6210C CIRCUIT DESCRIPTION

1 Base

a. RF Transmitter Section – RF Board

The compressed audio signal (RF module pin 10) is modulated through the varactor diode D3. These components, i.e. D3, C42, L2, Q5 and the external components of Q7 compose the voltage controlled oscillator circuit for the transmitter part. This circuit generates the TX VCO frequency. A portion of this signal is fed back to the PLL IC1 (8825B)'s pin1 (FIN1) for phase comparison. Once the phase of oscillation stabilized, the PLL circuit generates the error voltage necessary for the VCO to oscillate at the desired transmitter's RF frequency. The RF amplifier Q5 boosts the signal for transmission. This amplified RF signal is trimmed to the desired frequency band by FL2 (BPF903) so as not to interfere with the receiver circuit. The transmitter RF signal is then propagated through the antenna.

b. RF Receiver Section – RF Board

The Base Unit antenna receives RF signal. The Band Pass Filter FL1 (BPF927) trims the signal to the desirable frequency band. Transistor Q8 is a low noise amplifier that boosts the RF signal to a specific level for mixing. PLL IC1 (8825B) is used as a Universal Phase Lock Loop circuit. The frequency from the Voltage Controlled Oscillator (VCO) D1, L1 and Q4, is fed back to the PLL IC1 through pin 16 (FIN2) for phase comparison. During channel scanning or turning the unit on, once the phase of oscillation stabilized (locked), the PLL circuit generates the first local oscillator frequency for down-converting the received RF signal into the first IF frequency 10.7Mhz. This process is accomplished through the IF mixer circuit Q3. Q1 is used for matching the impedance of the mixer circuit with the succeeding circuits. The resulting IF signal is kept constant by the IF Filter FL3 to 10.7MHz which is then mixed with the second local oscillator frequency 11.150MHz (derived from X1 & C47) to produced a much lower IF frequency. This lower IF frequency if further filtered by IF Filter FL4 to produce a more stable signal of 450KHz. Quadrature signal detection is accomplished internally by the Narrow-band Detector IC2 (KA3361) with the IF coil L7. The recovered audio frequency can be taken from IC2 audio output pin9.

c. Transmitter Audio Section – Main Board

The Audio Frequency signal from the telephone line that is through R3,C5, Q1, IC1, R88, C10, etc is compressed through the compressor part of IC3 to minimize the transmission noise. The degree of compression depends on the external RC combinations. AGC is also utilized by IC4 to avoid shock noise caused by abrupt change of audio levels. The compressed audio is filtered and amplified for better acoustical performance.

d. Receiver Audio Section – Main Board

The compressed Audio Frequency signal from the RF module (pin4) is passed through passive RC filters for acoustic compliance. The filtered audio is then fed to the Compander IC4 (pin16 and pin17) for expansion thus retrieving the original Audio signal with noise filtered out. Through C21,R24,Q4,Q3 is used as buffer circuit. Bridge rectifier D1-D4 isolates the high-voltage

telephone line to the rest of the circuit.

2 Handset

a. RF Transmitter Section – RF Board

Refer to portion 1.b for this section. All circuit performance is the same except that Band Pass Filter BPF903 is changed to BPF927 for the handset transmission.

b. RF Receiver Section – RF Board

Refer to portion 1.b for this section. All circuit performance is the same except that Band Pass Filter BPF927 is changed to BPF903 for the handset transmission.

c. Transmitter Audio Section – Main Board

Audio Frequency signal from the handset or from the headset microphone is compressed through the compressor part of IC2 to minimize the transmission noise. The degree of compression depends on the external RC combinations. AGC is also utilized by IC2 to avoid shock noise caused by abrupt change of audio levels. The compressed audio is filtered and amplified for better acoustical performance. Q4 is a switching transistor that controls the power supply for the TX RF part.

d. Receiver Audio Section – Main Board

The compressed Audio Frequency signal from the RF module is passed through passive RC filters for acoustic compliance. The filtered audio is then fed to the Compander IC2 for expansion thus retrieving the original audio signal with noise filtered out. Q2 & Q9 act as audio amplifier to sufficiently drive the handset speaker. Q7 and Q8 are switching transistors that control the power supply for the RF part, the Compander part and the AF amplifier respectively. An earphone jack is provided for an optional headset unit for hands free conversation on the handset.

3 OTHERS (Handset):

a. Charging and Reset Controls

Recharging the handset battery is accomplished by putting the handset on the cradle. Q1 and its external components are the reset circuit. R16 and R25 detect this action and send a command to the CPU (IC2 pin24) for proper exchange of security code.

b. RX Data

Commands from the Handset is filtered and re-constructed by the Schmitt trigger circuit IC3-B The composite output is the RX Data that is input to the CPU for validation and processing.

c. Ring Detection

When the handset receives the ring command from the base unit, the CPU will send buzzer signal to the ringer amplifier Q5 and Q6 that drives the Buzzer.

d. Squelch Detection

The pin6 of the RF module outputs the RSSI signal for the IC3-a to examine the noise level.

4 OTHERS (Base):

a. Hook Switching and Dialing

The IC4 that is controlled by the CPU (pin21) accomplishes the hook switching and the pulse dialing function. The DTMF signal from the CPU(pin29) is amplified by Q4.

b. Over-voltage Protection

Fuse BX1 and varistor ZR1 act as high current and high voltage protectors for the telephone line interface. In case of presence of voltage surge across the telephone line, Fuse BX1 decreases its resistance and dumps the line voltage to a safe level. Fuse BX11 opens when excessive current is present on the line thus protecting both the user and the line interface.

c. Battery Charging & Code Setting

Battery charging commences when Q8 detects the presence of the handset on cradle. Q2 form the reset circuit in conjunction with the charge detects circuit to command the CPU to change the security code. When the reset circuit is activated, the CPU will send a new security code to the handset selecting among 65536 combinations.

d. Ring Detection

The operational amplifier IC6-A detects incoming ring signal. The CPU checks the frequency of the ring signal, and when valid, sends the ringing command to the speaker or to the Handset.

e. Power Supplies

L5 ensures uniform polarity for the entire circuit. IC7 regulates the voltage to +5Vdc for the rest of the circuit. Transistor Q6 controls the power supplied to the TX part of the RF circuits.

f. Squelch Detection

The pin6 of the RF module outputs the RSSI signal for the IC6-B to examine the noise level.

g. Caller ID Detection

FSK Caller ID data is processed through the C15 and C16 to the CPU (pin43 and pin44). The CPU controls the call state signal detection whether it is a normal caller ID or a caller ID on call waiting.

h. RX Data

Commands from the Handset is filtered and re-constructed by the Schmitt trigger circuit IC6-C The composite output is the RX Data that is input to the CPU for validation and processing.