920 Circuit Description

1. Introduction

The model 920 is a 40 channel (902.80 - 927.25Mhz) cordless telephone. The whole unit is divided into two main parts as follow :

a. A remote Handset.
b. A Base unit.

2. Functional Blocks of the Remote Handset

2.1 Keyboard matrix and function LED

2.2 MCU and MCU interface

2.3 Antenna and RF module

2.4 Compander

2.5 Data shaper

2.6 Charge detector

2.7 Low battery detector

2.8 Buzzer amplifier

3. Circuit Block Description

3.1 Keyboard matrix and function LED
Pin 4 to pin7, pin 10 to pin 11 and pin 25 of the U5 ACT13H MCU form a keyboard, and the talk LED is controlled by the pin 12 of the MCU.

3.2 MCU and MCU interface
The handset and the base is link up by the pins(9,24 in HS and 21,24 in Base). Besides, the PLL of the RF Module is controlled by the pins 15,17 and 18 of the MCU.

3.3 Antenna and RF module
ANT is the common point for transmitting and receiving through antenna. MD1 is a RF module which consists of Duplexer, Power amplifier, Mixer & IF, RXVCO, TXVCO, VCC & TXVCC control, Synthesizer and DEMO Audio Output circuits.

3.4 Compander

A compander U2 is used for improving the S/N of the transmit and receive audio signal.

3.5 Data shaper

The information which sending from base unit, is recovered by the amplifier U3C.

3.6 Charge detector

ZD1, D7, D6, C43, R70, R68 and R69,D4, C42, R71, D5 form a charge detector to direct the charging signal to the MCU pin 26.

3.7 Low battery detector

A battery low detector is built-in by the U3B which detects the battery dropping and sends a signal to pin 19 of MCU.

3.8 Buzzer amplifier

Q2 is a buzzer amplifier driven directly by the MCU pin 23.

4. Functional Blocks of the Base unit

4.1 Power supply
-MCU and MCU interface
-Receiver amplifier
-Demodulator
-Audio amplifier
-Compander
-Antenna and RF Module
-Data shaper
-Charge detector
-Line audio interface
-Ring detector
-LED indications
-Power fail detector
-Switches
-DTMF generator·
-Voice switched speakerphone
-Keyboard matrix

5. Circuit Block Description

5.1 Power supply
BU4 LM7805 regulate the input DC 9V whichprovides dc power to every part of thecircuit.

5.2 MCU and MCU interface

The heart of the base is the MCU communicates with the PLL in RF module BMD1 via pin 1,43,44. RF transmitter on/off is selected by pin 35. The communication between Handset and Base is via the pin 33(TX DATA)and pin31(RX DATA) through the RF link.

5.3 Antenna and RF module
BANT1 is the transmit and receive signal antenna.
BMD1 is RF module which consists of Duplexer, Power amplifier,Mixer & IF, RXVCO,TXVCO, TXVCC control and demodulated audio output circuits.

5.4 Charge detector

BQ12 is a charge detector to direct the charging signal to the MCU pin 30.

5.5 Audio amplifier and compander

BU4 MM1100XF is a compander IC which performs compress at transmitted signal via pin12, pin8 and expand at received signal via pin1, pin4. The RF mute is controlled by the MCU pin 7 and pin 8.

5.6 Line audio interface
BQ9,BL3,BL4,BR83,BR84,BR62,BC69 and BT1 line transformer are the audio interface to the telephone line. The transformer is also for telephone line isolation.

5.7 Datashaper and carrier/noise detector
BC2,BR2,BR3,BR7,BR9,BR10,BR8 and BU3D form a datashaperwhich send the information from BASE to theMCU pin31(RXDATA).
BMD1 pin10 provides an output to MCU pin26 through BQ15 to gives result on monitoring the receiving carrier state for thecondition of changed channel in charging state.

5.8 Ring detector

BR85,BC70,BZD1&2,BD6,BU7(K817) form a ring detector.

5.9 Power fail detector

BZD4,BR136&7,BQ134,BR132 form a powerfail detector.

