SERVICE MANUAL

(FOR MBO Alpha 26xx / 27xx / 28xx)

CONTENTS

MODEL SPECIFICATION

GENERAL DESCRIPTION

- DECT TDMA: Time Division multiple Access

- DECT uses 10 frequency bands and time division multiplexing. Each channel has a frame structure. A DECT frame of 10 milliseconds is divided into 2 X 12 timeslots. Therefore one cell can handle up to 120 slots.

- LCD display and Hands-free in handset (portable part)

SUPPLY POWER
- HANDSET : 2X1.2V AAA 600mAhr Ni-MH rechargeable batteries
- BASE   : AC230V DC7V 300mA / AC7V 150mA adaptor

POSSIBLE RANGE
- OPEN SPACE : UP TO 300 METERS
- IN BUILDING : UP TO 50 METERS

WEIGHT
- HANDSET : Less than 120g (with batteries)
- BASE   : 180g

SIZE (L x W x H)
- HANDSET : 135x50x26
- BASESET   : 115x80x115

LIST OF STANDARD ITEMS

- Cordless handset (portable part) ------------------------------------- 1 pc
- Base station (fixed part) --- 1 pc
- Battery pack ……………………………………………………. 1 pc
- AC adaptor -- 1 pc
- Telephone line cord -- 1 pc
- Belt chip for handset ……………………………………………… 1 pc
- Instruction manual, single color ……………………………….. 1 pc
- Gift box with inner box ……………………………………………. 1 pc

FEATURES LIST

- Digital, cordless, easy to use telephone complying to DECT/GAP standards.
- CID function with caller list for 20 numbers or names from phonebook (network-dependent).
- Alphanumeric LC display.
- Exchangeable top covers.
- Telephone directory (phonebook) for 40 entries with names and telephone numbers.
- Extended redialing for 10 numbers.
- Microphone muting function.
- Acoustic battery and range warning signals.
- 10 incoming call ringing melodies.
- Headset connection.
- Can be expanded for use with up to 5 mobile handsets.
- Operation of a handset on up to 4 base stations.
- Paging function from base station to handset.
- Programmable call barring.
- Key lock.
- DTMF, Flash.
- Up to 150 hours standby.
- Up to 12 hours continuous call time.
- Operation via 2 standard batteries, AAA type. (micro, Ni-MH)
- Hands-free calling using the handset.

ANSWERING MACHINE PART

- Fully digital answering machine
- Adjustable call acceptance, 2-7 rings
- Date and time display for each message (network-dependent)
- Answering machine operati0on via the handset
- Remote control option
- Security code

PRODUCTION TECHNICAL SPECIFICATION

1. 8GHz DECT Telephone

TECHNICAL SPECIFICATION

ELECTRICAL

	PRODUCTION LIMIT			
	FIX PART	PORTABLE PART		REMARK
TESTING CONDITIONS				
Supply	230VAC $\pm$ 10%, 50Hz	2.6V $\pm$ 0.1V		unless otherwise stated
Temperature	25 $\pm$ 10°C	25 $\pm$ 10°C		unless otherwise stated
Humidity	65 $\pm$ 20%	65 $\pm$ 20%		unless otherwise stated
RADIO SECTION				
Frequency Range	1880 MHz ~ 1900 MHz	1880 MHz ~ 1900 MHz		
Number Of Channels	10	10		
Channel Frequency	RX TX	RX TX		
Channel 0	1881.792 MHz			
Channel 1	1883.520 MHz			
Channel 2	1885.248 MHz			
Channel 3	1886.976 MHz			
Channel 4	1888.704 MHz			
Channel 5	1890.432 MHz			
Channel 6	1892.160 MHz			
Channel 7	1893.888 MHz			
Channel 8	1895.616 MHz			
Channel 9	1897.344 MHz			
Frequency Stability	fc $\pm$ 65kHz	fc $\pm$ 65kHz		@20 $\pm$ 10°C
Modulation Method	GFSK	GFSK		
Frequency Deviation Maximum positive B-Field part 3	+203 / +403 KHz	+203 / +403 KHz		@CMD60
Maximum negative B-Field part 3	-403 / -203 KHz	-403 / -203 KHz		@CMD60
NTP Power	20 +6/ -2 dBm	20 +6/ -2 dBm		50 ohm Termination
Receiver Sensitivity BER $\leq$ 0.0001	$\leq$ -88 dBm	$\leq$ -88 dBm		
Jitter	0 $\pm$ 1µs	0 $\pm$ 1 µs		Slot - Slot
	0 $\pm$ 100ns	0 $\pm$ 100 ns		Bit - Bit
Radio Regulation	EN 301 406	EN 301 406		
LINE INTERFACE				
DTMF SIGNALING				
DTMF Freq. Tolerance: 697Hz	< $\pm$ 1.5%	X		Low Group, Row 1,2,3
770Hz	< $\pm$ 1.5%	X		Low Group, Row 4,5,6
852Hz	< $\pm$ 1.5%	X		Low Group, Row 7,8,9
941Hz	< $\pm$ 1.5%	X		Low Group, Row *,0,#
1209Hz	< $\pm$ 1.5%	X		High Group, Col 1,4,7, *
1336Hz	< $\pm$ 1.5%	X		High Group, Col 2,5,8,0
1477Hz	< $\pm$ 1.5%	X		High Group, Col 3,6,9,#
Tone Level: Low Group	-13.0 ~ -8.5 dBV	X		
High Group	-11.0 ~ -6.5 dBV	X		
Twist (HG > LG)	1 ~ 4.5 dB	X		

	PRODUCTION LIMIT			
	FIX PART	PORTABLE PART		REMARK
Tone Dial Digit Period, Td	65 ~ 90 ms	X		
Inter-digit Period, Tid	$\geq$ 65 ms	X		
Mute Level	$\geq$ 20 dB	X		I-CTR 37
Unwanted Freq. Component	< 20 dB			
Pulse Dial Signaling	See Table 1			Country specific
Flash Duration	See Table 1	X		Country specific
Maximum Ringer Stop Voltage		X		
Minimum Ringer Start Voltage		X		
Ringer Impedance @25Hz / 50Hz	> 4 k ohm	X		
On Hook DC Resistance @100Vdc T/R-Earth	$\geq$ 10MΩ	X		I-CTR 37
On Hook DC Resistance @100Vdc T-R	$\geq$ 1MΩ	X		I-CTR 37
Off Hook DC Characteristics	See Table 2 and Figure1	X		I-CTR 37
On Hook AC Impedance @ 300~3400Hz, 20mA, 50Vdc	>10kΩ	X		EN 300 001 4.1.1
Off Hook AC Impedance	270 + (750 $/\!/$ 150nF)	X		I-CTR 37
Leakage Current between Simplexed Tips & Ring to Charge Contacts	$\leq$ 3.5mA @1kVrms for 1sec.	X		
Line Interface Regulation	EN 300 001, I-CTR 37, CTR 38			

		C180x
PULSE DIAL SIGNALING	Speed	10$\pm$1pps
	Make	
	Break	60$\pm$4ms
	Pre-pulse	20ms
	Post-pulse	20ms
Flash(Address 0X1CF)	Break Duration	

Table 1 - **Country Specific: Pulse Dial Signaling and Flash Duration**

Point	Voltage (V)	Current (mA)
A	9,0	0
B	9,0	20,0
C	14,5	42,0
D	40,0	50,0
E	40,0	60,0
F	0	60,0
G	0	0
NOTE: Limits for intermediate currents can be found by drawing a straight line between the break points on a linear voltage/current scale.		

Table 2 - TE Voltage/Current Characteristics
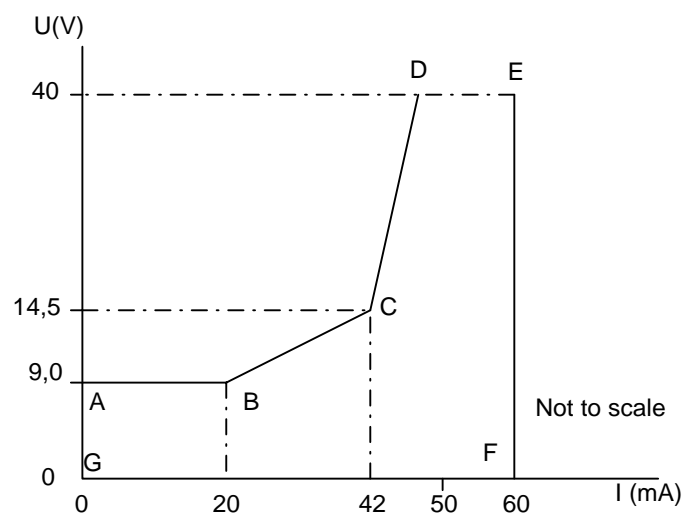
Figure 1: TE voltage/current characteristics

