NovAtel 8300/8301/8305 Training Manual

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This diagram represents any given area to be served by a Cellular Mobile Telephone System. This area is divided into smaller regions with slightly overlapping borders. These smaller regions are known as cells. Each cell is equipped with its own radio transmitter, receiver, and control equipment. Collectively, this equipment is known as a 'cell site'.

Each 'cell site' transmitter broadcasts relatively low power radio signals on a specific group of preassigned frequencies. Each signal (from this cell site) is intended to communicate with mobile units primarily within this cell. Each cell has a unique paging channel and SAT allocated to it for location purposes.

Accordingly, each mobile radio broadcasts a similarly low power signal to the 'cell site' receiver within its cell, thereby further minimising the potential for interference to surrounding cells (see Figure 1).

All 'cell sites' are connected to a mobile subscriber switching centre (MSSC) by land lines or microwave radio links. The MSSC is a computerised telephone switch connected by land lines to the public telephone network through which all calls to and from land line subscribers (telephones) are routed.
With proper location of cell sites within the area of mobile telephone service ensuring coverage, and low power transmitter operation minimising channel interference, the added benefit of up to 624 voice channels divided strategically among cells further enhances the performance of a cellular system.

This division or grouping of frequencies, coupled with the use of low power transmissions, allows the same frequencies to be re-used over and over in non-adjacent cells. Again, this contributes to the use of available channels by many more subscribers than in conventional systems (see Figures II, III, and IV).

In addition to the various omni antenna re-use patterns, frequency re-use may also occur through the use of sectored antennas. Again a key purpose of sectored patterns is to provide more channels in a given area while still not exceeding 624 total voice channels. However, sectored antenna patterns have other benefits also, such as directional use near mountains, hill, water and other terrain coverage and/or location identification. These are technical factors which are considered by systems design engineers and are not important to the function of the mobile unit (see Figures V and IV for example).

There is also one other device employed in the frequency re-use designs. And that is the use of Supervisory Audio Tones (or SAT tones) to help provide additional protection against a mobile trying to talk on the same frequency at two separate cell sites. The cellular system concept utilises 3 SAT tones (970 Hz, 6600 Hz and 6630 Hz) which are sent by the base/MSC and transponded (repeated by the mobile). If the SAT tone returned by a mobile is not the same sent by a cell site, the MSSC will not accept the call and a ‘Hand Off’ will be initiated. Thus a cellular system employs both a space separation of the same frequency plus a supervisory tone to minimise co-channel interference (see Figure VI for an example).

A key factor in the ability of a cellular system to provide effective communications between cells is the process known as ‘Hand Off’. As a mobile moves through a cell, its radio signal is picked up by the closest antenna/tower. As the mobile approaches the edge of the cell, its signal will become weaker within that cell. At the same time, the mobiles signal will grow stronger as it moves toward the next cell and into it.

The MSSC the strength of the mobiles signals in those calls nearest the mobile radio. At some point, the MSSC will decide to switch the mobile’s signal to the new cell where the signal is now the strongest. This is “Hand-Off” and is generally performed so smoothly in 0.2 second that subscribers don’t even know its happening. This delay may slow down data/fax transmissions if used.

If any one cell becomes too crowded as the number of mobile users on the system grows, the capacity can be increased by subdividing the cell into smaller cells, again re-using some of the same frequencies and reducing the power accordingly. This is called cell splitting.

To summarise, Cellular means

1. The city (or other area) is divided into small, lower powered cells.
2. Calls are routed through the nearest cell to the MSSC to the Public Telephone Network, or vice versa.
3. Calls are ‘Handed Off’ from cell to cell as a mobile moves through a city (or other area).
4. Frequencies can be re-used in non adjacent cells.
5. Cells can be subdivided, or split, into smaller cells to accommodate heavy user demand in particular areas as the number of mobile users increase.
6. Virtually unlimited channel capacity exists to handle mobile telephone conversations, the upper limit is typically 60,000 subscribers per MSSC.
7. Profit.
Design Objectives

1. Use about 666 (832 extended) ultra high frequency, duplex channels in a system with limited antenna height and RF power to minimise and control the area coverage to allow multiple frequency re-use in order to maximise total number of subscriber calls that can simultaneously be made in a given city.

2. Total, wide-area coverage is accomplished through electronic hand-off from one site (cell) to another, under the control of an electronic central switch.

3. Mobile power and frequency assignment is controlled by the MSC to also aid in controlling the coverage in order to increase frequency re-use for maximum simultaneous calls per city.

4. Unique subscriber identification on a Worldwide basis, minimises the ability of hackers to piggy-back onto another subscriber number. Older systems had no protection against multiple users operating under the same telephone number.

5. A grade of service (0.04 in Australia) and speech quality consistent with the conventional wired telephones, in use by any Telecom Administration.

Frequency Re-use Allocations

Figure II. 4 Cell Pattern

Figure III. 7 Cell Pattern (Used in Australia)
Cellular System, Cell-to-Cell Hand-Off

Radio communicates with this cell initially
‘Hand Off’ occurs here in 0.2 seconds
Radio now communicates with this cell only

Side View Fig. IV

Mobile Supervision At Cell Site

SAT SPATIAL ALLOCATION

SAT1: 5.970 Hz
SAT1: 6.000 Hz
SAT3: 6.030 Hz

Figure VI

SAT: SUPERVISORY AUDIO TONE (5970, 6000, 6030 Hz)
TRANSMITTED BY CELL SITE AND TRANSPONDED BY MOBILE

ST: SIGNALLING TONE (10kHz)
TRANSMITTED BY MOBILE TO:
1) CONFIRM ORDERS
2) SIGNAL FLASH REQUESTS
3) SIGNAL RELEASE REQUESTS
PRODUCT CONFIGURATION
RULES:

ALL PERIPHERALS CONNECT TO THE BUS VIA SBX-300 CONNECTOR BLOCKS

ORDER OF CONNECTION TO THE BUS IS ARBITRARY

A SMART PERIPHERAL CAN CONNECT DIRECTLY TO A TRANSCEIVER

CABLE TO THE PERIPHERALS IS SHIELDED

8 PIN MODULAR CONNECTOR
Connection Styles in the Car

STAR CONNECTION

JUNCTION BOX

HAND SETS

TRANSCEIVER

BUS CONNECTION

HAND SETS

TRANSCEIVER

CCU

NovAtel Communications, Ltd.

8300 Peripheral Options

TRANSCEIVER

GCH-300 SMART HANDSET

ALT-300/ATG-300 ALERT TONE
Power On

READY means that the radiotelephone is ready to make a call. NOSVC means that no cellular service is available at present. NOSVC also appears briefly when the phone is first turned on and when a call is ended.

The second line of the display indicates system preference status. For example, 'PREF - A-' indicates you prefer system A.

Along the top edge of the display are four status indicators: 'ROAM' indicates that you are not presently in service on your home system. 'NoSvc' indicates that no cellular service is available. 'Horn' indicates that the horn feature is activated. 'InUse' appears during a call and indicates that air time is being used.

1. YOUR VEHICLE IGNITION MUST BE TURNED ON.

2. The key sequence FCN PWR END will turn the power on, also turns it off. The power to your radiotelephone turns off automatically when you turn off your vehicle ignition.

3. If a call is in progress when you turn off the vehicle ignition, the phone stays on until you end the call.
Placing A Call Using The Handset

1. ENTER THE NUMBER THAT YOU WISH TO CALL ON THE KEYPAD
2. THE CALLED PARTY ANSWERS
3. REMOVE THE HANDSET FROM ITS CRADLE AND BEGIN YOUR CONVERSATION

You can also place your call with the handset off-hook. If the called party does not answer, or you get a busy signal, press the END key to terminate the call attempt.

