TITLE	**Product Specification**
MODEL	**VTH1930 (Wireless Headset Phone)**

VTH1930 Wireless Headset Phone w/IR Remote Dialcard, Corded Dialing Base, and Remote Charge Stand

Revision History:

Revision	Description	Page	Effective Date
1	Initial Release.	All	Aug 14/98

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CONTENTS

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1 Overview

The following product spec. defines the basic cosmetics, electrical specifications and operating functions & features of the VTH1930 wireless headset phone (WHS).

1.1 General Description

The VTH1930 is a wireless headset telephone that is based upon our PDL ADPCM core platform. The headset unit is accompanied with an Infrared dialcard, a dialing base unit with corded handset and a separate headset charging station.

This product is intended to address the market segment that is currently using products like our PDL w/wired headset, but desire to have a completely contained headset unit that can be worn for extended periods of time and does not require any type of wired beltpack.

1.2 Regulatory Standards

As a requirement for sale in the United States, the *product* will comply with the electrical specifications defined in the following documents:

- FCC Part 15 Radio Emmissions Requirements
- FCC Part 68 Telephone Line Interface Requirements
- UL 1459 Safety Requirements

As a requirement for sale in Canada, the *product* will comply with the electrical specifications defined in the following documents:

- IC RSS-210 Radio Emmissions Requirements
- IC CS-03 Telephone Line Interface Requirements
- CSA 225 Safety Requirements

In addition to the above mandatory regulations, the recommendations provided in EIA-470-A, TIA 571, TIA631and IEC801-2 will be used as a design guideline.

1.3 Feature List

The following feature lists provide a brief overview of the features that are and are not provided in this unit.

1.3.1 Basic Features

- 10 channel, 900MHz operation w/32kbps ADPCM voice coding
- Automatic search for available channel (when handset on cradle)
- 16 bit digital security code
- Pulse, DTMF, and temporary DTMF dialling modes
- 20 number speed dial memory; each number can be up to 16 digits
- Redial memory (16 digits)
- 3-AAA NiMH AAA battery pack.
- Battery charge interval: 6 days in STANDBY mode, 7 hours in PHONE mode
- Line-drop circuit included
- Extension in use & no line indication provided
- Non-volatile storage of speed dial numbers

- Non-volatile storage of security code at base unit protects against power failure
- In-the-dark answering of incoming calls

1.3.2 Unique Features

- Headset Binaural Sound using two receivers (non HAC)
- Headset will be re-chargeable via placement on remote charger.
- Retractable antenna will be incorporated into headset design.
- *Volume up/down* keys available on headset module.
- *Flash* key will be available on headset module to switch between lines during a call waiting condition.
- A CR2025 battery with an estimated lifetime of 1.5 yrs will be provided with remote dialcard and will be easily replaced via a sliding battery door.
- The effective distance of the dialcard will be over 15 ft. in normal lighting conditions. Under direct sunlight, the range will be limited to 4 ft (enough to allow hand held dialing).
- A plastic loop at the top of the dialcard chassis will allow for the attachment of an accessory strap to allow the user to hang the unit around the neck, dangle off the wrist, or dangle of a belt clip.
- 64 different combinations of dialcard security code will be randomized in the factory to prevent interference between different remote dialcards.
- Corded handset on base will have HI/MID/LOW volume control via slide switch on handset.
- Base dialing keypad is provided.
- PPU will be provided for in SW as a future option.
- The base will be equipped with VMWI as an available option. The base will be equipped with a speaker to indicate ringing, paging & other base status.
- The unit will include a ringer HI/LO/OFF on the side of the unit for volume adjustment as well as programming of individual ringer types (base only).
- A tone pulse switch will be accessible on the bottom of the unit.
- POTS mode will be available on the base via the spare battery.
- A trickle charging bay will be provided on the base unit (20-30 hours charge time).
- Remote charger will fully charge headset battery within 2 hours.
- Remote charger LED will glow red during fast charging, and will go green after the charge is complete. There will be no Power LED indication for the remote charger unit.
- Headset will automatically turn OFF when placed in remote charging unit, regardless of the mic boom position.
- Remote charger will have its own 300mAH power adapter which is interchangeable with the base unit power adapter so the end user will not be confused.
- Headset will ring when in the remote charge and will auto-answer when lifted out of the base cradle only if the mic boom is already in the ON position.

1.3.3 Features Not Provided

- Will not have stutter dial detection.
- Will not have MUTE function on headset (accomplished by HOLD condition only).
- Will not have CID display in the base unit (provided in future models).
- Will not have quick charge capability in the base spare batt charger.

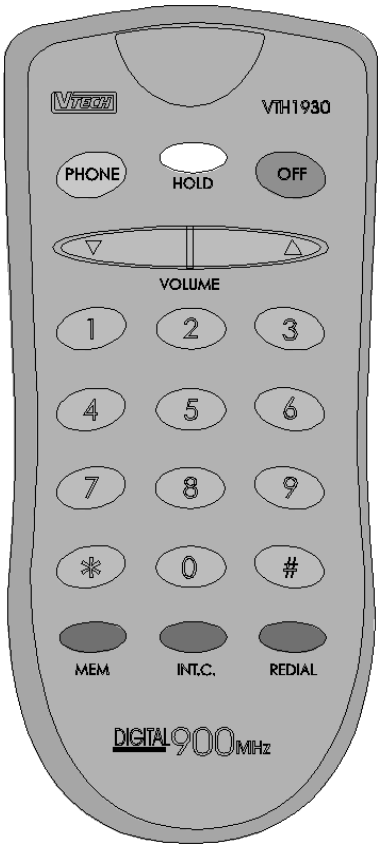
1.4 Cosmetic Styling

The following cosmetics renderings depict the proposed styling of the product components:

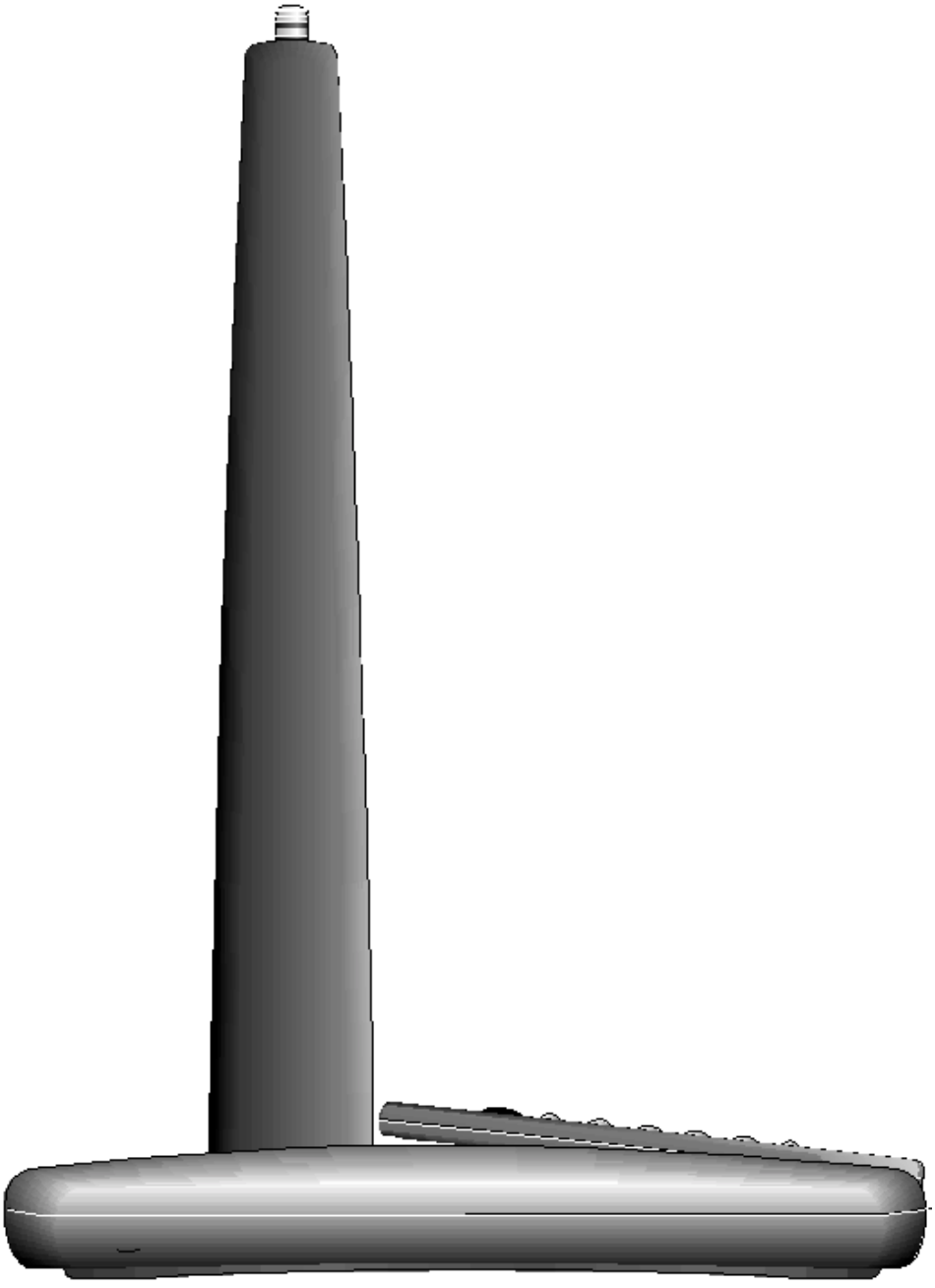
1.4.1 The Base Unit Cosmetics

1.4.2 Headset Unit Cosmetics

1.4.3 Remote Dialcard Cosmetics



1.4.4 Remote Charger Cosmetics



2 Functional Key and LED Indicator Descriptions

This section will provide a short description of the key and switch functions as well as any LED indicators which may appear on the headset or base units.

2.1 Headset LED Indicators & Key Descriptions

2.1.1 Dual Color LED

Dual color green/red LED on headset to indicate *ON* (solid green), *Incoming Ringing* (flashing green in cadence w/ringing), *Extension or Base in use* (flashing green), *Low Batt* (flashing red), and *Out of Range* (alternating red/green).

2.1.2 Volume Up/Down keys

These keys are used to adjust the headset volume up or down; there will be 8 discrete volume steps with a step size of 3dB each. Press and hold this key changes the handset receiver volume at a rate of one level per half second. There will be DTMF feedback present in the headset earpiece to acknowledge the keypress. Either key will act to temporarily mute the headset ringer during incoming ringing.

2.1.3 FLASH Key

This key will act to Flash the telephone line during an off-hook state. Otherwise, activating this key will act to auto-answer a call during incoming ringing.

2.1.4 Mic Boom

The Mic boom is a two position switch; in the up position it acts to turn off the headset unit and disables any input from the headset keys or the remote dialcard. In the down position it activates the headset, acts to answer incoming ringing, and allows the headset functions (including off) to be controlled via the remote dialcard.

