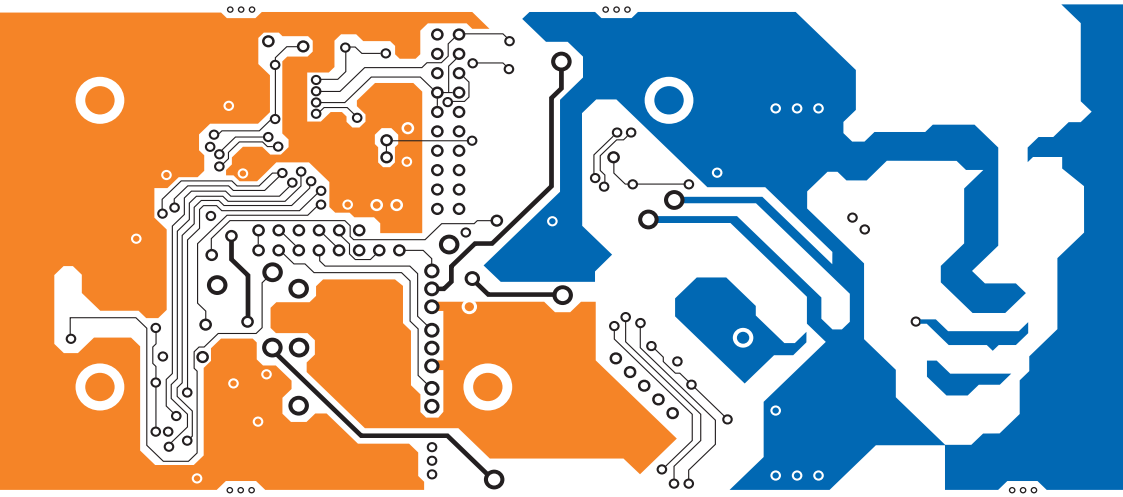
CODAN

NGT Transceiver

HF RADIO COMMUNICATIONS



GETTING STARTED GUIDE

Codan part number 15-04127-EN Issue 6, June 2005

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Introduction

Thank you for purchasing a Codan NGT Transceiver. With this great product and Codan's supreme after-sales support, you can look forward to many years of clear and reliable HF communication. Please read this guide thoroughly and retain it for future reference. There is an index at the end of this guide to assist you in finding information.

Overview of this guide

This guide provides instructions on how to connect up your NGT *AR*, *SR*, *AR Voice*, or *VR* Transceiver, and how to perform basic setup and operating tasks. It assumes that you have limited knowledge of HF communication and of using an HF transceiver.

Extensive reference material is provided on the CD at the back of this guide.

This guide contains the following sections:

Section 1 NGT transceiver compliance—provides compliance information and safety notices for your transceiver

Section 2 Installation—explains briefly how to connect the components of your transceiver

Section 3 The handset—describes the handset and the function of items on the handset

Section 4 Getting started—explains how to use the basic operating features of your transceiver

Appendix A Entering and editing text—explains how to enter and edit text in editable screens

Appendix B Using Quick Start—explains how to use the Quick Start feature, if enabled

Appendix C Using a GPS receiver—explains the information provided by the GPS receiver, if fitted

Appendix D Transceiver specifications—provides the common operational specifications of the transceiver

Appendix E HF radio transmission—describes the medium of HF communication and how to use it effectively

Appendix F Definitions—explains the terms and abbreviations used in this guide

Accessing the CD

To access the CD:

- ❑ Place the CD in the CD drive of your computer.

  The CD will automatically launch the NGT Transceiver Reference Manual as a fully text-searchable HTML help file.

1 NGT transceiver compliance

This section contains the following topics:

Introduction

This section describes how to ensure the NGT transceiver complies with the European Electromagnetic Compatibility Directive 89/336/EEC and the European Low Voltage Directive 73/23/EEC as called up in the European Radio and Telecommunications Terminal Equipment Directive 1999/5/EC.

The CE Declarations of Conformity and Expert Letters of Opinion for the product range are listed on page 77, *Associated documents*. These documents can be made available upon request to Codan or a Codan-authorised supplier.

This section also contains the requirements for FCC compliance.

European Radio and Telecommunications Terminal Equipment Directive

The NGT transceiver product range has been tested and complies with the following standards and requirements (articles of the R&TTE Directive):

- Article 3.1b: ETSI EN 301 489-1
- Article 3.1b: ETSI EN 301 489-15
- Article 3.2: Australian type approval according to ECR 209
- Article 3.1a: assessed against ICNIRP and FCC requirements
- Article 3.1a: EN 60950

Product marking and labelling

Any equipment supplied by Codan that satisfies these requirements is identified by the CE 0191 !, CE 0191 or CE markings on the model label of the product.

Declaration of Conformity and Expert Letter of Opinion

The CE Declarations of Conformity and Expert Letters of Opinion for this product range are listed on page 77, *Associated documents*. These documents can be made available upon request to Codan or a Codan-authorised supplier.

Protection of the radio spectrum

CAUTION

Most countries restrict the use of HF radio communications equipment to certain frequency bands and/or require such equipment to be licensed. It is the user's responsibility to check the specific requirements with the appropriate communications authorities. If necessary, contact Codan for more information.

Electromagnetic compatibility and safety notices

Radiation safety

To ensure optimal transceiver performance and to avoid exposure to excessive electromagnetic fields, the antenna system must be installed according to the instructions provided.

WARNING

High voltages exist on the antenna during transmission and tuning. Do not touch the antenna during these activities. RF burns may result.

WARNING

Install the grounding system or counterpoise as directed to prevent RF burns from any metal part of the transceiver.

WARNING

You should not transmit from your transceiver or tune the antenna unless people are beyond the safe working distance of:

- 1.5 m (5 ft) of any part of a mobile antenna
- 2 m (7 ft) of any part of a fixed antenna in a data installation of up to 125 W output
- 5 m (17 ft) of any part of a fixed antenna in a data installation of up to 1 kW output

Safe working distance is based on continuous exposure to CW type transmissions, as set out in the ICNIRP Exposure Guidelines (1998) for occupational exposure. Safe working distance can be reduced with normal voice communication.

Electromagnetic compatibility

To ensure compliance with the EMC Directive is maintained, you must:

- ❑ Use standard shielded cables supplied from Codan (where applicable).
- ❑ Ensure the covers for the equipment are fitted correctly.

  CAUTION — If it is necessary to remove the covers at any stage, they must be refitted correctly before using the equipment.

