IC9100 RF Taps

This project describes provision of RF taps, for an external SDR and waterfall / spectrum analyser programs, for each band (HF, 2m, 70cm, & 23cm) of the Icom IC9100 transceiver.

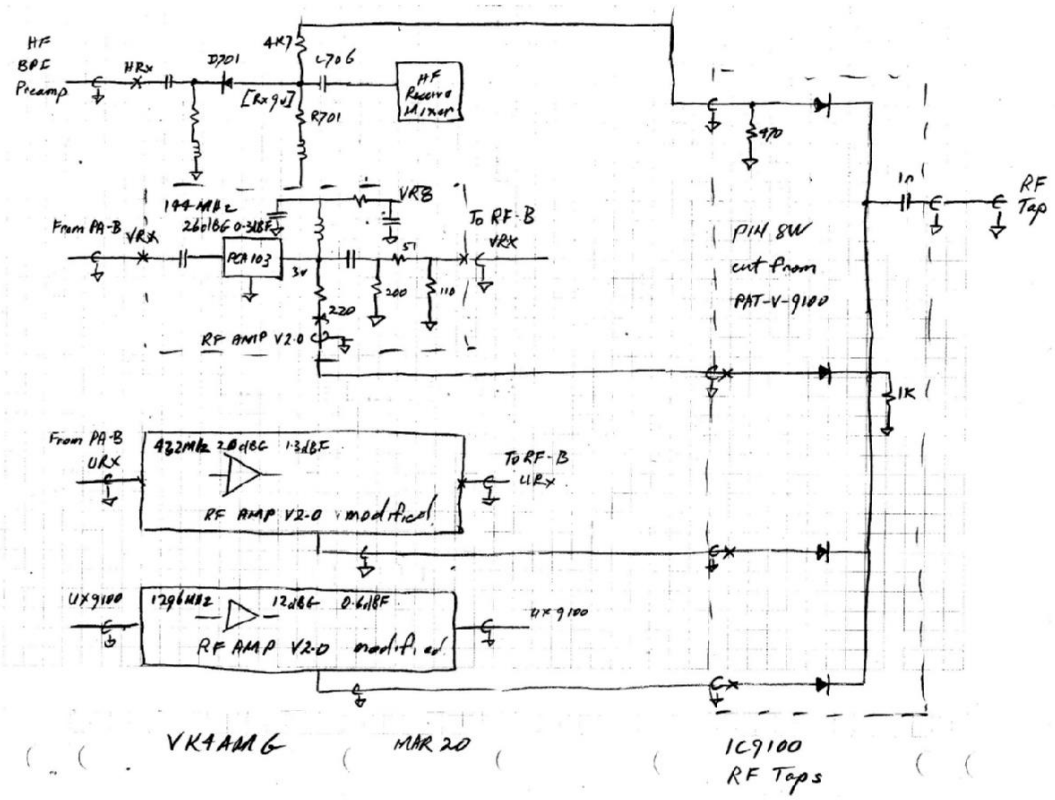
A SDR USB Dongle such as the Funcube Pro+ may be used with a SDR program such as HDSDR provide a wide waterfall for band monitoring for general operation, contests, and EME. For EME This allows an additional instance of WSJT as an alternative receiver / decoder.

An RF tap fitted internal to the transceiver provides a safe connection to extract the RF signal without degrading the receiver in the radio or risking exposing your SDR dongle to transmit power.

RF tap may be fitted for one through all bands. PIN diodes are required to switch where there are taps for more than one band.

Most Icom transceiver provide a convenient location to apply the RF tap. Coax cables designated HRX, VRX, URX etc interconnect the PA PCB and RF PCB.

The PA PCB provides the antenna low pass filter and antenna changeover. The RF PCB provides the receiver input protection, receiver front end tuning to preamp / attenuator and the remaining receiver functions.



Figure

Figure 1 IC9100 RF Tap - Block Diagram

A low cost eBay LNA 0.05-4G NF=0.6dB RF Amplifier Ultra-Low Noise High Linearity FM HF VHF/UHF, is modified to split the receiver RF into two paths. The Vcc series resistor selected to power the LNA from 8V and to provide DC to switch on the PIN diode for the operating band. Two simple attenuators split the amplifier output. One feeds the receiver preamp and one is fed to a rear panel SMA via a PIN diode switch PCB.

The signals from three of these amplifier splitters and that from the HF tap are feed to a PIN diode switch. Only the signal from the current operating band appears at the rear RF tap connector.