Placing A Call Using The Hands-Free

1. ENTER THE NUMBER THAT YOU WISH TO CALL ON THE KEYPAD
2. THE CALLED PARTY ANSWERS.
3. CARRY ON YOUR CONVERSATION VIA THE HANDS-FREE

There is no need to remove the handset from its cradle to initiate your hands-free conversation. If the called party does not answer, or you get a busy signal, press the END key to terminate the call.
Continuing a Handset Call Using Hands-Free

Your call will be transferred from the handset to the hands-free unit when the handset is secured on its cradle.

Display Scroll

Your phone can handle numbers up to 32 digits in length but can display only 14 digits at a time. An arrow in the top left corner indicates that there are some numbers preceding those displayed, e.g., international numbers which exceed the 14 digit display.
1 REPLACE THE HANDSET ON ITS CRADLE.

OR

Your call will be terminated if you replace the handset on its cradle, or press the end key. To terminate a hands-free call, press the end key.

1 HANDSET ON HOOK
Lift the handset off of the cradle and begin your conversation

OR

1 HANDSET OFF HOOK
There is no need to remove the handset from its cradle to initiate your handsfree conversation.

Call Diversion (Australia)

MobileNet can be instructed to automatically divert your incoming calls to another telephone service - mobile or not. This is useful for those times when you are absent from your mobile phone. You can instruct MobileNet to divert all calls to your home, office or to a colleague's telephone service.

There are three types of Call Diversion:
- Unconditional Call Diversion
- Diversion on No Reply
- Diversion on Busy

These three types of diversion can set to:
- Unconditional Call Diversion
- Diversion on No Reply
- Diversion on Busy
- Registered Number Division
- Variable Number Division

The Registered Number Division is the number you nominated when you first applied for the service. The Variable Number Division is any telephone number you insert after keying in the diversion access code.

Unconditional Call Diversion

MobileNet will divert all incoming calls, while outgoing calls may still be made. Unconditional Call Diversion can be set to the Registered Number Diversion or the Variable Number Diversion.

Call Diversion on No Reply (Recommended)

For those times when you are constantly leaving your phone unattended but would like to receive calls when you are there, you can instruct MobileNet to divert calls when there is no reply on your mobile phone. (This facility diverts calls even when the mobile phone is switched off.) Once again your registered number can be used or you can activate a variable number.

Call Diversion on Busy

MobileNet can also divert your incoming calls when your mobile telephone is engaged or busy. This is useful for those times when you are expecting an important call but the phone could be tied up. You can divert incoming calls to your registered number or to a variable number wherever a message can be taken.

Registered Number Division

Activating

Diversion
- Unconditional: *21 # SEND
- No Reply: *61 # SEND
- Busy: *24 # SEND

Deactivating

Diversion
- Unconditional: KEY IN PRESS "21 # SEND"
- No Reply: KEY IN PRESS "61 # SEND"
- Busy: KEY IN PRESS "24 # SEND"

When you activate, deactivate diversion, a recorded message will indicate the status of the diversion facility you dialled.

Variable Number Division

When activating this diversion facility insert the access code, then insert the telephone number required (including STD area code).

The Variable Number

- must be a full national number, ie, with STD area code
- maximum of 12 digits
- override diversion to registered number

Activating

Unconditional Call Division
key in: *21 0000000000000000 # press: (SEND)
Diversion on No Reply
key in: *61 0000000000000000 # press: (SEND)
Diversion on Busy
key in: *24 0000000000000000 # press: (SEND)

Deactivating

To deactivate Variable Number Division follow the same procedure as Deactivating Registered Number Diversion.

Note:

To return the Call Diversion to the Registered Number Diversion, you will need to cancel the Variable Number Diversion, then activate Registered Number Division.

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The Missed Call Register counts the number of calls received by the phone but not answered. For the calls to register, turn on the phone by activating the horn alert function.

If you do not want the horn to sound when calls are received and registered, first disable the horn function using the Menu.

NOTE: Once you read the contents of the register, it resets to zero.

For use with diversion on no reply.

This facility allows you to control the types of calls accessible by your mobile telephone.

- unrestricted access
- barred ISD
- national calls only
- local calls only
- incoming calls only

When you applied for the MobileNet service you were requested to choose two of the above call access types. This facility enables you to alternate between the two selected call types by using your Personal Identification Number (PIN).

To activate the alternative access
key in: *33 (PIN) #
press: (SEND)

To deactivate the alternative access and restore to normal
key in: #33 (PIN) #
press: (SEND)

To verify Call Type
key in: * #33 #
press: (SEND)

or

attempt to call a barred number.
(A recorded message will indicate the status, when activating, deactivating or verifying.)

Master Reset
By inserting #99 PIN # Mobile Net allows you to reset your call diversions and Call Access Category to pre-activated status.
Invoking this facility, deactivates all Diversions and the Call Access Control.

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**Electronic Lock & Unlock**

**TO UNLOCK**

Enter the TIER 1 or TIER 2 lock code on the keypad. This code will be between one and four digits long. The digits will not appear on the display, or make any tones sound as you enter them.

![Diagram of keypad]

**ENTER THE TIER 1 OR TIER 2 SECURITY CODE ON THE KEYPAD**

**TO LOCK**

![Diagram of keypad]

*TIER 1 AND TIER 2 SECURITY CODES*

Two separate, user programmable security codes are available.

Entering the tier 1 security code fully unlocks the phone; the user has full privileges.

Entering the tier 2 code unlocks the phone partially; the user cannot make STD calls. If a call to a STD number is made, the message ACCESS DENIED appears on the display.

Lock codes are changed through the Menu function.

**Volume Control**

**EARPIECE AUDIO (handset only)**

Earpiece audio is adjusted with the handset off-hook. Continue to pressing the indicated key until the desired result is achieved.

![Diagram of earpiece audio adjustment]

**SPEAKER TONES AND AUDIO**

Speaker tones and audio are adjusted with the handset on-hook (on the cradle). Continue pressing the indicated key until the desired result is achieved.

![Diagram of speaker tone adjustment]

**BELL VOLUME**

The bell volume can be adjusted with the handset on or off the hook. The two sequence must be pressed each time another level of bell volume is desired.

![Diagram of bell volume adjustment]

YOU CAN ADJUST ALL TONE OR AUDIO LEVELS WHILE THE PHONE IS IN USE. YOU CAN ALSO ADJUST THEM WHEN PHONE IS IDLE, A TONE WILL SOUND TO HELP.

IF YOU ARE USING A HANDSET WITH A CCU, EITHER UNIT CAN BE USED TO SET THE HANDSET EARPIECE VOLUME.
Last Number Redial

The last number that you called will appear here.

Making Corrections

Delete last character entered

Clear entire display/function

This function can be used to clear what is on the display or any function that is in progress.

It cannot be used to end a call.

This function recalls the display and sends the last number that you called. Note that this will be the last number that was entered and sent, or recalled and sent. If you did not press SEND after dialing a number, it will not be redialed.

It is best to check the display quickly after using this function to assure that it is the number that you want to dial. If not, press the END key.
Direct Recall from Memory

THE NAME CORRESPONDING TO THE NUMBER (IF ANY) APPEARS HERE.

THE RECALLED ENTRY NUMBER APPEARS HERE

NovA41

1. THE PROMPT 'ENTRY' WILL APPEAR ON YOUR DISPLAY

2. ENTER THE TWO DIGIT STORAGE LOCATION OF THE NUMBER YOU WISH TO RECALL

3. TO PLACE A CALL TO THIS ENTRY

THE PHONE NUMBER REPLACES THE NAME ON THE DISPLAY.