	PRODUCTION LIMIT			
	FIX PART		PORTABLE PART	REMARK
ACOUSTIC RESPONSE				
SLR (Sending Loudness Rating)				TBR10
@ 2800 ~ 1000 ohm	+/- 4dB		X	Refer to acoustic sample
@ 500 ohm	+/- 4dB		X	Refer to acoustic sample
Sending Response	See Figure 2 and Table 3		X	CTR 38
Sending Distortion				CTR 38
@1KHz,-4.7dBPa	< 7%		X	$2 \times 1400\Omega$
@500Hz,-4.7dBPa	< 7%		X	$2 \times 1400\Omega$
@1KHz, +5dBPa	< 10%		X	$2 \times 800\Omega$
RLR (Receiving Loudness Rating)				CTR 38
@ 2800 ~ 1000 ohm	X		+/- 4dB PP@volume 3	Refer to acoustic sample
@ 500 ohm	X		+/- 4dB PP@volume 3	Refer to acoustic sample
Receiving Response	See Figure 3 and Table 4		X	CTR 38
Receiving Distortion				CTR 38
@1KHz,-12dBV	X		< 7%	$2 \times 1400\Omega$
@500Hz,-12dBV	X		< 7%	$2 \times 1400\Omega$
@1KHz, 0dBV	X		< 7%	$2 \times 800\Omega$
STMR	X		> 10 dB	$2 \times 500\Omega$, Zr
Sending Noise			X	
Receiving Noise	X			
Return Loss – Impedance				
@200~300 Hz	>6 dB		X	I-CTR 37
@300~4000 Hz	>8 dB		X	
Echo Return Loss @300~3400Hz	>14 dB		X	CTR 38
			X	500 ~ 2500 Hz
Receiver Volume: Hi/Normal	X		≥6 dB	
Acoustic Reference	CTR 38			

	Frequency (Hz)	dB relative to arbitrary level
Upper limit	100	-6
	2000	+7
	4000	+7
	8000	-13
Lower limit	300	-14
	2000	-6
	3400	-11

Table 3 - Co-ordinates of Sending Sensitivity Limit Curves
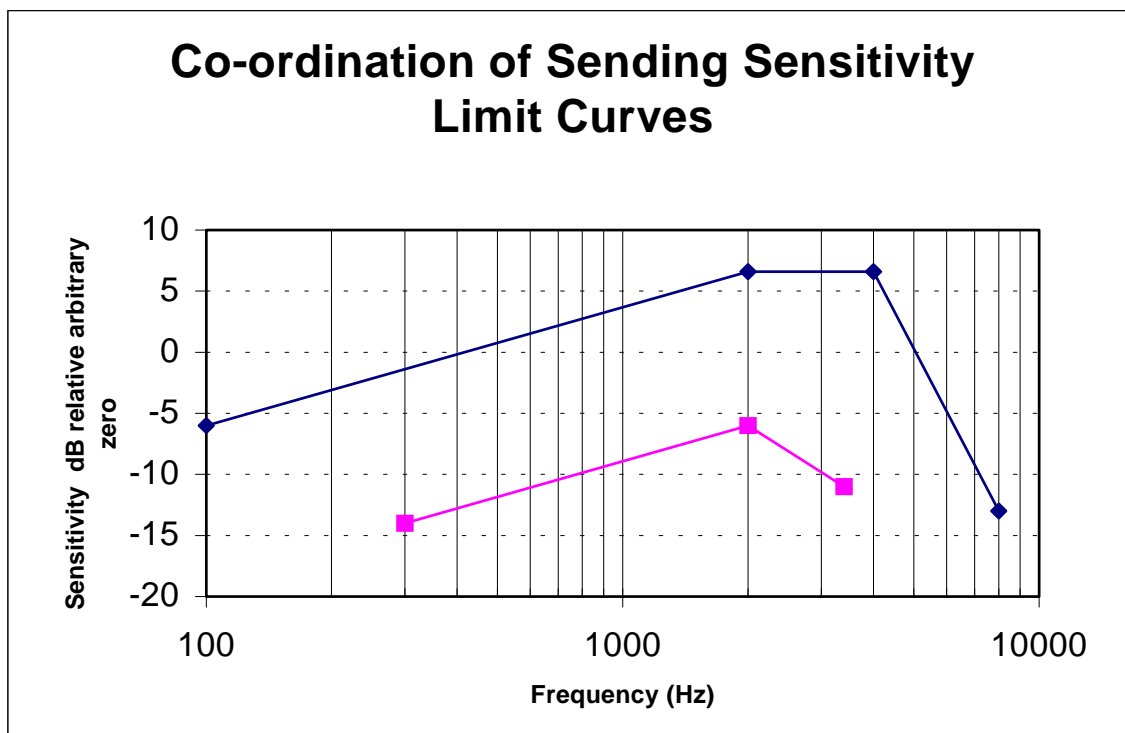
Figure 2: Co-ordination of Sending Sensitivity Limit Curves

	Frequency (Hz)	dB relative to arbitrary level
Upper limit	100	-10
	200	+2
	4000	+2
	8000	-15
Lower limit	300	-9
	1000	-7
	3400	-12

Table 4 - Co-ordinates of Receiving Sensitivity Limit Curves
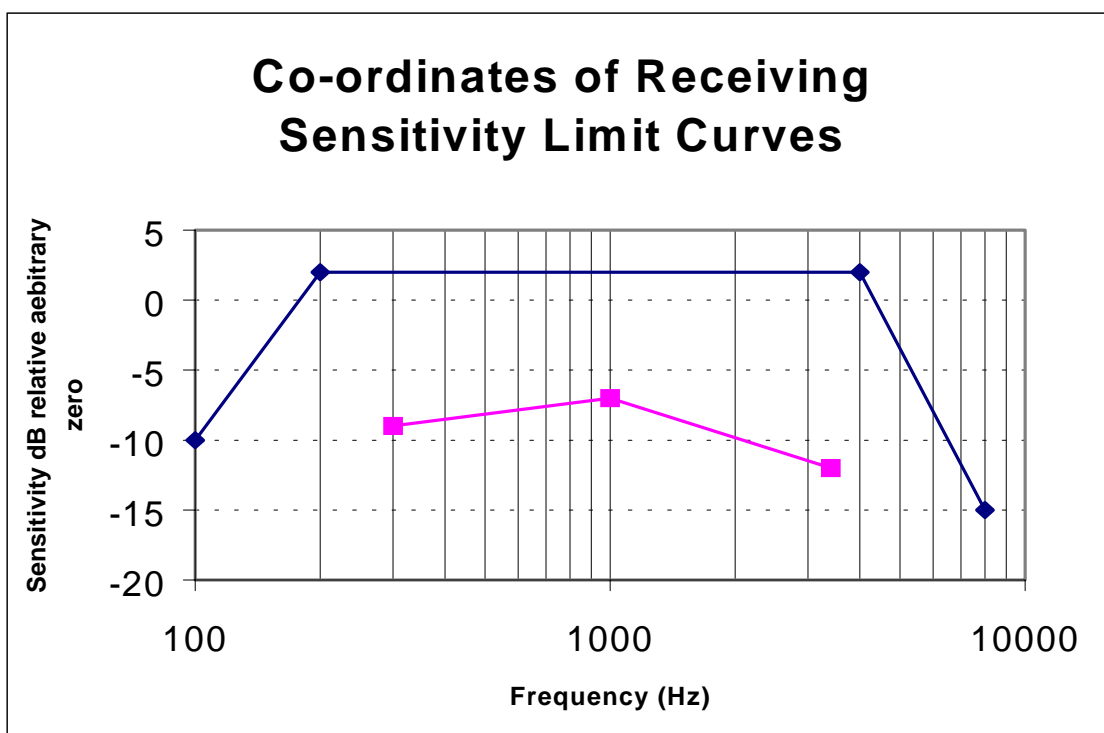
Figure 3: Co-ordinates of Receiving Sensitivity Limit Curves