2.2 Remote Dialcard LED Indicators & Key Descriptions

There are no LED indicators on the IR remote dialcard; this is done to eliminate excessive current consumption and extend battery life.

2.2.1 PHONE KEY

Press this key to access a LINE. If the headset has already accessed a line, pressing the PHONE key will flash the line. Pressing the PHONE key will cause the unit to immediately access a line from any state or mode the phone is in including hold.

2.2.2 HOLD KEY

This key has two functions. Pressing this key when the handset is off hook will place the call on HOLD. Pressing HOLD a second time will cancel hold. Pressing OFF will not cancel hold or end the call

2.2.3 OFF KEY

Press this key to exit all modes. The OFF key will cause the unit to exit only the mode that the phone is in at the time.

2.2.4 MEM KEY

Press this key during the off-hook state to access speed dial numbers.

2.2.5 INTERCOM KEY

Pressing the **INT.COM** key will generate a headset keybeep and send a paging signal to the base causing it to emit a distinctive ring. When in idle mode, the base will ring for a maximum of five times. To end the INTERCOM conversation, the user must press the OFF key or return the mic boom to the UP position.

2.2.6 REDIAL KEY

Pressing REDIAL will immediately dial out the last number in the redial buffer. The redial buffer size is 20 digits. During redial, the level of DTMF feedback generated in the earpiece will be attenuated by approx.6 dB from the normal DTMF level generated during live dialing.

2.2.7 VOLUME ⮝ KEY

Each press of this key will increment the headset receiver volume. There are a total of 8 volume level settings. Pressing the volume up key during incoming ringing will activate temporary ringer muting. Pressing a volume key will not generate a keybeep.

2.2.8 VOLUME ⮟ KEY

This key operates the same as above except to decrement the headset receiver volume.

2.3.9 0 ->9 Numeric Keys

In DTMF mode, pressing these keys will result in the appropriate DTMF tone being sent out over the line. In PULSE mode, pressing these keys will result in the appropriate pulse pattern being sent out over the line; A beep is heard from the headset.

2.3 Base Unit & Corded Handset LED Indicators & Key Descriptions

2.3.1 POWER LED

This LED illuminates when the base power adapter is plugged in and power is applied to the base unit.

2.3.2 SPARE BATTERY CHARGE LED

The Spare battery charge LED illuminates steadily when the spare battery is placed into the base charging compartment.

2.3.3 HEADSET/EXTENSION IN USE LED

This LED flashes when the headset is off hook or when a parallel extension is picked up.

2.3.4 MESSAGE WAITING LED

This LED will flash whenever the base has received a VMWI signal from the C.O.. It will remain in this state until either the cancel VMWI signal is received from the C.O. or the base unit power is removed..

2.3.5 INTERCOM LED

This LED will illuminate whenever INTERCOM mode is active.

2.3.6 HOLD LED

This LED will illuminate whenever a call is placed on hold; it does not matter whether the hold condition was initiated from the headset or the base.

2.3.7 INTERCOM KEY

Pressing the **INT.COM** key will generate a base keybeep and send a paging signal to the headset causing it to emit a distinctive ring. When in idle mode, the headset will ring for a maximum of five times. To end the INTERCOM conversation, the user presses **INT.COM** on the base or **OFF** on the handset. If the handset is in PHONE mode when the base pages it, the handset will generate a long, soft non-intrusive ringing tone.

2.3.8 0 ->9 Numeric Keys

In DTMF mode, pressing these keys will result in the appropriate DTMF tone being sent out over the line. If the key is held then the tone is continuously sent.
In PULSE mode, pressing these keys will result in the appropriate pulse pattern being sent out over the line. A beep is heard from the base.

2.3.9 */TONE key

When the **TONE/PULSE** switch on the base is in the PULSE position, pushing this key will change the outgoing numbers from PULSE to DTMF for the duration of the call. In TONE mode, this sends out the DTMF tone for *.

2.3.10 # key

In DTMF mode, pressing this key sends out an appropriate DTMF tone for #. In PULSE mode, this key is inactive.

2.3.11 MEM KEY

This key is used for recalling phone numbers stored in speed dial memory.

To dial a number stored in speed dial memory:
1.) Press **SPEAKERPHONE** to get a dial tone.
2.) Press **MEM** and the number key (**00..20**).
The number stored is dialed out - e.g. 555-1234.

Location 00 is shared with the QUICKMEM key and can be accessed by pressing the QUICKMEM key or by entering speed dial location 00. MEM dialing numbers can only be programmed from the handset.

2.3.12 REDIAL KEY

This automatically dials the last number dialed out from the base unit. To use the **REDIAL**, the user first goes off and then presses **REDIAL**. Pressing **REDIAL** will generate a base keybeep.

2.3.13 QUICK MEM KEY

Pressing this key when in phone mode will dial out the contents of MEM location 00.

2.3.14 HOLD KEY

This puts the line on hold when in PHONE mode. Pressing **HOLD** will generate a base keybeep.

2.3.15 MEM/PROG KEY

Beginning from idle mode, press and hold this to enter PROGRAM mode. An acknowledgment keybeep will accompany this action.

2.3.16 Switchook

Lifting the corded base out of the cradle will activate phone mode on the base unit; depressing the switchook for the correct duration will flash the line

2.3.17 Corded Handset VOLUME LOW/MID/HIGH

The base corded handset volume can be adjusted by selecting the slide switch mounted to the side of the handset to the low, mid, or high position. There will be a 6 dB difference in the volume levels.

2.3.18 SPKR RINGER OFF/LOW/HIGH SWITCH

Sets the baseset ringer to the HIGH, LOW or OFF state.

