

C420 CIRCUIT DESCRIPTION

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1. Introduction

The model C420 is a CID (Type I and Type II) cordless telephone working at 900MHz (40 channels)..

This unit is made up of two parts:

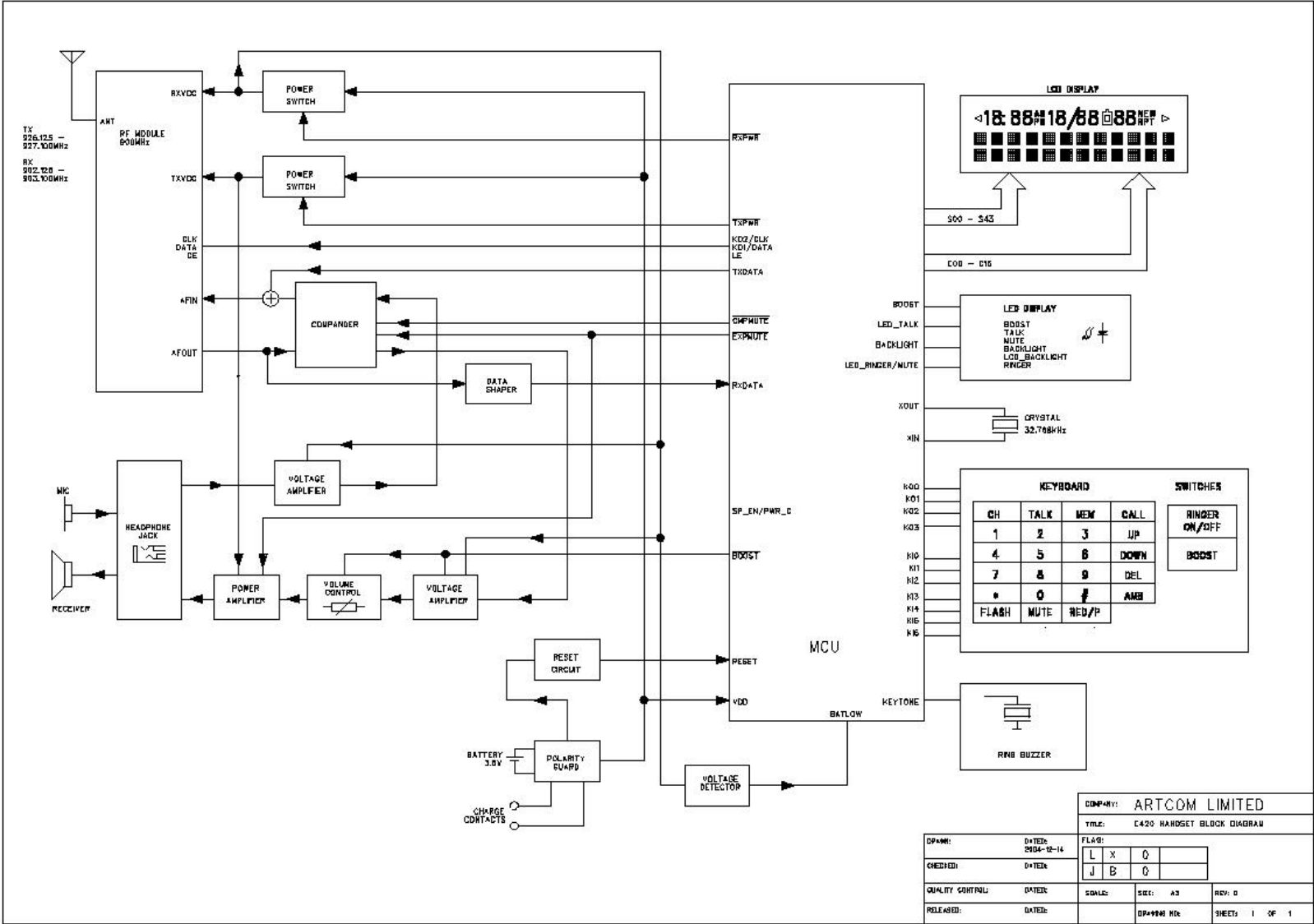
- a. A Handset unit.
- b. A Base unit.

2. Functional Blocks of C420 Handset

The block diagram of C420 handset unit is as shown below. It is made up of the following parts:

- 2.1 Keyboard Matrix, Switches and Function LED
- 2.2 MCU and MCU Interface
- 2.3 RF Module Section
- 2.4 Comander
- 2.5 Data Shaper
- 2.6 Charge and Control
- 2.7 Low Battery Detector
- 2.8 Buzzer
- 2.9 Audio Circuit

3. C420 Handset Block Diagram



3. C420 Handset Unit Circuit Block Description

3.1 Keyboard Matrix, Switches and Function LED

The keyboard consists of the following keys:

- CALL — for Caller ID operation
- DEL — for Caller ID menu operation
- AMB — one touch memory keys
- CH — for changing RF carrier frequency
- TALK — for On/Off hook control
- MEM — for memory program and dialing
- 1, 2, 3, 4, 5, 6, 7, 8, 9, *, 0, # — numeric keys
- FLASH (EXIT) — provides timed On/Off hook function
- MUTE — turns on/off handset microphone
- RD/P — redials the last number or provides a pause during dialing.

The keyboard is connected to Pins 84 to 94, and pin 97 of the MCU (MCU1).

The switches consist of the followings:

- UP/DOWN — for Caller ID menu operation
- BOOST – for On/Off the receiver amplifier gain
- RINGER ON/OFF – turns On/Off the ringer buzzer

This is connected to pins 84, 85, 88 and 89 of MCU.