	PRODUCTION LIMIT					
	FIX PART		**PORTABLE PART**		**REMARK**	
OFF-LINE CID DATA TRANSMISSION (ETS 300 778-1)						
Freq. and Baud Rate						
Space Freq.	2100 ± 32 Hz		X			
Mark Freq.	1300 ± 20 Hz		X			
Baud Rate	1200 ± 12 baud		X			
Mark Level Detection Range	-8 dBV ~ –36 dBV		X			
Space Level Detection range	-8 dBV ~ –36 dBV					
SNR Immunity @300~3400Hz	25 dB		X			
Transmission Prior to ringing – TE Alerting Signals					ETS 300778-1 4.2.1.1 & 4.2.3	
DT-AS: Nom. Frequency	2130 ± 11 Hz 2750 ± 14 Hz		X			
Signal Frequency	-9 ~ -40 dBV / tone		X			
Twist	± 6 dBV		X			
Duration	100 ± 10 ms		X			
Unwanted Signal Immunity (300 ~ 3400 Hz)	25 dB		X			
RP-AS: Ringing Voltage	30 V ~ 90 VRms		X			
Nom. Frequency	25 Hz and/or 50 Hz		X			
Duration	200 ~ 450 ms		X		Extended Recommendation	
Transmission During Ringing – First Ring Pattern					ETS 300778-1 4.2.1.2	
Ringing Voltage	30 V ~ 90 VRms					
Nom. Frequency	25 Hz and/or 50 Hz					
Duration	350 ~ 1200 ms					
Channel Seizure Detection Length	96 ~ 300 bits		X			
Mark Signal Detection Range	180 ± 25 bits and / or 80 ± 25 bits		X			
ON-LINE CID DATA TRANSMISSION (ETS 300 778-2)						
Freq. and Baud Rate						
Space	2100 ± 32 Hz		X			
Mark	1300 ± 20 Hz		X			
Baud Rate	1200 ± 12 baud		X			
Mark Level Detection Range	-10 ~ -33 dBV		X			
Space Level Detection range	-10 ~ -33 dBV		X			
SNR Immunity @ Frequency 300 ~ 3400 Hz	25 dB		X			
DT-AS Nom. Frequency	2130 ± 11 Hz 2750 ± 14 Hz		X			
DT-AS Detection Level	-10 ~ -35 dBV / tone					
DT-AS Detection Duration	80 ± 5 ms					
DT-AS Twist	± 6 dB		X			
DTMF Acknowledge TE-ACK)	DTMF-D		X			
Freq. Tolerance: 941 Hz	1.5%		X			
1163Hz	1.5%		X			
Tone Level: Low Grp@20mA	-8.5 ~ -13 dBV		X		I-CTR 37	
Tone Level: High Grp@20mA	-6.5 ~ -11.0 dBV		X		I-CTR 37	
Duration	65 ms ~ 90 ms		X			
Response Time	< 85 ms		X		Between end of DT-AS and start of TE-ACK	
Mark Signal Detection Length	80 bits ± 25 bits		X			

OPERATION MANUAL

1. Making External Calls

Charge the battery:

- Before you can use your new phone, you need to charge the battery.
- Put the supplied rechargeable batteries into the handset battery compartment and make sure it is in the right polarity.
- Place the handset on the charge cradle of the base unit.
- The charge indicator 🔋 on the base unit will light.
- The charge strength icon 🔋 on the handset display will scroll.
- Charge the battery overnight for the first time.

To make a call:

- Press 📞 and wait for dialing tone.
- The base in-use indicator 📟 will be turned on.
- Dial the number you require.

To end a call:

- Press 📞.

Pre-dialing:

  To make a call:

  - Dial the number you require.
  - To delete an incorrectly entered digit by pressing 🔘.
  - Press 📞.
  - The phone will connect the line and dial the number you required.

  To end a call:

  - Press 📞.

To insert Pause for PBX system:

When you press and hold the digit, a Pause of 3 seconds will be added after the digit. A "**P"** will be shown on the display.

2. Making Internal Calls

There should be more than one handset registered to a single base in order to make internal calls.

To make a call:

- Press 🔘.
- Press the registered handset number you wish to dial.

To end a call:

- Press .

Or Pre-Dialing:

    To make a call:

- Enter the number of the handset you wish to call.
- Press .
- The call will be connected.

    To end the call:

- Press .

NOTE: During an internal call, if an external call comes through, you will hear short beeps.

3. Receiving Calls

When receiving an external call, all handsets including the base unit will ring. The **EXT** icon on the handset display and the indicator on the base will flash. When receiving an internal call, the **INT** icon of the called handset will flash.

When the handset is on the base unit:

- Lift the handset and the line will be connected automatically (when AUTO ANS is on).
- User has the option to turn off AUTO ANS feature where he/she has to press to connect the call.

When the handset is not on the base unit:

- Press to connect the call.

1.1.1   Ringing Volume:

During the ringing, user can press to increase or decrease the loudness of the ring.

4. Handsfree Mode

- Press for handsfree operation during a call.
- Press again will return to non-handsfree Mode.
- You call use either or to make or answer an external or internal call.
- To end the call, press .

5. Microphone Mute

During a call, you can mute the microphone by pressing ⬡ and the ▦ icon will turn on. To un-mute, press ⬡ again.

6. Phonebook Dialing

To make a call:

- Press ⬡ , the ▆ icon will be on.

- Scroll through the phonebook by using ⬡ until you find the number you wish to dial.
- This phonebook provides a search by letter function where the phonebook will jump to the names starting with the letter keyed in. For example, when it is in the phonebook mode, user can reach RON's phone number by pressing ▭ three times.

- Press ⬡ .
- The phone will connect the line and dial the number you required.

To end the call:

- Press ⬡ .

7. Storing Numbers

- Press ⬡ to enter the menu mode and then scroll through the menu by using ⬡ until the handset reads PHONEBK.

- Press ⬡ .
- The handset reads STORE.

- Press ⬡ .
- The display will read NAME?
- Use the alphanumeric keypad to enter the name of the person (maximum 8 characters) whose telephone number you wish to enter.

- Press ⬡ .
- The display will read NUMBER?
- Enter the telephone number (maximum 18 digits), the ◀ icon will show when the number is more than 11 digits.

- Press ⬡ to complete the storing of the number.

To exit STORE mode:

- Press ⬡ .

8. Editing Numbers

* Press _____ to enter the menu mode and then scroll through the menu by using _____ until the handset reads PHONEBK.

* Press _____ .

* Press _____ until the handset reads EDIT.

* Press _____ .
* The display will show the first name from the phonebook.

* Press _____ to select the entry you wish to edit.

* Press _____ .
* The display will show the name of the entry with a cursor next to it.

* Press _____ to delete any characters you wish to alter.
* Use the alphanumeric keypad to make the changes.

* Press _____ . The number will be displayed.

* Press _____ to delete any digits you wish to alter and re-enter the number.

* Press _____ .
* The handset will return to EDIT menu.

* To exit EDIT mode, press _____ .

9. Deleting Numbers

Deleting a single telephone number:

* Under PHONEBK menu, press _____ until the handset reads DELETE.

* Press _____ .
* The display will show the first entry of the phonebook.

* Press _____ to search the entry to be deleted.

* When entry is found, press _____ .
* The number of the entry will be displayed.

* Press _____ .
* The handset will read CONFIRM.

* Press _____ .
* The handset will read DELETE.

* Press _____ to delete another entry.

* To exit DELETE mode, press _____ .

10. VIP Ringing (Melody)

The phone will give you a distinctive ringing tone if the call comes from one of your favorite callers.

- Under PHONEBK menu, press ⌄ until the handset reads MELODY. Press ⊞.
- Select the name to attach a melody to and press ⊞.
- Use ⌄ to select the desired melody from 10 different melodies and press ⊞.
- To exit MELODY mode, press C/⊙.

11. Handset Ringing Volume

- Press MENU/⌃ to enter the menu mode and then scroll through the menu by using ⌄ until the handset reads HANDSET.
- Press ⊞ to read VOLUME.
- Press ⌄ to select the desired volume level, 5 levels plus VOL OFF.
- Press ⊞ to confirm the setting.
- To exit VOLUME mode, press C/⊙.

When Ringing Volume is set to OFF, the 🔕 icon on the display will be on.

12. Changing the Ringing Tone

The Handset has 10 ringing tones to choose from. User can select a different ringing tone to differentiate internal and external calls.

Changing the Handset External Ringing Tone:

- Under HANDSET menu, press ⌄ until it reads EXT RING.
- Press ⊞ and then press ⌄ to select the desired tone MELODY 1 to MELODY 10.
- Press ⊞ to confirm the setting.
- To exit EXT RING mode, press C/⊙.

Changing the Handset Internal Ringing Tone:

- Under HANDSET menu, press ⌄ until it reads INT RING.
- Press ⊞ and then press ⌄ to select the desired tone MELODY 1 to MELODY 10.
- Press ⊞ to confirm the setting.
- To exit INT RING mode, press C/⊙.
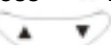
13. Warning Tones

The handset can provide the following warning tones:

Key: Sound a tone each time a key is pressed.
Low Battery: When all the bars inside the battery icon 🔋 go off, it will sound a tone to remind the user that the battery needs recharging.
Confirmation: Sound a tone when a setting or choice is confirmed.
Range: Sound a tone when the handset is out of range with the base, when the antenna icon 📡 blinks; it signals that the handset has already lost the link with the base unit.

All warning tones' default settings are ON.

To modify the warning tones:

- Under HANDSET menu, press   until it reads TONES.

- Press   and then press   to select from KEY, LOW BATT, RANGE or CONFIRM, then press   .

- Press   to select ON or OFF.

- Press   to confirm the setting.

- To exit TONE mode, press   .

14. Timer

The length of the call can be timed and displayed on the handset after the call started for 10 seconds.

Pressing and hold the   key for 2 seconds will display the call number again for 5 seconds.

