

Chapter 3 - Circuit Description

3.1) Base Unit Circuit Description

This Unit will be main switch and interface between telephone line and PC. Operated by a 10V AC power source included the following block:

MCU

This is central control unit of the device control the audio buffer, mixers and RF Module. It also handles the digital signal received by RF module and DTMF generator.

Oscillator

This is basic system timer reference.

Tel. Line Interface

Tel. Line Interface circuit provide ring detect, make-break and pulse dialing function. Moreover, it gives necessary insulation between line and the device.

Mic. In

This is interface of external microphone. This block circuit will provide the signal transfer and power isolation between basic unit and external microphone.

Mic. Out

This is interface of PC microphone. This block circuit will provide the signal transfer and power isolation between basic unit and PC.

Speaker In

This is interface of PC Speaker. This block circuit will provide the signal received and power isolation between basic unit and PC.

Audio Switch and Buffer

This block will provide the audio mixer function.

Power Supply

This will be converter the AC power to the DC power for the system operation.

Compandor

Compandor compressing signal to be transmitted and expanding signal received in order to reduce the noise.

RF Module

It is a 40 channel 900M Hz ISM band transceiver and receiver.

In the receiver part, 927M Hz RF signal from the filter is amplified then converted to 10.77M Hz and by the first IF amplifier. The signal is then convert to 450K Hz and amplified by the second IF amplifier again. Finally, FM-detector demodulator the RF signal to the audio output. A PLL is used to provide frequency signal for the frequency converting.

In the transmitting part, carrier (903M Hz) is generated by a PLL. The modulating the carrier through the VCO in the PLL. The modulated signal is then amplified by a power amplifier and through a 903M Hz filter before transmission.

Hand Set Charger

This is hand set and basic unit interface. Main function is handset battery charger.

3.2) Handset Unit Circuit Description

Operated by a 3.6V battery included the following block.

MCU

This is central control of the device control RF module and handles the digital signal received by RF module. The user interface is a LED and a keypad.

Oscillator

This is basic system timer reference.

LCD Display

Visual Interface of the hand set. Main function is provides the system information to user.

Buzzer

Loud speaker for the user alerts. Like as call in, battery low etc. to inform the user.

Keyboard

For the user input the data and system setup.

Power Supply

For power management and provide the protection between the handset to external system.

3.6V Battery

This is rechargeable battery cell.

Compandor

Compandor compressing signal to be transmitted and expanding signal received in order to reduce the noise.

RF Module

It is a 40 channel 900M Hz ISM band transceiver and receiver.

In the receiver part, 927M Hz RF signal from the filter is amplified then converted to 10.77M Hz and by the first IF amplifier. The signal is then convert to 450K Hz and amplified by the second IF amplifier again. Finally, FM-detector demodulator the RF signal to the audio output. A PLL is used to provide frequency signal for the frequency converting.

In the transmitting part, carrier (903M Hz) is generated by a PLL. The modulating the carrier through the VCO in the PLL. The modulated signal is then amplified by a power amplifier and through a 903M Hz filter before transmission.

Headset Interface

This for the headset interface.

Volume Control

Speaker and headset speaker signal level control.

3.3) Cradle Unit Circuit Description

Is Handset battery charge and audio amplifier. Operated by a 10V AC power source included the following block:

Power Supply

This will be converter the AC power to the DC power for the system operation.

Hand Set Charger

This is hand set and basic unit interface. Main function is handset battery charger and audio signal input.

Audio Amplifier

Received the signal from the handset and amplifier it.

1.1) Technical Specification

Feature List:

PC Software-

1. Compatible with MS Windows 98, ME and 2000
2. Remote channel selection via handset
3. 99 pre-selected radio stations or local sources from PC.
4. Bookmark and playlist management system.
5. Top 20 channels list.
6. Auto Internet connectivity detection and set up

900M Hz Radio Phone

1. 40 channels auto or manual trigger scanning via handset
2. Caller ID (Type I and Type II)
3. Last number re-dial (Max. 32 Digits)
4. 65536 random combinations of security code
5. Handset volume control
6. 3 Level receiver volume control
7. Handset power saving in standby mode (up to 7.5 days)
8. Line Flash for call waiting and call transfer (Flash time 650mS)
9. Back-Light LCD on handset
10. Any Key answer during ring detected
11. Internet Radio Control
12. Station number display on handset during Internet Radio Mode.
13. Talk Time display on the handset during the talk mode.
14. Low battery detection and warning

1.2) RF Channel frequencies Table:

<i>ch.</i>	base tx	h/s tx	<i>ch.</i>	base tx	hs/tx
1	902.125	926.125	21	902.625	926.625
2	902.150	926.150	22	902.650	926.650
3	902.175	926.175	23	902.675	926.675
4	902.200	926.200	24	902.700	926.700
5	902.225	926.225	25	902.725	926.725
6	902.250	926.250	26	902.750	926.750
7	902.275	926.275	27	902.775	926.775
8	902.300	926.300	28	902.800	926.800
9	902.325	926.325	29	902.825	926.825
10	902.350	926.350	30	902.850	926.850
11	902.375	926.375	31	902.875	926.875
12	902.400	926.400	32	902.900	926.900
13	902.425	926.425	33	902.925	926.925
14	902.450	926.450	34	902.950	926.950
15	902.475	926.475	35	902.975	926.975
16	902.500	926.500	36	903.000	927.000
17	902.525	926.525	37	903.025	927.025
18	902.550	926.550	38	903.050	927.050
19	902.575	926.575	39	903.075	927.075
20	902.600	926.600	40	903.100	927.100