The jack consists of the following:

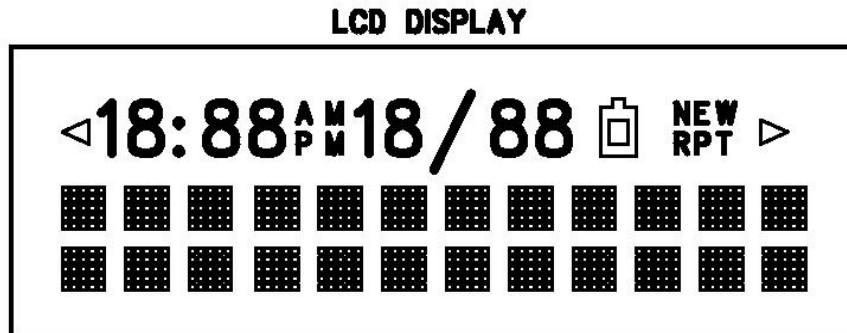
- HEADSET – for connection of an external microphone and receiver

The function LEDs consist of the followings:

- MICMUTE (LED2 - Red) – Located under the “MUTE” key. On/Off when microphone is Off/On.
- BOOST (LED1 – RED) – Located under the “TALK” key. On/Off when the receiver amplifier extra gain is On/Off.
- IN-USE (LED1 – GREEN) – Located under the “TALK” key. On/Off when the handset is Off-hook/On-hook.
- BACKLIGHT (LED7 – LED18, LED5 – LED6 - Green) – Located under the keyboard and LCD backlight. On for a short time when any key is pressed
- NEWCALL/IN-USE/RINGER (LED3, LED4 - Red) – Located in the handset antenna. Flashes when the telephone line rings. Steady on/off when handset is off-hook/on-hook. Blinks when there is New Call to

be reviewed and during memory programming.
These LEDs are controlled by pins 66, 91, 98, 99 of MCU.

The display format of the LCD is as shown below.



The display is controlled by pins 12 – 65 of MCU.

3.2 MCU and MCU Interface

The controller of the handset is MCU1. The frequency of the crystal used is 32.768 KHz.

It controls the functions of the handset through the keyboard interface and signals from the base unit. The data to and from the base goes through pin 69 (data from base) and pin 71 (data to base).

3.3 RF Module Section

For operation and frequency see RF module section.

It receives the PLL data through pins 5, 6, 7 from MCU pins 93, 94 and 95.

The antenna located at the top of the unit and is permanent attached to RF module section through a copper wire.

3.4 Compander

A compander U3 is used for improving the S/N of transmit and receive audio signals.

3.5 Data Shaper

The information which sent from base unit is recovered by the amplifier Q11.

3.6 Charge and Control

ZD1, D2, Q1 provide polarity and over-voltage protection during battery charging. When the handset is put into the base cradle, the charge signal is detected by pin 84 of the MCU.

3.7 Low Battery Detector

The battery voltage is detected by U1-D and Q27. The signal is sent to pin 67 of MCU.

3.8 Buzzer

Q4 is the buzzer signal amplifier and driven by the MCU pins 72.

3.9 Audio Circuit

When handset is off-hook, speech signal is picked up by the internal microphone MIC1 and sent to the telephone line through amplifier U1-C, the compander U3 and the RF section.

The incoming speech is received through the RF section, the compander, the amplifier U1-A, and amplifier U2. When BOOST is on, extra gain is inserted in this audio path by Q16, Q17, Q29 and Q21. The high frequency is boosted with the increase in volume setting.

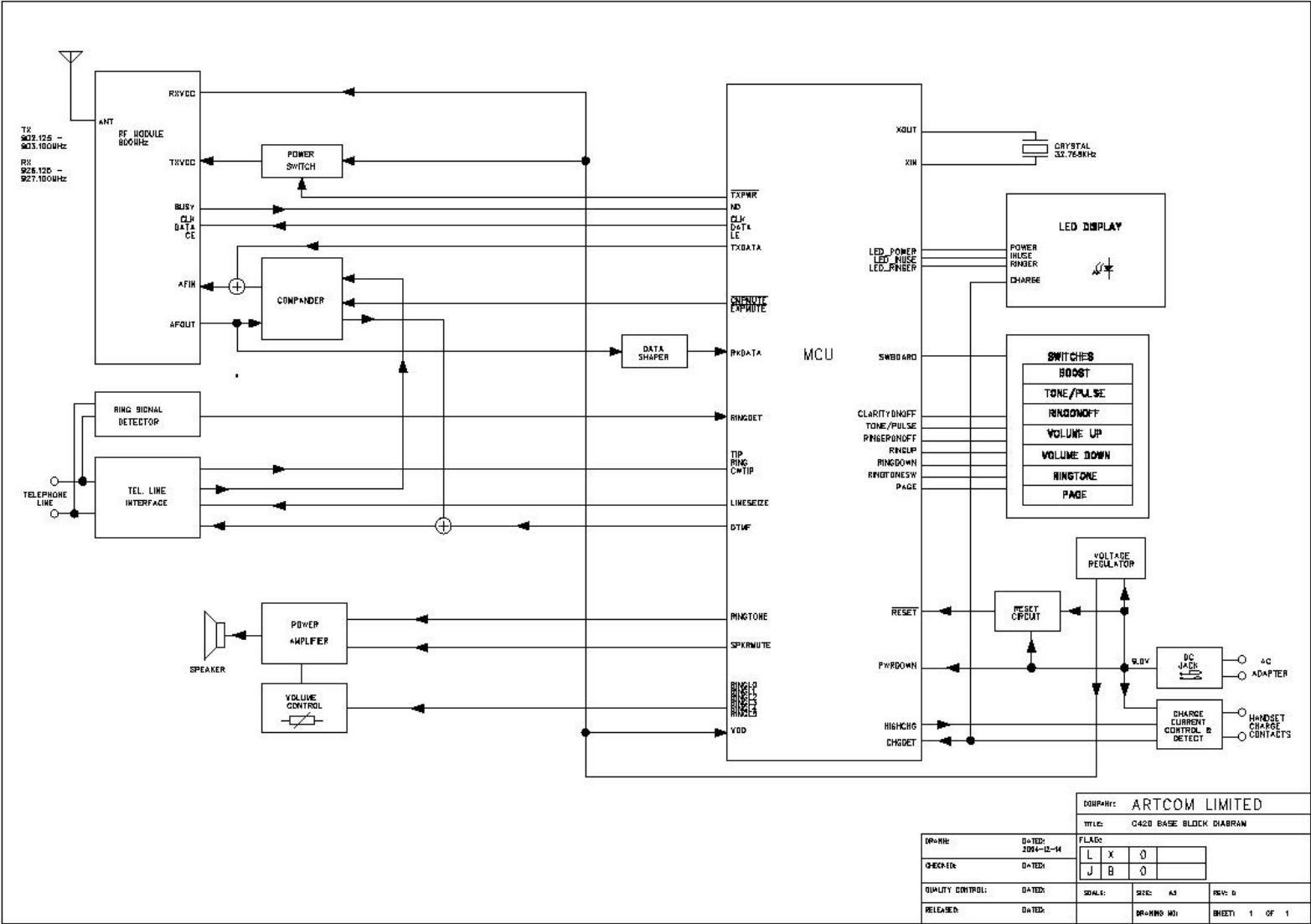
The headset jack is for external receiver and microphone.