TO VIEW THE TELEPHONE NUMBER ON THE DISPLAY BEFORE SENDING IT. (Can be used for any method of recalling numbers.)

Recalling from a Tag Location

THE NAME CORRESPONDING TO THE TAG NUMBER APPEARS HERE.

THE RECALLED TAG NUMBER APPEARS HERE

NovA41

1. THE PROMPT 'ENTRY' WILL APPEAR ON YOUR DISPLAY

2. THE PROMPT 'TAG' WILL REPLACE 'ENTRY'

3. ENTER THE ONE DIGIT TAG FOR THE NUMBER YOU WISH TO RECALL (1-4)

4. TO PLACE A CALL TO THIS ENTRY

THE PHONE NUMBER REPLACES THE NAME ON THE DISPLAY.

Tag memory locations give you fast access to four stored telephone numbers using fewer keystrokes. You can enter your own tag names or use the default names provided.

The four default tag names are:

# 1) HOME
# 2) OFFICE
# 3) OPERATOR,
# 4) EMERGENCY
Storing a Number in Direct Memory

ENTRY PROMPTS YOU TO ENTER A STORAGE LOCATION NO.
STORED AT CONFIRMS THE LOCATION

1. ENTER THE TELEPHONE NUMBER YOU WISH TO STORE. IF YOU WANT TO USE AN ALPHA NAME AS WELL, DO IT NOW USING ALPHA MODE.

2. SND
3. CLR
4. PWR

5. ENTER THE STORAGE LOCATION NUMBER (01-46)
6. THE DISPLAY CONFIRMS THE STORAGE LOCATION

There are 50 memory locations numbered 01-50 available for storing telephone numbers: 46 telephone numbers up to 32 digits in length with their 8-character names and four fast access tag memory locations. Storing numbers with names in locations 47 through 50 overwrites the tag memory. Memory location '00' is reserved for the Scratchpad.

You can enter the name and number in a storage location in any order.

Storing a Number in a Tag Location

TAG DEFAULTS
#1- HOME
#2- OFFICE
#3- OPERATOR
#4- EMERGENCY

1. ENTER THE TELEPHONE NUMBER FOR THE TAG. IF YOU WANT TO CHANGE THE TAG NAME, DO IT NOW USING ALPHA MODE

2. SND
3. CLR
4. PWR

5. ENTER THE TAG NUMBER (#1- #4) IN WHICH YOU WANT TO STORE THE NUMBER (AND NAME, IF CHANGED)

Tag memory locations give you fast access to four stored telephone numbers using fewer keystrokes. You can enter your own tag names or use the default names provided.

Storage in tag locations # 1-4 is distinguished from direct memory locations 01-04 by the presence of the ' #' at the beginning of the number, and the absence of the '0'. The four tag locations occupy memory locations 47-50.
Use this function to make note of information given to you during a call. The display will clear automatically as soon as you enter the first character. Unless your phone is configured for Fast Dialing from the Menu, the party on the other end of the line will not hear your keypad tones as you enter.

You can store the information from the Scratchpad (maximum 32 characters) during your conversation, or recall it at the end of the conversation as shown above.

Each depression of the Volume Control displays the next (or previous) number and name (if any). Once the desired entry is found, place the call as in direct recall.
Enter up to 8 characters to be searched for. You don't have to enter the entire name (i.e., you could enter GE to search for GEORGE). You can then search for other items in this alphabetic string (i.e., GEOFF or GERMANY) by using the volume control key to scroll up or down numerically through the memory locations. Once an entry is found, place the call as in direct memory recall.

The NO ENTRY message on your display indicates that no more entries match the alphabetic string.

**EXAMPLE:** Enter the name "Mona"

1. **M**
2. **O** (no need for "#" key here, as you have selected the last letter on the key.)
3. **N** (no need for "#" key here, as your next letter is entered with another key.)
4. **A**

Certain characters do not appear on the key pad, to access them: 'Z' follows 'Y', 'Q' follows 'P', and a blank space is entered with the 'O'.
To adjust the illumination of the handset (display and keypad) press the indicated keys simultaneously. This can be done with the handset on or off the hook.

Microphone Mute

This function mutes all handset, COU and hands-free microphones connected to the transceiver.

Use the MUTE function to prevent the called party from hearing a private conversation at your end.

You must hold the mute button down for as long as you want the function activated.

The radio sends the numbers on the display in DTMF or touch-tone format to the terminal at the other end of the line during regular conversation mode.
Air-Time records & displays the duration of the most recent call made in hours, minutes and seconds. The counter restarts at the beginning of each call. This function updates once per second when selected during a call.

Total Air-Time records & displays the total air time used by the phone since installation in hours, minutes and seconds. The number is reset to 00 00 00 at 99 59 59.

The menu feature is used to reconfigure your radiotelephone to suit your needs. It gives you the capability to:
1) Change both Tier 1 and Tier 2 Lock Codes,
2) Set the time interval for Automatic Call Retry,
3) Fast Dial Feature - Set silent, auto or manual fast dial mode,
4) Enable or Disable your Horn Alert,
5) Verify your Electronic Serial Number.

Toggle through the various Menu selections with the volume control button.

You can exit the Menu at any time by pressing the END key.
**Selection 1 - Lock Codes**

1. Enter the old Tier 1 lock code. The factory code is 1,2,3,4. (If this code is entered incorrectly, you will not be able to change the lock code.)

2. Enter the new lock code for Tier 1 (any combination of 1 - 4 numeric digits) the leading "F" characters represent nothing to the radiotelephone.

3. To commit the new entry to your radiotelephone's memory.

4. To go to the next menu selection:

**Selection 2 - Retry Interval**

1. Enter the desired interval between call retries. The interval range is 2 to 512 seconds in increments of two.

2. To commit the new entry to your radiotelephone's memory.

3. To go to the next menu selection.

**Selection 3 - Fast Dial**

1. The send key toggles between the three available modes, continue to press it until the desired mode appears on the display.

2. To go to the next menu selection.

**Fast Dial Mode Descriptions**

After placing a call, touch-tone may be sent directly from the keypad. The Fast Dial feature selects one of three methods to send touch-tone from the keypad.

- **Silent**: No tones are sent.
- **Auto**: Tones are sent in short burst.
- **Manual**: Tones are continuous as the key is pressed (up to 3 seconds long).

Note that this feature does not affect sending tones from memory under "Send Touch-Tone".
SELECTION 4 - HORN ALERT

1 PRESS THE SEND KEY TO TOGGLE BETWEEN THE TWO HORN ALERT OPTIONS

HRN ALRT ENABLED

A-B SND CLR PWR

CE END

TO EXIT

HRN ALRT DISABLED

A-B SND CLR PWR

CE END

The Horn Alert feature allows you to enable or disable the Horn Alert function. With the Horn Alert DISABLED, you can use the Missed Calls Register without the horn sounding when calls are received. With the Horn Alert ENABLED, the vehicle horn will sound when an incoming call is received if the Horn function is activated.

SELECTION 5 — VERIFY E.S.N.

SERIAL
8EO X X X X

A-B SND CLR PWR

CE END

TO EXIT

This screen shows you the Electronic Serial Number for the phone. The Serial Number cannot be changed. Telecom Australia must have this number correctly registered in order to place phone calls.

Call Re-Try

CALL
RTRY ON
OR
CALL
RTRY OFF

A-B SND CLR PWR

CE END

If the system won’t process your call (fast busy or other alert tone) due to system congestion or being out of range, the re-try function will repetitively dial the number for you at timed intervals. The default interval is every 20 seconds, but you can select your own interval using the menu function.

NOTE: This function is not applicable for calls which result in a busy signal from the called party.