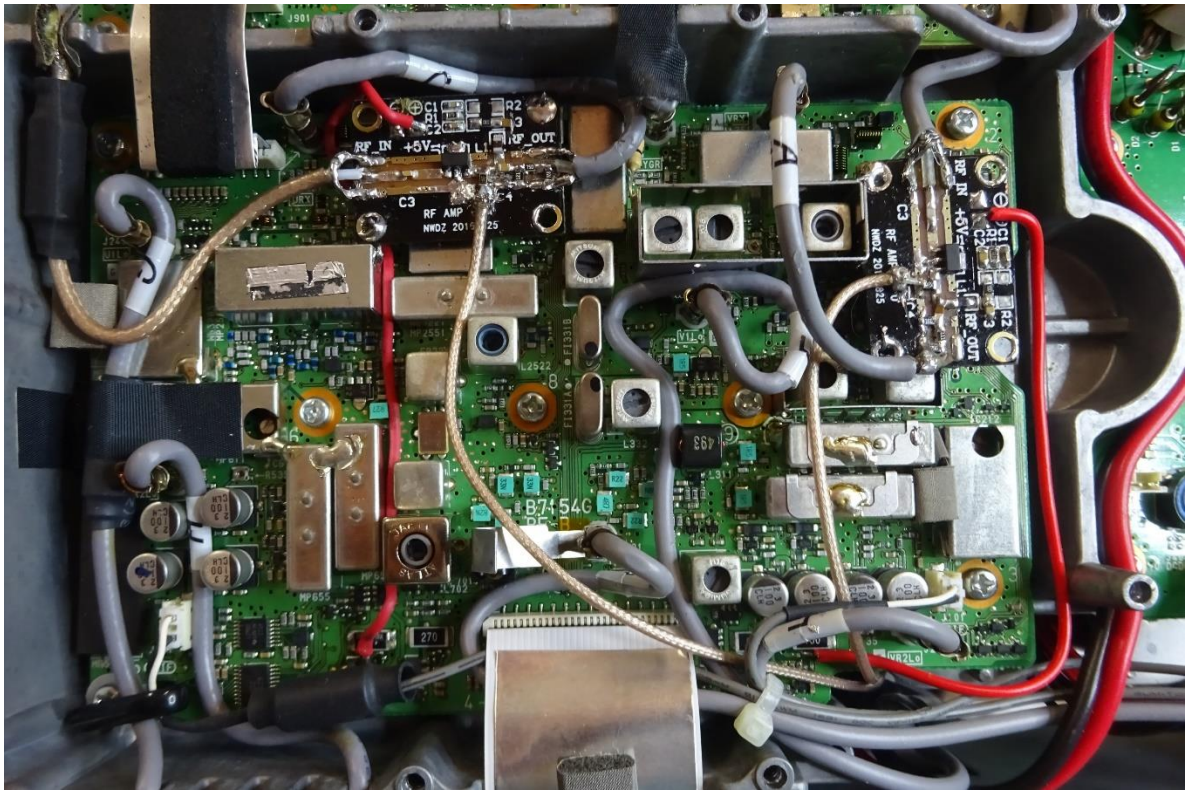


Figure 2 - VHF and UHF Taps using Chinese RF Amp V2.0 modified PGA103

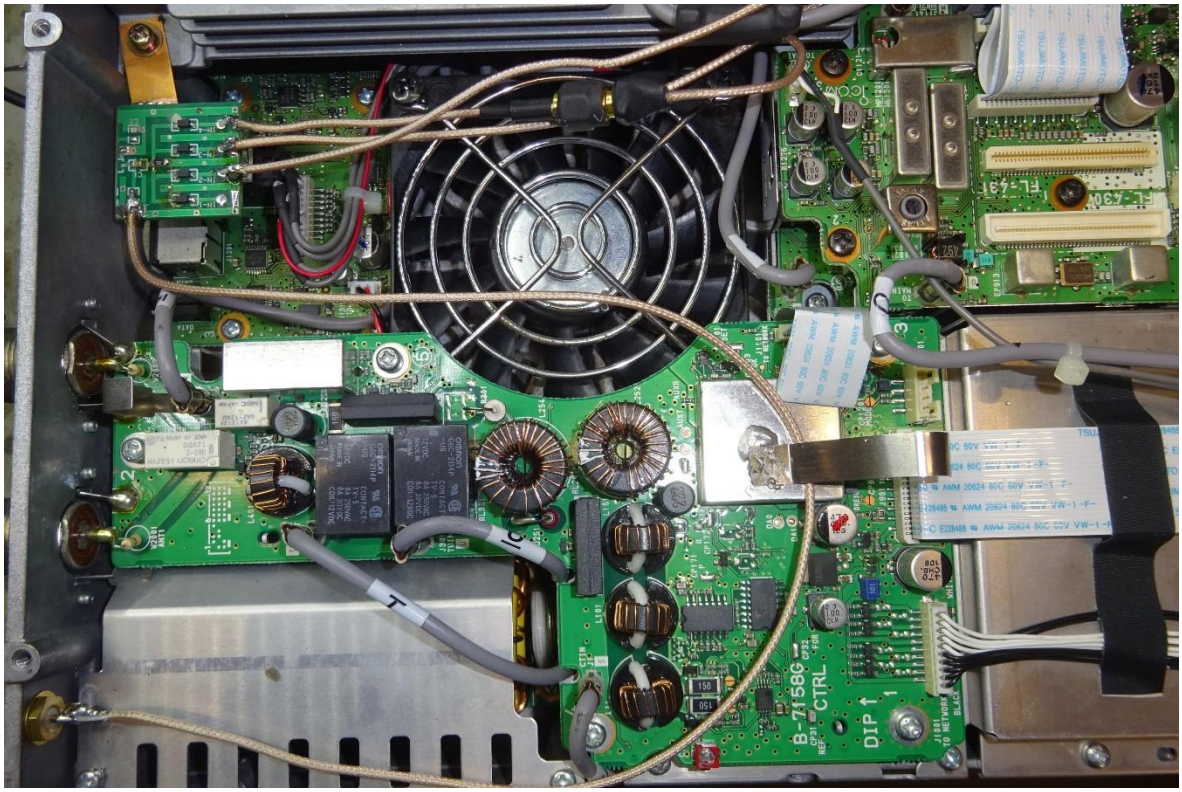


Figure 3 - RF taps combined with cutdown PAT-V-9100 Pin Diode Board

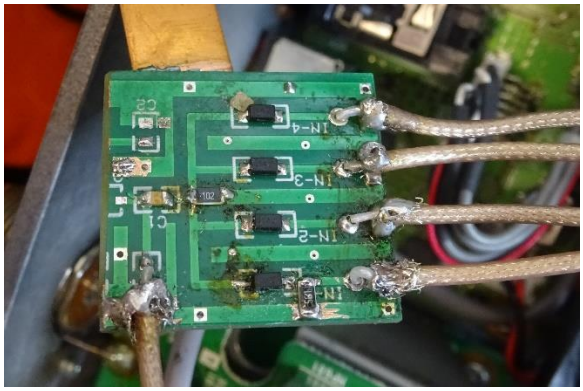


Figure 4 - Close up of PIN diode board

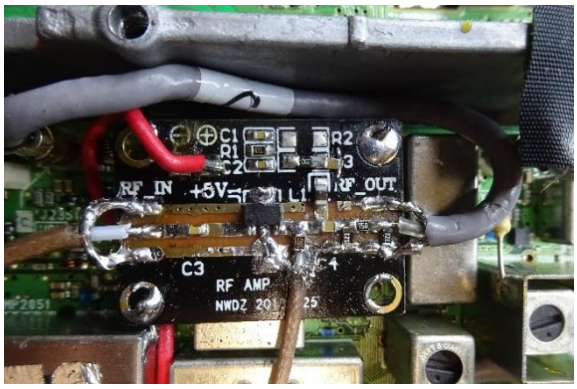


Figure 5 - Close up Chinese RF Amp V2.0 modified (PGA103)