4. Functional Blocks of C420 Base Unit

The block diagram of C420 base unit is as shown below. It is made up of the following parts:

- Power Supply
- MCU and MCU Interface
- RF Module
- Comander
- Data Shaper
- Charge and Control
- Telephone Line Interface
- Ring Signal Detector
- Base Ringer
- Keyboard Matrix, Switches and Function LED

C420 Base Unit Block Diagram



5. C420 Base Unit Circuit Block Description

5.1 Power Supply

The base unit is powered by an AC adapter (9V dc). The voltage regulator (BU3) regulates the input DC to 5V. This provides power to every part of the unit.

5.2 MCU and MCU Interface

The controller of the base is BMCUX1 and it controls the function of the unit.

The frequency of the crystal used is 32.768 KHz.

It communicates with the handset through the RF module. PLL data to the RF module BMD1 is sent through pins 84, 95, 97 and 98.

The data between Handset and Base is via the pin 94 (data from handset) and pin 96 (data to handset) through the RF module. The transmitter and receiver powers are controlled by the signals from pin 72 and pin 71.

The MCU monitors ring signal from telephone line through the telephone line interface at pin 5. MCU pin 2 provides DTMF signal. The keyboard interface is provided by pins 75 to 81 and 83.

5.3 RF Module

For operation and frequency see RF module section.

It receives the PLL data through pins 5, 6, 7 from MCU pins 84, 95 and 97.

The antenna partly located inside the plastic rod at the side the unit is permanent attached to RF module.

5.4 Componder

The compander BU2 is used for improving the S/N of the transmit and receive audio signals.

5.5 Data Shaper

The information sent from handset unit is recovered by the amplifier BQ4.

5.6 Charge and Control

BQ12 detects the handset charging current and sends signal to MCU pin 91.

BQ13, BQ29 and BQ16 control the charging current delivered to the handset.

Resistors BR55 and BR109 provide current limiting function.

BQ20 detects the 9V supply and sends a negative pulse to MCU pin 99.

5.7 Telephone Line Interface

BL1, BL2, BF1, BVAR1, BR32 and BC61 provide telephone line surge protection. BQ18, BQ32, BQ15, BD24, BD25, BD26, BD27 provide telephone On/Off hook function. BQ33 is the audio interface to the telephone line.

5.8 Ring Signal Detector

BL1, BR102, BC57, BR31, BZD5, BQ10, BD24, BD25, BD26, BD27, BR32, BF1 and BL2 form the ring signal detector. The signal is sent to pin 5 of MCU.

5.9 Base Ringer

BU7 and speaker BSPKR1 provide base ringer sound output. MCU pin 87 provides ringer tones (six types), and this is set by MCU pin 77 (RING STYLE switch). The ringer output level (six levels) is controlled by MCU pin 63 to 68 and they are set by pin 75 (VOLUME UP switch), or pin 76 (VOLUME DOWN switch).

5.10 Keyboard Matrix, Switches and Function LEDs

The keyboard and switches consist of the followings:

- PAGE – for base to page handset
- STYLE – for changing Ringer sound frequency
- VOLUME DOWN – for reducing Ringer sound output volume
- VOLUME UP – for increasing Ringer output sound volume
- RINGER CONTROL ON/OFF – turns On/Off the ringer output
- BOOST ON/OFF – turns On/Off handset receiver extra gain
- T/P – for selecting Tone or Pulse mode dialing

These switches are connected to pins 75 – 81 of MCU (BMCU1).