- ❑ Cover unused connectors on the junction box (if fitted) and RF unit with the protective caps supplied to prevent electrostatic discharge passing through your NGT equipment.

Electrical safety

To ensure compliance with the European Low Voltage Directive is maintained, you must install and use the NGT transceiver in accordance with the instructions in the *NGT Transceiver Getting Started Guide* and the *NGT Transceiver Reference Manual*.

When using equipment that is connected directly to the AC mains these precautions must be followed and checked before applying AC power to the unit:

- ❑ Use the standard AC mains cable supplied.
- ❑ Ensure the covers for the equipment are fitted correctly.

CAUTION

If it is necessary for a qualified electronics technician to remove the covers during servicing, they must be refitted correctly before using the equipment.

WARNING

A protective earth connection must be included in the mains wiring to the 3020 Transceiver Supply (see below, *Earth symbols*).

The protective cover must always be fitted when the 3020 Transceiver Supply is connected to the AC mains.

Earth symbols

Chassis earth connection points are provided on the NGT transceiver and 3020 Transceiver Supply. A protective earth is provided in the AC mains wiring of the 3020 Transceiver Supply. This protective earth needs to be connected at the AC mains supply outlet. The symbols shown in Table 1 are used to identify the earths on the equipment.

Table 1: Earth symbols

Symbol	Meaning
	Chassis earth
	Protective earth

FCC compliance

FCC Part 90 certification

The NGT *SR* Transceiver has been tested and certified to FCC Part 90 (FCC identifier code DYYNGT-1).

FCC Part 15 compliance

Any modifications made to the NGT *SR* Transceiver and 3020 Transceiver Supply that are not approved by the party responsible for compliance may void your equipment's compliance under Part 15 of the FCC rules.

The NGT *SR* Transceiver and 3020 Transceiver Supply have been tested and found to comply with the limits for a Class B device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by switching the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient or relocate the receiving antenna
- increase the separation between the equipment and receiver
- connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- consult the dealer or an experienced radio/TV technician for help

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2 Installation

This section contains the following topics:

Mobile stations for NGT *AR*, *SR*, *AR Voice*, and *VR* Transceivers

A mobile NGT station typically consists of:

- a handset and cradle
- a junction box (NGT *AR* and *SR* Transceivers only)
- a speaker
- an RF unit and vehicle mounting cradle (includes DC power cable)
- a 12 V DC power supply (battery)
- an automatic tuning antenna

Figure 1 on page 15 shows a typical mobile NGT *AR* or *SR* station.

Figure 2 on page 16 shows a typical mobile NGT *AR Voice* or *VR* station.

Figure 1: Typical mobile NGT *AR* or *SR* station

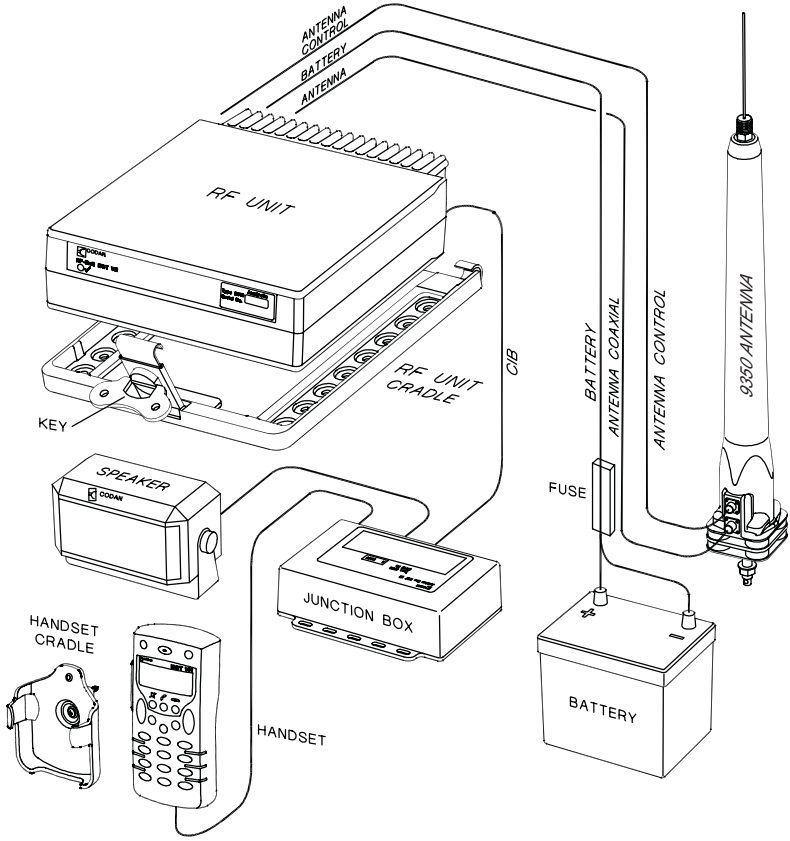
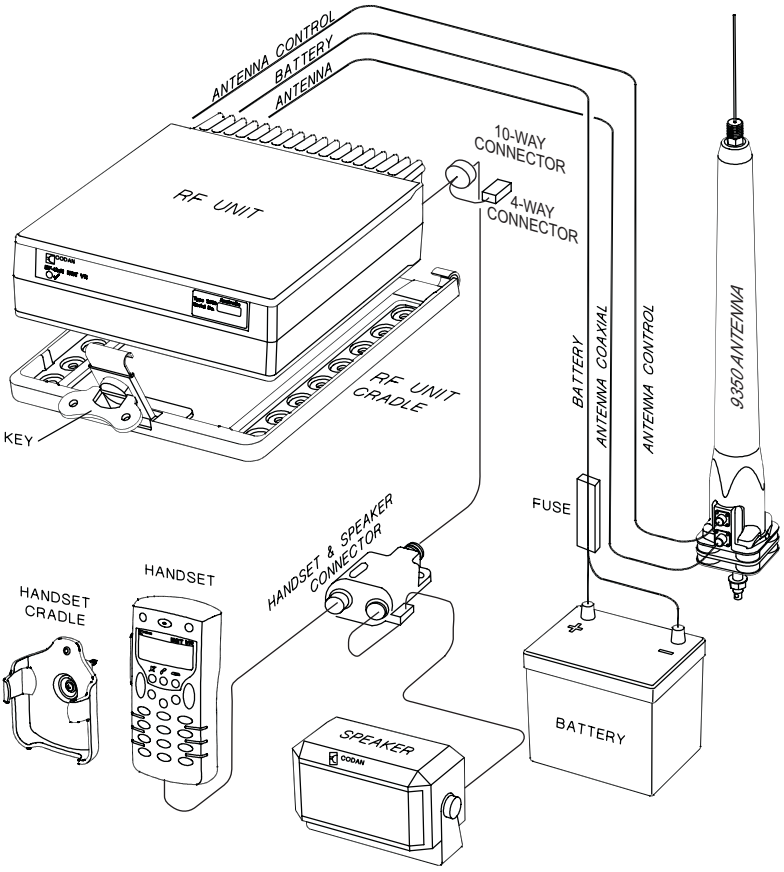