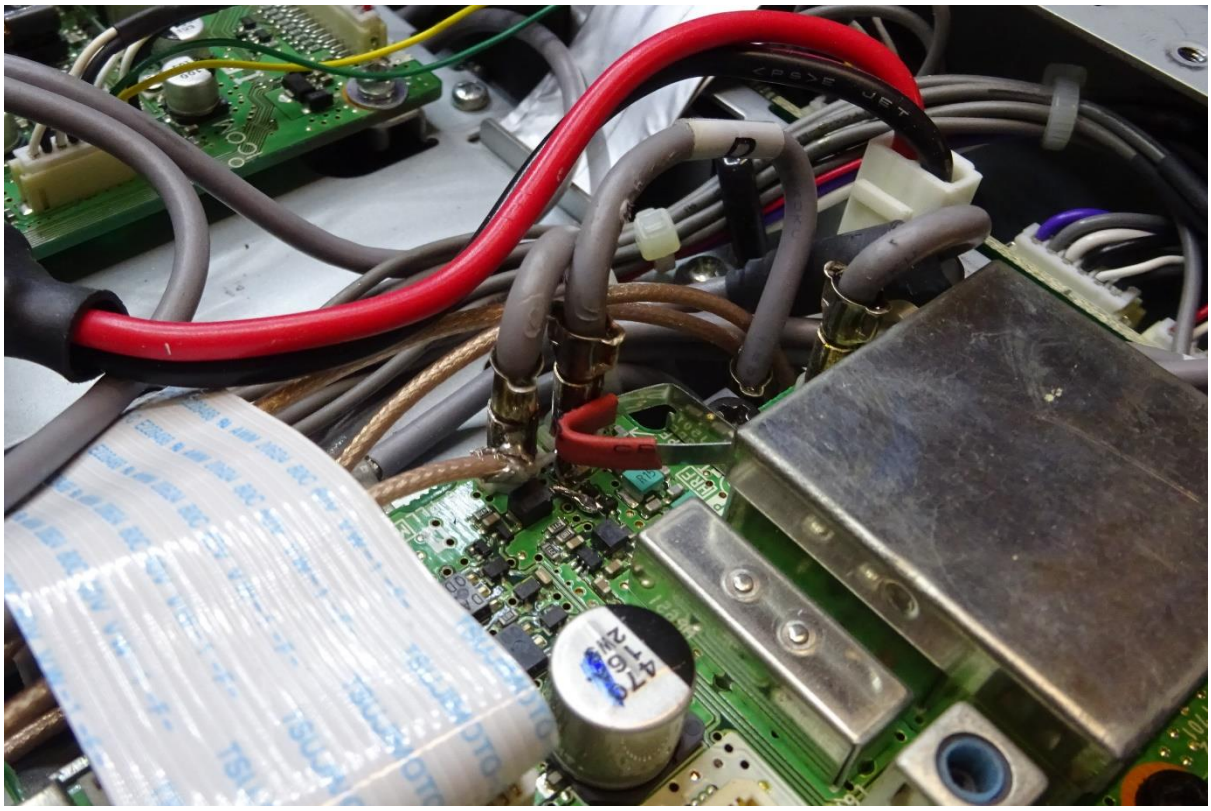


Figure 6 - HF RF tap using resistor after BPF on HRX line

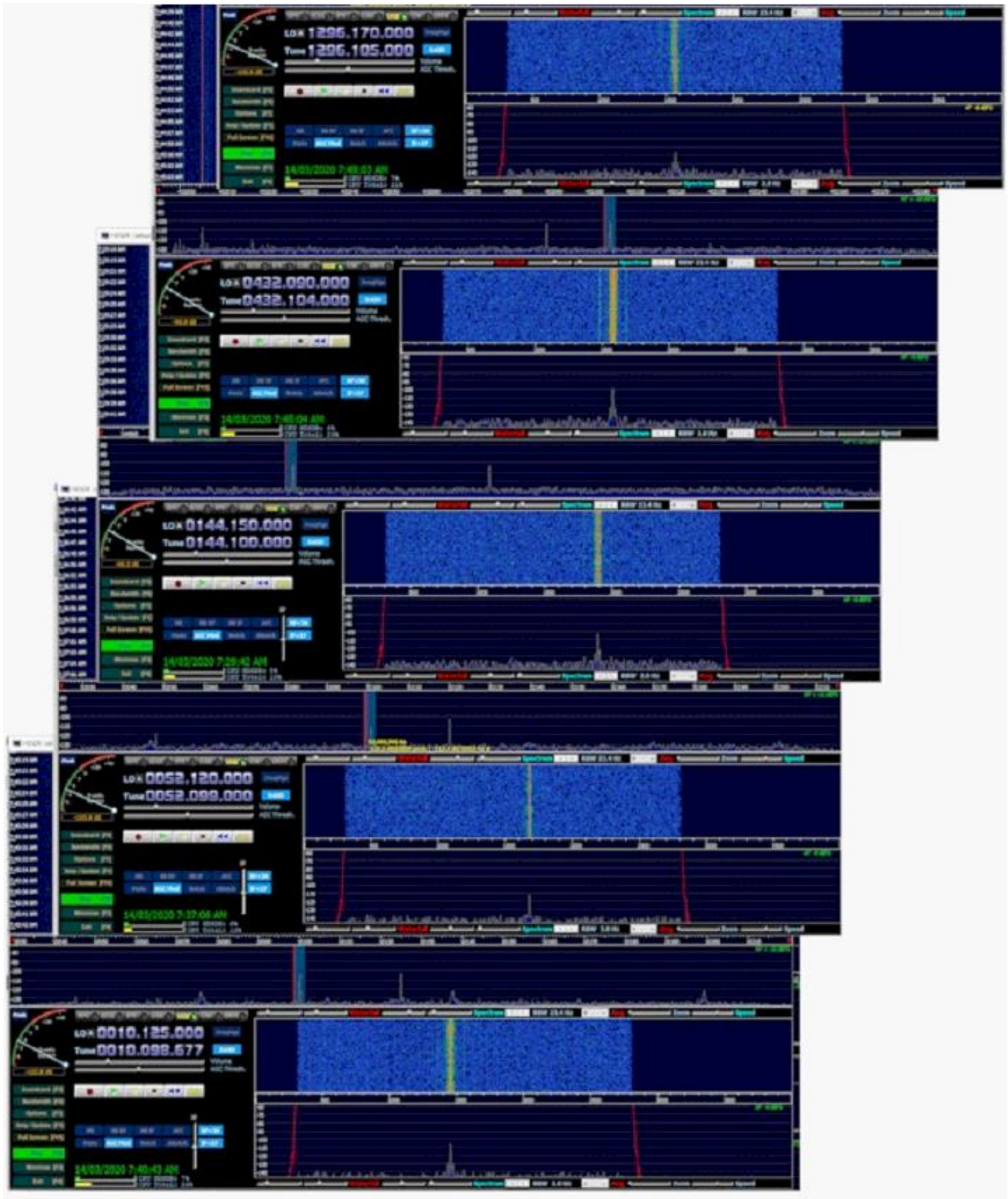