The LEDs consist of the followings:

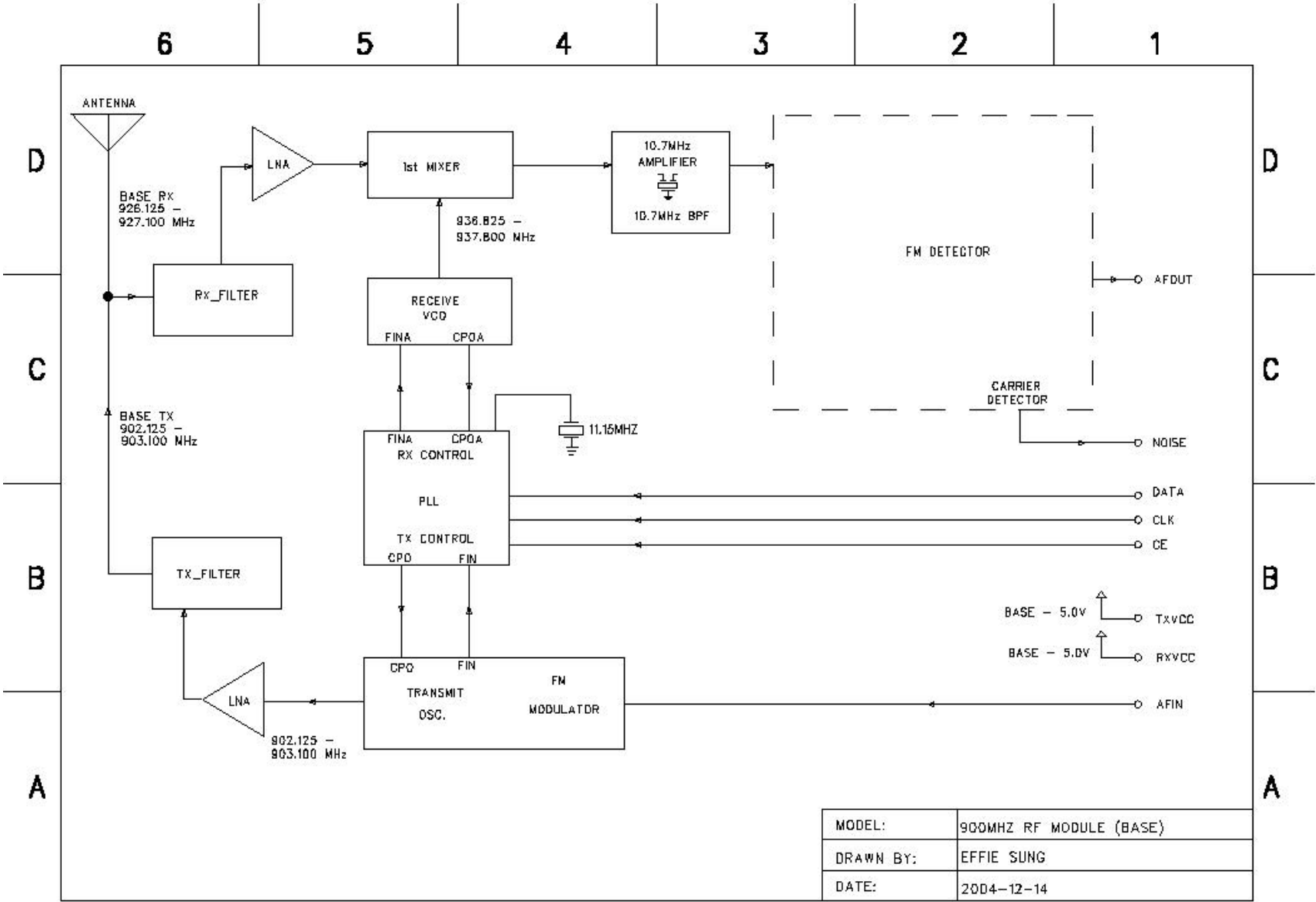
- RINGER (BLED3, BLED5, BLED8 – Red) – Located under the red lens.
They are controlled by transistor BQ11 and pin 70 of MCU (BMCU1).
- IN-USE (BLED5 – Green)/CHARGE (BLED5 – Red) – Green when C420 is talking to the telephone line. It is controlled by transistor BQ6 and pin 88 of BMCU1. Red when handset is the cradle. It is controlled by transistor BQ12.
- POWER (BLED6 – Red) – On when the base is powered by 9V AC adapter.