Figure 2: Typical mobile NGT *AR Voice* or *VR* station



Cables

Table 2: Cables for a typical mobile NGT station

Cable	Symbol	Part number
CIB cable between RF unit and junction box[a] (NGT *AR* and *SR* Transceivers only)		08-05610-006
Handset and speaker connector cable[b] (NGT *AR Voice* and *VR* Transceivers only)		08-06022-001
Coaxial cable between RF unit and antenna[c]		08-01503-006
Control cable between RF unit and antenna[c]		08-05627-006
DC power supply cable[b]		08-03255

a. The part number for this cable corresponds to a standard 6 m CIB cable. The cable is also available in a number of shorter and longer lengths.
b. The part number for the cable corresponds to a standard 6 m cable.
c. The part number for the cable corresponds to a standard 6 m cable. The cable is also available in a number of shorter and longer lengths.

Mounting a mobile NGT station

Most components of a mobile NGT *AR*, *SR*, *AR Voice*, and *VR* station are provided with their own mounting cradles. For general guidance on suitable locations for equipment and installing these stations see the reference material on the enclosed CD.

Mounting the handset cradle

To mount the handset cradle:

- ❑ Mount the handset according to the fitting instructions (Codan part number 15-00129-001) provided with the handset cradle.

Mounting the speaker

To mount the speaker:

- ❑ Secure the mounting cradle to the surface with at least two screws.

  Ensure there is sufficient space at the rear for the cable.

- ❑ Attach the speaker to the cradle with the two screws and rubber washers.

Mounting the junction box (NGT *AR* and *SR* Transceivers only)

To mount the junction box:

- ❑ Use cable ties or screws to secure the junction box in a suitable location.

Mounting the handset and speaker connector (NGT *AR Voice* and *VR* Transceivers only)

To mount the handset and speaker connector:

- ❑ Use cable ties or screws to secure the handset and speaker connector in a suitable location.

Mounting the RF unit

WARNING

If you are transferring a fixed station to a mobile station and you have installed rubber feet to the bottom of the RF unit, you must remove the rubber feet before installing it into the mounting cradle.

To mount the RF unit:

- ❑ Secure the mounting cradle to the surface with at least four screws, one in each corner of the cradle.

  NOTE

  Ensure there is sufficient space at the rear of the cradle to clear the RF unit heatsink.

- ❑ If the key is locked to the base of the cradle, flip the key away from the base until it can be rotated (see Figure 1 on page 15), then rotate the key in a counterclockwise direction.
- ❑ Place the RF unit into the cradle and push it under the tabs at the rear of the cradle, then hold the clamp against the front of the RF unit.
- ❑ Rotate the key clockwise, then push the key toward the base of the cradle to lock the RF unit into position.

Connecting a mobile NGT station

Connecting a mobile NGT *AR* or *SR* station

To connect a mobile NGT *AR* or *SR* station:

- ❑ Connect the plug of the handset cable to the socket on the junction box, then secure the locking ring tightly into position.
- ❑ Connect the plug at the end of the speaker cable to the socket on the junction box.
- ❑ Connect the socket at the end of the cable to the plug at the end of the cable lead from the RF unit, then secure the locking ring tightly into position.
- ❑ Connect the socket at the opposite end of the cable to the plug on the junction box, then secure the locking ring tightly into position.
- ❑ Connect the plug at the end of the cable to the socket at the end of the cable lead from the RF unit, then secure the locking ring tightly into position.
- ❑ Connect the plug at the opposite end of the cable to the socket located at the base of the antenna, then secure the locking ring tightly into position.

Connecting a mobile NGT *AR Voice* or *VR* station

To connect a mobile NGT *AR Voice* or *VR* station:

- ❑ Connect the socket at the end of the handset and speaker connector cable to the 10-way plug on the cable lead from the RF unit, then secure the locking ring tightly into position.
- ❑ Connect the plug of the handset cable to the socket on the handset and speaker connector, then secure the locking ring tightly into position.
- ❑ Connect the plug at the end of the speaker cable to the socket on the handset and speaker connector, then secure the cable by pushing it into the slot on the side of the connector (see Figure 2 on page 16).
- ❑ Connect the plug at the end of the cable to the socket at the end of the cable lead from the RF unit, then secure the locking ring tightly into position.
- ❑ Connect the plug at the opposite end of the cable to the socket located at the base of the antenna, then secure the locking ring tightly into position.

Connecting the control cable to an automatic tuning antenna

To connect the control cable:

- ❑ Connect the socket at the end of the cable into the plug at the base of the antenna, then secure the locking ring tightly into position.
- ❑ Fit the plug at the opposite end of the cable into the socket at the end of the lead from the RF unit.

Connecting the power supply

To connect the transceiver to the battery power supply:

- ❑ Connect the power supply cable (Codan part number 08-03255) to the plug at the end of the 12 V cable lead from the RF unit.
- ❑ Route the power supply cable according to the instructions supplied with the Vehicle Installation Kit (Codan part number 15-00112).
- ❑ Insert the 32 A fuse and holder in the power supply cable at a convenient location, as close as possible to the battery terminals.
- ❑ Connect the power supply cable to the battery terminals, black to negative, red to positive.

Connecting ancillary equipment

The NGT *AR* and *SR* Transceiver mobile systems use the junction box for connecting to ancillary equipment.

The 4-way connector on the RF unit of the NGT *AR Voice* Transceiver is available for connecting a GPS receiver.