Figure 7 Screen dumps HDSDR IC9100 bands HF through 1296 MHz

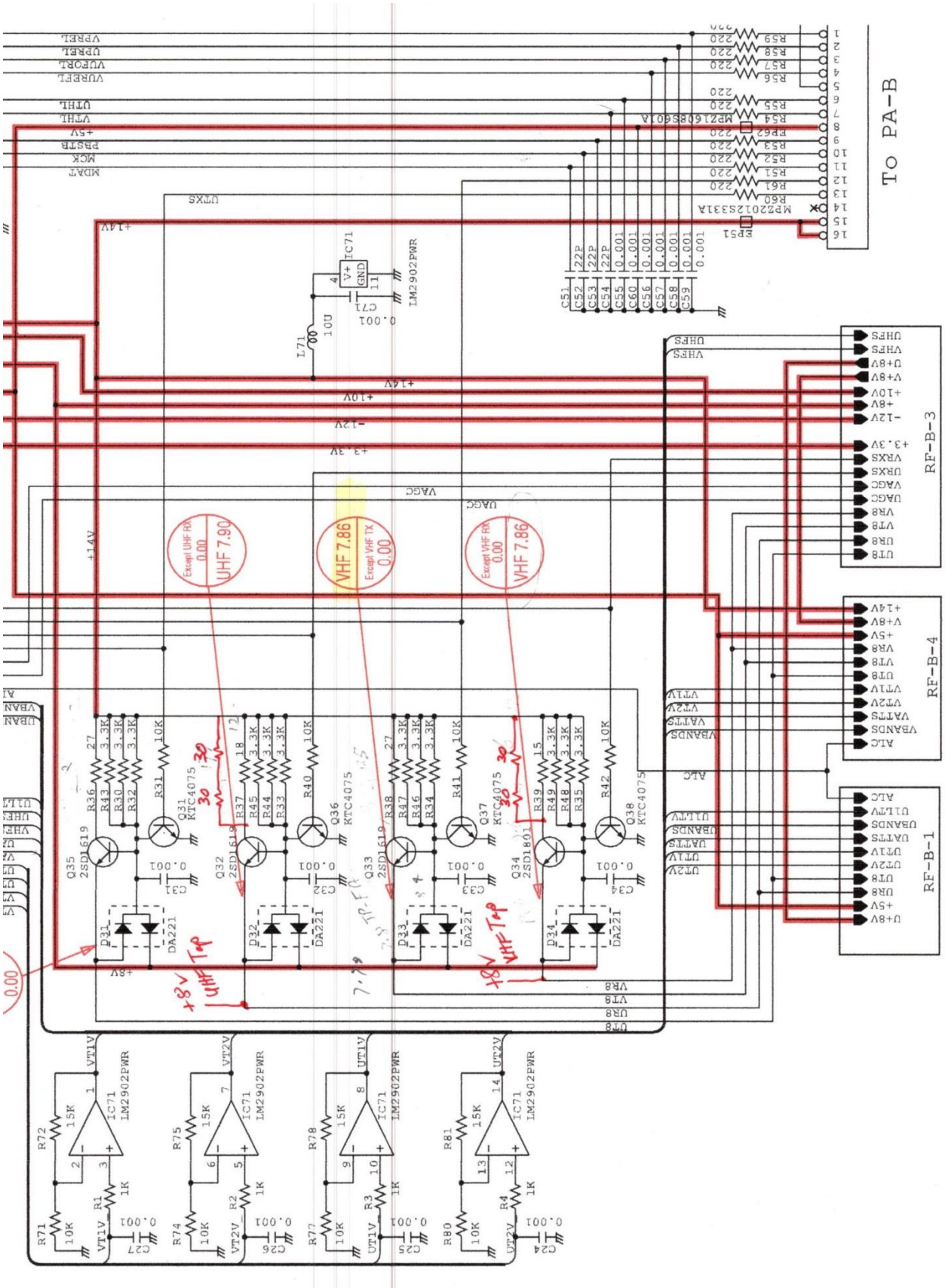


Figure 8- VHF and UHF Power Supply Points