To activate the Timer function:

- Under HANDSET menu, press   until it reads TIMER.

- Press   .

- Press   to select ON or OFF.

- Press   to confirm the setting.

- To exit TIMER mode, press   .

15. Changing Handset Label

To name the handset:

- Under HANDSET menu, press   until it reads LABEL.

- Press   .

- Use the alphanumeric keypad to enter the handset name (maximum 8 characters).

- Press to confirm the setting.

- To exit LABEL mode, press .

16. Auto Answer

- Under HANDSET menu, press until it reads AUTO ANS.

- Press .

- Press to select ON or OFF.

- Press to confirm the setting.

- To exit AUTO ANS mode, press .

17. Base Menu

The base has two modes, Unprotected and PIN Protected.

Unprotected: Setting base ringing volume
                  Setting base melody

PIN Protected: Setting Call Barring
                  Changing the PIN code
                  Deleting handset
                  Factory default
                  LCR On / Off

18. Base Ringing Volume

- Press to enter the menu mode and then scroll through the menu by using until the handset reads BASE.

- Press and it reads UNPROTEC.

- Press again and it reads VOLUME (first option within UNPROTEC mode).

- Press once more and it display the last value set.

- Press to select the desired volume level, 5 levels plus VOL OFF.

- Press to confirm the setting.

- To exit VOLUME mode, press .

19. Base Melody

- Under BASE and UNPROTEC menu, press [▲ ▼] until the handset reads MELODIES.
- Press [OK] and then press [▲ ▼] to select the desired tone MELODY 1 to MELODY 10.
- Press [OK] to confirm the setting.
- To exit MELODIES mode, press [C/⊘].

20. Call Barring

The following call barring options can be selected:

OFF: All calls allowed
INTERNAL: All external calls are barred
LOCAL: International and National calls are barred except local calls, user can define prefix for local
                  numbers.
NATIONAL: International calls are barred (starting with 00).
CUSTOM: Pre-defined number is barred.

To select:

- Under BASE menu, press [▲ ▼] to select PIN PROT mode.
- Press [OK] and it reads PIN.
- Enter the 4-digit PIN number (default is 0000).
- Press [OK] to read CALL BAR (first option within PIN Protected mode).
- Press [OK] to select barring handset.
- Press [▲ ▼] to select the desired handset to bar.
- Press [OK] to confirm.
- Press [▲ ▼] to select OFF, INTERNAL, LOCAL, NATIONAL or CUSTOM.
- For OFF, INTERNAL, LOCAL and NATIONAL, press [OK] to confirm setting.
- For LOCAL, press [OK] to read PREFIX. Enter the prefix used for local numbers. Press [OK] to confirm setting.
- For CUSTOM, press [OK] to read BAR. Enter the desired phone number (maximum 5 digits) to be barred. Press [OK] to confirm setting. **WARNING: USE WITH SPECIAL CARE SINCE YOU CAN BAR THE EMERGENCY NUMBER.**
- To exit CALL BAR mode, press [C/⊘].

21. PIN Code

To change the PIN code:

- Under BASE & PIN PROT mode, after entering the PIN code and enters the PIN PROT mode,

  press ⌣ until it read PIN CODE.

- Press ⌣ to read NEW PIN.
- Enter new PIN to replace the old PIN (maximum 4 digits)

- Press ⌣ to read REPEAT.

- Re-enter the same new PIN as before and press ⌣ to confirm.

- To exit PIN CODE mode, press ⌣.

Note: Service personnel can use the pre-defined Super-PIN code to enter into PIN protected mode in case of the PIN code is lost or forgotten.

22. Delete Handset

- Under BASE & PIN PROT mode, after entering the PIN code and enters the PIN PROT mode,

  press ⌣ until it read DEL HS.

- Press ⌣ to read HANDSET 1.

- Press ⌣ to select another handset within 1 to 5.

- Press ⌣ to read CONFIRM.

- Press ⌣ once more to confirm.

- To exit DEL HS mode, press ⌣.

23. Factory Default

- Under BASE & PIN PROT mode, after entering the PIN code and enters the PIN PROT mode,

  press ⌣ until it read DEFAULT.

- Press ⌣ to read CONFIRM.

- Press ⌣ once more to confirm.

The handset will be restored to factory default setting. Display will return to standby mode. (Please refer to the appendix for factory setting detail)

24. Recall

This key ⌣ is often used for a number of services available from the telephone network, and for use when connected to certain telephone switches. Details on when to use this button will be explained by the network service provider. Many people will use this as flash key.
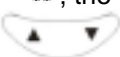
25. Redialing

The phone stores the last 10 external numbers dialed. You can select any number to redial within the redial buffer in Pre-dialing mode. However, in dialing mode, you can only select the last number for redial.

To redial the last number:

- Press ⟨☎⟩ and wait for dialing tone.
- Press ⟨▸▸⟩, the last number dialed will be displayed and dialed out automatically.
- To end the call, press ⟨☎⟩.

To redial in Pre-dialing mode:

- Press ⟨▸▸⟩, the last number dialed will be displayed.
- Press ⟨▲ ▼⟩ to scroll through the remaining dialed numbers.
- Press ⟨☎⟩, the phone will connect the line and dial out the number.
- To end the call, press ⟨☎⟩.

26. Caller ID

If you subscribe to the Caller ID service (please consult your telephone service provider for details about the service), your phone automatically stores the last 30 incoming calls. When the phone rings, the display will show either:

- The name, if any, as transmitted by the network, (only the first 8 characters will be displayed).
- Or the number only (last 12 digits).
- Or the name as stored in the phonebook if the identified number is stored in phonebook.
- If the CID is an unavailable call, it will display NOT AVAI.
- If the CID is a private call, it will display PRIVATE.
- If the CID does not contain number information, it will display 12 dashes in the number field.

When you have new calls, the handset display shows a blinking 📞 icon and the base IN USE indicator 🔲 will blink as well.

27. Call Waiting Caller ID

If you subscribe to the Call Waiting Caller ID service (please consult your telephone service provider for details about the service), your phone will display and store the Caller ID information even while you are on the phone.

When you hear the Call Waiting signal, you can see the Caller ID information displayed for around 5 seconds.

28. Reviewing the Call Log

To review the Call log:

- Press ____ while on-hook (standby mode).
- The last call will be displayed.

- Use ____ to scroll through the log.

- You can choose to display the next available information for any record by pressing ____ . The sequence is Name, Number, Date & Time.

- If you press ____ again after the Date & Time display, you will be prompted to delete this entry. Press ____ again to delete. To keep this entry, press ____ to go back to the standby mode.

- At other times, press ____ also returns the phone to standby mode.

- To call back the number, press ____ while reviewing that record.

29. Delete all CID Records

- Press ____ to enter the menu mode and then scroll through the menu by using ____ until the handset reads HANDSET

- Press ____ and then ____ until it reads DEL CID.

- Press ____ .
- The handset reads CONFIRM.

- Press ____ to confirm deletion.

- To exit DEL CID mode, press ____ .

30. Page

In the event of misplacing the handset, press the page button ____ on the base unit will page all handsets. The handsets will ring for 10 rings or until the user press any key, which will stop the ring.

31. Low Power Mode

You can put the handset in idle (low power mode) to conserve the battery power. The display and ringer will be off. Any incoming calls will ring at the base and other non-idle handsets.

To activate Low Power Mode, press and hold ____ for longer than 2 seconds. To de-activate, press ____ .

32. Transferring Calls

You can transfer phone calls to other handsets registered to the same base unit by pressing ⬭ followed by the handset number that you wish the call to be transferred to. The caller from the external call will be put on hold. Once the other handset picks up the call, you can press ⬭ at any time to transfer the call. If the second handset doesn't answer, press ⬭ to end the call to the second handset and return to the phone call.

33. Conference Call

While on an external call, you can invite another handset to join the conversation and have a 3-way conference call. Press ⬭ followed by the handset number that you wish to invite to join the conference call. The caller from the external call will be put on hold. Once the other handset answers the call, press ⬭ to activate the conference call. Either handset can press ⬭ to leave the conference and the other handset can continue with the external call.

34. Base Selection

Base selection defines how handset links to the base. There are three choices as follows:

AUTO: Choose the best base.
FIXED: Choose a particular base only.
PREFER: Starts with a particular base then the other.

To select the options:

- Press ⬭ to enter the menu mode and then scroll through the menu by using ⬭ until the handset reads B SELECT.

- Press ⬭ and the display will show the previously selected option FIXED, AUTO or PREFER.

- Press ⬭ to select the option you want.

- Press ⬭ and the display will show BS 1 2 3 4. The base number that has been registered with the handset will blink.

- Key in the desired base number to register. For example, if option FIXED and base number 2 is chosen, the display will show FIXED 2.

35. Room Monitoring

When more than one handset are registered, one of the handsets can be used as a (baby) Monitor device.

