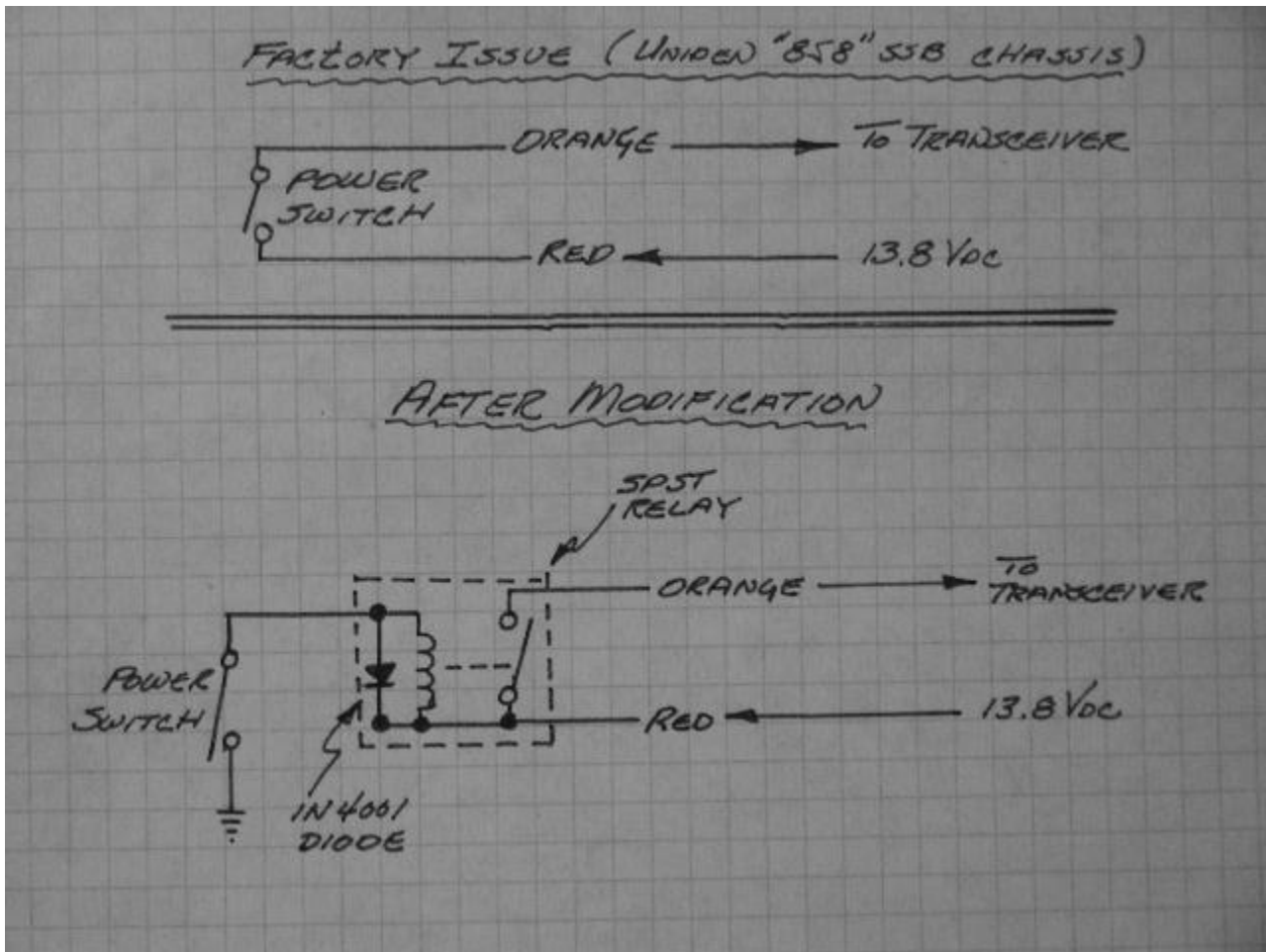


Tape Record (Line Out) Circuit

MODIFICATION # 2.

Relay-switched B+

The power switch in the 858 rigs is a low reliability device. After having several of them burn out due to internal arcing, I developed this circuit. It uses a relay to switch the power on and off. The original on/off switch is used to control the relay.