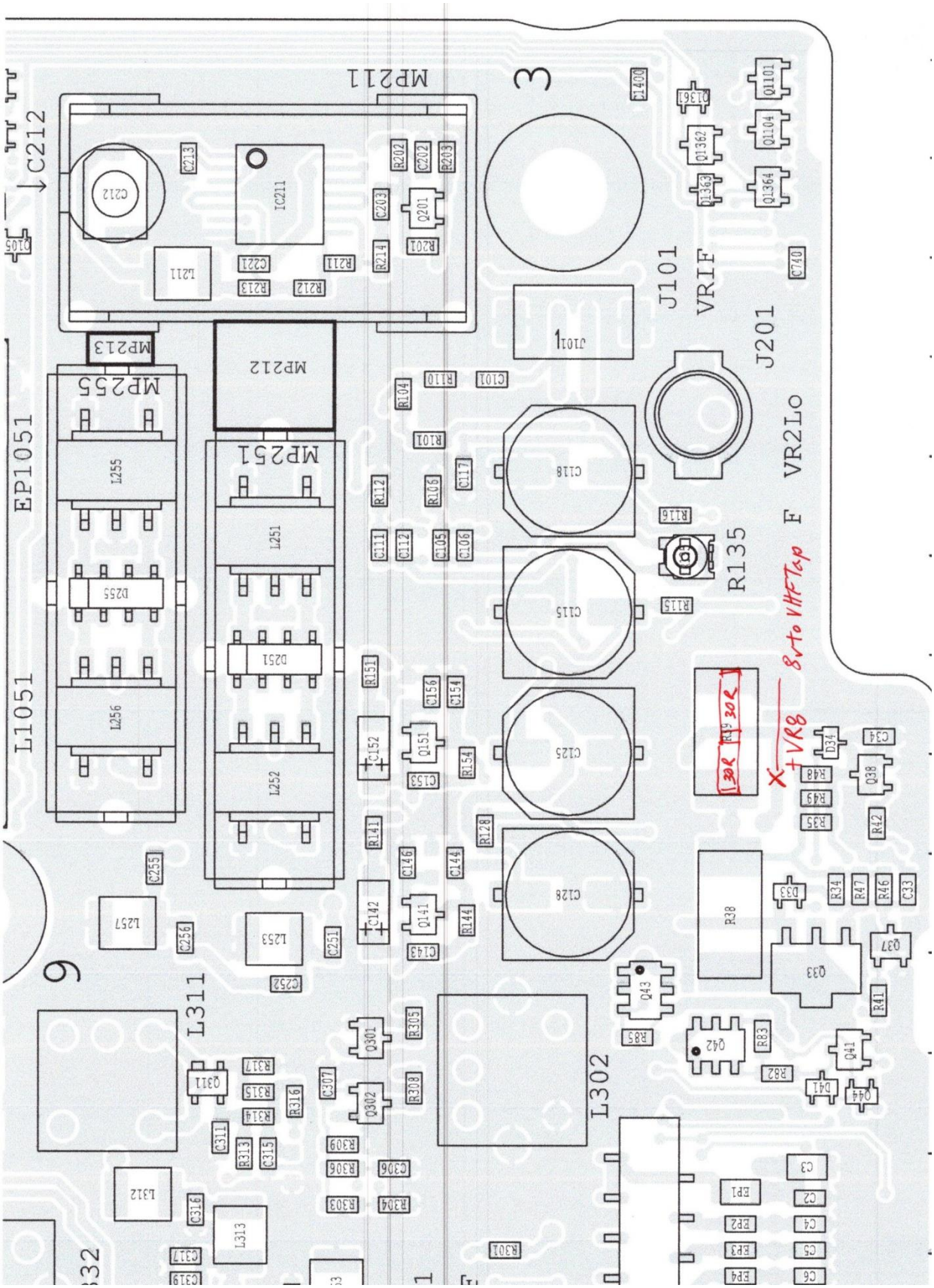


Figure 9- VHF power Supply Connection Point

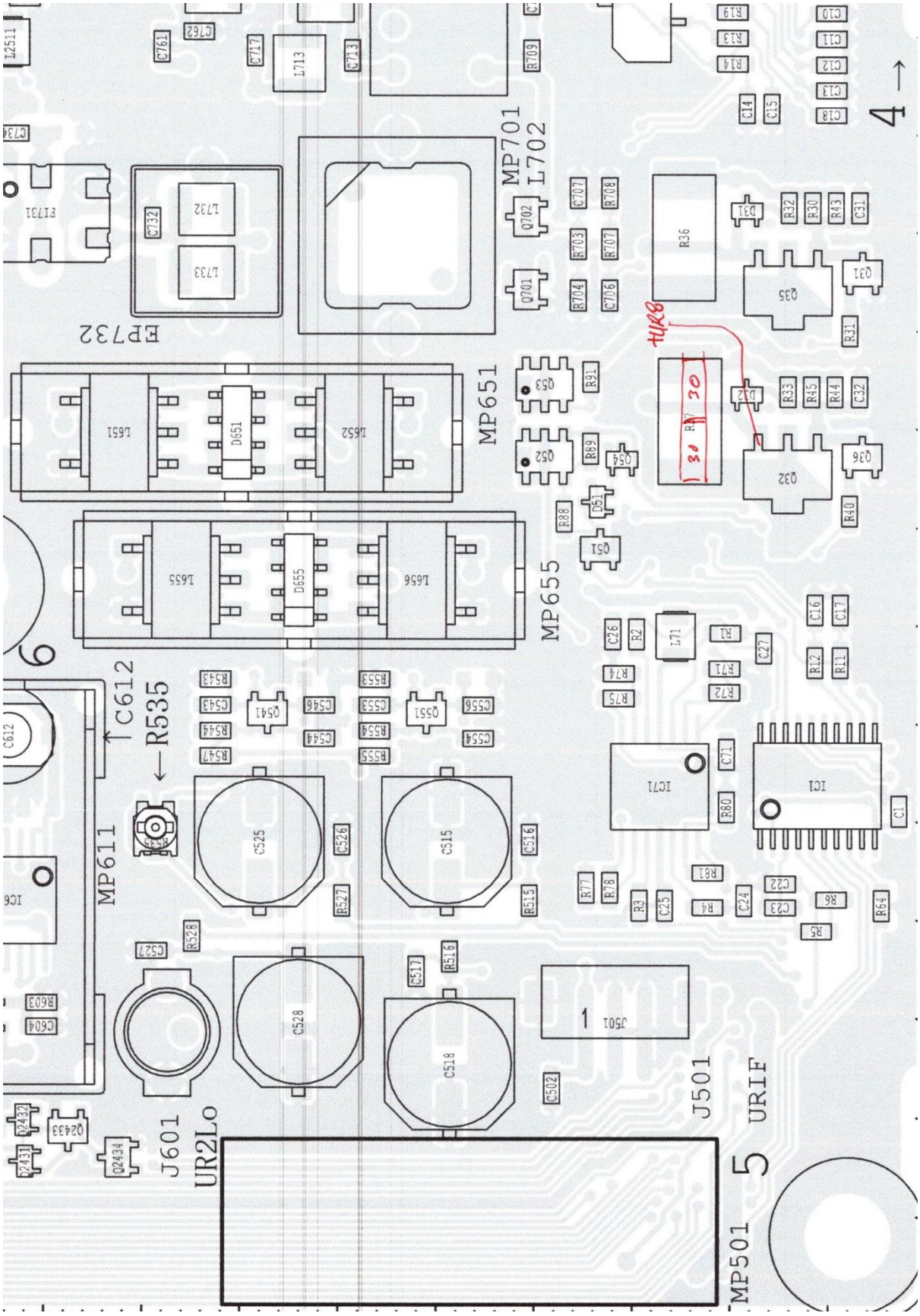


