P7

LIONDA TECHNOLOGY COMPANY LIMITED
ENGINEERING DEPARTMENT

CIRCUIT DESCRIPTION

Model: GH9452/GH9454 (BELLSOUTH)

1 Base

a. RF Transmitter Section - RF Board

Compressed audio signal is frequency modulated through the varactor diode D3. Diode D3, L4 and HN2 the external components formed 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 IC'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 VCO circuit impedance is matched with the succeeding circuit through the transistor Q10 that also acts as the buffer amplifier. RF amplifier Q2 boosts the signal for transmission. This amplified RF signal is trimmed to the desired frequency band by BPF2475 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. Band Pass Filter BPF906 trims the signal to the desirable frequency band. Transistor Q6 & Q9 is a low noise amplifier that boosts the RF signal to a specific level for mixing. PLL IC1 (KB8825) is used as a Universal Phase Lock Loop circuit. The frequency from the Voltage Controlled Oscillator (VCO) D1, L5 and HN1, is fed back to the PLL IC 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 FL2 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. Double conversion of received signal is utilized to improve the image frequency rejection of the unit.

P8

c. Transmitter Audio Section - Main Board

Audio Frequency signal from the telephone line is compressed through the compressor part of IC4 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 is passed through passive RC filters for acoustic compliance. The filtered audio is then fed to the Compander IC4 for expansion thus retrieving the original Audio signal with noise filtered out. Q5 is used as buffer circuit. Bridge rectifier D12-D15 isolates the high-voltage telephone line to the rest of the circuit. D12-D15 is also act as a hybrid transformer to create a two-way path for audio transmission to and reception from the telephone line.

2 Handset

b. RF Transmitter Section - RF Board

Refer to portion 1.b for this section. All circuit performance is exactly the same except that Band Pass Filter BPF2475 be changed to BPF906 for the handset transmission.

b. RF Receiver Section - RF Board

Refer to portion 1.b for this section. All circuit performance is exactly the same except that Band Pass Filter BPF906 be changed to BPF2475 & BPF817 for the handset reception.

c. Transmitter Audio Section - Main Board

Audio Frequency signal from the handset or from the headset microphone is compressed through the compressor part of IC1 to minimize the transmission noise. The degree of compression depends on the external RC combinations. AGC is also utilized by IC1 to avoid shock noise caused by abrupt change of audio levels. The compressed audio is filtered and amplified for better acoustical performance. Q3 is a switching transistor that controls the power supply for the TX RF part.

P9

d. Receiver Audio Section - Main Board

The compressed Audio Frequency signal is passed through passive RC filters for acoustic compliance. The filtered audio is then fed to the Compander IC1 for expansion thus retrieving the original audio signal with noise filtered out. Q2 & Q10 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 handsfree 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. IC5 detects this action and sends a command to the CPU for proper exchange of security code.

b. 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.

4 OTHERS (Base):

a. Hook Switching and Dialing

Hook switching and pulse dialing is accomplished by the transistor Q6 which is controlled by the CPU. DTMF signal from the ladder circuit internal to the CPU is filtered and amplified by Q5.

b. Over-voltage Protection

Fuse1 and varistor Z1 act as high current and high voltage protectors for the telephone line interface. In case of presence of voltage surge across the telephone line, Fuse1 decreases its resistance and dumps the line voltage to a safe level. Fuse1 opens when excessive current is present on the line thus protecting both the user and the line interface.