2.3.19 Tone/pulse switch

This switch controls whether the unit will dial out using DTMF tones or using pulse dialing. The factory default position is DTMF dialing.

2.4 Remote Charger LED Indicators

2.4.1 CHARGE STATUS LED

When the headset is not sitting on the remote charger, the Charge status LED will be OFF. During “Quick Charging” the charge status LED will glow RED. Once the headset battery has attained full charge, the charge status LED will Glow GREEN to indicate that the headset is fully charged and ready to use.

3 Operating Modes

The following section will outline in detail the operation of the product in particular modes in accordance to various stimuli. Some sections will describe the operation of various elements in response to different operating modes.

3.1 Headset & Remote Dialcard Unit

The headset and the Remote dialcard operation will be grouped together since the remote dialcard is simply and Infrared extension of the headset.

3.1.1 Headset Phone Mode (OFF-HOOK)

The headset can enter PHONE mode (OFF-HOOK) in the following manner :

- Moving the mic boom switch to the extended or down position will always activate PHONE mode.
- With the mic boom in the down position, and the unit in an ON-HOOK state, pressing the PHONE key on the dialcard will always activate PHONE mode.
- When incoming ringing is present, pressing any key on the headset or dialcard with the exception of the volume up/down keys will activate PHONE mode.

The response to stimuli while in PHONE mode is outlined below:

Remote Dialcard Action	Response
OFF KEY	ON-HOOK
PHONE KEY	FLASH LINE
HOLD KEY	ON-HOLD
INTERCOM	NO ACTION (no Keybeep)
MEM	ACCEPT MEM LOCATION
REDIAL	DIAL OUT CONTENTS OF REDIAL BUFFER
VOLUME UP/DOWN	INCREMENT/DECREMENT VOLUME SETTING (no keybeep)
# KEYS	DIAL OUT CORRESPONDING DTMF OR PULSE DIGITS (except * key activates temporary tone in pulse mode)

Headset Action	Response
MIC BOOM TO UP POSITION	ON-HOOK
FLASH KEY	FLASH LINE
VOLUME UP/DOWN	INCREMENT/DECREMENT VOLUME SETTING (no keybeep)

Base Action	Response
CORDED HANDSET LIFTED	CORDED HANDSET OFF-HOOK
SWITCH HOOK FLASHED	NO ACTION
HOLD KEY	ON-HOLD
INTERCOM	NON-INTRUSIVE PAGING TO HEADSET
MEM	ACCEPT MEM LOCATION
REDIAL	DIAL OUT CONTENTS OF REDIAL BUFFER
QUICK MEM	DIAL OUT CONTENTS OF MEM LOCATION 00
PROGRAM	NO ACTION
# KEYS	DIAL OUT CORRESPONDING DTMF OR PULSE DIGITS (except * key activates temporary tone in pulse mode)

Other Stimuli	Response
PLACE HEADSET ON CHARGER	ON-HOOK

3.1.2 Headset IDLE Mode, Placed On remote Charger

The response to stimuli of the headset while in idle mode and resting on the remote charger is outlined below:

Remote Dialcard Action	Response
VOLUME UP/DOWN	TEMPORARY HEADSET RINGER MUTING DURING INCOMING RINGING
ALL KEYS	NO ACTION

Headset Action	Response
MIC BOOM TO UP/DOWN POSITION	NO ACTION
FLASH KEY	NO ACTION
VOLUME UP/DOWN	TEMPORARY HEADSET RINGER MUTING DURING INCOMING RINGING

Base Action	Response
INTERCOM	PAGING TO HEADSET
ALL OTHER KEYS	NO ACTION

Other Stimuli	Response
REMOVE HEADSET FROM CHARGER – MIC BOOM UP	NO ACTION
REMOVE HEADSET FROM CHARGER – MIC BOOM DOWN	NO ACTION EXCEPT DURING INCOMING RI NGING WILL AUTO ANSWER AND ENTER PHONE MODE
BASE PAGING HEADSET	INTERCOM MODE CANNOT BE ENTERED ON REMOTE CHARGER
INCOMING RINGING	PHONE MODE CANNOT BE ENTERED ON REMOTE CHARGER

3.1.3 Headset IDLE Mode, *Headset NOT Placed On remote Charger and with the Mic Boom Switch in the DOWN Position*

The response to stimuli of the headset while in idle mode, *NOT* resting on the remote charger and with the mic boom down is outlined below:

Remote Dialcard Action	Response
PHONE KEY	OFF-HOOK
OFF KEY	NO ACTION (No Keybeep)
HOLD KEY	NO ACTION (No Keybeep)
INTERCOM	PAGING TO BASE
MEM	NO ACTION (No Keybeep)
REDIAL	NO ACTION (No Keybeep)
VOLUME UP/DOWN	NO ACTION (No Keybeep) *EXCEPT* TEMPORARY HEADSET RINGER MUTING DURING INCOMING RINGING
# KEYS	NO ACTION (No Keybeep)

Headset Action	Response
MIC BOOM TO UP POSITION	NO ACTION (No Keybeep)
FLASH KEY	NO ACTION (No Keybeep)
VOLUME UP/DOWN	NO ACTION (No Keybeep) *EXCEPT* TEMPORARY HEADSET RINGER MUTING DURING INCOMING RINGING

Base Action	Response
INTERCOM	PAGING TO HEADSET
ALL OTHER KEYS	NO ACTION

Other Stimuli	Response
BASE PAGING HEADSET	ONLY INTERCOM KEY WILL INITIATE INTERCOM MODE
INCOMING RINGING	ALL HEADSET AND REMOTE DIALCARD KEYS WILL ANSWER CALL, EXCEPT FOR VOLUME UP/DOWN KEYS.