To activate Monitor function:

- Press ⬭ to enter the menu mode and then scroll through the menu using ⬭ until the handset reads MONITOR.

- Press ⬭ .

- Press ⌃ ⌄ to select ON.

- Press ▦.

The handset will display MONITOR (blinking) to indicate the handset is in monitor mode. Another handset can call this handset over the internal call, which will activate the microphone on this handset (being in monitor mode) so that the voice can be listened.

NOTE: The handset under monitor mode will not ring when an external call comes in.

To stop the Monitor function:

- Press ⌃ will take you to the MONITOR menu directly.

- Press ▦ and the display read ON.

- Press ⌃ ⌄ to select OFF.

- Press ▦ and the handset will exit to standby mode.

36. Handset Lock/Unlock

To prevent accidental touching the keypad, you can lock the keypad.

To lock:

- Press ⌃ to enter the menu mode and then scroll through the menu by using ⌃ ⌄ until the handset reads KEY LOCK.

- Press ▦ .

- Press ⌃ ⌄ to select ON.

- Press ▦ .
- The handset will return to standby mode and the ▦ icon will be shown.

To unlock:

- Press ⌃ and the handset will go to KEY LOCK menu directly.

- Press ▦ .

- Press ⌃ ⌄ to select OFF.

- Press ▦ .
- The handset will return to standby mode and the ▦ icon will go off.

Emergency Call during Key Locked:

You can still make an emergency call while the handset keypad is locked. Dial the emergency number and then press ⌒ will connect the line and dial the emergency number.

37. Registration – Using Additional Handsets

Each additional GAP compatible handset must go through the registration process with the base. It is up to 5 handsets to each base and each handset can be registered up to 4 base units.

To register:

- Press to enter the menu mode and then scroll through the menu by using until the handset reads REGISTER.

- Press , the handset will read BS 1 2 3 4.
- Enter the number of the base unit you wish to register.
- The handset will read PIN.
- Enter the PIN number (default is 0000).
- The handset will read SEARCH while it searches for the base unit.
- Press and hold the PAGE button ☏ on the base unit until you hear 2 beeps.
- Once a connection has been made, the handset name and number (the next available number if the number of handsets already registered with the base is less than 5) will be shown on the display.

Modify Handset Names:

Each handset comes with a default handset name. You can modify the handset name to whatever you like with a maximum of 8 characters.

- Press to enter the menu mode and then scroll through the menu by using until the handset reads HANDSET.

- Press , the handset will enter the HANDSET sub-menu.

- Press until the handset reads LABEL.

- Press and then enters the handset name (8 characters maximum).

- Press again to confirm the entry.

38. Language Selection

Each handset comes with 2 different languages. You can select the language you want by:

- Press to enter the menu mode and then scroll through the menu by using until the handset reads LANGUAGE.

- Press , the handset will enter the LANGUAGE sub-menu.

- Press to select the language you want.

- Press to confirm the selection.

- To exit LANGUAGE mode, press .

39. Answering Machine

The answering machine is operable from the handset in the answering machine mode (AM) by pressing during standby.

The answering machine operates in two different modes:

Answer-Record   Plays an OGM (OGM1) and records a incoming message (ICM with maximum duration of around 2 minutes). The machine can hold 20 ICM with a total recording time of 9 minutes.

Answer-Only   Plays an OGM (OGM2) and hangs up. This mode will be automatically activated if the memory is full.

If no OGM is recorded, the answering machine will not be activated. The AM indicator on the base will flash if there are new messages and the handset 📭 icon will go on. The new message indication will go off if the messages have been heard.

To exit answering machine mode, press again.

40. Record and Play OGM1 (Answer-Record Mode)

To Record OGM1 (maximum duration 30 seconds):

- In AM mode, press and then .
- Wait for a beep, which indicates the beginning of the recording.
- The display will show REC_OGM1.
- Press to stop the recording.
- The recorded OGM1 will be played back after the recording.
- If you didn't stopped the recording within 30 seconds, the recording will be stopped automatically after 30 seconds and under this condition, the OGM will not be played back automatically.

To Play OGM1:

- In AM mode, press and then .

- You can stop the playback by pressing at any time.

41. Record and Play OGM2 (Answer-Only Mode)

To Record OGM1 (maximum duration 60 seconds):

- In AM mode, press and then .
- Wait for a beep, which indicates the beginning of the recording.
- The display will show REC_OGM2.

- Press [5 jkl ■] to stop the recording.
- The recorded OGM2 will be played back after the recording.
- If you didn't stopped the recording within 60 seconds, the recording will be stopped automatically after 60 seconds and under this condition, the OGM will not be played back automatically.

To Play OGM2:

- In AM mode, press [mm 8] and then [2 abc ►] .

- You can stop the playback by pressing [5 jkl ■] at any time.

42. Answering Machine On / Off

To turn on or off the Answering Machine:

- In AM mode, press [8 tuv ●] will toggle the answering machine on and off.
- The display will show TAD_ON for on and TAD_OFF for off.

Note: Answering machine cannot be activated if no OGM is recorded.

43. Answering Machine Mode Setting

To set Answer-Record Mode:

- In AM mode, press [7 pqrs] and then [1 ◄◄] to set answer-record mode.
- The handset displays AR_MODE1.

To set Answer-Only Mode:

- In AM mode, press [7 pqrs] and then [2 abc ►] to set answer-only mode.
- The handset displays AO_MODE2.

44. Ring Delay

Ring delay is used to set the number of rings after which the AM will seize the line. It can be set to 2 rings to 7 rings or Economy mode (2 rings if new messages recorded, 4 rings if no new messages).

To set Ring Delay:

- Press [MENU ▲] to enter the menu mode and then scroll through the menu by using [▲ ▼] until the handset reads TAD MENU.

- Press [OK ↔] to enter the TAD MENU sub-menu.

- Press [▲ ▼] until it reads RG DELAY.

- Press [icon] to enter the RG DELAY sub-menu.

- Press [icon] to select among ECONOMY, RING2 to RING7.

- Press [icon] to confirm the selection.

- To exit to TAD MENU, press [icon].

45. Record and Playback a Memo

You can record a memo message to the answering machine for later review.

To record a Memo (maximum duration 2 minutes):

- In AM mode, press [icon] and then [icon].
- Wait for a beep, which indicates the beginning of the recording.
- The display will show REC_MEMO.

- Press [icon] to stop the recording.
- If you didn't stop the recording within 2 minutes, the recording will be stopped automatically after 2 minutes or when the memory is full.
- The memo will be stored to the AM in the ICM memory. Hence recording a memo will reduce the amount of time available for taking ICM.

You can playback the memo directly by:

- In AM mode, press [icon] and then [icon].
- The display will show PLAYMEMO.

- Press [icon] to stop memo playing.

Note: Only one memo message can be stored in the machine. You have to delete the old memo before you can record a new memo.

46. Play Messages

In AM mode, you can use the following shortcuts to playback the messages recorded in the AM including memo:

[icon] :   Plays the previous message, stops when beginning of message is reached.

[icon] :   Play / Repeat the current message.

[icon] :   Plays the next message, stops when end of message is reached.

[icon] :   Stop playing

[icon] :   Delete the message currently played.

During playback, the display will show MESSAGE and the # count or PLAYMEMO when it reach the

memo message. You can use [icon] to adjust the playback volume.

47. Delete all Messages

You can delete all recorded messages (even new messages) at once by:

- In AM mode, press [icon] and then [icon] .
- The handset displays CONFIRM.

- Press [icon] to confirm and all messages will be deleted at once.

48. SOS Code and Filtering

There SOS Code is used to specify break through the filtering and ring the base for 8 seconds. You can set your phone to one of the following filtering options:

OFF: No filtering

SPK FILT: Speaker filtering is to allow all calls to be listened on the speaker of handset #1. The handset #1 speaker will be turned on when the OGM is played. When speaker filtering is activated, all other handsets cannot answer any call.

FUL FILT: Full filtering is used to direct all the calls to the AM without ringing. Caller can enter the SOS code (begins with *) to stop this function and have the base ring for 8 seconds.
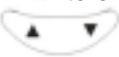
CID FILT1:   CID Filtering1 is used to filter all the calls (direct them to AM) except one number (from the phonebook) that is allowed to pass. Caller can enter the SOS code (begins with *) to stop this function and have the base ring for 8 seconds.

CID FILT2:   CID Filtering2 is used to allow all the calls to ring except one number (direct it to AM) from the phonebook that is not allowed to pass. Caller can enter the SOS code (begins with *) to stop this function and have the base ring for 8 seconds.

To Set SOS Code:

- Press [icon] to enter the menu mode and then scroll through the menu by using [icon] until the handset reads TAD MENU.

- Press [icon] to enter the TAD MENU sub-menu.

- Press [icon] until it reads SOS CODE.

- Press [icon] , the handset displays PIN.

- Enter the SOS PIN number (default is 111) and press [icon] .
- Display will show NEW PIN.