The FCN 77 which activates the call retry function will also turn the function off.

The FCN 7 on the 8305 telephone will show call retry status.
CONFIGURATION MODE

8300

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The Configuration Utility is used to program the radiotelephone with information needed for identification, billing and special features. Some of these features concern the ability of the radiotelephone to select from two available cellular systems. For the Australian market, it is important that these features be programmed to accommodate the national cellular network as described in these instructions.

Access Configuration Mode by entering a special lock code into the handset or CCU that came with the transceiver. The volume control is used to advance through the parameters. Each parameter appears on the display with its current configuration. Change the configuration by entering the information on the handset or CCU keypad. Advance to the next parameter by pressing the SND key. The actual programming of the radiotelephone takes place when you press the END key to exit the mode. You can press the END key to exit at any time.

Lock the radiotelephone (if not already locked) ▶ FCN lock 1 LOCKED

Enter the configuration access code. ▶ # 2 5 9 CNF 8300 REV AA03

Press the O (increase) volume control to advance to the first parameter.

This screen shows the serial number for the radiotelephone that is encoded in memory. The information is encoded as shown below. The serial number cannot be changed.

```
SERIAL 8E0XXXXX
```

The first screen displays the current Subscriber Area Code and Subscriber ID Number for the radiotelephone.

Enter the new mobile identification (the digits 5050, plus the balance of the phone number, excluding the prefix 018) and press SND. Otherwise advance to the next screen.

Use the CE key to make corrections.
The second screen is the repertory memory initialization utility. It clears the repertory memory, air-time and air-charge registers.

- Press the SND key to initialize (clear) the stored repertory memory of the radiotelephone.

The wait message indicates that the initialization process is in progress (this could take as long as 10 seconds).

This display shows the current Home Area System ID Number. This number is used to identify the home area system of the radiotelephone.

- Enter the new identification number and press SND.
- Press CE to revert to the original number.

This display shows the current Initial Paging Channel. The IPCH is the channel on which the radiotelephone initially accepts a call while in its home service area. In Australia the only valid Initial Paging Channel is 333.

- Ensure that the screen reads IPCH 333. If it does not, enter 333 and press SND, or press CE to revert to Channel 333.

This display shows the current Access Overload Class for the radiotelephone. The ACCOLC default value is the 2nd to last digit in the Subscriber ID Number as set in step 1.

- Enter 0 and the last digit of the phone number, than press SND.

This display shows the current Group Identification Mark for the radiotelephone. The GIM provides for the grouping of units for local control options.

- Enter the GIM as 00 value (0 - 15) and press SND.
- Press CE to revert to the original value.

This display shows the Initial Data Control Channel for System A. In some markets this channel can be changed for system testing.
This feature is not used in Australia.

This display shows the Initial Data Control Channel for System B. In some markets this channel can be changed for system testing.
This feature is not used in Australia.
This display shows the Registration Table Size (1 to 4, one-digit). Enter 1, then

- **SND** to program the selection.

If another value is subsequently selected,

- **CLR** to return to the original selection.

This display shows the current Tier 1 lock code for the radiotelephone. See the Owner's Manual for information on how to change lock codes.

This display shows the current Tier 2 lock code for the radiotelephone. See the Owner's Manual for information on how to change lock codes.

This series of four screens lets you define and enable or disable four different Invalid System Identification numbers. The message "NONE" beside the location number indicates the location is disabled. Use the volume control to select one of the four numbers.

- Press the # key to toggle the status of the location.

    ![Invalid ID](Wieh01.0107.png)

Enter the Invalid ID number in decimal format (it can range from 0 to 32767). Press CE to revert to the original state for the location. Press the SND key to enter the number.

This screen shows the Local Use Option. This option, when SET, allows the use of local system enhancements in some markets. Ensure that the screen reads OPTION LU CLR.

- Press the SND key to toggle the status.
The Fast Dial option and the following screen Manual Fast Dial option are used to configure the Fast Dial feature. Use the matrix below to determine how the two options should be set. This feature can also be configured using the menu feature, see the Owner's Manual for details.

- Press the SND key to toggle the status.

<table>
<thead>
<tr>
<th>FD</th>
<th>MDF</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLR</td>
<td>CLR</td>
</tr>
<tr>
<td>SET</td>
<td>CLR</td>
</tr>
<tr>
<td>SET</td>
<td>SET</td>
</tr>
</tbody>
</table>

This display shows the status of the 32-Digit Dialling option. When SET, the radiotelephone is able to display and transmit phone numbers up to 32-digits in length. When CLR, the radiotelephone can display and transmit only phone numbers up to 16-digits in length.

- Press the SND key to toggle the status.

This screen shows the status of the Mobile-to-Land Hold-off. This option, when SET, causes the accumulated air-time counter to ignore the first thirty seconds of a mobile-originated call if the call is terminated within this time.

- Press the SND key to toggle the status.

This screen shows the status of the Land-to-Mobile Hold-off option. When SET, this option causes the Accumulated Air-Time counter to ignore the first thirty seconds of a land-originated call if the call is terminated within this time.

- Press the SND key to toggle the status.

This screen shows the status of the Call Round-Up option. When SET, causes the air time to be displayed in hours and minutes with the seconds rounded up to the nearest minute. When CLR, the air time is displayed in hours, minutes and seconds.

- Press the SND key to toggle the status.

This screen displays the status of the No Land-to-Mobile option. The NLM option, when SET, causes the air-time to be saved for mobile-originated calls.

- Press the SND key to toggle the status.

This screen displays the status of the Horn Alert Enable option. When this option is SET, the horn alert feature is enabled; when CLEAR, the horn alert is disabled. With the horn alert enabled, the radiotelephone's missed calls register can be used without the horn alert sounding when calls are received. This option is also accessible by the user through the Menu feature.

- Press the SND key to toggle the status.

This screen shows the status of the On-Line Diagnostic option. The ONL option, when SET, enables the use of On Line Diagnostics.

- Press the SND key to toggle the status.

The parameters wrap around to the beginning.

- Use end to finish this mode.
BILLING MODE

8300

NovAtel
The Billing Mode information utility is used to examine billing and power-down information for the 8300 Radiotelephone. It is also used to reset the internal air-timer and control scratchpad status.

Access Billing Mode by entering a special lock code. Press the O (increase) volume control to advance through each utility. Press the o (decrease) volume control to back-up. Use the following instructions to use each utility. Press the END key to exit the mode:

Lock the radiotelephone (if not already locked)

Enter the billing access code.

Press the O (increase) volume control to advance to the first information screen.

The first of the accumulated air-time screens appears. Press the CE key to clear the contents of the accumulated air-time register. Press any key other than volume, CE or END to advance to the next screen.

An ACC ERR message indicates that the radiotelephone was turned off while a call was in progress. The air-time indication may not be accurate.
This screen displays the telephone number of the radiotelephone. See the Configuration Utility Description for information on changing the telephone number.

This screen displays the tier 1 Lock Code for the radiotelephone. See the Owner's Manual for information on changing the Lock Codes.

- Pressing any key other than volume or END displays a second screen which shows the tier 2 Lock Code.

This screen shows the Invalid System ID numbers that have been set for the radiotelephone. Use any key other than volume or END to display all of the invalid system ID numbers (there can be up to four). The message NONE indicates that there is no number programmed at that location.

This screen shows the Stack Alarm status. Any value other than 1 or 0 indicates a software problem.

The Scratchpad Enable/Disable screen controls the scratchpad memory status. When enabled, the scratchpad operates as described in the Owner's Manual. When disabled, phone numbers cannot be entered on the keypad. Calls can only be made to numbers that can be recalled from memory.

- Toggle the scratchpad status by pressing any key except volume and END.