3.1.4 Headset IDLE Mode, *Headset NOT Placed On remote Charger and with the Mic Boom Switch in the UP Position*

The response to stimuli of the headset while in idle mode, *NOT* resting on the remote charger and with the mic boom up is outlined below:

Remote Dialcard Action	Response
ALL KEYS	NO ACTION (No Keybeep)

Headset Action	Response
MIC BOOM TO DOWN POSITION	OFF-HOOK
FLASH KEY	NO ACTION (No Keybeep)
VOLUME UP/DOWN	NO ACTION (No Keybeep) *EXCEPT* TEMPORARY HEADSET RINGER MUTING DURING INCOMING RINGING

Base Action	Response
INTERCOM	PAGING TO HEADSET
ALL OTHER KEYS	NO ACTION

Other Stimuli	Response
BASE PAGING HEADSET	MOVING MIC BOOM TO THE DOWN POSITION WILL INITIATE INTERCOM MODE
INCOMING RINGING	ONLY MOVING MIC BOOM TO DOWN POSITION WILL ANSWER CALL & INITIATE PHONE MODE

3.1.5 Headset in HOLD Mode, *OFF Charger, Mic Boom DOWN*

HOLD mode is initiated by pressing the HOLD key while the headset is in PHONE mode.

The response to stimuli of the headset while in HOLD mode is outlined below:

Remote Dialcard Action	Response
PHONE KEY	PHONE MODE
OFF KEY	NO ACTION (No Keybeep)
HOLD KEY	PHONE MODE
INTERCOM	PAGES BASE
MEM	NO ACTION (No Keybeep)
REDIAL	NO ACTION (No Keybeep)
VOLUME UP/DOWN	INCREMENT/DECREMENT VOLUME SETTING
# KEYS	NO ACTION (No Keybeep)

Headset Action	Response
MIC BOOM TO UP POSITION	NO ACTION (No Keybeep)
FLASH KEY	NO ACTION (No Keybeep)
VOLUME UP/DOWN	INCREMENT/DECREMENT VOLUME SETTING

Base Action	Response
INTERCOM	PAGING TO HEADSET
ALL OTHER KEYS	NO RELATED HEADSET ACTION

3.1.6 Headset in HOLD Mode*, OFF Charger, Mic Boom UP*

The response to stimuli of the headset while in HOLD mode is outlined below:

Remote Dialcard Action	Response
ANY KEY	NO ACTION

Headset Action	Response
MIC BOOM TO DOWN POSITION	HEADSET OFF-HOOK, CANCEL HOLD CONDITION
FLASH KEY	NO ACTION (No Keybeep)
VOLUME UP/DOWN	INCREMENT/DECREMENT VOLUME SETTING

Base Action	Response
INTERCOM	PAGING TO HEADSET
ALL OTHER KEYS	NO RELATED HEADSET ACTION

3.1.7 Headset in INTERCOM Mode (*Mic Boom must be Down & Base Corded must be Lifted)*

INTERCOM mode is entered by pressing the INTERCOM key on the headset to page the base; if the base answers the page, then INTERCOM mode is enabled. INTERCOM mode can be entered while in the IDLE or HOLD state.

The response to stimuli of the headset while in INTERCOM mode is outlined below:

Remote Dialcard Action	Response
PHONE KEY	PHONE MODE
OFF KEY	EXIT INTERCOM & RETURN TO PREVIOUS MODE
HOLD KEY	NO ACTION (No Keybeep)
INTERCOM	NO ACTION (No Keybeep)
MEM	NO ACTION (No Keybeep)
REDIAL	NO ACTION (No Keybeep)
VOLUME UP/DOWN	INCREMENT/DECREMENT VOLUME SETTING
# KEYS	NO ACTION (No Keybeep)

Headset Action	Response
MIC BOOM TO UP POSITION	EXIT INTERCOM & ENTER IDLE MODE
FLASH KEY	NO ACTION (No Keybeep)
VOLUME UP/DOWN	INCREMENT/DECREMENT VOLUME SETTING

Base Action	Response
INTERCOM	NO ACTION (No Keybeep)
RETURN BASE CORDED TO CRADLE	EXIT INTERCOM & RETURN TO PREVIOUS MODE
QUICK MEM	EXIT INTERCOM, ENTER PHONE MODE AND DIAL OUT QUICK MEM DIGITS
ALL OTHER KEYS	NO ACTION (No Keybeep)

Other Stimuli	Response
INCOMING RINGING	HEADSET WILL RING & REMAIN IN INTERCOM MODE

3.2 Base Unit

3.2.1 Base Phone Mode (OFF-HOOK), *Headset also in PHONE mode*

The base can enter PHONE mode (OFF-HOOK) by lifting the corded handset out of its cradle, except during Headset PAGING (which initiates INTERCOM mode).