P/D

c. Battery Charging & Code Setting

Battery charging commences when resistor R74 detects the presence of the handset on cradle. Q4 form the reset circuit in conjunction with the charge detect 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

Incoming ring signal is detected by the operational amplifier IC21D. 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

Diode D10 ensures uniform polarity for the entire circuit. IC5 regulates the voltage to +5Vdc for the rest of the circuit. Transistor Q3 controls the power supplied to the TX part of the RF circuits.

f. Squelch Detection

In conjunction with the 3361 IC (IC2 of the Base RF), SVR1 sets the level of signal detection and 1C2A acts as the comparator circuit whose composite output is the RSSI signal for the CPU.

g. Caller ID Detection

FSK Caller ID data is processed through the FSK detector IC8 for input to the CPU. The signal levels and signal frequency spectrum is filtered by IC1A & IC1B. The CPU controls the call state signal detection whether it be 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 IC2B. The composite output is the RX Data that is input to the CPU for. validation and processing

- END -

50 CHANNEL - AUTOMATIC CHANNEL SELECTION MECHANISM
MODEL: GH9452/GH9454 (BELLSOUTH)

During the activation of Talk, the Handset receiver scans for free channel from its last linked receiver channel (about 50ms per channel). Once a free channel is found, the Handset transmits the Talk instruction to Base together with the receiver's free channel information for the Base to use this free channel as the Transmit channel.

Likewise, the Base receiver continuously scans each channel (25ms per channel) and stores all free channels into its memory. Once the Base receiver received the instruction from its Handset, it will stop from scanning and transmits its acknowledgement data with the Base receiver free channel information. When the Handset receives this Base free channel information, it will transmit the link command to Base and both will link on the clearest channel. The Handset and Base scan and find their receiver's clearest channel separately. If all transmit channels of Handset and Base are occupied (all busy), Handset and Base will link on the default channel (Channel 25).

BASE			HANDSET		BASE			HANDSET	
CH	TX	RX	TX	RX	CH	TX	RX	TX	RX
1	2472.215	906.010	906.010	2472.215	26	2474.625	907.616	907.616	2474.625
2	2472.312	906.074	906.074	2472.312	27	2474.722	907.681	907.681	2474.722
3	2472.408	906.138	906.138	2472.408	28	2474.818	907.745	907.745	2474.818
4	2472.504	906.202	906.202	2472.504	29	2474.914	907.809	907.809	2474.914
5	2472.601	906.267	906.267	2472.601	30	2475.011	907.873	907.873	2475.011
6	2472.697	906.331	906.331	2472.697	31	2475.107	907.938	907.938	2475.107
7	2472.794	906.395	906.395	2472.794	32	2475.204	908.002	908.002	2475.204
8	2472.890	906.460	906.460	2472.890	33	2475.300	908.066	908.066	2475.300
9	2472.986	906.524	906.524	2472.986	34	2475.396	908.131	908.131	2475.396
10	2473.083	906.588	906.588	2473.083	35	2475.493	908.195	908.195	24575.493
11	2473.179	906.652	906.652	2473.179	36	2475.589	908.259	908.259	2475.589
12	2473.276	906.717	906.717	2473.276	37	2475.686	908.323	908.323	2475.686
13	2473.372	906.781	906.781	2473.372	38	2475.782	908.388	908.388	2475.782
14	2473.468	906.845	906.845	2473.468	39	2475.878	908.452	908.452	2475.878
15	2473.565	906.910	906.910	2473.565	40	2475.975	908.516	908.516	2475.975
16	2473.661	906.974	906.974	2473.661	41	2476.071	908.580	908.580	2476.071
17	2473.758	907.038	907.038	2473.758	42	2476.168	908.645	908.645	2476.168
18	2473.854	907.102	907.102	2473.854	43	2476.264	908.709	908.709	2476.264
19	2473.950	907.166	907.166	2473.950	44	2476.360	908.773	908.773	2476.360
20	2474.047	907.231	907.231	2474.047	45	2476.457	908.837	908.837	2476.457
21	2474.143	907.295	907.295	2474.143	46	2476.553	908.902	908.902	2476.553
22	2474.240	907.359	907.359	2474.240	47	2476.650	908.966	908.966	2476.650
23	2474.336	907.424	907.424	2474.336	48	2476.746	909.030	909.030	2476.746
24	2474.432	907.488	907.488	2474.432	49	2476.842	909.094	909.094	2476.842
25	2474.529	907.552	907.552	2474.529	50	2476.939	909.159	909.159	2476.939