5.10 LED indicationsfunction board _
KLED2 is for SPEAKERPHONE
KLED3 is for INTERCOM
KLED4 is for CHARGING

5.11 Keyboard matrix
Pin 2 to pin 6 , pin 29   and pin 42 of the MCU form a keyboard.

5.12 Switches
MCU pin 28 (line mute) control BQ8 on and off for the line audio selection.
MCU pin 27 (intercom mute) control BQ6,BQ7on and off for the speakerphone audio selection.
MCU pin 7 and 8 (Txmute and Rxmute) control BQ3,BQ4 on and off for the cordless audio
selection.

5.13 DTMF generator
MCU pin 19 to 24 generates DTMF signal through a resistor network and is via BU5
amplification to line.

5.14 Voice switched speakerphone
BU6 is a voice switched speakerphone IC.
Audio come from receiver or line is input via BU6 pin 27, and through on and off of BQ1,2 &23
can control the speakerphone output loudness. MIC signalis input via BU6 pin 9, output signal
is viaBU6 pin 4.

~~FF905/906/907/908A~~ Channel Table

Channel	BASE (MHz)			HANDSET (MHz)		
	Rx	LOCAL	Tx	Rx	LOCAL	Tx
Ch1	925.30	936.00	902.80	902.80	892.10	925.30
Ch2	925.35	936.05	902.85	902.85	892.15	925.35
Ch3	925.40	936.10	902.90	902.90	892.20	925.40
Ch4	925.45	936.15	902.95	902.95	892.25	925.45
Ch5	925.50	936.20	903.00	903.00	892.30	925.50
Ch6	925.55	936.25	903.05	903.05	892.35	925.55
Ch7	925.60	936.30	903.10	903.10	892.40	925.60
Ch8	925.65	936.35	903.15	903.15	892.45	925.65
Ch9	925.70	936.40	903.20	903.20	892.50	925.70
Ch10	925.75	936.45	903.25	903.25	892.55	925.75
Ch11	925.80	936.50	903.30	903.30	892.60	925.80
Ch12	925.85	936.55	903.35	903.35	892.65	925.85
Ch13	925.90	936.60	903.40	903.40	892.70	925.90
Ch14	925.95	936.65	903.45	903.45	892.75	925.95
Ch15	926.00	936.70	903.50	903.50	892.80	926.00
Ch16	926.05	936.75	903.55	903.55	892.85	926.05
Ch17	926.10	936.80	903.60	903.60	892.90	926.10
Ch18	926.15	936.85	903.65	903.65	892.95	926.15
Ch19	926.20	936.90	903.70	903.70	893.00	926.20
Ch20	926.25	936.95	903.75	903.75	893.05	926.25
Ch21	926.30	937.00	903.80	903.80	893.10	926.30
Ch22	926.35	937.05	903.85	903.85	893.15	926.35
Ch23	926.40	937.10	903.90	903.90	893.20	926.40
Ch24	926.45	937.15	903.95	903.95	893.25	926.45
Ch25	926.50	937.20	904.00	904.00	893.30	926.50
Ch26	926.55	937.25	904.05	904.05	893.35	926.55
Ch27	926.60	937.30	904.10	904.10	893.40	926.60
Ch28	926.65	937.35	904.15	904.15	893.45	926.65
Ch29	926.70	937.40	904.20	904.20	893.50	926.70
Ch30	926.75	937.45	904.25	904.25	893.55	926.75
Ch31	926.80	937.50	904.30	904.30	893.60	926.80
Ch32	926.85	937.55	904.35	904.35	893.65	926.85
Ch33	926.90	937.60	904.40	904.40	893.70	926.90
Ch34	926.95	937.65	904.45	904.45	893.75	926.95
Ch35	927.00	937.70	904.50	904.50	893.80	927.00
Ch36	927.05	937.75	904.55	904.55	893.85	927.05
Ch37	927.10	937.80	904.60	904.60	893.90	927.10
Ch38	927.15	937.85	904.65	904.65	893.95	927.15
Ch39	927.20	937.90	904.70	904.70	894.00	927.20
Ch40	927.25	937.95	904.75	904.75	894.05	927.25