Figure 10 - UHF Power Supply Point

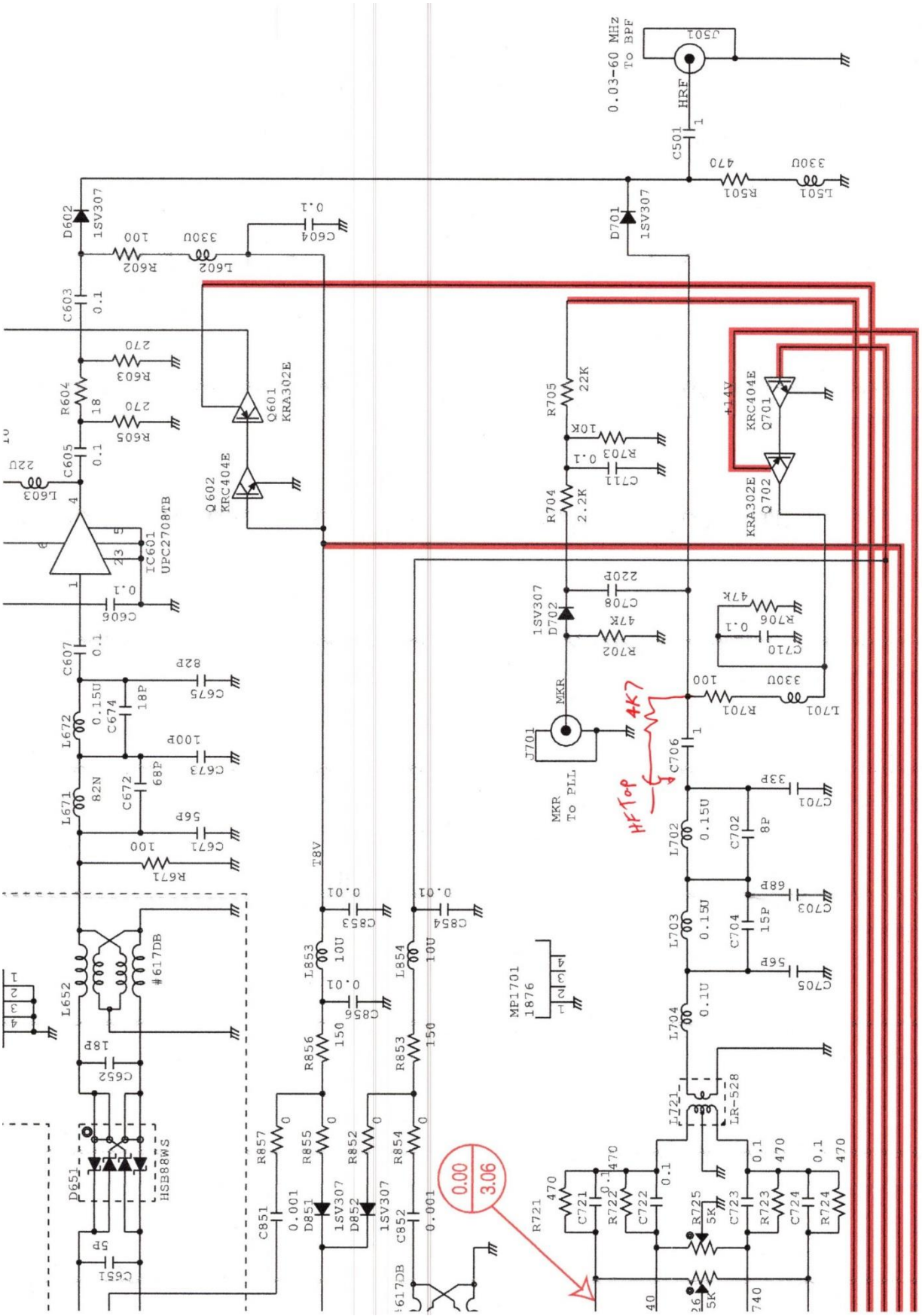


Figure 11 - HF Tap Point

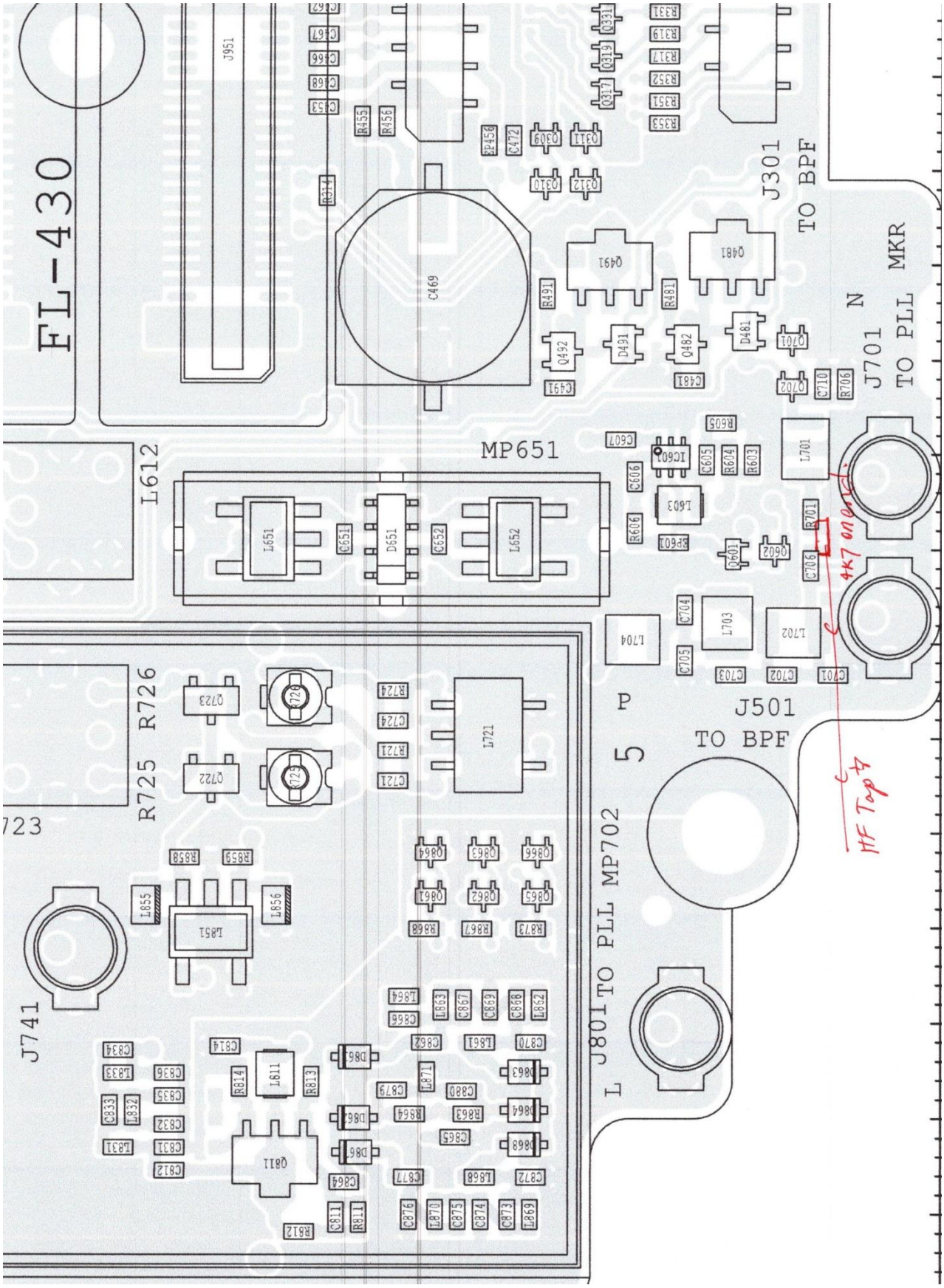


