

MIC and LINE Input

Q100 amplifies the audio signal from microphone and feed it to the audio amplifier through a transistor switch Q101. When the LINE jack is plugged, the base of transistor Q101 is floated and it stop the microphone signal to pass through. Only the LINE signal can be fed into the audio amplifier and modulate the transmitter.

Audio Amplifier and Compressor

IC101A amplifies the audio signal. The audio signal is pre-emphasized by a high pass filter (C121 and R127) and fed to the compressor network (IC100 and IC101B) to improve the Signal-to-Noise ratio by compress the signal's dynamic range. The audio output is routed to the RF board to modulate the transmitter through the switch transistor Q104.

Auto Level Control (ALC)

To prevent the transmitter from over-modulation, IC100 is also utilized as a buffer amplifier of the ALC circuitry. It amplifies the audio signal and injects the signal into the rectifier D101 and D102. With strong signal, the rectifier will provide a sufficient current to bias the transistor Q103 and turn on the transistor Q102. In return, Q102 shunt the input signal to ground, and maintain constant output amplitude to the compressor.

If the ALC function is switched OFF, then the gain of the audio amplifier (IC101A) is set by adjusting VR100.

Oscillator and Modulator

The oscillation frequency is derived from a single 4MHz crystal by means of a phase locked loop. Frequency modulation is provided by a varactor diode VD1 when the audio signal is applied through the resistor R1.

RF Power Amplifier

Q3 is adopted as the power amplifier to drive the antenna through the low pass filter (L5, L6, C31 and C26).

Low Battery Detector

The voltage detector IC151 pushes the pin 11 of the MCU to low, as the battery is weak. And the Low Battery LED will be flashed by the MCU.