The response to stimuli while in PHONE mode is outlined below:

Base Action	Response
CORDED HANDSET RECRADLED	BASE EXITS PHONE MODE
SWITCH HOOK FLASHED	LINE FLASH (except when headset is in PHONE mode)
HOLD KEY	ON-HOLD
INTERCOM	NO ACTION (no keybeep)
MEM	ACCEPT MEM LOCATION
REDIAL	DIAL OUT CONTENTS OF REDIAL BUFFER
QUICK MEM	DIAL OUT CONTENTS OF MEM LOCATION 00
PROGRAM	NO ACTION
# KEYS	DIAL OUT CORRESPONDING DTMF OR PULSE DIGITS (except * key activates temporary tone in pulse mode)

Remote Dialcard Action	Response
OFF KEY	HEADSET EXIT PHONE MODE
PHONE KEY	PHONE MODE - NO LINE FLASH
HOLD KEY	ON-HOLD
INTERCOM	NON INTRUSIVE PAGING TONE AT BASE
MEM	ACCEPT MEM LOCATION FROM B/S OR HEADSET
REDIAL	DIAL OUT CONTENTS OF REDIAL BUFFER
VOLUME UP/DOWN	INCREMENT/DECREMENT VOLUME SETTING (no keybeep)
# KEYS	DIAL OUT CORRESPONDING DTMF OR PULSE DIGITS (except * key activates temporary tone in pulse mode)

Headset Action Response

MIC BOOM TO UP POSITION	HEADSET EXIT PHONE MODE
FLASH KEY	NO LINE FLASH
VOLUME UP/DOWN	INCREMENT/DECREMENT VOLUME SETTING (no keybeep)

3.2.2 BASE IDLE Mode*, Corded Headset Placed in Cradle, Headset in Idle Mode*

The base is always in idle mode when the corded headset is placed in the base cradle.

The response to stimuli while in IDLE mode is outlined below:

Base Action	Response
CORDED HANDSET LIFTED	BASE PHONE MODE
SWITCH HOOK FLASHED	N/A
HOLD KEY	NO ACTION (no keybeep)
INTERCOM	NO ACTION (no keybeep)
MEM	NO ACTION (no keybeep)
REDIAL	NO ACTION (no keybeep)
QUICK MEM	NO ACTION (no keybeep)
PROGRAM	PROGRAM MODE
# KEYS	NO ACTION (no keybeep)

Remote Dialcard Action	Response
INTERCOM	BASE PAGING
ALL OTHER KEYS	NO RELEVANT ACTION FOR HEADSET IDLE MODE

Headset Action	Response
ALL KEYS & SWITCH	NO RELEVANT ACTION FOR HEADSET IDLE MODE

Other Stimuli	Response
HEADSET PAGING BASE	LIFT CORDED HEADSET TO INITIATE INTERCOM MODE
INCOMING RINGING	LIFT CORDED HEADSET TO INITIATE INTERCOM MODE

3.2.3 BASE IDLE Mode*, Corded Headset Placed in Cradle, Headset in PHONE Mode*

The base is always in idle mode when the corded headset is placed in the base cradle.

The response to stimuli while in IDLE mode with the headset in PHONE Mode is outlined below:

Base Action	Response
CORDED HANDSET LIFTED	BASE PHONE MODE
SWITCH HOOK FLASHED	N/A
HOLD KEY	ON HOLD
INTERCOM	NO ACTION (no keybeep)
MEM	ACCEPT MEM LOCATION
REDIAL	DIAL OUT CONTENTS OF REDIAL BUFFER
QUICK MEM	DIAL OUT CONTENTS OF MEM LOCATION 00
PROGRAM	NO ACTION (no keybeep)
# KEYS	DIAL OUT CORRESPONDING DTMF OR PULSE DIGITS (except * key activates temporary tone in pulse mode)

Remote Dialcard Action	Response
ALL KEYS	NO RELATED BASE ACTION

Headset Action	Response
ALL KEYS	NO RELATED BASE ACTION

3.2.4 BASE in HOLD Mode*, Corded Headset in cradle*

Hold mode can be initiated from either the headset or base unit by pressing the pressing the HOLD key when either the base or headset is in PHONE mode.

The following describes the reponse to stimuli when the base is in HOLD Mode:

Base Action	Response
CORDED HANDSET PICKED UP	HOLD CANCELLED - BASE PHONE MODE
SWITCH HOOK FLASHED	N/A
INTERCOM	NO ACTION (no keybeep)
MEM	NO ACTION (no keybeep)
REDIAL	NO ACTION (no keybeep)
QUICK MEM	NO ACTION (no keybeep)
PROGRAM	PROGRAM MODE
# KEYS	NO ACTION (no keybeep)

Remote Dialcard Action	Response
PHONE KEY	HOLD CANCELLED - HEADSET PHONE MODE (boom down)
HOLD KEY	HOLD CANCELLED - HEADSET PHONE MODE (boom down)
INTERCOM	BASE PAGING
ALL OTHER KEYS	NO RELATED BASE ACTION

Headset Action	Response
MIC BOOM TO DOWN POSITION	HOLD CANCELLED - HEADSET PHONE MODE
FLASH KEY	NO ACTION (no keybeep)
VOLUME UP/DOWN	NO ACTION

Other Stimuli	Response
HEADSET PAGING BASE	LIFT CORDED HEADSET TO INITIATE INTERCOM MODE

3.2.5 BASE in HOLD Mode*, Corded Headset Picked Up out of Cradle*

Hold mode can be initiated from either the headset or base unit by pressing the pressing the HOLD key when either the base or headset is in PHONE mode.