Figure 12- HF Tap Point

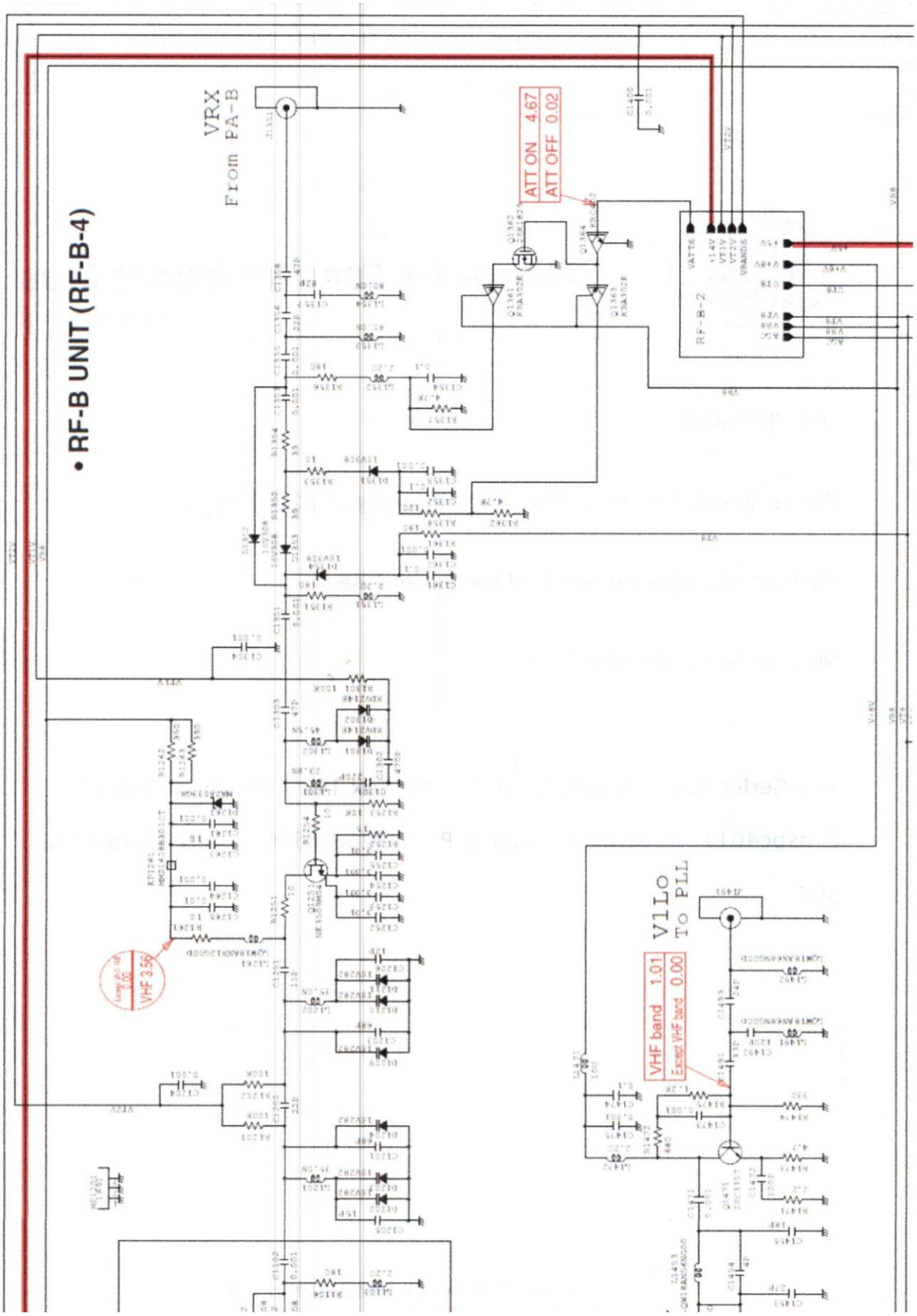


Figure 13- VHF Tap Point

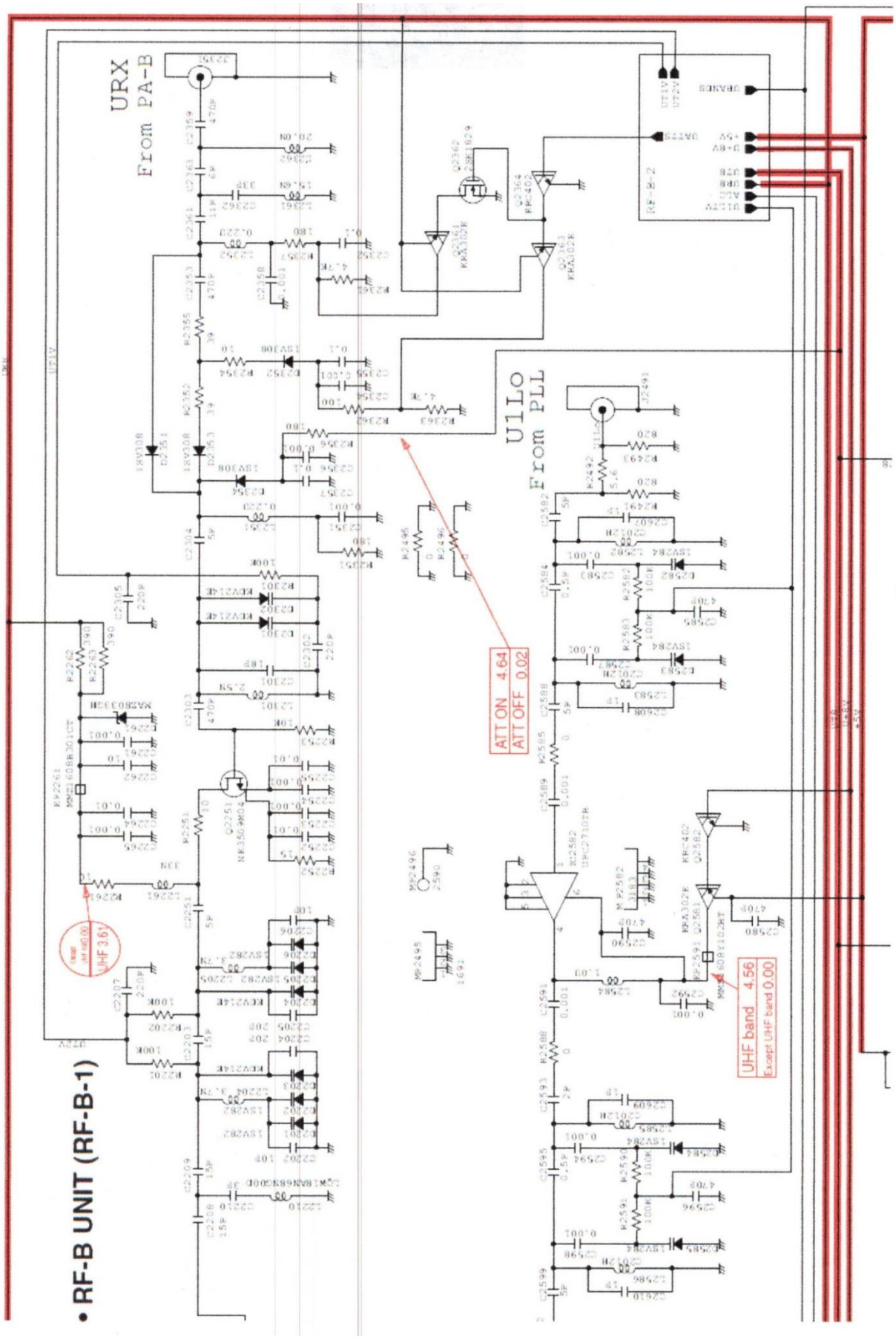