The Power Down Code screen displays a code that describes the most recent power-down sequence. The codes are:

0 Uncontrolled power down. Usually means an external power loss or external voltage out of range, i.e. less than 7.5 Vdc or greater than 18 Vdc.

1 The ignition switch of the automobile was turned off.

2 The radiotelephone was powered off from the handset.

3 Either the handset was unplugged from the transceiver or the transceiver cannot communicate with the handset.

4 The RF detector inside the transceiver detects RF energy when there should not have been any present. This can be internal to the transceiver (connector or transmitter problem) or the antenna can pick-up signals from other sources.

5 A firmware memory failure

6 Electronic serial number read error.

7 NAM read error.
This screen shows the serial number for the radiotelephone that is encoded in memory. The information is encoded as shown below. The serial number cannot be changed.

- **SERIAL**
- **860XXXXX**

Serial number (in hex)
000000-XXXXXX<FFFE

The Billing Mode rotation starts over from the beginning.
### Installation Diagram

**Note:** Other combinations possible

![Diagram](image)

### 8300 SERIES STANDARD SYSTEMS

#### RULES

1. Only one loudspeaker in the system; either one HFU or CCU or ALT.
2. Total control cable length not to exceed 10 metres.
3. Ensure that control cables FROM the transceiver are not plugged into sockets for the handsets. If this rule is not followed, the person in the vehicle cannot be heard at the other end of the conversation.
4. Unplug power cable at transceiver before adding any new parts to the system.

#### BASIC MODEL

<table>
<thead>
<tr>
<th>XCVR</th>
<th>ATG/ALT</th>
</tr>
</thead>
</table>

#### HANDS-FREE MODEL

<table>
<thead>
<tr>
<th>XCVR</th>
<th>HFU or CCU</th>
</tr>
</thead>
</table>

#### TWO HANDSETS

<table>
<thead>
<tr>
<th>XCVR</th>
<th>SBX</th>
<th>ALT</th>
</tr>
</thead>
</table>

#### TWO HANDSETS

<table>
<thead>
<tr>
<th>XCVR</th>
<th>SBX</th>
</tr>
</thead>
</table>

#### HANDS-FREE AND TWO HANDSETS

<table>
<thead>
<tr>
<th>XCVR</th>
<th>SBX</th>
<th>SBX</th>
</tr>
</thead>
</table>

### DO'S AND DON'TS

The Cellular Mobile Telephone you are about to install is a high tech electronic device that has been designed to provide many years of trouble-free service. This unit has been thoroughly tested before shipment from the factory. Good installation practices are important if the phone is to function properly and provide long service to your customer.

#### DO'S

- a. **DO** bench check operation on phone before installation by hooking up a 12-volt regulated power supply (3-4 AMP rating) and alternate antenna.
- b. **DO** make a test call using the phone as it comes from the factory. The call will not be completed, but expect a recorded message from the phone company.
- c. **DO** connect power cable directly to the battery. **DO** use the fuse provided.
- d. **DO** make good connections when installing the TNC coax connector to the antenna feed line. Use a good quality crimping tool when connecting TNC “crimp-on” connector.
- e. **DO** mount transceiver away from underside exhaust system. **DO** mount cables away from exhaust system, away from sharp edges, and away from high travel areas.
- f. **DO** move vehicle outside the building when making initial “on the air” check. Often buildings with metal construction will shield RF signals and interfere with phone operation.
- g. **DO** check efficiency of antenna operation by using the Bird model 43 wattmeter or equivalent. A poor connection in antenna system will cause erratic operation between “service and no service”, and cause intermittent noise conditions including drop-out. A glass mounted antenna should always be checked for efficient operation with wattmeter.
- h. **DO** check out phone on bench when customer complains of poor operation of the phones before exchanging phone or handset.
- i. **DO** verify that all cables are making good connections and are properly seated on sockets before removing phone or handset from vehicle for bench check.
- j. **DO** verify Electronic Serial Number with the telephone company when customer’s complaint is “too busy”. Experience indicates system operator occasionally makes mistakes when entering ESN on system. Use wattmeter to verify power output if complaint is fast busy.

#### DON'TS

- a. **DON'T** use a 1/4 wave antenna (about 100 mm long) unless mounted on the roof.
- b. **DON'T** splice power cable.
- c. **DON'T** ground power cable to fire wall or any location other than the battery.
- d. **DON'T** attempt internal adjustments to radio.
- e. **DON'T** mount transceiver with heat sink in down position, resting heat sink on floor or on carpeting.
Installation Tool Kit

This list describes a minimum toolkit necessary to install the phone. Certain vehicles will need specific tools peculiar to those vehicles.

1. Phillips Head Screwdrivers.
2. Flat Screwdrivers.
3. 10, 11, 12, 13, 14 mm socket set
4. 10, 11, 12, 13, 14 mm ring and open end spanners.
5. RG58 style connector crimp tools, normal power connector crimp tools, normal power connector crimp tool.
6. Spare TNC RG58 cable crimp connectors.
7. 3, 4.5 mm drill bits.
8. Power drill.
11. PVC tape (BLACK).
12. Cable ties (BLACK).
13. Scotchlocks, solderless cable connectors.
14. Spare 50, 100, 200 mm Handset extensions.
15. Bird 43 wattmeter with 5 w 400-1000 MHz element or telewave thru line wattmeter.
17. Spare relay, connector if horn option is required.

Installation

Introduction

This radiotelephone is easy to install using a few common tools and about two hours of your time. The secret to an excellent installation is planning. Take the time to think through the entire installation, evaluating where each component should go and planning which cable routes to use. There are many different ways to install a radiotelephone in an automobile— one not necessarily being better than the other. To make better decisions, read through this installation guide once to understand what the mounting requirement of each component is. Then layout where each component is to be installed and make sure that all your cables have enough length.

If you are uncertain about how an electrical connection is made or how a component is installed, contact your dealer or distributor for assistance.

Caution!

Be absolutely certain of what is on the other side of a surface before you drill. Typical hazards include electrical wiring, transmission housings, fuel tanks, brake lines, heater cores, etc. Wear eye protection when drilling holes.

For mounting locations where it is necessary to drill through carpet material, the following method is recommended:

1. Punch holes with a small punch.
2. Make a small slit in the carpet, insert a short piece of metal tubing and drill through the tubing.

Electrical connections should be made with no power applied; the connection to the positive battery terminal should be your LAST INSTALLATION STEP.
Installation
Please note the following equipment configuration limitations:

One Hands-Free Unit (HFU) per transceiver. One compact Control Unit (CCU) per transceiver. Do not connect a HFU and a CCU to the same transceiver. Do not use an ALT-300 with a HFU or CCU.

Do not connect or disconnect any peripheral from the transceiver while the ignition line power is on. Damage or incorrect operation of the peripheral could result.

Transceiver
Disconnect the positive lead from the vehicle battery.

Start the installation by mounting the transceiver. Transceivers are usually mounted in the trunk but also can be mounted under a seat, behind the dashboard or inside a cargo compartment. Mark three holes with a punch using the mounting base as a template. Drill three holes suitable for the mounting hardware provided. Refer to the illustration below. Clean away any debris left from the drilling operation. Mount the transceiver in the most convenient orientation on the mounting base.

Secure the mounting base. Use the thick washers to level the mounting base, as needed.

Attach the transceiver. Push the lever as shown. Lock with key. (If fitted.)

Power harness
Route the power harness next. The power harness consists of four wires:

The black wire is ground and connects to the black wire on the power filter. The red wire is the power wire and connects to the red wire on the power filter. The violet wire is the ignition sense. As its name implies, it senses the status of the ignition switch but draws no significant amount of power. It connects to an ignition switch terminal. The yellow wire is the horn alert and connects to the vehicle horn circuit as shown in the horn wiring diagrams on p.71. (This connection is optional.)

