

Circuit Description Theory of Operations

Circuit Description

Receiver(RX):

1. RF and Demodulation

Low Noise Amplifier(LNA) consist of the Q1 and Q2, FIL1 for suppression the image frequency. Crystal X1 (three frequencies: 52.935MHz/53.1817MHz/53.735MHz) VC1 and Q5 etc. act oscillator, the Lo signal (triple up to the desired LO frequency 158.805MHz/159.545MHz/161.205MHz) will be selected by L9 C40 L8 C36. RF signal from LNA and Lo signal is mixed by Q3, FIL2 Q4 FIL3 act the IF amplifier and filter the unwanted signal .U1(TA31161) is RF demodulation IC, AF and RSSI signal will be output .

2. Power control regulator

S1 is Power ON/OFF push switch, Q9 Q7 Q8 and C44 reduce the “POP” noise, Q13 ZD1 and C69 provide +8v DC power and U3 provides a +5v DC for circuit, the POWER LED D2 will light when the S1 sets to ON.

3. Mute and Squelch

The Mute circuit are controlled by U2-B VR2 and Q15, if the RF signal is weak then the Q15 will short the AF signal to ground. The noise section from the RF MODULE will be selected by U2-A U2-B and amplified by Q12 and rectifying the DC voltage which is filtered by C56 and R47 compare with the voltage of the U2's Pin 9 from SQUELCH control VR1 and VR5, if the RF signal is weak then the AF signal will be shorted by Q6 and Q16 to ground and the indicator SQ-LED D4 will OFF.

4. AF Amplifier and Expander

Q14 and Q10 etc. are the AF amplifier,U4 acts the expander to improve the SNR of the recover voice. VR3 is volume control and J2 and J3 are different AF out (Line output or Mic output).