The following describes the reponse to stimuli when the base is in HOLD Mode, with the corded headset picked up out of the base cradle:

Base Action	Response
CORDED HANDSET RECRADLED	NO ACTION (no keybeep)
SWITCH HOOK FLASHED	HOLD CANCELLED - BASE PHONE MODE
HOLD KEY	HOLD CANCELLED - BASE PHONE MODE
INTERCOM	HEADSET PAGING
MEM	NO ACTION (no keybeep)
REDIAL	NO ACTION (no keybeep)
QUICK MEM	NO ACTION (no keybeep)
PROGRAM	NO ACTION
# KEYS	NO ACTION (no keybeep)

Remote Dialcard Action	Response
PHONE KEY	HOLD CANCELLED - HEADSET PHONE MODE (boom down)
HOLD KEY	HOLD CANCELLED - HEADSET PHONE MODE (boom down)
INTERCOM	BASE PAGING
ALL OTHER KEYS	NO RELATED BASE ACTION

Headset Action	Response
MIC BOOM TO DOWN POSITION	HOLD CANCELLED - HEADSET PHONE MODE
FLASH KEY	NO ACTION (no keybeep)
VOLUME UP/DOWN	NO ACTION

Other Stimuli	Response
HEADSET PAGING BASE	PRESS INTERCOM TO INITIATE INTERCOM MODE

3.2.6 Base INTERCOM Mode

The base can enter INTERCOM Mode by paging the headset (press INTERCOM key) and having the headset answer the page to initiate INTERCOM. The base can also enter INTERCOM mode in the opposite manner by answering a page from the Headset. The corded handset is always lifted during INTERCOM mode.

The response to stimuli while in INTERCOM mode is outlined below:

Base Action	Response
CORDED HANDSET RECRADLED	EXIT INTERCOM MODE
SWITCH HOOK FLASHED	EXIT INTERCOM MODE - BASE PHONE MODE ACTIVE
HOLD KEY	NO ACTION (no keybeep)
INTERCOM	EXIT INTERCOM MODE
MEM	NO ACTION (no keybeep)
REDIAL	NO ACTION (no keybeep)
QUICK MEM	EXIT INTERCOM, ENTER PHONE MODE AND DIAL OUT QUICK MEM DIGITS
PROGRAM	NO ACTION (no keybeep)
# KEYS	NO ACTION (no keybeep)

Remote Dialcard Action	Response
OFF KEY	EXIT INTERCOM MODE - RETURN TO PREVIOUS MODE
PHONE KEY	EXIT INTERCOM MODE - PHONE MODE
HOLD KEY	NO ACTION (no keybeep)
INTERCOM	EXIT INTERCOM MODE
MEM	NO ACTION (no keybeep)
REDIAL	NO ACTION (no keybeep)
VOLUME UP/DOWN	INCREMENT/DECREMENT VOLUME SETTING (no keybeep)
# KEYS	NO ACTION (no keybeep)

Headset Action	Response
MIC BOOM TO UP POSITION	EXIT INTERCOM MODE
FLASH KEY	NO ACTION (no keybeep)
VOLUME UP/DOWN	INCREMENT/DECREMENT VOLUME SETTING (no keybeep)

Other Stimuli	Response
INCOMING RINGING	BASE WILL RING & REMAIN IN INTERCOM MODE

4 "Special" Features & Operating Modes

This section is also used to describe any special hardware or software features that do not fall under the description of a particular mode.

5 Electrical Specifications

5.1 Operating Conditions

	Parameter	Min	Typ	Max	Units
	Operating Temperature Range	0	25[1]	50	°C
	Base Unit Operating Voltage (AC Voltage, 60Hz)	96	120[1]	144	Vrms
	Base Unit Operating Voltage (AC Adapter Output)		9[1]		Vdc
	Handset Operating Voltage[2]	3.2	3.6[1]	4.2	Vdc

Notes:
1. Typical value represents the nominal testing value
2. Handset operates from a 3-cell NiMH Battery

6.2 DC Electrical Characteristics

Specifications marked with * are guaranteed at the nominal testing temperature and voltage on all units with the use of automated production test equipment (ATE)

	Parameter	Min	Typ	Max	Units
*	Base Unit Current - Standby Mode[1,2]		TBD		mA
*	Base Unit Current - Talk Mode[1,2]		TBD		mA
	Handset Current - Sleep Mode		1	3	mA
*	Handset Current - Wake Mode	45		70	mA
*	Handset Current - Talk Mode	65		101	mA
*	Handset Sleep Duration - Standby Mode	750		1150	ms
	Handset Wake Duration - Standby Mode		52	60	ms
*	Low Battery Detection Threshold (HS)	3.4			Vdc
*	MCU Shutdown Threshold (HS)	3.2			Vdc
	Handset Standby Time	6			Days
	Handset Continuous Talk Time	7			Hours
*	Loaded Cradle Charge Contact Voltage[3]	3.3		4.3	V
*	Loaded Spare Battery Charge Contact Voltage[3]	1.7		2.5	V

Notes:
1. DC current from 9v power supply
2. Cradle and spare battery charge currents = 0mA
3. Voltage measured across a 50Ω charge circuit load resistor

6.3 Headset Audio Specifications

Specifications marked with * are guaranteed at the nominal testing temperature and voltage on all units with the use of automated production test equipment (ATE)

	Parameter	Min	Typ	Max	Units
*	Transmit Objective Loudness Rating (TOLR)[1]		TBD		dB
*	Receive Objective Loudness Rating (ROLR)[1,2]		TBD		dB
*	Sidetone Objective Loudness Rating (SOLR)[3]		TBD		dB
*	Receive volume adjustment range		TBD		dB
*	Transmit Direction Acoustic Overload (into microphone)[4]		TBD		dBspl
*	Receive Direction Acoustic Overload (from receiver)[4]		TBD		dBspl
	Transmit Direction Noise[5]			20	dBrnC
	Receive Direction Noise[2,5]			35	dB(A)
	Peak Acoustic Pressure[6]			TBD	dBspl

Notes:
1. Tested using 0kft of simulated telephone line
2. Tested at normal (low) volume level
3. Base unit connected to 0kft of simulated telephone line terminated with 900Ω
4. Acoustic level that results in 5% THD, measured at 1kHz through a 5kHz lowpass filter
5. Handset isolated from sound input and mechanical disturbances
6. Tested at high volume level