- Enter New PIN (e.g. 333) and press [icon] .
- Display will show REPEAT.

- Re-enter New PIN 333 again and press [icon] to confirm.
- Display will show SOS CODE.

- To exit to TAD MENU, press [icon] .

To Set Filtering Option:

- Press [icon] to enter the menu mode and then scroll through the menu using [icon] until the handset reads TAD MENU.

- Press [icon] to enter the TAD MENU sub-menu.

- Press [icon] until it reads FILTERIN.

- Press [icon] to enter the FILTERIN sub-menu.

- Press [icon] to select either OFF, SPK FILT, FUL FILT, CID FILT1 and CID FILT2.

- Press [icon] to confirm the selection.

Note: In all circumstances, the activation of monitor mode will override the activation of speaker filtering. It means that when speaker filtering is enabled after the monitor function, the monitor function will still be in effect. To activate the speaker filtering, the monitor function must be se to off first.

49. PIN Code and Remote Access the Answering Machine

This 3-digits PIN code is used to remote access the answering machine (AM) while you are away from home.

To change the PIN Code:

- Press [icon] to enter the menu mode and then scroll through the menu by using [icon] until the handset reads TAD MENU.

- Press [icon] to enter the TAD MENU sub-menu.

- Press [icon] until it reads PIN CODE.

- Press [icon], the handset displays PIN.

- Enter the PIN number (default is 000) and press [icon].
- Display will show NEW PIN.

- Enter New PIN (e.g. 222) and press [icon].
- Display will show REPEAT.

- Re-enter New PIN 222 again and press [icon] to confirm.
- Display will show PIN CODE.

- To exit to TAD MENU, press [icon].

Note: The remote PIN code and SOS code cannot be set as the same number because user can enter either code while OGM is played.

To Remote Access AM (when AM is On):

- Call the phone from outside using a touch-tone phone.
- During the OGM is being played, key in * then the 3-digit PIN Code.
- If the PIN Code is correct, it gives 2 beeps.   If not, user can try 2 more times.

- If the PIN code is still incorrect after three attempts, the line will be dropped.
- There is an 8-seconds timeout between key inputs before the line is dropped.
- After the 2 beeps, you can access the answering machine in the same way as the handset by entering the AM shortcuts.

To Remote Access AM (when AM is Off):

- Call the phone from outside using a touch-tone phone.
- Let it ring for 10 times, the AM will answer and give 2 beeps.
- Key in the 3-digit PIN Code.
- If the PIN Code is correct, the AM will be turned ON automatically and the recorded OGM will be played.
- The AM can take all the AM shortcuts. The first shortcut must be entered during the OGM play, otherwise the line will be cut off after OGM stops.
- If the PIN code is incorrect, the line will be dropped after three attempts.
- There is an 8-seconds timeout between key inputs before the line is dropped.

50. Prefix Dialing Option

If your phone comes with the Prefix Dialing (LCR) option, when the phone goes off-hook, the handset will display LCR for 2 seconds to remind you that the LCR option is enabled.

You can Enable / Disable the LCR Option by:

- Press to enter the menu mode and then scroll through the menu by using until the handset reads BASE.

- Press and then press to select PIN PROT sub-menu.

- Press and it reads PIN.
- Enter the 4-digit PIN number (default is 0000).

- Press to enter PIN PROT sub-menu.

- Press to select LCR.

- Press to enter LCR sub-menu.

- Press to select ON to enable or OFF to disable LCR.

- Press to confirm the selection.

- To exit LCR setting mode, press .

Answering Machine Shortcuts Summary:

The available shortcuts for ANS MAC mode and remote access are:

Feature	Shortcut for ANS MAC mode and remote access control
Play messages	2 ▶
Repeat current message	2 ▶
Jump to previous message	1 ◀◀
Jump to next message	3 ▶▶
Stop	5 ■
Delete the current message while the message is being played	0 Del
Delete all Messages	+ 0 Del
Record OGM1	+ 1 ◀◀
Record OGM2	+ 2 ▶
Play OGM1	OGM + 1 ◀◀
Play OGM2	OGM + 2 ▶
Record a memo	4 + 2 ▶
Play a memo	4 + 1 ◀◀
Answer Machine On / Off	8
Set Answer-record mode	7 + 1 ◀◀
Set Answer-only mode	7 + 2 ▶

1.1.2   Memory Full

If the memory is full, then the AM hangs up after the OGM2 was played.

Appendix: Base and Handset Default Setting

Default settings for Base and Handset is as follow:

Base default setting:	Volume: 5
	Melody: 1
	Call Barring: Off for all Handset
	Custom and Local Barring: No Prefix
	LCR: On
	PIN Code: 0000 (for base menu)
	AM: Off
	ICM: Reset
	OGM: No Change
	SOS Code: 111
	PIN Code 000 (for remote and TAD MENU)
	Filtering: Off
	TAD Message Volume: 3

Handset default setting:	Volume: 5
	Ext. Melody: 1
	Int. Melody: 5
	Monitor: Off
	Timer: On
	Tones: All On
	Auto Answer: On
	Base Selection: Auto
	Keypad Lock: Off
	Phonebook: No Change
	CID: Reset
	Redial: Reset
	Handset Volume: 3
	Handset Name: No Change

MAIN PARTS DESCRIPTIONS

● **MCU** ---- Philips
The MCU PCD509xy family is designed for low power GAP compatible DECT handset (pp) and base station (FP) applications. The circuit includes the audio interface, the DSP, the micro controller and the burst mode logic, and contains all functionality to convert speech and data signals from/to the analog side (microphone and earpiece or line interface circuit) to /from the radio side (1.152Mb/s data).

● **POWER AMPLIFIER** --- **UAA3590TW** --- Philips
The UAA3590TW is a silicon Monolithic Microwave Integrated Circuit (MMIC) power amplifier specifically designed to operate from a 2.4V to 3.2V supply voltage. The voltages applied on pins Vcc and Von control the power of the PA and permit it to be switched off.
For the 1.88 to 1.9 GHz transceivers for DECT and the 2GHz radios applications.

FEATURES:
1. Power Amplifier (PA) overall efficiency 45%
2. 27.5 dBm saturated output power at 3.2V
3. 3 dBm input power
4. 35dB linear gain
5. Wide operating temperature range from –30 to +85 °C
6. HTSSOP20 package

● **Fully Integrated DECT Transceiver – UAA3545HL –** Philips
The UAA3545HL BICMOS device is a low power, highly integrated circuit, for Digital Enhanced Cordless Telecommunication (DECT) applications.
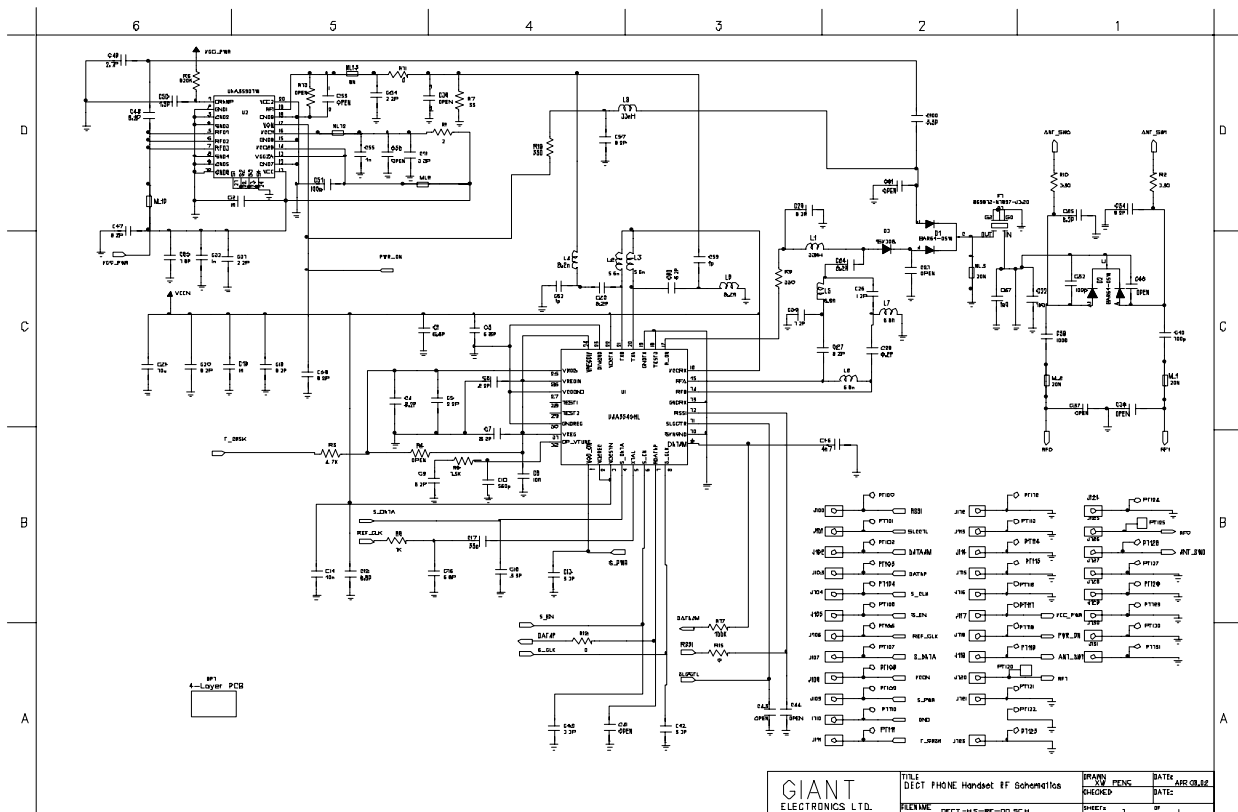For the 1880 to 1930 MHz cordless telephones applications.