Fixed stations for NGT *AR*, *SR*, *AR Voice*, and *VR* Transceivers

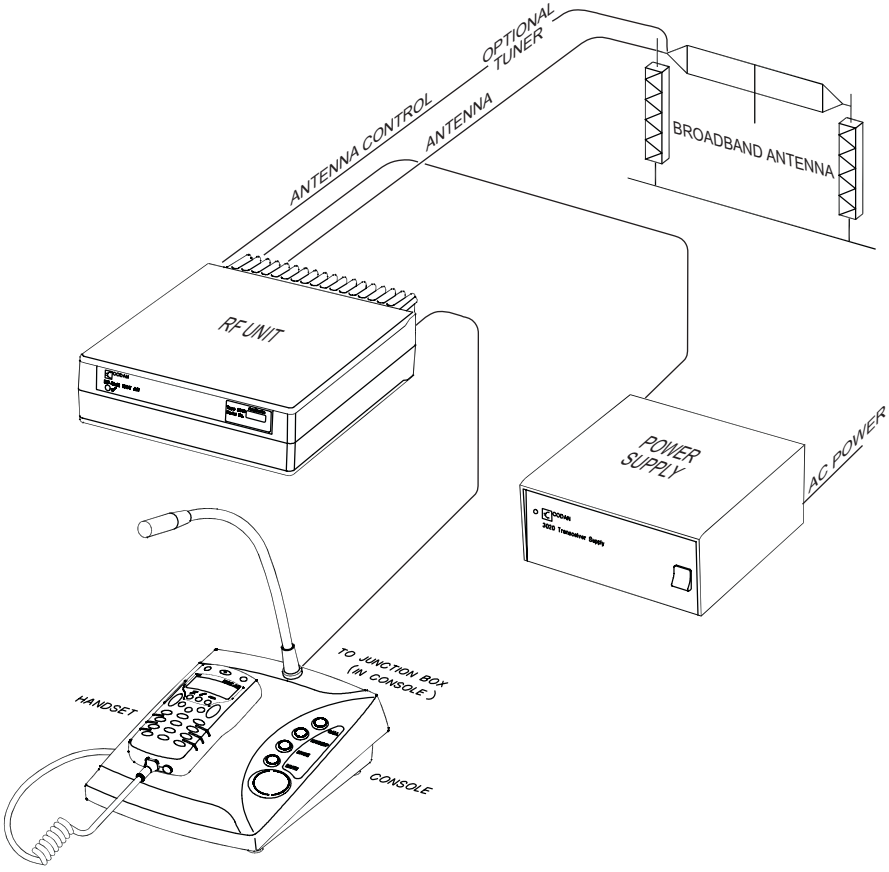
A fixed NGT station typically consists of:

- a desk console, containing a handset, a goose-neck microphone, a junction box, and a speaker (NGT *AR* and *SR* Transceivers only)
- a handset and cradle (NGT *AR Voice* and *VR* Transceivers only)
- a speaker (NGT *AR Voice* and *VR* Transceivers only)
- an RF unit
- an AC transceiver supply
- a suitable fixed antenna (see the reference material on the enclosed CD)

Figure 3 on page 24 shows a typical fixed NGT *AR* or *SR* station.

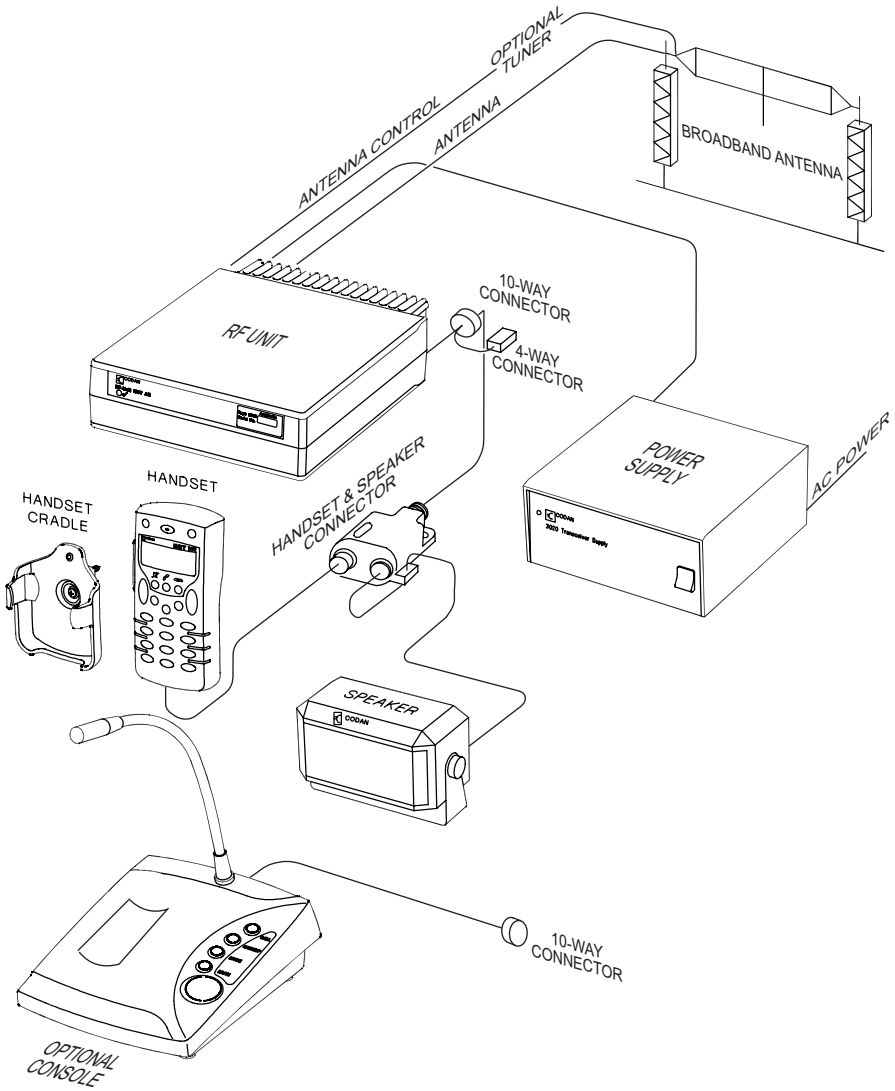
Figure 4 on page 25 shows a typical fixed NGT *AR Voice* or *VR* station.

Figure 3: Typical fixed NGT *AR* or *SR* station



NOTE The junction box is fitted inside the desk console. The connectors on the junction box are at the rear of the desk console.