Refer to the interconnection diagram at the end of this installation guide. Connect the power harness connector to the transceiver. Route the power harness from the transceiver to the engine compartment (the illustration below shows a typical trunk mount routing). Note that the wires with fuses on them are separate from the main harness. This is so the harness can be passed easily through a small opening in the firewall. You may not want to pass the violet (ignition sense) wire through the firewall if you intend to connect it to a fuse terminal inside the passenger compartment.

Pass wires through grommet separate from other vehicle wires.

Transceiver
Power Cable
Control Cable
Noise Filter
Battery
Roof-Mount SBF or ALT Antenna
Trunk-clip Mount Antenna
Coax antenna wire
Once the harness is routed, connect the wires as follows (refer to the interconnection diagram):

First, connect the short violet ignition sense wire to the accessory or ignition terminal in the fuse box. Attach a suitable terminal to the end of the short violet wire to make the connection. Cut the violet wire in the harness to meet the short violet wire. Connect the two violet wires using the crimp connector provided.

Connect the black wire from the power harness to the short black wire on the noise filter using the crimp connector provided. Connect the long black wire on the filter to the negative battery terminal using the eye connector. Connect one end of the short fused red wire to the battery terminal and the other end to the orange noise filter wire using the crimp connector. Connect the red wire from the transceiver to the red wire of the filter.

The noise filter is not necessary with the model 8305 telephone, but can be used if desired.

Horn alert feature
The yellow wire in the power harness provides a path to ground in the transceiver when the radiotelephone's bell circuit is activated, thereby sounding the horn when a call is received. If you are not going to use this feature, coil up the yellow wire and fasten it out of the way. If you are going to use the horn alert, it will be necessary first to install a horn relay. As indicated in the illustrations below, the horn relay contacts are installed in the same line as the existing horn button. It is recommended that the horn relay you install be equipped with a 1N4001 diode, or equivalent, to prevent spiking to the transceiver. Connect one terminal of the relay coil to the yellow transceiver wire and the other terminal, through a fuse, to the positive battery terminal. If the vehicle ignition must be on for the horn to sound, then it will be necessary to wire a bypass around the ignition switch.
SBX-300 Junction box
Mount the SBX-300 junction box in a location that provides easy control cable connection and access. If you are going to be using a handset, make sure that the SBX-300 location provides suitable handset cord length (extension cables for the handset cord are available from your dealer). Drill a suitable mounting hole. Remove the paper from the adhesive backing on the SBX-300. Insert the screw provided through the hole in the centre of the SBX-300 and tighten.

ALT-300 Junction box
Mount the ALT-300 junction box in a location that provides easy control cable connection and access. Make sure that the ALT-300 location provides suitable handset cord length. Drill suitable mounting holes and install the ALT-300 as shown.

ATG-300 Alert Tone Generator
The ATG-300 alert tone generator can be used in place of the ALT-300 alert tone speaker, as indicated on the 8301/8300 Interconnection Diagram. Allow enough room for the handset cord to stretch comfortably to the user's ear and ensure that the speaker is in an unobstructed line with the user. Mount the ATG-300 on one of the mounting plates provided, depending on which of the two mounting configurations (illustrated below) is chosen.

1. Stand-alone mounting
Use two machine screws to attach the base plate to the alert tone generator.
Use the self-tapping screw to attach the ATG/base plate assembly to a sound surface in the vehicle.

Ensure that the prongs on the base plate projection face downward. This will prevent twisting of the assembly.

2. Mounting with swivel
Remove the cradle/swivel (if already mounted).
Use two machine screws to attach the base plate to the alert tone generator.
Clamp the projection from the base plate under the cradle/swivel.
Control cable
Connect one end of the control cable to the SBX-300 (or ALT-300). Run the cable beneath the carpet (along one side of the driveline/exhaust tunnel is a good location) to the transceiver (if you have to pull the cable at all, wrap some tape around the connector to prevent it from catching and breaking). Coil any excess cable and connect the other end of the cable to the transceiver. If a longer control cable is required, contact your dealer.

Handset cord
Control cable (to transceiver)

Handset
Mount the handset as shown in the diagram. If required, use the right angle bracket. Make sure that the handset does not interfere with the operation of any controls, sliding seats, glovebox doors, etc. Rotate the collar on the swivel to adjust the degree of effort required to reposition the handset. Connect the handset cord to the SBX-300 (or ALT-300), (ATG-300). If necessary the swivel may remove and the Cradle fitted directly to the right angle bracket.

Compact Control Unit (CCU)
The CCU is best installed close to your line of sight so you don't have to look too far away from the road when you want to use it. Mount the CCU as shown in the diagram. Connect a length of control cable from the SBX to the connector on the side of the CCU. Install the SPK-300 next finding a location where it is out of the way but can still be heard easily. Connect the speaker cable to the speaker connector on the CCU. If you plan to use the optional extension microphone with the CCU, install it now connecting it to the microphone connector.
Hands-Free Unit
The Hands-Free Unit (HFU) does not have to be accessed once it is installed so you can locate it out of sight (under the instrument panel, center console, etc) using the supplied bracket. Refer to the Diagram. Install the SPK-300 finding a location where it is out of the way but can still be heard easily. Connect the speaker cable to the speaker connector on the HFU.

HFU Microphone placement
The microphone should be mounted in a quiet, vibration-free location away from heavy air flow, for example on the roof near the rear view mirror. Other good locations include on top of the dash or under the crash pad. The foam mount may be attached directly to the vehicle interior or to the microphone clip. The microphone should not be in a direct line with the SPK-300 speaker. Connect the microphone cable to the microphone connector on the HFU.

Antenna Connection
Use only antennas recommended by your dealer for use with your radiotelephone! Install the selected antenna using the instruction supplied with it.

Connect the antenna TNC connector to the antenna connector on the transceiver. Shown below are some sample antenna mounting locations.

Glass-mount with gain type antenna.

Centre of trunk through hole mount with gain type antenna.

Follow fitment instructions supplied with the antenna kit.
NovAtel Trouble Shooting Guide

Initial Phone Diagnostics Using Telecom's Recorded Messages

1. Telecom Message

'The number you have called is not available from this service. To enquire about the numbers available, please call your Telecom business office.'

Possible Fault

a. Incorrect configuration – check for the correct phone number programmed into phone.

b. Telecom have not validated phone, or they have validated incorrect information.

2. Telecom Message

Fast busy ('Beep Beep Beep')
The phone is being denied access by Telecom.

a. This could either be a phone or Telecom fault.

Program test number 'A' into the phone (via configuration) see p79 for your area test number.

Initiate phone call eg. 1194, or to test number 'B' for your area.

Telecom Message

'The number you have called is not available from this service. To enquire about the numbers available, please call your Telecom business office.'

b. This recording shows there are no faults with the mobile phone – the fault is at Telecom's end i.e., incorrect phone number or serial No.

Telecom Message

Fast Busy ('Beep Beep Beep')
This implies the mobile phone has a fault i.e., transceiver or antenna problem. Check programming. Check for proper ESN. Check number registrations with Telecom. If a test call cannot be completed substitute a known working transceiver with a test number into the vehicle and make a test call for system intercept. Check antenna. Program a test number into unit and check for recorded message.