6. Functional Blocks of the RF Module/Section

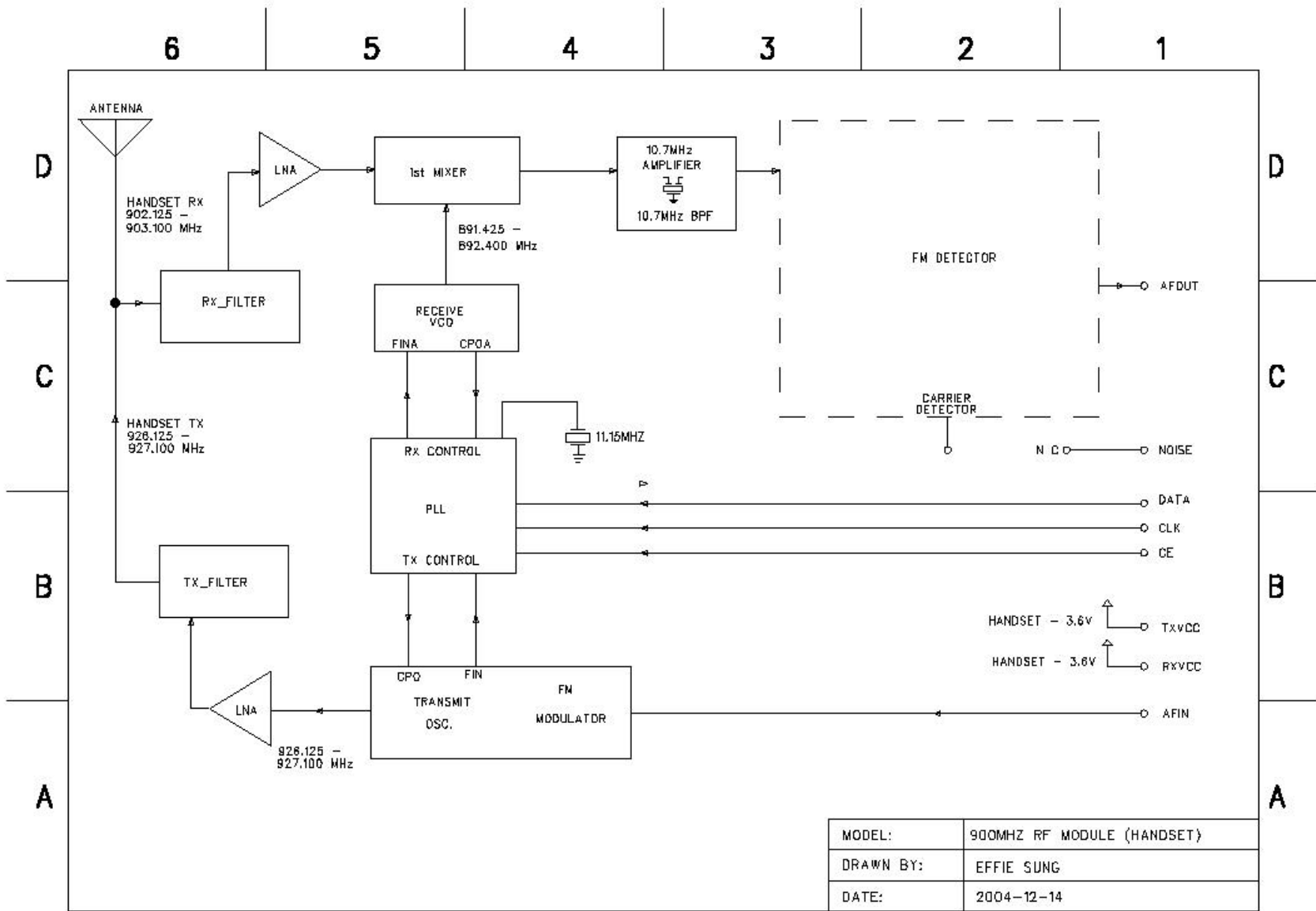
The block diagrams of RF Module (Base) and RF Section (Handset) are as shown below. It is made up of the following parts:

- 6.1 Power Supply
- 6.2 PLL and MCU Interface
- 6.3 RF Transmitter
- 6.4 RF Receiver
- 6.5 Audio Detector

RF Module (Base) Block Diagram



RF Section (Handset) Block Diagram



7. RF Module/Section Circuit Block Description

7.1 Power Supply

The RF transmitter receives power from TXVCC. This voltage is 5V for the base unit and 3.6V for the handset unit. For the base unit, TXVCC is enabled only during TALK or RINGING mode. For the handset unit, TXVCC is enabled only during TALK mode.

The RF receiver receives power from RXVCC. This voltage is 5V for the base unit and 3.6V for the handset unit. For the base unit, RXVCC is enabled all the time. For the handset unit, RXVCC is enabled only during TALK or scanning for ringing signal from the base unit.

7.2 PLL and MCU Interface

The frequencies of the RF transmitter and RF local oscillator are controlled by a PLL IC (U1). The MCU transmits data to the PLL IC through DATA, CLK and CE signal lines. The basic clock frequency of the PLL IC is derived from an 11.15MHz crystal inside the RF module.

7.3 RF Transmitter

The RF transmitter frequency for the base is 902.125 MHz – 903.100 MHz and the handset is 926.125 MHz – 927.100 MHz.

The RF transmitter oscillator frequency is controlled by the PLL IC (U1) through CPO pin. The PLL IC samples the RF frequency through FIN pin. The audio input signal AFIN is fed to this RF oscillator through the FM modulator. The RF oscillator output is amplified through the LNA (Q4, Q3) and coupled to the RF antenna through the TX_FILTER.

7.4 RF Receiver

The incoming RF signal is coupled from the antenna through RX_FILTER to a LNA (Q1) where it is amplified and fed to the 1st mixer/IF amplifier (Q2, Q6). The receiver local oscillator (Q5) frequency is controlled by the PLL IC through CPOA pin. The PLL IC samples the local oscillator RF frequency through FINA pin.

For the base unit, the local oscillator frequency is (RF + 10.7MHz).

For the handset unit, the local oscillator frequency is (RF – 10.7MHz).

7.5 Audio Detector

The audio detector (U2) receives the incoming signal from the 10.7MHz filter.

The audio signal is recovered from a FM detector to AFOUT. The quality of the incoming RF signal is indicated by logic output NOISE.

8. C420 Operation (Base)

8.1 Setting the Ringers

The RINGER OFF/ON switch on the side of the base set the base ringer sound off/on.

Pressing the “UP” button key on the base increases the ringer sound by one level while pressing the “DOWN” button reduces the sound by one level. There are a total of six levels from maximum to minimum.

There are six types of ringer sound output. To change the tone, press the “STYLE” button once.

The speaker will output a sample of two seconds with the latest selection of tone frequency and output level when any of these buttons are pressed.

See later section for details about the interactions between the base and handset Ringer On/Off switches.

8.2 PULSE/TONE SWITCH (Base)

It is a 2-position switch for setting dialing mode.

T – TONE (DTMF)

P – PULSE (10pps, 40/60).

The dialing mode is determined while going from on-hook to off-hook.

8.3 BOOST ON/OFF SWITCH (Base)

When set to “OFF”, the handset will go off-hook with the amplifier off.

When set to “ON”, the handset will go off-hook with the amplifier on.