Figure 4: Typical fixed NGT *AR Voice* or *VR* station



NOTE

The Code 766 Desk Console comes with a 2 m cable that connects directly to the 10-way connector from the RF unit. The console replaces the 6 m handset and speaker connector cable, and external speaker. The handset connects directly to the back of the console.

Cables

Table 3: Cables for a typical fixed NGT station

Cable	Symbol	Part number
CIB cable between RF unit and console[a] (NGT *AR* and *SR* Transceivers only)		08-05610-006
Handset and speaker connector cable (NGT *AR Voice* and *VR* Transceivers only)		08-06022-001
Coaxial cable between RF unit and antenna[b]		08-01503-030

a. The part number for this cable corresponds to a 6 m CIB cable. The cable is also available in a number of shorter or longer lengths.

b. The part number for this cable corresponds to a 30 m coaxial cable. The cable is also available in a number of shorter lengths.

Mounting a fixed NGT station

A fixed NGT *AR* or *SR* station is most commonly mounted using a desk console (Codan part number 15-10471). A fixed NGT *AR Voice* or *VR* station may be mounted using a desk console (Codan part number 15-00766). For general guidance on suitable locations for equipment and installing the fixed station see the reference material on the enclosed CD.

Desk console

The pre-assembled NGT Desk Console (Codan part number 15-10471, used with the NGT *AR* and *SR* Transceivers only) combines a handset, a goose-neck microphone, a junction box, an in-built speaker, and a headphone jack (see Figure 3 on page 24). The Code 766 Desk Console (Codan part number 15-00766, used with the NGT *AR Voice* and *VR* Transceivers only) does not have an internal junction box or attached handset. The handset connects to the rear of the console. The console cradles the handset.

RF unit and transceiver supply

The RF unit and the transceiver supply are self-contained and are usually stacked loosely. If you want to mount the RF unit and/or the transceiver supply, contact your Codan representative to obtain a rack-mounting unit or the appropriate mounting cradles.

WARNING If you are mounting an RF unit in a cradle, do not fit rubber feet to the bottom of the RF unit.

NOTE If you are transferring a mobile station to a fixed station, and you are not mounting the RF unit in a cradle, rubber feet can be fitted to the bottom of the RF unit. The rubber feet are available from Codan (Codan part number 30-11208-000).

Rack-mounting unit

A rack-mounting unit consists of a 19 inch rack tray. It can be used in conjunction with a desk console, or the handset and cradle, to mount your fixed station.

Connecting a fixed NGT station

Connecting a fixed NGT *AR* or *SR* station

NOTE The handset is supplied connected to the desk console (Codan part number 15-10471).

To connect a fixed NGT *AR* or *SR* station:

- ❑ Connect the socket at the end of the cable to the plug at the end of the cable lead from the RF unit, then secure the locking ring tightly into position.
- ❑ Connect the socket at the opposite end of the cable to the plug at the rear of the desk console, then secure the locking ring tightly into position.
- ❑ Connect the plug at the end of the cable to the socket at the end of the cable lead from the RF unit, then secure the locking ring tightly into position.
- ❑ Connect the plug at the opposite end of the cable to the socket located at the base of the antenna, then secure the locking ring tightly into position.

Connecting a fixed NGT *AR Voice* or *VR* station

To connect a fixed NGT *AR Voice* or *VR* station:

- ❑ Connect the lead from the handset and speaker connector or desk console to the 10-way plug on the cable lead from the RF unit, then secure the locking ring tightly into position.
- ❑ Connect the plug of the handset cable to the socket on the handset and speaker connector or to the rear of the optional Code 766 Desk Console, then secure the locking ring tightly into position.
- ❑ Do one of the following:
  - If you are using the handset and speaker connector and cable, connect the plug at the end of the speaker cable to the socket on the handset and speaker connector, then secure the cable by pushing it into the slot on the side of the connector (see Figure 4 on page 25).
  - If you are using the optional Code 766 Desk Console, connect the 2 m flying lead from the rear of the console to the 10-way connector plug on the cable lead from the RF unit, then secure the locking ring tightly into position.
- ❑ Connect the plug at the end of the cable to the socket at the end of the cable lead from the RF unit, then secure the locking ring tightly into position.
- ❑ Connect the plug at the opposite end of the cable to the socket located at the base of the antenna, then secure the locking ring tightly into position.

Connecting an automatic tuner to the RF unit and antenna (optional)

NOTE — You may need to install a tuner to improve the efficiency of the antenna in your fixed station (see the reference material on the enclosed CD).

NOTE — The tuner used in most applications has connectors at the end of the cables attached to the tuner, as described below. However, you may have a tuner that has sockets on the connector panel of the tuner.

To connect the tuner to the RF unit:

- ❑ Connect the plug at the end of the coaxial cable from the tuner to the socket at the end of the ᛉ cable lead from the RF unit, then secure the locking ring tightly into position.
- ❑ Connect the plug at the end of the control cable from the tuner to the socket at the end of the ᛯ cable lead from the RF unit, then secure the locking ring tightly into position.
- ❑ Connect the antenna to the antenna connector on the tuner, then secure it tightly into position.

Connecting the transceiver supply

To connect the transceiver to the transceiver supply:

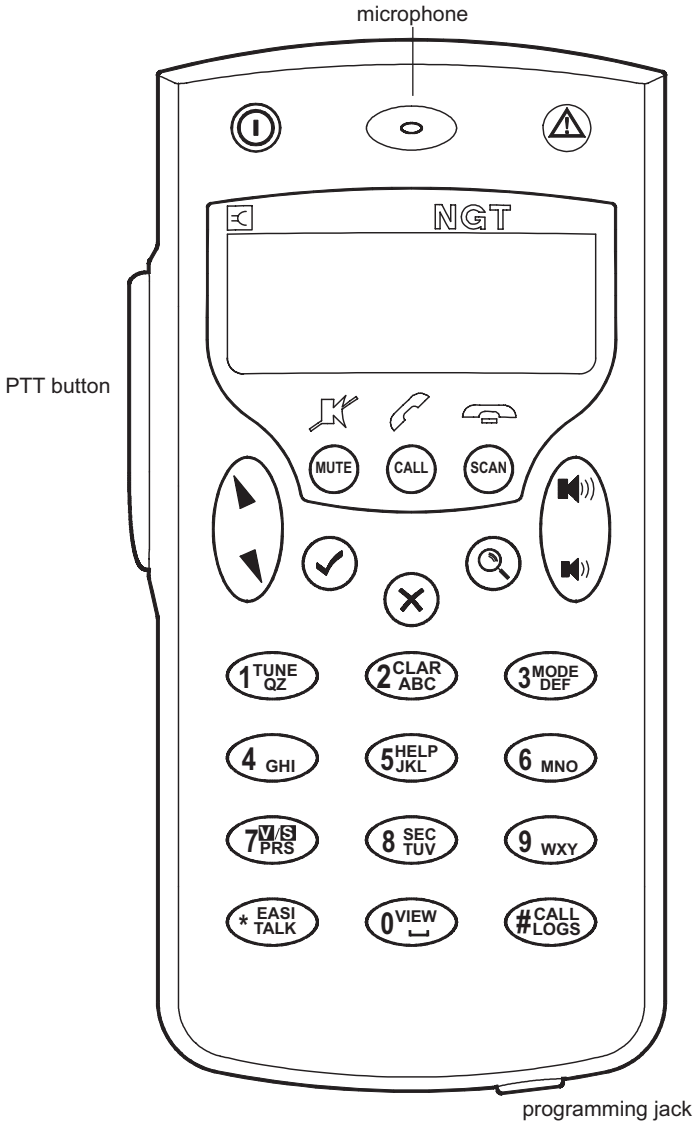
- ❑ Connect the DC output from the transceiver supply to the plug at the end of the 12 V cable lead from the RF unit.
- ❑ Connect the transceiver supply to the AC mains supply.