MODIFICATION# 3 FREQUENCY EXPANSION The 858 chassis is easily modified to operate on frequencies

well above and below the standard cb band. The charts that follow show how it's done.

A '2MHz Bandwidth' has been mentioned at various times in this manual. For a simple explanation, of what it means: The efficient frequency range within limits of existing circuitry and sufficient RF power output at those frequencies.

Frequency ranges are usually the following:

26.085-28.045MHz, 26.455-28.405MHz, 26.855-28.805MHz,
26.965-29.045MHz, 27.455-29.405MHz, 27.855-29.805MHz.

Conversions most utilized are 26.085-28.045MHz, and 26.965-29.045MHz. The latter is used by Hams, as 28.000MHz starts their band, but most just convert to 27.965-29.805MHz +..

'858' Chip Logic chart below is used by permission of "Custom Conversions" from their master files.

<u>Freq. in MHz</u>	<u>Selector</u>	<u>Logic-Pin change</u>
26.085-26.405	11-40	21-0
26.415-26.445	31-34	21-0,17-1
26.455-26.535	8-15	21-0,19-1
26.545 (*)	15	21-0,19-1, 13-1
26.555-26.805	16-40	21-0,19-1
26.815-26.845	31-34	21-0,19-1,17-1
26.855-26.955	8-16	21-0,20-1
26.965-27.405	1-40	none-track
27.415-27.445	31-34	17-1
27.455-27.485	8-11	19-1
27.495 (**)	8	19-1,15-1
27.505-27.805	12-40	19-1
27.815-27.845	31-34	19-1,17-1
27.855-28.045	8-25	20-1
28.055-28.405	8-40	22-1,21-0
28.415-28.445	31-34	22-1,21-0,17-1
28.455-28.805	8-40	22-1,21-0,19-1
28.815-28.845	31-34	22-1,21-0,19-1,17-1
28.855-29.045	8-25	22-1,21-0,20-1
(*) U.S. "A.M. Trucker's Frequency."		
(**) U.S. "SSB Trucker's Frequency."		
27.965-28.405	1-40	22-1,21-0
28.415-28.445	31-34	22-1,21-0,17-1
28.455-28.805	8-40	22-1,21-0,19-1
28.815-28.845	31-34	22-1,21-0,19-1,17-1
28.855-29.045	8-16	22-1,21-0,20-1
29.055-29.405	8-40	22-1,21-1
29.415-29.445	31-34	22-1,21-1,17-1
29.455-29.805	8-40	22-1,21-1,19-1
29.815-29.845	31-34	22-1,21-1,19-1,17-1
29.855-	8-	22-1,21-1,20-1
28.965-29.405	1-40	22-1,21-1
29.415-29.445	31-34	22-1,21-1,17-1
29.455-29.805	8-40	22-1,21-1,19-1
29.815-29.845	31-34	22-1,21-1,19-1,17-1
29.855-	8-	22-1,21-1,20-1

MODIFICATION # 4

5 Kc CHANNEL STEPS

With more operators using export or amateur transceivers for 11 meter dxing, the use of frequencies 5 kc below the standard cbchannels (i.e. 27.400 instead of 27.405) is becoming popular on single sideband . Typically, operators with regular cb rigs "unlock" the clarifier control and swing the xmit frequency up or down 5kc to get these "zero" channels. However, unlocking the clarifier opens a Pandora's box of problems because using the clarifier to tune in an off-freq station will then put your transmitter off-frequency too. This paper explains how to modify the popular Uniden 858SSB chassis (Cobra 138/139XLR, Realistic TRC449/457/458, etc.) to select frequencies in 5kc steps rather than the standard 10 kc switching, allowing the transceiver to pick up the "zero" frequencies without unlocking the clarifier.

Many of the older PLL chips, like the PLL02A and UPD858c, were used in applications other than cb radios. Because of this, these chips had an input pin that could be programmed for 5 or 10 kc channel steps. On the 858 chip, this is done by manipulating the logic state on pin 7: Logic 0 = 5kc steps, logic 1 = 10kc steps. To perform the modification, first isolate pins 7, 19, 20, and 21, and 22 as shown below using 5.1k ohm resistors.