8.4 PAGE KEY (BASE)

The base can locate the handset by pressing the “PAGE” button once.

See later section for details.

9. C420 Operation (Handset)

9.1 Setting Parameters

Press and hold “CALL” key to enter setup mode

a. Set Language

After entering setup mode, the LCD display will show “SET LANGUAGE”, and the current selected language, e.g. “ENGLISH”.

Press “CALL” key once to change the language and the current selected language will blink.

Press “UP(↑)” or “DOWN(↓)” button to change the language to “SPANISH” or “FRENCH”. Press “CALL” key to confirm. The selected language will be steady on.

Press “UP(↑)” to go to the next menu.

If there is no input within 30 seconds, the language will be set to the last selected one and go back to stand-by mode.

b. Set Contrast

There are 3 contrast levels and the default is set to level 2.

After setting the language, press “UP(↑)” button to begin setting contrast.

The LCD display will show “CONTRAST X”, X is the last selected level.

Press “CALL” key once to change the contrast level. The current selected level blinks. Press “UP(↑)” or “DOWN(↓)” button to change the level.

Press “CALL” key to confirm. The selected level will be steady on.

Press the “UP(↑)” or “DOWN(↓)” button to go to the next menu.

If there is no input within 30 seconds, the program will set to last selected value and go back to stand-by mode.

c. Set Time/Date

The time and date will be automatically updated when the first incoming CALLER ID is received.

The time will start from default Time/Date “12:00 AM 01/01”.

If the setting of time is lost during power down, the clock will blink when power is up again.

After setting Contrast, press “UP(↑)” button to set the date and time. The LCD display will show “TIME/DATE”.

Press “CALL” to start changing the date.

The LCD display will show the current time and date on the top line,
e.g. “12:05^{AM} 12/20” with the month digits blinking.

Press the “UP(↑)” or “DOWN(↓)” button to change the month digits.

Press “CALL” key once to confirm.

After the month digits, the date digits will blink. Press “UP(↑)” or
“DOWN(↓)” button to change the date digits. Press “CALL” key
once to confirm.

After the date digits, the hour digits will blink. Press “UP(↑)” or
“DOWN(↓)” button to change the hour digits. Press “CALL” key once
to confirm.

After the hour digits, the minute digits will blink. Press “UP(↑)” or
“DOWN(↓)” button to change the minute digits. Press “CALL” key
once to confirm.

After the minute digits, the AM/PM icon will blink. Press “UP(↑)” or
“DOWN(↓)” button to change the AM/PM icon. Press “CALL” key
once to confirm.

After setting the AM/PM icon, the time/date digits will be blanked.

Press “CALL” key once to display the time/date again.

Or

Press the “UP(↑)” or “DOWN(↓)” button to go to next menu.

If there is no input within 30 seconds, the program will set to last updated time
and go back to stand-by mode.

d. Set CID ON/OFF

After setting Time/Date, press “UP(↑)” button to set the CID mode
(default to ON).

If the CID is on, the LCD display will show “CID MODE” and “ON”.

If the CID is off, the LCD display will show “CID MODE” and “OFF”

Press “CALL” to change. The mode characters (ON/OFF) will blink.

Press the “UP(↑)” or “DOWN(↓)” button to change the mode.

Press “CALL” to confirm. The selected mode characters (ON/OFF) will be
steady on.

Press the “UP(↑)” or “DOWN(↓)” button to go to the next menu.

If there is no input within 30 seconds, the program will set to last selected value and go back to stand-by mode.

e. Set AUTOTALK ON/OFF

After setting CID On/Off, press “UP(↑)” button to set AutoTalk mode (default to on).

If AutoTalk is on, the LCD display will show “AUTOTALK” and “ON”.

If AutoTalk is off, the LCD display will show “AUTOTALK” and “OFF”.

Press “CALL” to change. The mode characters (ON/OFF) will blink.

Press the “UP(↑)” or “DOWN(↓)” button to change the mode.

Press “CALL” to confirm. The selected mode characters (ON/OFF) will be steady on.

Press the “UP(↑)” or “DOWN(↓)” button to go to the next menu.

Or

Press “FLASH” key to exit setup menu.

If there is no input within 30 seconds, the program will set the area code to last selected value and go back to stand-by mode.

f. Set Area Code

After setting AutoTalk On/Off, press “UP(↑)” button to set area code.

The LCD display will show “AREA CODE ?” and “***” or last selected value “XYZ”.

Press “CALL” to change. The digits will change to “XYZ -> XYZ” with the second digit “X” blinking.

Enter the area code number using the numeric keys on the handset. Press “CALL” key to confirm. The entered digits will be moved to the far left and steady on.

Press the “UP(↑)” or “DOWN(↓)” button to go to the next menu.

Or

Press “FLASH” key to exit setup menu.

If there is no input within 30 seconds, the program will set the area code to last selected value and go back to stand-by mode.

9.2 Receiving/Terminating/Making A Call

a. Receiving a Call

When the phone rings, the handset LCD displays “RINGING”.

- If the handset is out of the cradle, press the “TALK” key.
- If the handset is in the cradle, lift the handset. If AutoTalk is off, press the “TALK” key.

The handset LCD displays “TALK” and “00:00:XX”.

b. Terminating a Call

When the handset is off-hook, putting it back into the cradle will terminate the call on the handset; or press “TALK” key.

The handset will mute the audio, off the lighted LED. The LCD will display “OFF” for 2 seconds and go back to stand-by.

c. Making a Call

The handset must be out of the cradle in order to make a call.

- Press the “TALK” key. Handset will go off-hook.
The handset LCD displays “TALK”.
- Press numeric keys to dial the numbers.

