DESCRIPTION OF CIRCUITS EMPLOYED FOR SUPPRESSION OF SPURIOUS EMISSIONS, LIMITING MODULATION AND LIMITING POWER

Refer to schematic page 2. When the PTT switch is pressed, the microprocessor turns on the power to the microphone amplifier, PLL oscillator, pre-driver Q3 and bias to driver Q2 and Q1. Audio signal enters the microphone which is amplified by op-amp and is amplitude-limited by the diode clipper D7 and D8. It then passes through three stages of RC low-pass (composed of R30,31,34 and C5,12,16,44) and fed into the VCO for FM modulation. This serves the purpose of modulation limiting. The modulated VCO is fed to pre-driver Q3 whose supply is controlled by the microprocessor and is a regulated 3-volt supply. This stabilizes the driving power into pre-driver Q2 and hence the power amplifier Q1. Q1 and Q2 have their supply directly from the batteries and are current-limited and protected by resettable fuses FUS1 and FUS2. The final amplified signal passes through the RF switch formed by PIN diode D1 and passes through a band-pass filter realized by L15 and stripline. Finally it goes through three stages of LC low-pass and to the antenna. The antenna is of helical type which has a very narrow bandwidth and provide further filtering of the signal. The DC voltages and currents of the power amplification elements are as follows:

Element Function	Voltage	Current
Q3	pre-driver 3V	10ma
Q2	driver 4.5V	100ma
Q1	power amp 4.5V	200ma

Transmit spurious emission is suppressed by band-pass filter L15 and stripline and two stages of LC low-pass composed of L16, L17 and C62,63,64.

Limiting modulation

Modulation limiting is accomplished by diode clipper D7,D8 which limits the amplitude of the audio amplifier output and low-passed filtered by three RC steps to limit high frequency response.

Limiting power

Power limiting is accomplished by regulating the supply voltage of the pre-driver to 3V by use of voltage regulator. Additionally, the biases to the pre-driver and power amplifier are regulated and their supply current are limited by resettable fuses.