Then connect the pins to a 4 pole switch or relay so that operating the switch will set the logic on the pins as follows:

Pin 7 - logic 0
pin 19 - logic 1
pin 21 - logic 0
pin 22 - logic 1

The unit will now tune from 27.335 to 27.430 in 5 kc steps on channel selector positions 24 to 40.

For additional 5 kc freqs, set the logic as follows:

pin 7 - 0
pin 19 - 0
pin 20 - 1
pin 21 - 0
pin 22 - 1

The unit will now tune 27.440 to 27.510 in 5kc steps on selector positions 8 - 22, 24 - 25.

For even more freqs, set the logic at :

pin 7 - 0
pin 19 - 0
pin 22 - 1

and... the unit will tune 27.510 to 27.730 in 5 kc steps on selector positions 1 thru 40.

MODIFICATION # 5

IMPROVED ADJACENT CHANNEL REJECTION

Mentioned earlier were the missing parts, L-6 and FT-2 in some units. The manuals may or may not show the jumper or installation of the parts. Diagrams below locates the parts.

Component side of board...



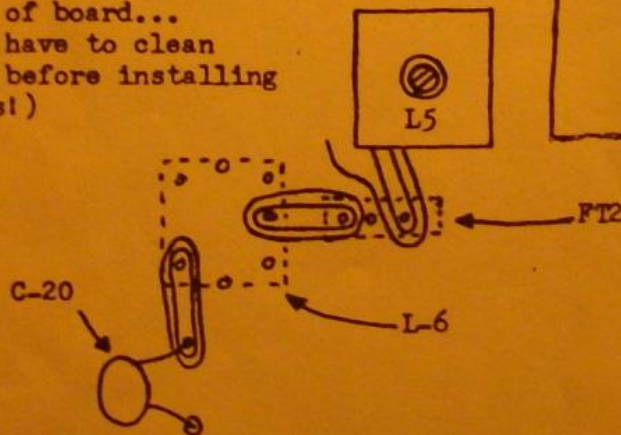
Put L-6 in - then

Wire two FT2's
in series



Component side of board...

(will probably have to clean
all holes out before installing
new components!)



Remove jumper and install parts, tune the 'new' L-6 for maximum signal. Do Not install either part without the other!

MODIFICATION # 6

MOSFET FINAL FOR 858SSB CHASSIS

This conversion was perfected and written up by my online friend EXIT THIRTEEN. (Used by permission.)

After doing some research, and a lot of testing, I have successfully done conversions on the upD858 AM/SSB For these conversions, I used IRF520N's from International Rectifier. I'm sure you could substitute ERF2030's if you wanted to do so.

For the upD858 chassis (President Washington, Madison, Grant, Cobra 138XLR, 139XLR, etc):

Parts you will need:

IRF520 (or ERF2030) EKL companion part EN-369FN (You can build your own, too)

56K ohm 1/2 watt resistor 39pf disc or mica capacitor (Optional, see installation text)