FEATURES:
1. Economical solution for a radio in DECT cordless telephones
2. Integrated low phase noise VCO with no production tuning required
3. Fully integrated receiver with high sensitivity
4. Dedicated DECT PLL synthesizer
5. 3 dBm output preamplifier with an integrated switch
6. 3-line serial interface bus
7. Low current consumption from 3.2V supply
8. Compatible with Philips Semiconductors'baseband ship
9. Reduction of control signals

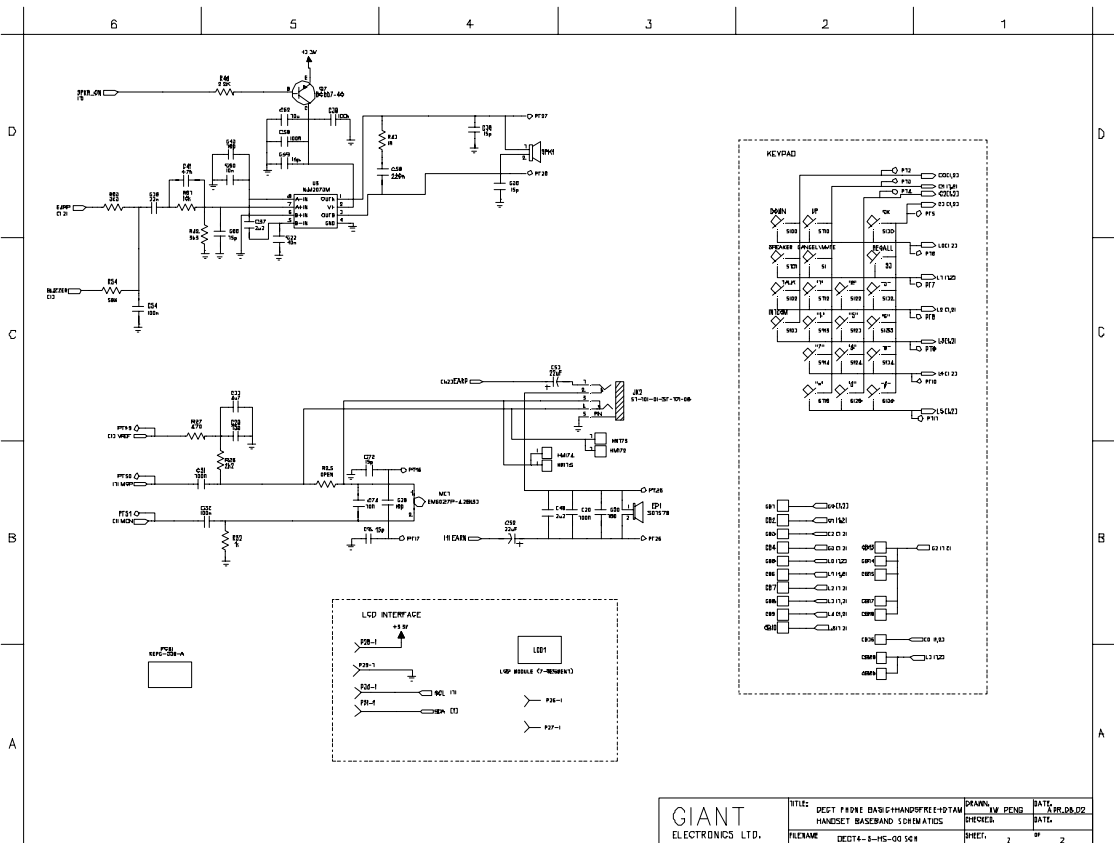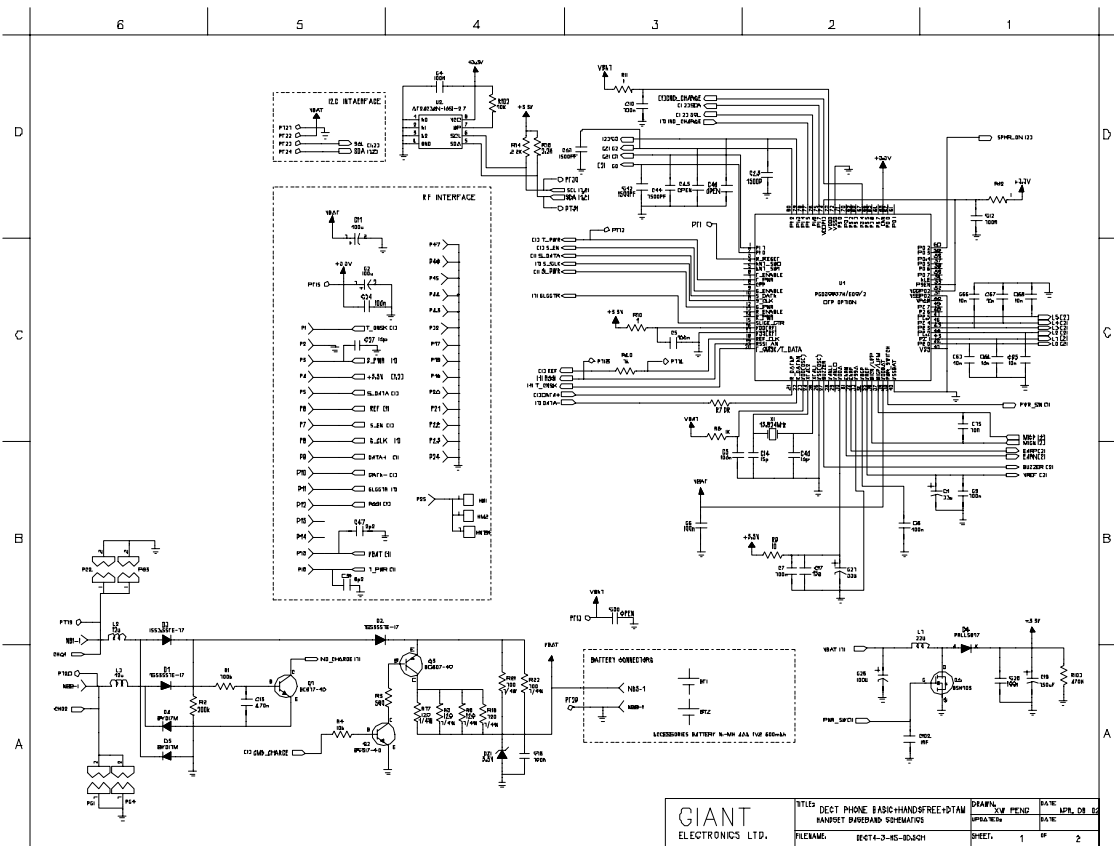● **2-Wire Serial EEPROM --- AT24C08/32** --- ATMEL
The AT24C08/32 provides 8192/32,768 bits of serial electrically erasable and pro-grammable read only memory (EEPROM) organized as 1024/4096 words of 8 bits each.

