CIRCUIT DESCRIPTION

1. RECEIVER SECTION

Radio Frequency signal received by the antenna (ANT1), passing through the Low Pass Filter (L1, L2, L22, C2-C4, C153). The RF signal is then amplified by Low Noise Amplifier Q1 and passes through a Band Pass Filter (FL1 = 465MHz). The filtered signal within the range of 462 MHz – 467 MHz is then mixed with the first local oscillator signal from the Voltage Controlled Oscillator (VCO) circuit (Q9,Q10, D4, L16) through Q8, a portion of VCO signal is then feedback to the PLL IC (IC2) for phase comparison generating a stable RX frequency, the output signal is filtered by FL2 (21.7 MHz) which is the first Intermediate Frequency (IF) and is then amplified by Q3. The IF signal is fed to the discriminator IC1 pin 16 which is then mixed with the second local oscillator supplied by crystal X1 (21.25 MHz) to produced a reduced second IF signal which is then filtered by FL3 (KTM450HTW). Demodulated signal is recovered through correct adjustment of IF tank coil (IFT1) and the internal discriminator circuit of IC1. The recovered Audio signal is outputted at pin 9 of IC1 and then processed through filtering done by IC7 circuit, the fully recovered audio signal is then further amplified by Power Amplifier IC3. An audible sound is therefore produce by the speaker SPK100, which can be varied digitally from the CPU pins 76 – 79 and the corresponding series of resistors R31 – R34.

2. TRANSMITTER SECTION

PTT switch (SW7) when pushed triggers the Transmitter Circuit “ON”, the voice signal generates by the surrounding noise passes through the microphone MIC100 where mechanical to electrical transformation occurs, the electrical transformed signal is then filtered by a Band Pass Filter IC6, and Q23. The output signal is Modulated by a modulator circuit with a varactor diode D4 and L16. The external components from Q9,Q10 form a VCO Circuit which generates the required oscillating frequency for transmission, a portion of this signal is feedback to the PLL IC2 pin 14 for phase comparison in order to produce a stabilized TX frequency. The modulated signal is then amplified by a Cascaded Amplifier Circuit Q6,Q17 and Q7 and again amplified by Q4 and Q5 to produce a sufficient Radio Frequency signal emitted by the Antenna (ANT1).

3. CALL TRANSMISSION

By pushing the CALL key, a signal is detected by the CPU (IC8), a CALL data is then produced by the CPU. This data passes through the Band Pass Filter IC6C and modulated by the varactor diode D4 and L16. The signal follows it’s conventional transmission section path through the antenna.

4. BATTERY LOW DETECTION

Battery Low Detection is controlled by the CPU pin 43 as detected on the LCD 1, however a voltage divider circuit R64 and R65 serve as the stabilize reference voltage for the CPU to process its detection.

5. SQUELCH DETECTION

Supported by the linear IC circuit (IC1), a resistor R12 sets the level of detection and Diode D5 acts as a comparator circuit interface with the CPU.

6. POWER SUPPLY

Supply voltage of 6.0 Volts dc is needed to power “ON” the whole circuitry, by four (4) batteries “AAA” size.

FREQUENCY CHART

CHANNEL	FREQUENCY (MHz)	CHANNEL	FREQUENCY (MHz)
1	462.5625	12	467.6625
2	462.5875	13	467.6875
3	462.6125	14	467.7125
4	462.6375	15	462.5500
5	462.6625	16	462.5750
6	462.6875	17	462.6000
7	462.7125	18	462.6250
8	467.5625	19	462.6500
9	467.5875	20	462.6750
10	467.6125	21	462.7000
11	467.6375	22	462.7250

CTCSS CODE FREQUENCY CHART

CODE	FREQUENCY (Hz)	CODE	FREQUENCY (Hz)
1	67.0	20	131.8
2	71.9	21	136.5
3	74.4	22	141.3
4	77.0	23	146.2
5	79.7	24	151.4
6	82.5	25	156.7
7	85.4	26	162.2
8	88.5	27	167.9
9	91.5	28	173.8
10	94.8	29	179.9
11	97.4	30	186.2
12	100.0	31	192.8
13	103.5	32	203.5
14	107.2	33	210.7
15	110.9	34	218.1
16	114.8	35	225.7
17	118.8	36	233.6
18	123.0	37	241.8
19	127.3	38	250.3