Remove old transistor at TR43, Remove R179, Remove L44

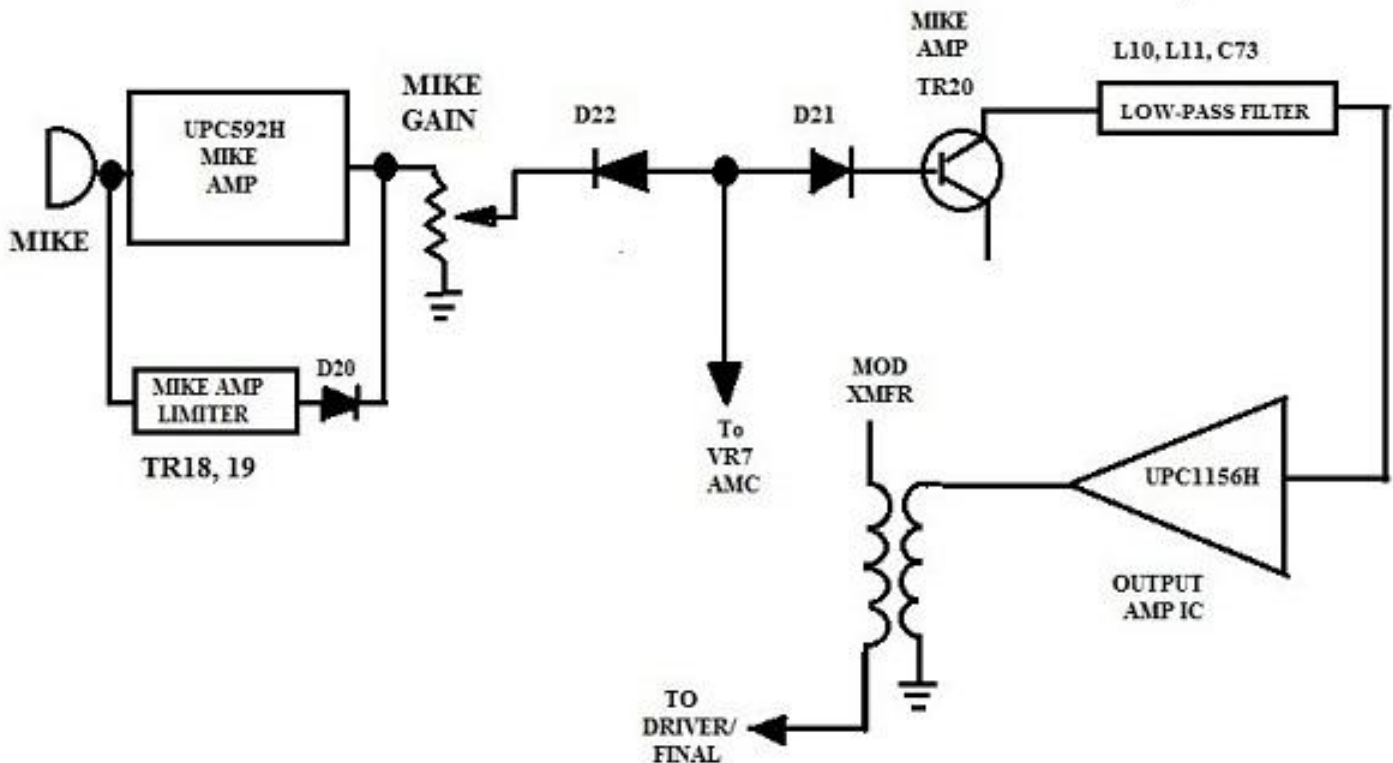
Install IRF520 at TR43, Install EN-369FN companion part across final, positive side to gate, unmarked side to source Install 56k ohm resistor from IRF520 gate to L31 (goes to far side of L31, furthest away from final, +13V). Install 39pf capacitor across C167 (This is optional, will bump up output in some units, test radio without first). Check voltage at gate of final, should read approx. 3.65V + or - .1V Retune TX.

That's it! Double check your work, and you should have the same output if not more than the old stock transistor. My President Washington did about 22W onSSB before, with the MOSFET in place, it now does 27W on SSB.

