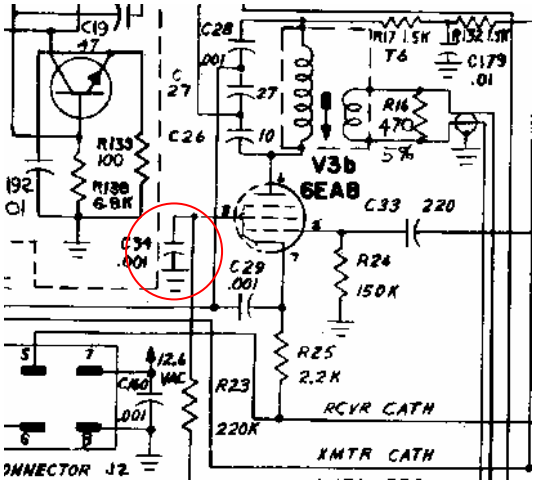
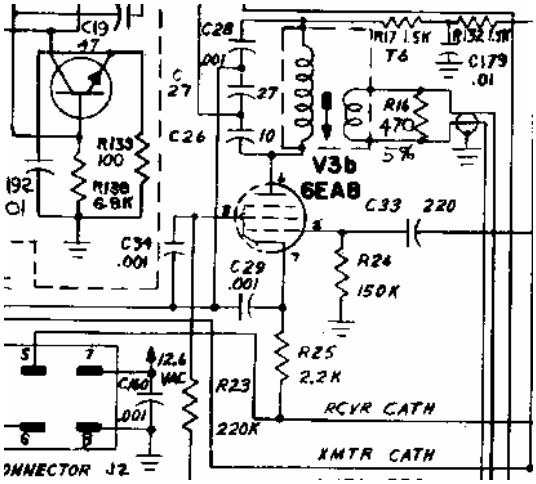
RECEIVER MIXER IMPROVEMENT FOR YOUR DRAKE TR-4 TRANSCEIVER.

DRAKE TR-4 transceivers employ a pentode in the first (and only) receiver mixer. This device somehow defines the ability of the receiver to detect faint signals near stronger ones.
In pentodes, cathode current is determined by the voltage between first grid and cathode and the voltage between screen grid and cathode. If you look at the schematic diagram, and put a "virtual" ground on cathode, you see that input signal is applied to the first grid and local oscillator is applied to both first and screen grids. Conceptually it is like using a diode mixer and applying the input signal to first port and local oscillator to both first and second port! This is certainly a method to degrade the performances.
The mixer design can be corrected at no cost.



Original TR-4 RX mixer circuit



New TR-4 RX mixer circuit

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The same mod apply to V1b, the premixer pentode. This is useful for the 40 m band. In fact the xtal for 40 m is 21.5 Mhz. With VFO at 5.4 MHz we have 21.5 – 5.4 - 9 = 7.1 Mhz, but we also have 5.4 * 3 – 9 = 7.2 MHz, which is unwanted. Reducing the "chaos" produced by the two VFO inputs to V1b, improves the situation.

SPICE simulations and experiments have shown a remarkable improvement. Just try and let me know….

Best Regards. IN3IEX Giorgio…