6.3 Base Corded Audio Specifications

Specifications marked with * are guaranteed at the nominal testing temperature and voltage on all units with the use of automated production test equipment (ATE)

	Parameter	Min	Typ	Max	Units
*	Transmit Objective Loudness Rating (TOLR)[1]	-40	-46	-53	dB
*	Receive Objective Loudness Rating (ROLR)[1,2]	51	+46	41	dB
*	Sidetone Objective Loudness Rating (SOLR)[3]	+3	+8	+19	dB
*	Receive volume adjustment range		TBD		dB
*	Transmit Direction Acoustic Overload (into microphone)[4]	105			dBspl
*	Receive Direction Acoustic Overload (from receiver)[4]	105			dBspl
	Transmit Direction Noise[5]			20	dBrnC
	Receive Direction Noise[2,5]			35	dB(A)
	Peak Acoustic Pressure[6]			130	dBspl

Notes:
1. Tested using 0kft of simulated telephone line
2. Tested at normal (low) volume level
3. Base unit connected to 0kft of simulated telephone line terminated with 900Ω
4. Acoustic level that results in 5% THD, measured at 1kHz through a 5kHz lowpass filter
5. Handset isolated from sound input and mechanical disturbances
6. Tested at high volume level

6.4 Telephone Line Interface Specifications

Specifications marked with * are guaranteed at the nominal testing temperature and voltage on all units with the use of automated production test equipment (ATE)

	Parameter	Min	Typ	Max	Units
*	DTMF Frequency Tolerance	-1.5		+1.5	%
*	DTMF Low Group Tone Level[1]	-7.5	-5.0	-4.0	dBm
*	DTMF High Group Tone Level[1]	-5.5	-3.0	-2.0	dBm
	DTMF Combined Tone Level[1]			+2.0	dBm
	DTMF High Group Preemphasis (Twist)		2.0	4.0	dB
	Pulse Dialling Break Duration		60		ms
	Pulse Dialling Make Duration		40		ms
	Pulse Dialling Rate		10		pps
	Ring Detection Frequency[2,3]	15		68	Hz
	Ring Response Voltage[3]	40			Vrms
	Ring No-Response Voltage[4]			15	Vrms

Notes:
1. Measured across a 900Ω terminating impedance
2. The ringer must ring with signals within this range
3. Measured with a frequency of 20Hz
4. The ringer must not ring with signals within this range

6.5 Radio Specifications

Specifications marked with * are guaranteed at the nominal testing temperature and voltage on all units with the use of automated production test equipment (ATE)

	Parameter	Min	Typ	Max	Units
	Number of RF Duplex Channels[1]		10		-
	Duplex Frequency		22.75		MHz
	RF Channel Spacing		300		kHz
	RF Bandwidth[2]		150		kHz
	IF Frequency		10.70		MHz
	Base Unit Transmission Frequency	902.30		905.00	MHz
	Headset Transmission Frequency	925.05		927.75	MHz
	Transmitter Frequency Stability (over temperature range)	-10		+10	kHz
*	Base FSK Peak Deviation - Data	40	50	60	kHz
*	Headset FSK Peak Deviation - Data	40	50	60	kHz
*	Receiver Sensitivity - 30dB SINAD[3]	-105	-106		dBm
	Adjacent Channel Rejection[4]	55			dB
	Image Rejection[4]	65			dB
*	Clear Channel Detection Level	-100		-80	dBm

Notes:
1. A duplex channel includes 1 base to handset link and 1 handset to base link
2. 3dB bandwidth of IF filter
3. Measured through a CCITT audio weighting filter
4. RF level of desired signal set to provide 25dB SINAD (CCITT); rejection is relative level of interference signal above desired signal to reduce SINAD to 20dB (CCITT)

6.6 Frequency Allocation Tables

The RF channels for the 910ADL are allocated in fixed pairs as indicated in the tables below. The duplex frequency is maintained at a fixed 22.75MHz for all 10 channels.

6.6.1 Base Unit Frequencies

Channel #	Transmit Frequency	Receive Frequency	Rx LO Frequency
1	902.30 MHz	925.05 MHz	914.35 MHz
2	902.60 MHz	925.35 MHz	914.65 MHz
3	902.90 MHz	925.65 MHz	914.95 MHz
4	903.20 MHz	925.95 MHz	915.25 MHz
5	903.50 MHz	926.25 MHz	915.55 MHz
6	903.80 MHz	926.55 MHz	915.85 MHz
7	904.10 MHz	926.85 MHz	916.15 MHz
8	904.40 MHz	927.15 MHz	916.45 MHz
9	904.70 MHz	927.45 MHz	916.75 MHz
10	905.00 MHz	927.75 MHz	917.05 MHz

6.6.2 Headset Frequencies

Channel #	Transmit Frequency	Receive Frequency	Rx LO Frequency
1	925.05 MHz	902.30 MHz	913.00 MHz
2	925.35 MHz	902.60 MHz	913.30 MHz
3	925.65 MHz	902.90 MHz	913.60 MHz
4	925.95 MHz	903.20 MHz	913.90 MHz
5	926.25 MHz	903.50 MHz	914.20 MHz
6	926.55 MHz	903.80 MHz	914.50 MHz
7	926.85 MHz	904.10 MHz	914.80 MHz
8	927.15 MHz	904.40 MHz	915.10 MHz
9	927.45 MHz	904.70 MHz	915.40 MHz
10	927.75 MHz	905.00 MHz	915.70 MHz