4. DESCRIPTION OF RADIO CIRCUIT

4.1 Frequency synthesizer

a) VCO

VCO is composed of One VCO. Oscillation circuit takes colpitts circuit using variable Diode. And VCO is composed of D7, L19, C55, C56, C58, C70, Q11, Q12.

VCO control voltage through loop filter adjusts frequency and Microphone Signal through Modulation terminal mates modulation.

b) PLL IC

PLL IC is adjustable IC(U2) to produce the wished frequency, which VCO provides through loop filter. It has internal counter using 21.25MHz reference frequency to make 6.25kHz as reference Signal. VCO frequency from prescaled input is divided signal is compared with reference signal phase in phase comparator. Built-in charge pump changes voltage (until two signal are in phase) and charged voltage supplies VCO through loop filter to produce the desired frequency.

Frequency data associated with channel goes to PLL IC by CPU through CLOCK, DATA. PLL IC enables by strobe line of CPU.

4.2 Receiver

a) Front End

Front-end has Q6 to provide a high sensitivity and low noise feature. It employs SAW filter as band pass filter to eliminate image frequency and to produce enough pass band by Q6 input and output.

b) Mixer

Mixer has two gate (Q7) to feature high, low noise quality. It has RF signal through Q6 and FL1, L15 and RF signal from Local Oscillator mixed.

c) IF AMP and Detection

1'st IF AMP Q8 supplies IF IC (U8) mixer input pin16 .

Squelch Circuit

Noise component of detected outputs has amplification squelch threshold is controlled by resistor VR2.

d) Audio Amplifier

Demodulated audio signal enters to pin3 of AF IC (U5).

After above signal amplifiers in U5 pin1 and pin8 through C89, R54. It comes out to pin5 then, it reaches at speaker.

4.3 Transmit

When Tx develops with pressing PTT switch, VCO output amplifies through Q4, Q3, Q2, Q1 transmits by antenna through low pass filter.

a) Audio Modulation and Audio Amplification

Audio signal produced by external or internal microphone, limits amplification, low pass filter by IC U7.

Max. frequency modulation deviation is adjusted by VR2.