Australian Test ‘A’ Numbers

<table>
<thead>
<tr>
<th>City</th>
<th>Test ‘A’ Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney</td>
<td>5050 22 52 00</td>
</tr>
<tr>
<td>Brisbane</td>
<td>5050 72 28 91</td>
</tr>
<tr>
<td>Adelaide</td>
<td>5050 82 06 50</td>
</tr>
<tr>
<td>Melbourne</td>
<td>5050 31 13 91</td>
</tr>
<tr>
<td>Hobart</td>
<td>5050 12 02 50</td>
</tr>
<tr>
<td>Darwin</td>
<td>5050 89 33 91</td>
</tr>
</tbody>
</table>

Test ‘B’ Numbers

<table>
<thead>
<tr>
<th>City</th>
<th>Test ‘B’ Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney</td>
<td>018 201 399</td>
</tr>
<tr>
<td>Brisbane</td>
<td>018 701 399</td>
</tr>
<tr>
<td>Adelaide</td>
<td>018 801 399</td>
</tr>
<tr>
<td>Melbourne</td>
<td>018 301 399</td>
</tr>
<tr>
<td>Hobart</td>
<td>018 101 399</td>
</tr>
<tr>
<td>Darwin</td>
<td>018 80 1399</td>
</tr>
</tbody>
</table>

Problem Description

No power-up (wake up)

Possible Remedy

Check all fuses, power and ignition connections. Substitute known working transceiver and/or control unit in vehicle.

Powers down during all processing.

Intermittent power-up/power-down.

Check all power connections. If possible read power-down code in Billing Mode. Substitute known working control unit and/or transceiver.

No transmit audio

Reverse hands free and control unit connections on the SBX-300. Substitute HF mic. Check to ensure the transceiver and control unit are connected to the appropriate socket on the SBX-300 or the ALT-300. Check all cables, remake all cable connections. Try control unit directly into transceiver. Substitute known working control unit and/or transceiver.
<table>
<thead>
<tr>
<th>Problem Description</th>
<th>Possible Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermittent transit audio</td>
<td>Control unit must be initialised on cradle. Plug control unit directly into the transceiver. Check all data cables and connections. Substitute known working control unit and/or transceiver.</td>
</tr>
<tr>
<td>No Service – will not go ready</td>
<td>Check programming (INVLD SID TABLE). Substitute known good transceiver.</td>
</tr>
<tr>
<td>Backlighting stays on – No power-up/power-down.</td>
<td>Remove main power for approximately 30 sec, reconnect and check out. Check all power and data cable connections. Plug the control unit directly into the transceiver. Check the voltage on the Red and Violet wires relative to ground. Substitute known working control unit and/or transceiver.</td>
</tr>
<tr>
<td>Phone number does not appear on the display – tones are present.</td>
<td>Check &quot;SCRATCH PAD ENABLE/DISABLE&quot; in the Billing Entry mode. Substitute a known working control unit and/or transceiver.</td>
</tr>
<tr>
<td>Control Unit, transceiver or other peripheral drawing excess current.</td>
<td>Check all power connections and fuses. Check all data and power cables for pinches or cuts which may cause a short. Replace damaged device and check out. Substitute a known working control unit and/or transceiver.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem Description</th>
<th>Possible Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will make calls but will not receive calls.</td>
<td>Check programming. Ensure correct telephone number is used. Change location of vehicle. Substitute a known working registered transceiver into the vehicle. Usually a system problem. Check if &quot;INCOMING CALLS ONLY&quot; has been selected with Access Control.</td>
</tr>
<tr>
<td>Cannot make long distance or information calls, display shows ACCESS DENIED.</td>
<td>Unlock unit with tier 1 lock code. If not known use billing entry to read the lock codes. Substitute known working transceiver.</td>
</tr>
<tr>
<td>Unit drops calls or excessive static during call processing.</td>
<td>Possible system problem or unit in bad service area. Substitute antenna and drive vehicle to suspect area to see if problem persists. Substitute a known working registered transceiver and repeat test.</td>
</tr>
<tr>
<td>Corrupted ESN or ESN reads incorrectly into system or simulator.</td>
<td>Replace the transceiver.</td>
</tr>
<tr>
<td>Partial backlighting on control unit.</td>
<td>Replace control unit.</td>
</tr>
<tr>
<td>Unit initialises during programming.</td>
<td>Check all power and data cable connections. Substitute control unit and/or transceiver with known working units.</td>
</tr>
<tr>
<td>Control unit display changes system preference or roam indicator illuminates on display incorrectly during call processing.</td>
<td>Replace transceiver.</td>
</tr>
</tbody>
</table>
Problem Description | Possible Remedy
--- | ---
Keypad buttons stick on control unit. | Replace control unit.
Partial loss of display segments in control unit. | Remove main power from transceiver for 30 seconds, connect power and retry for correct display. Substitute known working control unit and/or transceiver.
No speaker audio. Control unit has earpiece audio. | Remove main power from the transceiver for 30 seconds, connect and retry. If hands free is used replace SPK-300 and re-test. Replace hands free with power removed and re-test. If no hands free is used remove main power and replace ALT-300 and test. Substitute a known working control unit, hands free, cradle or data cables.
No control unit earpiece audio. Unit has speaker audio. | Check all cable connections. Remove main power for 30 seconds and retry. Substitute known working control unit, transceiver and/or cradle and re-test.
No speaker or control unit earpiece receive audio. | Check all data cables and connections. Remove the main power for 30 seconds. Reconnect power and re-test. Substitute known working data cables, hands free (if equipped), control unit, ALT-300 SPK-300 and/or transceiver.
Intermittent or no control unit back-lighting. | With unit powered-up, press and hold the FCN and the volume up/down keys. Check all data and power connections. Substitute known working control unit and/or transceiver.

Problem Description | Possible Remedy
--- | ---
Distorted transmit audio. | Substitute known working control unit, hands free, hands free microphone, ALT-300 and/or transceiver.
Distorted receive audio. | Substitute known working control unit, hands free, ALT-300, SPK-300 and/or transceiver.
Insufficient transmit audio. | Check ALT-300/SBX-300 connections are correct. Substitute known working control unit, hands free (if equipped), hands free microphone, ALT-300/SBX-300 and/or transceiver.
Insufficient receive audio. | Increase volume settings. Substitute known good hands free (if equipped), SPK-300, ALT-300 and/or transceiver.
Partial loss of keypad action (loss of row or column). | Substitute known working control unit and re-test.
Unit goes into LOCKED on power-up. | Both lock codes may be the same, change one lock.
No Service. | Bad antenna connection, check for shorts.
Buzz in speaker which changes with engine speed. | Make sure that power filter is connected. Route cables away from ignition leads.
Horn Alert Inoperative | Make sure horn function is selected and ignition is off. Ground the yellow lead, the horn must function. Replace transceiver.
### TNC CRIMP CONNECTOR ASSEMBLY INSTRUCTIONS

<table>
<thead>
<tr>
<th>Component</th>
<th>Symbol</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crimp Sleeve</td>
<td><img src="image" alt="Crimp Sleeve" /></td>
<td>Trim cable to dimensions shown, taking care not to nick the inner conductor or the braid.</td>
</tr>
<tr>
<td>Contact</td>
<td><img src="image" alt="Contact" /></td>
<td>Slip crimp sleeve over cable, Place inner conductor into contact. Note that the end of contact and inner dielectric must be butting and square. Crimp with appropriate tooling.</td>
</tr>
<tr>
<td>Connector Housing</td>
<td><img src="image" alt="Connector Housing" /></td>
<td>Fill outer braid and gently but firmly push the contact into the connector housing until a gentle snap is felt, indicating the contact is in place. Slip the crimp sleeve in place, butting the flange against the connector housing, and crimp with appropriate tooling.</td>
</tr>
</tbody>
</table>

1. Check that no shorts exist between inner conductor and the outer. If using glass antenna, unscrew connector from sender unit before testing.
2. Check continuity to antenna and to earth.