In Pulse dialing mode, press “*” will change to Tone dialing mode.

When the handset is in receiver mode, press “BOOST” button will add extra gain in the receiver output. Adjust “VOLUME” control to vary the receiver output level.

9.3 Memory Operations

a. Adding a Memory Number

- i. Unit must be in stand-by mode only.
- ii. Press “MEM” key once. The antenna and “TALK” key will blink.
- iii. Press the desired numbers (16 digits max). To insert a Pause, press “RED/P” key once.
- iv. Press “MEM” key again.
- v. Press a memory location (0 – 9) or the emergency key (AMB).
- vi. The handset will give a long beep and the indicators will go off.
- vii. Repeat the above procedure for other locations.

b. Review Memory Information

- i. Unit must be in stand-by mode only.
- ii. Press and hold “MEM” key for 3 seconds. The LCD will show “ENTER MEMO” and “NUMBER”.
- iii. Enter location number (0 – 9) or press the one touch key (AMB) to review the stored numbers.
- iv. If the location is not blank, the display will show
 - Location number at the top right hand corner
 - Telephone number on the third line
- v. If the location is blank, the display will show
 - Location number at the top right hand corner
 - “RECORD EMPTY” on the second line
 - Blank on the third line
- vi. Press “FLASH” key to return the handset to stand-by mode. Or
If no key entry for 30 seconds, the handset will return to stand-by mode.

c. Dial-Out Sequence

- i. In stand-by mode, press “TALK” key to go off-hook.
- ii. Press “MEM” key and the desired memory location number [x].
OR
- iii. Press the emergency key “AMB”.

The display will show for about two seconds:

- location number at the top right hand corner
- telephone number on the third line

Then the number is dialed automatically in TONE or PULSE mode determined by the base “T/P” switch while on-hook to off-hook.

OR

- iv. While the display is showing the memory information (see previous section), press “TALK” key. The handset will go off-hook and dial out the displayed numbers.

The dialing mode (TONE or PULSE) is determined by the base “T/P” switch while on-hook to off-hook.

d. Deleting a Stored Number

- i. Unit must be in stand-by mode only.
- ii. Press and hold “MEM” key for 3 seconds. The LCD will show “ENTER MEMO” and “NUMBER”.

- iii. Enter location number (0 – 9) or press one of the emergency keys to review the stored numbers. The display will show
 - location number at the top right hand corner
 - telephone number on the third line.
- iv. Press “DEL” key to erase memory. The LCD will show
“ERASE” and “MEMO XY?”
- v. Press “DEL” key to confirm.
LCD will show “MEMO XY”, “ERASED” together with a success key tone.
Or,
Press “FLASH” key to return to standby mode.
- If the memory location is empty, pressing “DEL” key will have no action.
- This sequence will time-out after 30 seconds if no key is pressed.

9.4 CALLER ID Information

Type I + Type II (Caller ID with Call Waiting capability)

a. Caller Information

When somebody calls, the received caller information is displayed on the LCD. If the call is answered by this phone, this caller information is considered “old”. Otherwise, the CID information will be stored in the call log. Information which has not been reviewed will be considered as “new call”. The antenna LED (NewCall) will blink.

The top row will display the time and date of call.

The second row will display the caller’s ID.

The third row will display the incoming telephone number.

If the number of digits is 7, it will be displayed as XXX-XXXX.

If the caller’s number is 10 digits and the caller’s area code matches the stored area code, only the last 7 digits will be displayed “XXX-XXXX”. Otherwise it will be shown as “XXX-XXX-XXXX”.

Maximum 12 characters and 16 digits will be stored in the call log.

If you answer the incoming call before the second ring, the unit will not display the call information.

b. Receiving Call Waiting Caller ID

When you are on an existing call, you will hear a beep and the display will show incoming call waiting caller ID information.

If you access the call waiting call, the Caller ID information will disappear and the Time/Day screen will appear.

If you do not access the call waiting call, the Caller ID information will be transferred into the Caller log. This caller information is considered “old”.

c. Withheld Call Number

If the caller’s number is withheld, the display will show “NUM BLOCKED”. It will be stored in Caller ID log.

d. Unknown Call Number

If the caller’s number is not available, the display will show “NO NUMBER”. It will be stored in Caller ID log.

e. Name Blocked Call

If the name is withheld, the display will show “CID BLOCKED”. It will be stored in Caller ID log.

f. Unknown Name

If the caller’s name is not available, the display will show “NO CALLER ID”. It will be stored in Caller ID log.

g. Repeated Call

If this is a repeated call, it means the same number called before and has not been reviewed.

9.5 CALLER ID Operation

a. Caller ID Review

If there is new call information, the ringer LED “NewCall” will blink.

During stand-by mode, press “UP(↑)” or “DOWN(↓)” switch will display the latest caller information.

Press “UP(↑)” or “DOWN(↓)” again to view the next CID content.

If the caller’s number is more than 12 digits, press “#” to display second part of the information.

While it scrolls over the list, “-- END --” is shown.

If the CID list is empty, the display will show “- NO CALLS -”.

- At anytime, user can press “FLASH” key one time to go back to stand-by mode. Or
- It will go back to stand-by automatically at 30 seconds time out if there is no action.

b. Callback from Caller ID Information

While dialing from Caller ID information, there are 5 variations:

- 7 digits without Area Code:**
- Area Code + 7 digits without a 1 prefix:**
- Area Code + 7 digits with a 1 prefix:**

When reviewing the Caller ID information, press “CALL” will cause the LCD to display the above numbers in sequence.

Example 1:

Stored Area Code: 770.

Stored incoming call number 770-123-4567.