MODIFICATION # 7

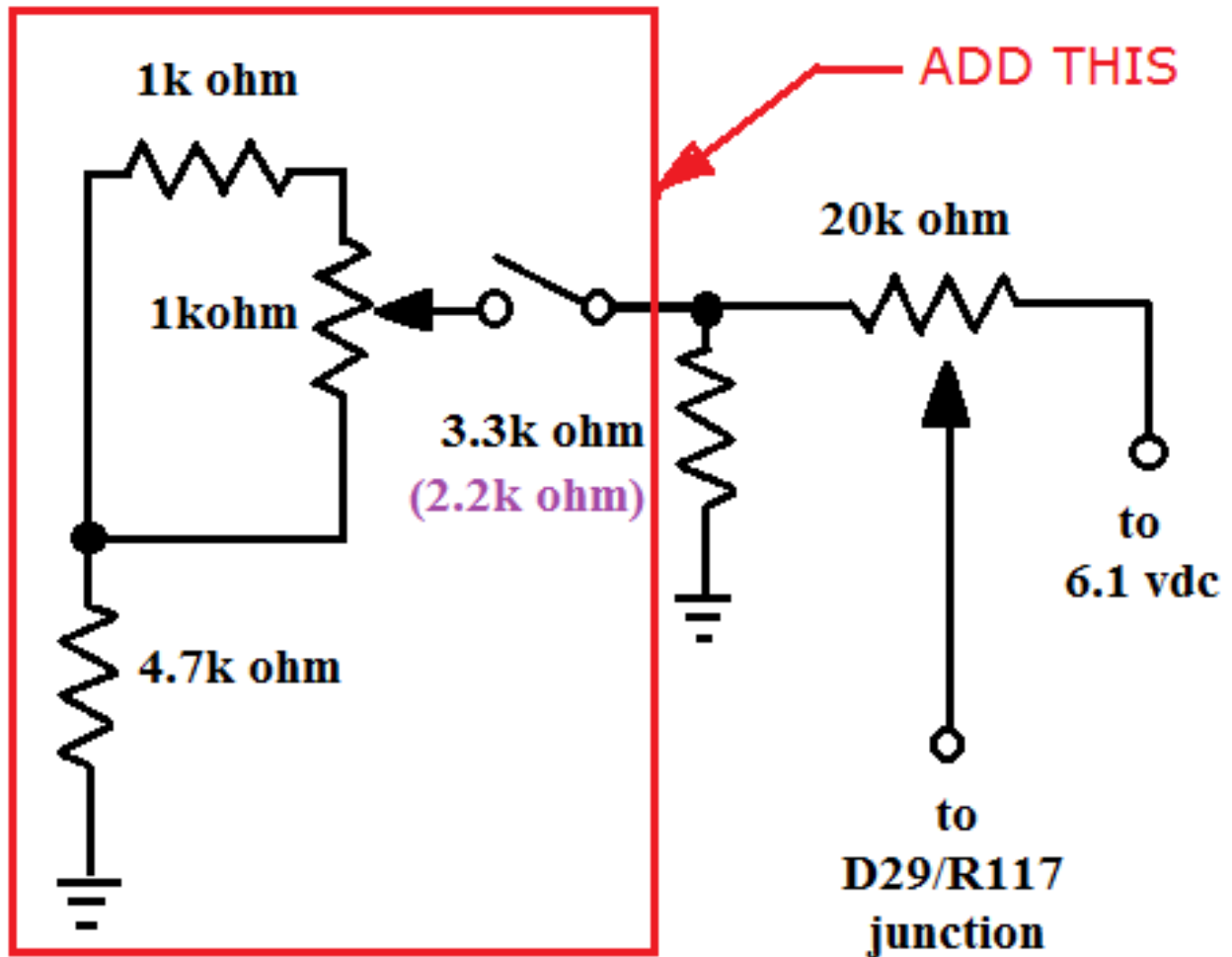
HOW THE 858 SPEECH CLIPPER WORKS

The 858SSB chassis utilizes a speech clipper circuit to raise the average modulation. This was Uniden's most sophisticated clipping circuit, and should be left as is. The diagram below is a simplified version of the circuit. The signal from the mike amp (IC3) is clipped by the back-to-back diodes D21 and D22. With the mike gain control at maximum, the audio output from the diodes is a constant 1.3 volt peak to peak almost-squarewave. TR20 re-amplifies the clipped audio to a level sufficient to drive the output modulator (IC4) to 100%+ modulation, and low-pass filter L10/L11 rolls off the harmonics generated by the clipping. I like to bump the value of C87 from 10uf to 15uf/16V. This adds some compression to the clipping for a smoother sound. These rigs have so much audio that an amplified mike is unnecessary.



Modification #7 Clarifier Fine Tuning Modification

The clarifier on the 858 SSB rig is very sensitive and it's difficult to tune an incoming signal easily. A 10 turn potentiometer will work but all those turns are a pain in the a\$\$\$. This mod makes fine tuning easy. A 1k pot switched into the factory circuit as shown below will allow a few hundred cycles above or below the main clarifier position. The switch allows the fine tuning to be taken out of service.



858SSB Clarifier - Fine Tuning Mod.