Connecting ancillary equipment

The NGT *AR* and *SR* Transceiver mobile systems use the junction box for connecting to ancillary equipment.

The 4-way connector on the RF unit of the NGT *AR Voice* Transceiver is available for connecting a GPS receiver.

Figure 5: The handset



The handset comprises:

- an LCD
- navigation keys (, , ✓, ✗,)
- volume controls (,)
- **MUTE**, **CALL** and **SCAN** hot keys
- alphanumeric keys (**0**–**9**, *, **#**)
- emergency key (⚠)
- power key (⏻)
- microphone
- PTT button
- programming jack

There are two ways to use the keys on the handset. You can:

- press a key, briefly
- *hold* a key for 2 seconds

The ✓ and ✗ keys

Press ✓ to:

- select the item on the active line in the list
- save changes
- answer ‘yes’ to prompts

Hold ✓ to edit settings.

Press ✗ to:

- navigate up from settings to entries
- backspace over text
- remove messages on the screen
- cancel changes
- answer ‘no’ to prompts

Hold ✕ to go from any location to the home screen. If you have entered text into a setting and want to discard the changes you made, *hold* ✕.

The scroll keys

The ◣ and ◥ keys are the scroll keys. Use these keys to scroll up or down through any list, to scroll left or right over text, and to increase or decrease a value.

Hot keys

Hot keys enable you to perform a task quickly. The transceiver comes with some standard hot keys programmed; the keys are labelled with the corresponding task performed. You can also create your own hot keys (see the reference material on the enclosed CD).

Table 4: Standard hot keys

Hot key	Function
MUTE	Pressing **MUTE** toggles mute on or off.
CALL	Pressing **CALL** starts a call.
SCAN	Pressing **SCAN** switches off scanning, or if you were in a call, ends the call and switches scanning on.
TUNE	Pressing **TUNE** displays the **PTT to tune** screen so you can manually tune the antenna.
CLAR	Pressing **CLAR** enables you to adjust the receive frequency to compensate for any frequency offset between your transceiver and the remote transceiver.
MODE	Pressing **MODE** selects the next allowable mode programmed for the channel, usually USB or LSB.
V/S	Pressing **V/S** toggles the mute type between Voice mute and Selcall mute.
SEC	Pressing or *holding* **SEC** enters Secure mode, if the hardware option is fitted, and special firmware is programmed into the transceiver and enabled.
9	Pressing **9** displays your current GPS position, if the hardware option is fitted and enabled.
EASITALK	Pressing **EASITALK** toggles the DSP noise reduction algorithm on or off.

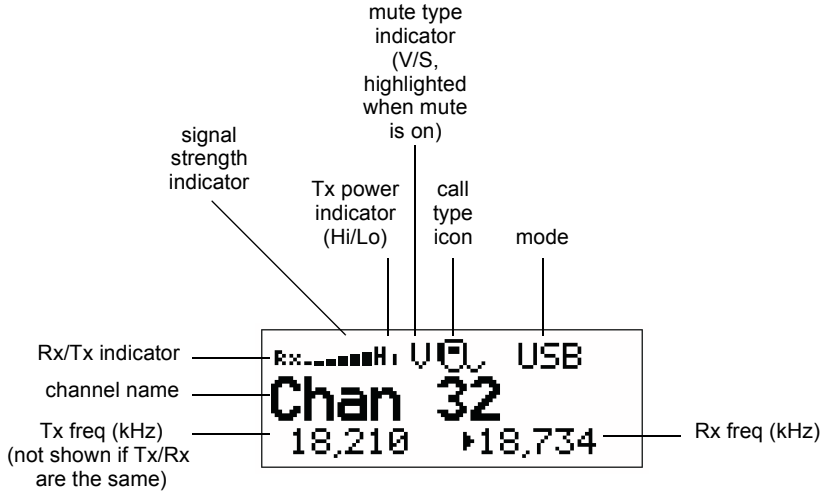
Table 4: Standard hot keys (cont.)

Hot key	Function
VIEW	Pressing **VIEW** toggles between the channel screen and the Address List.
CALL LOGS	Pressing **CALL LOGS** repeatedly steps through a number of call logs: Calls Out, Calls In, then back to the screen from which you began. In these logs, you can view the details of the calls.
⚠ (Emergency)	*Holding* ⚠ begins an automatic Emergency call transmission using call information contained in the Emergency entries in the Address List.
ⓘ + **9**	Pressing ⓘ + **9** enables you to change the default setting for the screen contrast.
ⓘ + **0**	Pressing ⓘ + **0** enables you to change the default setting for the screen and keypad backlighting.

The channel screen

The channel screen is displayed when you press ✕ or **VIEW**.

Figure 6: The channel screen in the Channel List



When the transceiver is scanning, the call type icon is replaced by the scanning icon and the channel information is replaced by **Scanning**.

4 Getting started

This section contains the following topics:

WARNING

You should not transmit from your transceiver or tune the antenna unless people are beyond the safe working distance of:

- 1.5 m (5 ft) of any part of a mobile antenna
- 2 m (7 ft) of any part of a fixed antenna in a data installation of up to 125 W output
- 5 m (17 ft) of any part of a fixed antenna in a data installation of up to 1 kW output

Switching on the transceiver

To switch on the transceiver:

- ❑ Press ⏻.