Figure 14- UHF Tap Point

IC9100 RF Taps

Figure 15- UX9100 Tap

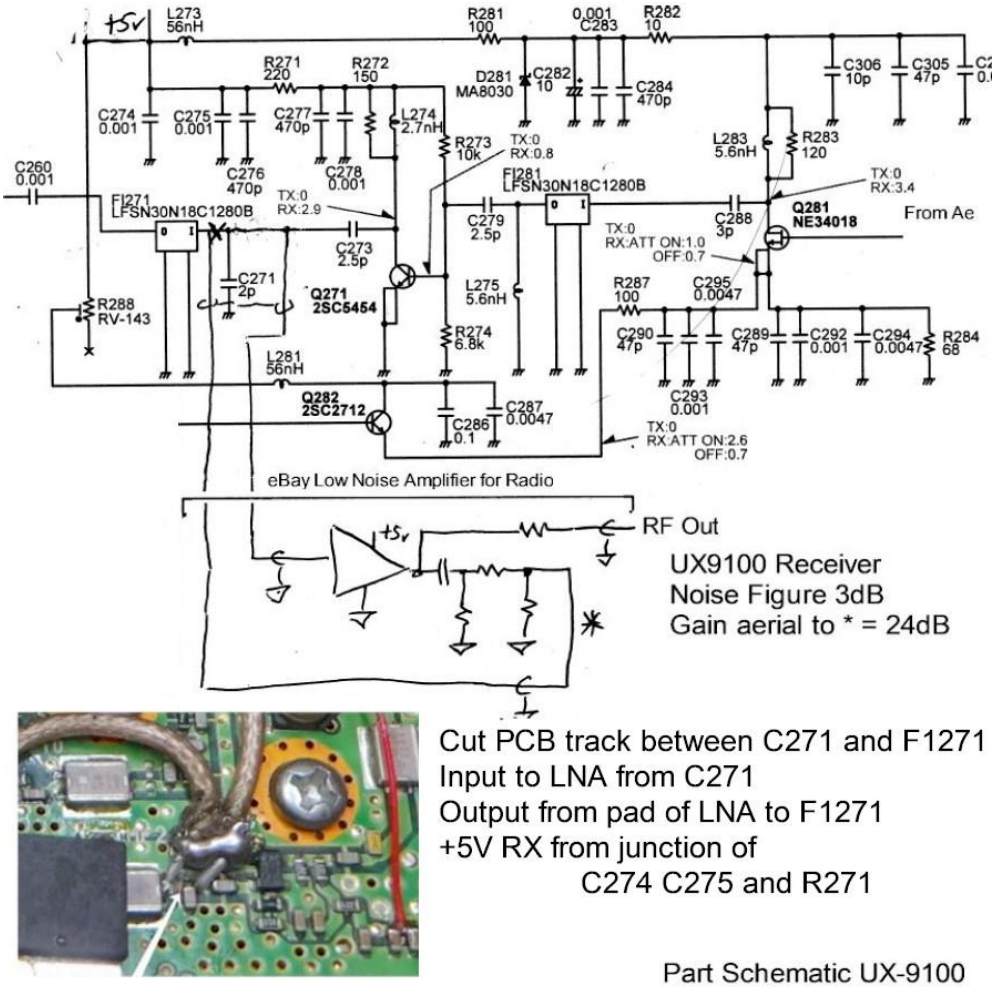


Figure 16 - UX9100 Connection Points