---

### SYDNEY AREA

District Telecommunications Manager  
Sydney City D.T.B.  
GPO Box 7045  
Sydney 2001  
Attention: Special Products Group  

Telephone: (02) 234 1311  
Facsimile: (02) 235 0817  
Telex: AA70293

### MELBOURNE AREA

Customer Services Section  
Business Terminals Branch  
Commercial Department  
Telecom Australia  
7th Floor  
219 Elizabeth St  
Melbourne 3000  

Telephone: (03) 605 6428  
Facsimile: (03) 670 6099  
Telex: AA152723

### BRISBANE AREA

Officer in Charge  
Mobile Service Centre  
188 Vulture Street  
South Brisbane 4001  

Telephone: (07) 837 2821  
Facsimile: (07) 844 1848  
Telex: AA140086

### ADELAIDE AREA

Mobile Products Service Centre  
Business Systems Branch  
46 King William Street  
Kent Town  
South Australia 5067  

Telephone: (08) 42 9283  
Facsimile: (08) 363 0038  
Telex: AA89411

### HOBART AREA

Business Systems Branch  
1/80 Elizabeth Street  
Hobart Tasmania 7000  

Telephone: (02) 20 6800  
Facsimile: (02) 20 8129  
Telex: AA58123

### DARWIN AREA

Telecom Mobile Products  
PO Box 1134  
Darwin NT 5794  

Telephone: (089) 81 7366  
Facsimile: (089) 83 3332

### WOLLONGONG AREA

Business Sales Manager  
PO Box 1787  
Wollongong NSW 2500  

Telephone: (02) 28 2680  
Facsimile: (02) 29 2000  
Telex: AA29023

### NEW ZEALAND

Secular Communications Ltd  
153 Nelson Street  
Auckland  

Telephone: (09) 789 770, 797 195  
Facsimile: (09) 778 797

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**Note:**  
* Request must be typed with owners signature.  
* A telex or phone call is not acceptable.  
* Approximately two days should be allowed for Telecom processing.  
* If validation request is sent via facsimile the original MUST be mailed to Telecom within 5 working days.
### Appendix 1

**SIDH, System Identification Code and #MIN1, #MIN2 Numbering.**

<table>
<thead>
<tr>
<th>City</th>
<th>Code</th>
<th>MIN1</th>
<th>MIN2</th>
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<tbody>
<tr>
<td><strong>Australia</strong></td>
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</tr>
<tr>
<td>Adelaide</td>
<td>08329</td>
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<tr>
<td>Albury/Wodonga</td>
<td>08365</td>
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<tr>
<td>Brisbane</td>
<td>08327</td>
<td>MIN1</td>
<td>089 XXX</td>
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<tr>
<td>Buniny</td>
<td>08347</td>
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<td></td>
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<tr>
<td>Campbelltown</td>
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<tr>
<td>Canberra</td>
<td>08339</td>
<td></td>
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</tr>
<tr>
<td>Darwin</td>
<td>08333</td>
<td>MIN1</td>
<td>08X XXX</td>
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<tr>
<td>Devonport</td>
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<tr>
<td>Geelong</td>
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<tr>
<td>Hobart</td>
<td>08355</td>
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<td></td>
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<tr>
<td>Iron Triangle</td>
<td>08345</td>
<td></td>
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</tr>
<tr>
<td>Launceston</td>
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<tr>
<td>Melbourne</td>
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<tr>
<td>Mornington</td>
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<tr>
<td>Noosa</td>
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<tr>
<td>Nowra</td>
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<tr>
<td>Parramatta</td>
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<tr>
<td>Rockhampton</td>
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<tr>
<td>Sydney</td>
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<td>Toowoomba</td>
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<tr>
<td>Townsville</td>
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<tr>
<td><strong>New Zealand</strong></td>
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</tr>
<tr>
<td>Auckland</td>
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<td>MIN1</td>
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<tr>
<td>Christchurch</td>
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<tr>
<td>Wellington</td>
<td>08581</td>
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</table>

### Appendix 2

**ABBREVIATIONS used in the Electronics Industry.**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
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</thead>
<tbody>
<tr>
<td>AC</td>
<td>Access Channel/Alternating Current</td>
</tr>
<tr>
<td>BHCA</td>
<td>Busy Hour Call Attempts</td>
</tr>
<tr>
<td>BOM</td>
<td>Bill of Materials</td>
</tr>
<tr>
<td>BS</td>
<td>Base Station</td>
</tr>
<tr>
<td>CAD</td>
<td>Computer Aided Design</td>
</tr>
<tr>
<td>CCITT</td>
<td>International Telegraph and Telephone Consultative Committee</td>
</tr>
<tr>
<td>CPU</td>
<td>Central Processing Unit of computer</td>
</tr>
<tr>
<td>DTMF</td>
<td>Dual Tone Multi-Frequency (dialling signalling)</td>
</tr>
<tr>
<td>DOC</td>
<td>Department of Communications</td>
</tr>
<tr>
<td>dB</td>
<td>Decibel (ratio of electrical quantities)</td>
</tr>
<tr>
<td>dBm</td>
<td>Decibel with ref. to 1 milliwatt</td>
</tr>
<tr>
<td>dBmO</td>
<td>Decibel with ref. to normalised level</td>
</tr>
<tr>
<td>dBmOp</td>
<td>Decibel with ref. to normalised level psophometric weighted</td>
</tr>
<tr>
<td>dBu</td>
<td>Decibel with ref. to 1 microvolt</td>
</tr>
<tr>
<td>EIA</td>
<td>Electronic Industries Association (USA)</td>
</tr>
<tr>
<td>EMF</td>
<td>Electromotive Force ignoring equivalent impedances</td>
</tr>
<tr>
<td>FCC</td>
<td>Federal Communications Commission (USA)</td>
</tr>
<tr>
<td>FM</td>
<td>Frequency Modulation</td>
</tr>
<tr>
<td>GPIB</td>
<td>IEEE-488 Interface Standard</td>
</tr>
<tr>
<td>HMSG</td>
<td>Home Mobile Switching Centre</td>
</tr>
<tr>
<td>MTS</td>
<td>Mobile Telephone System (Telecom's old system)</td>
</tr>
<tr>
<td>MSSC</td>
<td>Mobile Services switching centre</td>
</tr>
<tr>
<td>NMT</td>
<td>Nordic Mobile Telephone System</td>
</tr>
<tr>
<td>PC</td>
<td>Paging Channel/Personal Computer</td>
</tr>
<tr>
<td>PSTN</td>
<td>Public Switched Telephone Network</td>
</tr>
<tr>
<td>SAT</td>
<td>Supervisory Audio Tone (cellular system)</td>
</tr>
<tr>
<td>SIDH</td>
<td>System Identification Code (cellular systems)</td>
</tr>
<tr>
<td>SMD</td>
<td>Surface Mount Devices</td>
</tr>
<tr>
<td>SMT</td>
<td>Surface Mount Technology</td>
</tr>
<tr>
<td>SPC</td>
<td>Stored Programme Control</td>
</tr>
<tr>
<td>TACS</td>
<td>Total Access Communications System</td>
</tr>
<tr>
<td>UHF</td>
<td>Ultra High Frequency band, Cellular, TV etc.</td>
</tr>
<tr>
<td>VC</td>
<td>Voice Channel</td>
</tr>
<tr>
<td>VLSI</td>
<td>Very Large Scale Integration</td>
</tr>
<tr>
<td>VMSC</td>
<td>Visited Mobile Services Switching Centre</td>
</tr>
<tr>
<td>Z</td>
<td>Impedance (similar to resistance but for AC quantities)</td>
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</tbody>
</table>