

THEORY OF OPERATION

Model: 2612

Ver.: 1.0

1. Frequency Configuration

Both Tx and Rx utilizes the frequency of 49.860MHz, in the AM modulation scheme

2. Receiver System

1) RF AMP

The RF signal coming from the antenna passes through resonance LC consisting of L1, C5, selected by switch SW1B and is amplified by RF Amplifier Q5, and goes to the super-regenerative circuit

2) Super-Regeneration Circuit

The signal from the front end is demodulated by the regenerative circuit consisted of Q6, L7, C11, L6 etc., which turns to frequency of 49.86MHz

3) AF amplifier

The AF signal from the regenerative circuit passes through the SW1D, then goes to the pre-amp by IC1B(OP-AMP LM324), then goes to the active Low-pass filter by IC1C (OP-AMP LM324), after the Volume control VR1A and enters the audio power amplifier IC2 (KA8602) to drive the speaker.

4) Noise suppression circuit

Part of the AF signal from the IC1B enters the noise suppression circuit by Q3 and Q7, which can automatically reduce the AF level while the noise level is too high due to weak RF signal.

3. Transmitter System

1) Transmit audio

The audio is picked up from the internal MIC, the signal is switched by SW1D, then amplified by Amplifier IC1B (OP-AMP LM324) then goes to flower by IC1A (OP-AMP LM324).

2) Modulation and RF amplifier

The amplified audio signal from microphone is send to modulate the local crystal oscillator by Q1 and XT1 (49.860MHz), through the driver by Q2. The amplitude modulated signal output from the oscillator is amplified by Q4.

3) ANT switch and LPF

The amplified signal then passes through a band -pass filter network which consists of C7, C6, C45, L2, C8 filters out spurious emission, and passes the switch SW1B. The signal is then applied to the antenna terminal.

4. Power Supply

9V battery is switched to Tx and RX power supply by the switches VR1B and SW1A.

5. Power indicator

IC1D(OP-AMP LM324), Z1, and LED1 consist a low battery detector, to monitor the battery voltage. LED1 will indicate the power supply status.