  If you are prompted to enter a password, enter your user or administrator password, then press ✓.

  If you enter an incorrect password it is automatically erased. If you enter an incorrect password three times, the transceiver automatically switches off.

Switching off the transceiver

To switch off the transceiver:

- ❑ *Hold* ⏻.

  The transceiver is switched off.

Setting up basics

NOTE

Basic information for the transceiver, such as channels, self addresses, time and date, and enabling channels for scanning, should be set up by your system administrator using the NGT System Programmer. If Quick Start is enabled you can enter some of this information (see page 51, *Using Quick Start*).

Selecting a channel

To select a channel:

- ❑ Press **VIEW** until the channel screen is displayed.

  If scanning is on, press **SCAN** to switch it off.

- ❑ Scroll through the channels in the list. Stop scrolling when the channel you want is displayed.

  The channel is selected.

- ❑ If you want to change the sideband or IF filter settings, press **MODE**.

  If the mode does not change, there is only one mode for the channel.

NOTE If you have an automatic antenna fitted, press PTT to tune the antenna to the currently selected channel.

Making a basic voice call

To make a basic voice call:

- ❑ Select the channel that you want to use (see page 40, *Selecting a channel*).
- ❑ *Hold down* PTT then speak, releasing PTT when you have finished speaking.

Muting the transceiver

If you do not want to listen to on-air noise, you can mute the transceiver so that you will only hear voice traffic on the channel.

To switch mute on or off:

- ❑ Press **MUTE**.

  When the channel screen is displayed, the mute status is indicated by a V (Voice) or S (Selcall) at the top centre of the screen. If the letter is highlighted, mute is on.

  If the letter is not highlighted, mute is off.

- ❑ Press **V/S** until V is displayed on the channel screen.

  The transceiver will remain muted until it detects voice traffic on the channel.

Making a Selective call

NOTE The call types available will depend on the options installed in your transceiver.

To make a Selective call:

- ❑ Press **CALL**.
- ❑ Enter the address of the station you want to call, scroll to the type of call you want to make, then press **CALL**.

Call type	Icon	Used for...
Channel Test		Testing the audible quality of a channel in a Codan Selcall or Open Selcall network.
Emergency		Sending an emergency alert tone with a call.
Get Position		Requesting the location of a remote transceiver with a GPS receiver connected and enabled.
Get Status		Requesting diagnostic or configuration information from a remote transceiver.
Message		Sending a message to a remote transceiver.
Phone		Sending a call to a radio/telephone interconnect unit, which connects the call to the public telephone network.
RFDS Emgcy		Sending an emergency call to an RFDS base station (Australia only).
Selective		Sending a selective call to a remote transceiver.
Send Position		Sending your GPS position to a remote transceiver. A GPS receiver must be connected to and enabled in your transceiver.

- ❑ If you are prompted for details about the call, use the information in the following table to enter them, then press **CALL**.

If this prompt is displayed...	Do this...
Select network	• select the network in which you want to make the call
My address?	• select or enter the self address from which you want to send the call
Select chan/mode	**In an ALE/CALM network:** • select **<auto>** if you want the transceiver to select the best channel/mode for the call, starting with the channel on which the most recent successful link was established, or • select the channel/mode you want to use to make the call **In a Codan Selcall or Open Selcall network:** • select the channel/mode you want to use to make the call and check that it is clear of voice and data traffic

NOTE To abort the call before a connection to the other station is made, press PTT.

- ❑ If you made the call in:
  - an ALE/CALM network, wait until a message informs you that the call has been successful (this means your call has been automatically answered by the other station)
  - a Codan Selcall or Open Selcall network, wait until a message informs you that the call has been sent and listen for audible beeps transmitted from the other station
- ❑ *Hold down* PTT then speak.

  Release PTT when you have finished speaking.
- ❑ To end the call, press **SCAN**.

  If the transceiver was scanning prior to the call it resumes scanning.

Scanning channels

Before you can switch scanning on, you need to allocate some channels to be scanned. If you have Quick Start enabled, you can create a scan list from channels programmed into the transceiver (see page 51, *Using Quick Start*). If this feature is disabled, your system administrator will allocate some channels to a network, then enable scanning of this network.

Switching scanning on or off

To switch scanning on or off:

- ❑ Press **SCAN**.

  Scanning is toggled on or off.

  SCAN is also used to end a call.

  NOTE — If the transceiver was scanning before the call was sent or received, it resumes scanning. If the transceiver was not scanning before the call, press **SCAN** to switch scanning on.

When scanning is switched on, mute is also switched on.

You cannot use PTT while the transceiver is scanning.

Pausing scanning

To pause scanning:

- ❑ Do one of the following:
  - to pause scanning on the current channel/mode, press ✓
  - to pause scanning and scroll to another channel/mode, press ◣ or ◥

  The channel/modes through which you can scroll are those in the networks that were being scanned. They are not listed alphabetically but in the order in which they were being scanned.

  If you do not press a key within 30 seconds, the transceiver automatically resumes scanning.
- ❑ While scanning is paused, do one or more of the following:
  - to converse, *hold down* PTT
  - to resume scanning immediately, press ✓

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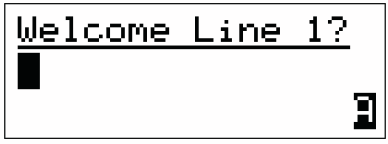
Appendix A—Entering and editing text

Editing a screen

To gain access to an editable screen:

- ❑ *Hold* ✓.

  A question mark is displayed at the end of the heading to show that you can now enter and/or edit text in the setting.



NOTE If text has already been entered on the line it is highlighted.

- ❑ Do one of the following:
  - To use the text displayed, press ✓.
  - To enter new text, start typing. When you have entered the text, press ✓.
  - To edit the text displayed, press ✗. The cursor is placed at the end of the line so you can backspace over characters and/or enter new text. When the text is correct, press ✓.

Entering text

To enter text in an editable screen:

- To enter one of the letters on a key, press the key repeatedly until the letter is displayed.

NOTE You can also *hold* the key until the letter you want is displayed, then release the key.

- To enter another letter on the same key, wait until the cursor moves to the next space...

...then press the key repeatedly until the letter you want is displayed.

- To enter a letter on another key, press the key for the letter.