- Press “UP” or “DOWN” switch will show steady “123-4567”.
- Press “CALL” key will cause “123-4567” to blink.
- While display is blinking, press “UP”/“DOWN” switch will cycle the displayed number between “123-4567”, “770-123-4567” and “1-7701234567” (with each switch button press).
- Press “CALL” key once while blinking “123-4567” will dial out “1234567”.

OR

- Press “CALL” key once while blinking “770-123-4567” will dial out “7701234567”.

OR

- Press “CALL” key while blinking “1-7701234567” will dial out “17701234567”.

OR

- While the digits are blinking, press “DEL” key will make the digits steady. Then “UP” or “DOWN” to review next record.

Example 2:

Stored Area Code: 770.

Stored incoming call number 413-456-7890.

- Press “UP” or “DOWN” switch will show steady “413-456-7890”.
- Press “CALL” key will cause “413-456-7890” to blink.

c. While display is blinking, press “UP”/”DOWN” switch will cycle the displayed number between “1-4134567890”, “567-7890” and “413-456-7890” (with each key press).

d. Press “CALL” key once while blinking “1-4134567890” will dial out “14134567890”.

OR

e. Press “CALL” key while blinking “456-7890” will dial out “4567890”.

OR

f. Press “CALL” key once while blinking “413-456-7890” will dial out “4134567890”.

OR

g. While the digits are blinking, press “DEL” key will make the digits steady. Then “UP” or “DOWN” switch to review next record.

□ The display shows all the dialing digits for 1 second before dialing.

c. Delete Caller ID Information

While reviewing the Caller ID, press “DEL” key to delete the displayed caller information. LCD will display flashing “ERASE ?”.

Press “DEL” to confirm. “CID ERASED” will be displayed for 2 seconds.

Or press any other key to exit the delete mode.

The next record is shown automatically or “- NO CALLS -” if the list is empty.

- At anytime, user can press “FLASH” key one time to go back to stand-by mode. Or

- It will go back to stand-by automatically at 30 seconds time out if there is no action.

d. Delete All Caller ID Information

While reviewing the Caller ID, press and hold the “DEL” key for two seconds. LCD will display flashing “ERASE ALL ?”.

Press “DEL” to confirm. LCD will display “ALL CID” and “ERASED” for 2 seconds and then “-- NO CALLS --”.

Or press any other key to exit the delete mode.

- At anytime, user can press “FLASH” key one time to go back to stand-by mode. Or
- It will go back to stand-by automatically at 30 seconds time out if there is no action.

10.C420 Operation (Base and Handset)

10.1 PAGE Function

Only the base can page the handset while the unit is in stand-by mode.

Press the base “PAGE” switch once and the handset will beep for 15 seconds.

Pressed and hold for 5 seconds, the handset will beep for 60 seconds.

The handset LCD displays “PAGING”.

Press any numeric key on the handset to stop paging.

If there is no response from handset, the LCD display will revert back to normal.

10.2 Ringer Function

The relationship between the handset and base ringer sound outputs are as shown in the following table.

Charge State	Ringer Switch		Base		Handset	
	Base	Handset	Sound	LED	Sound	LED
Off	Off	Off	Off	On	Off	On
Off	Off	On	Off	On	On	On
Off	On	On	On	On	On	On
Off	On	Off	On	On	Off	On
On	Off	Off	Off	On	Off	On
On	Off	On	On	On	Off	On
On	On	On	On	On	Off	On
On	On	Off	On	On	Off	On

11. RF Channels

CHANNEL	BASE		HANDSET	
	TX (MHz)	LOCAL (MHz)	TX (MHz)	LOCAL (MHz)
CH 01	902.125	936.825	926.125	891.425
CH 02	902.150	936.850	926.150	891.450
CH 03	902.175	936.875	926.175	891.475
CH 04	902.200	936.900	926.200	891.500
CH 05	902.225	936.925	926.225	891.525
CH 06	902.250	936.950	926.250	891.550
CH 07	902.275	936.975	926.275	891.575
CH 08	902.300	937.000	926.300	891.600
CH 09	902.325	937.025	926.325	891.625
CH 10	902.350	937.050	926.350	891.650
CH 11	902.375	937.075	926.375	891.675
CH 12	902.400	937.100	926.400	891.700
CH 13	902.425	937.125	926.425	891.725
CH 14	902.450	937.150	926.450	891.750
CH 15	902.475	937.175	926.475	891.775
CH 16	902.500	937.200	926.500	891.800
CH 17	902.525	937.225	926.525	891.825
CH 18	902.550	937.250	926.550	891.850
CH 19	902.575	937.275	926.575	891.875
CH 20	902.600	937.300	926.600	891.900
CH 21	902.625	937.325	926.625	891.925
CH 22	902.650	937.350	926.650	891.950
CH 23	902.675	937.375	926.675	891.975
CH 24	902.700	937.400	926.700	892.000
CH 25	902.725	937.425	926.725	892.025
CH 26	902.750	937.450	926.750	892.050
CH 27	902.775	937.475	926.775	892.075
CH 28	902.800	937.500	926.800	892.100
CH 29	902.825	937.525	926.825	892.125
CH 30	902.850	937.550	926.850	892.150
CH 31	902.875	937.575	926.875	892.175
CH 32	902.900	937.600	926.900	892.200

CH 33	902.925	937.625	926.925	892.225
CH 34	902.950	937.650	926.950	892.250
CH 35	902.975	937.675	926.975	892.275
CH 36	903.000	937.700	927.000	892.300
CH 37	903.025	937.725	927.025	892.325
CH 38	903.050	937.750	927.050	892.350
CH 39	903.075	937.775	927.075	892.375
CH 40	903.100	937.800	927.100	892.400