● **Dual Low Voltage Power Amplifier --- NJM2073M**
The NJM2073 is a monolithic integrated circuit in 8 lead dual-in-line package, which is designed for dual audio power amplifier in portable radio and handy cassette player.
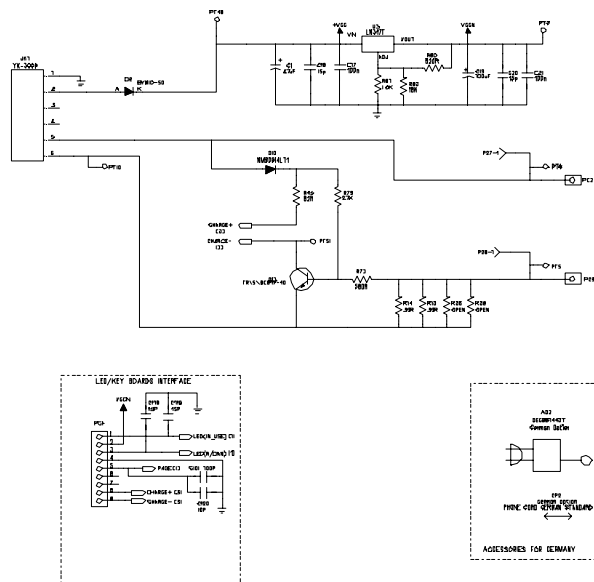
BASE RF CIRCUIT DIAGRAM

TITLE	DECT PHONE BASE RF CIRCUIT DIAGRAM	DRAWN	X.W. FENG	DATE: APR.09.02
		CHECKED		DATE:
FILENAME	DECT-BS-RF-DG.SCH	SHEET: 1	OF 1	

HANDSET RF CIRCUIT DIAGRAM

TITLE	DECT PHONE Handset RF Schematics	DRAWN	X.W. FENG	DATE: APR.09.02
		CHECKED		DATE:
FILENAME	DECT-HS-RF-DG.SCH	SHEET: 1	OF 1	

HANDSET PROCESSOR CIRCUIT DIAGRAM

BASE PROCESSOR CIRCUIT DIAGRAM

BASE LINE INTERFACE CIRCUIT DIAGRAM
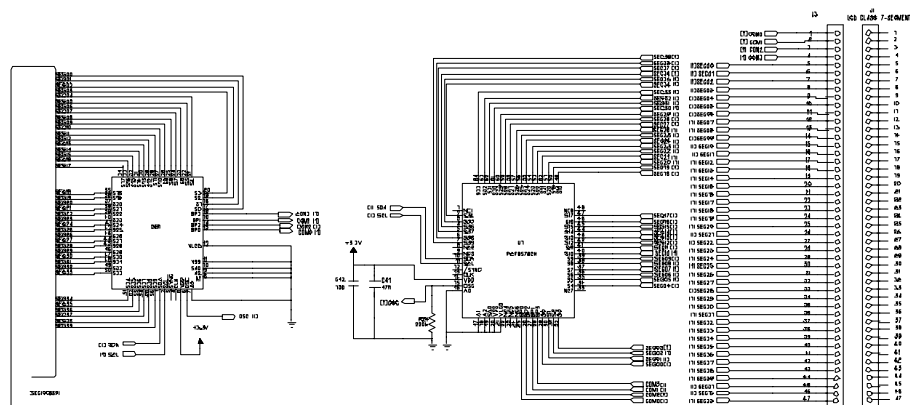
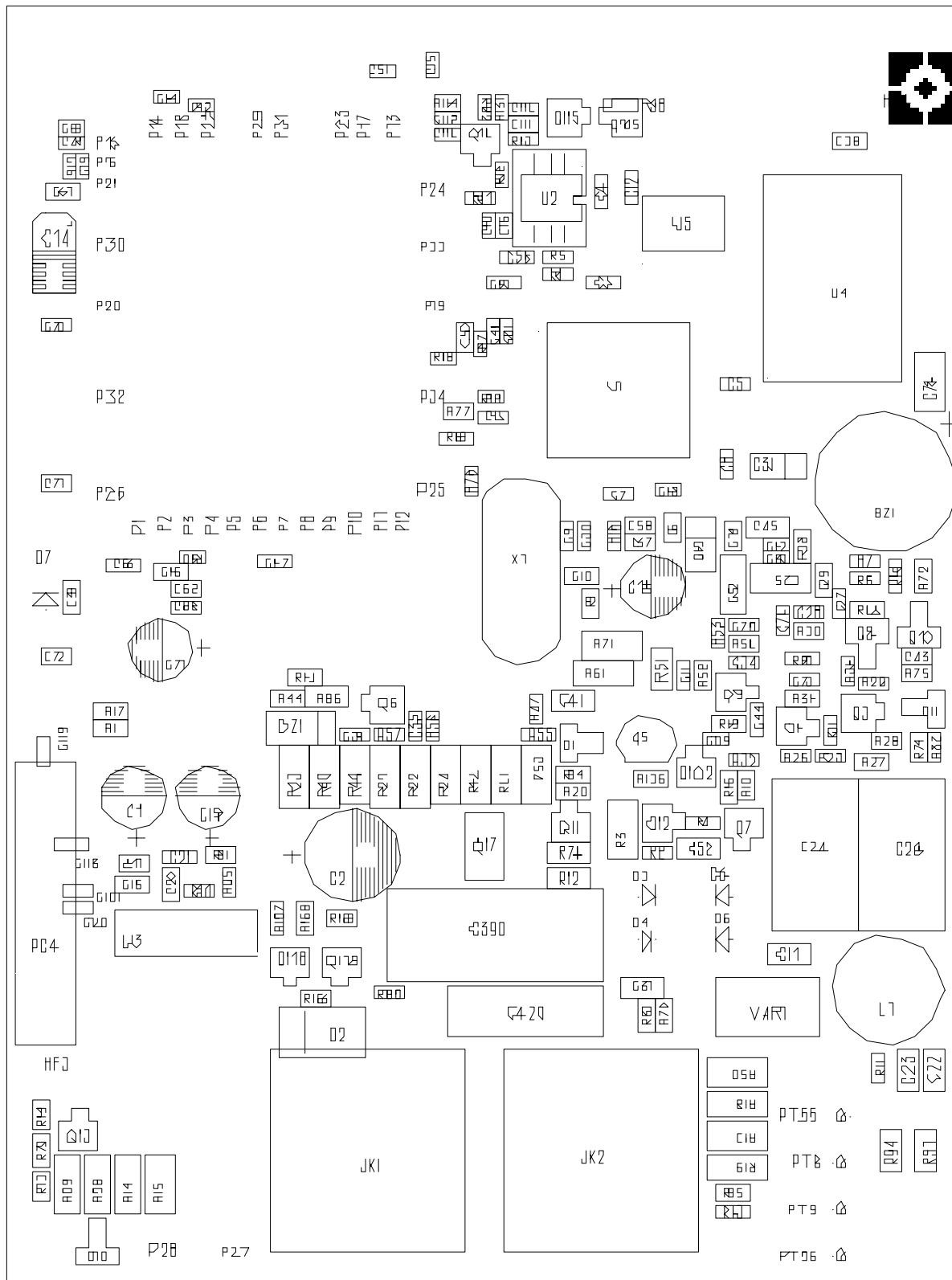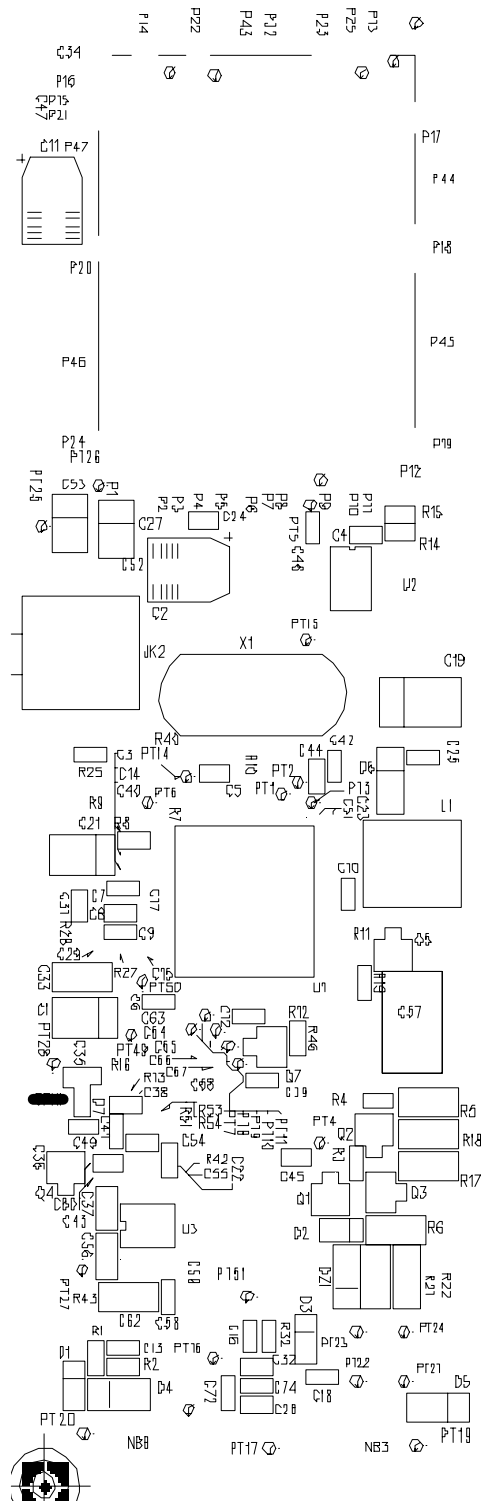# BASE POWER & LEDS CIRCUIT DIAGRAM

HANDSET LCD CIRCUIT DIAGRAM

BASE MAIN ASSEMBLY LAYOUT DRAWING

HANDSET MAIN ASSEMBLY LAYOUT DRAWING

BASE & HANDSET RF ASSEMBLY LAYOUT DRAWING