  You do not need to wait until the cursor moves to the next space.

Changing between alpha and numerical characters

To change between upper-case and lower-case letters and numbers in an editable screen:

- ❑ Press **#** to change the character/case indicator at the bottom right of the screen from **A** (upper-case) to **a** (lower-case) to **#** (numbers).

NOTE — When you are prompted to enter a call address, the characters that you can enter are determined by the call systems installed in the transceiver.

Moving the cursor

To move the cursor across the text:

- ❑ Use ◣ or ◥ to move the cursor left or right respectively.

Inserting text

To insert text:

- ❑ Use ◣ or ◥ to move the cursor to the point where you want to insert text (or a space), then press the required character key.

NOTE — If you want to insert a space, make sure that **A** or **a** is displayed at the bottom right of the screen before you press **0** otherwise you will enter a zero.

NOTE — You can enter a special character using ✱, or 🔍 with ◣ and ◥.

Deleting text

To delete text:

- ❑ Use ◣ or ◥ to move the cursor one position to the right of the character that you want to delete, then press ✕.

Saving text changes

To save the changes you have made:

- ❑ Press ✓.

  The question mark is removed from the heading.

  If you do not want to save the text, *hold* ✕ to discard the changes.

Appendix B—Using Quick Start

Quick Start provides simple methods to configure your transceiver to a basic operating state.

Quick Start will be available if your transceiver contains only one station self address and network names from this default list:

- *Voice
- *Selcall
- *CALM
- !Default

When you *hold* 🔍, you should see the Quick Start entries, for example, **Add/Edit channel**, **Set scan list** etc. If these entries are not displayed, then Quick Start is not available to you.

NOTE Quick Start is only available in countries that permit programming of transmit frequencies using the handset.

For detailed information on programming your transceiver without Quick Start see the reference material on the enclosed CD.

Opening and closing Quick Start

To open Quick Start:

❑ *Hold* 🔍.

To close Quick Start:

❑ Press or *hold* ✕.

Adding/Editing a channel

To add or edit a channel:

- ❑ Open Quick Start.
- ❑ Scroll to **Add/Edit channel**, then press ✓.
- ❑ Enter the name of the channel that you want to use, then press ✓.

  NOTE — For help with entering text see page 47, *Entering and editing text*.

  If you want to use an existing channel, scroll to the channel, then press ✓.
- ❑ Enter the receive frequency in kilohertz, then press ✓.

  NOTE — You can enter the frequency to three decimal places. Press * to enter a decimal point, then continue with entering the frequency.
- ❑ Enter the transmit frequency in kilohertz, then press ✓.
- ❑ Scroll to the mode combination you want to use, then press ✓.

  The transceiver returns to Quick Start.
- ❑ If you want to add more channels to your transceiver, scroll to **Add/Edit channel** and repeat this process.
- ❑ Close Quick Start, if required.

  NOTE — If you want to make or receive calls on this new channel, you must add it to your scan list.

Setting up a scan list

To set up a scan list:

- ❑ Open Quick Start.
- ❑ Scroll to **Set scan list**, then press ✓.

  The first channel in the transceiver is displayed.
- ❑ If you want to add this channel to the scan list, press ✓.

  If you do not want to add this channel to the scan list, press ✗.

  When all the channels have been viewed or you have added 15 channels to your scan list, the transceiver returns to Quick Start.

  If you do not want to scroll through all the channels in your scan list, *hold* ✓ to return to Quick Start.
- ❑ Close Quick Start, if required.

CAUTION Each time you enter **Set scan list**, the resulting scan list overwrites the existing scan list.

Setting the time and date

To set the time and date:

- ❑ Open Quick Start.
- ❑ Scroll to **Set time/date**, then press ✓.

  The display appears with a line under the day of the month.
- ❑ Use ◣ or ◥ to change the current setting to the correct value, then press ✓.

  The line appears under the month.
- ❑ Repeat the previous step until you have made all of the changes to the time and date.

  When all the changes have been made, the transceiver returns to Quick Start.
- ❑ Close Quick Start, if required.

Setting your station self address

NOTE

When Quick Start is available, any self address that you enter using this method replaces the previous self address. If you want to enter more than one self address, and hence disable the Quick Start features, see the reference material on the enclosed CD.

To set your station self address:

- ❑ Open Quick Start.
- ❑ Scroll to **Set my address**, then press ✓.
- ❑ Enter your station self address (maximum of 6 numeric digits for Codan Selcall or Open Selcall networks, or 15 upper-case/numeric digits for ALE/CALM networks), then press ✓.

  NOTE

  For help with entering text see page 47, *Entering and editing text*.

- ❑ Close Quick Start, if required.

Adding/Editing an entry in the Address List or Call Book

To add or edit an address that you call frequently:

- ❑ Open Quick Start.
- ❑ Scroll to **Address/CallBk**, then press ✓.
- ❑ Enter the name of the station or person that you want to add to the list, or use ◣ or ◥ to select an existing entry, then press ✓.

  NOTE For help with entering text see page 47, *Entering and editing text*.

- ❑ Scroll to the type of call that you want to make, enter the station address that you want to call, then press ✓.
- ❑ If you selected **Message?** or **No call type**, enter the message, then press ✓.

  If you do not want to select a message, press ✓.
- ❑ Scroll to the call system that you want to use to make the call, then press ✓.
- ❑ If you selected **Phone?** or **No call type**, select **<blank>** for the phone link that you want to use, then press ✓.

  When all the changes have been made to the call address, the transceiver returns to Quick Start.
- ❑ If you want to add more call addresses to your Address List or Call Book, scroll to **Address/CallBk** and repeat this process.
- ❑ Close Quick Start, if required.

Deleting an entry

To delete addresses, channels or phone links:

- ❑ Open Quick Start.
- ❑ Scroll to **Delete...**, then press ✓.
- ❑ Scroll to the list from which you want to delete an item, then press ✓.
- ❑ Scroll to the item you want to delete, then press ✓.

NOTE If you delete a channel from the Channel List, it is deleted automatically from the scan list.

- ❑ Close Quick Start, if required.

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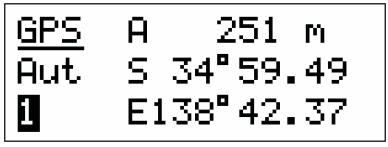
Appendix C—Using a GPS receiver

The GPS option is available for NGT *AR*, *SR*, and *AR Voice* Transceivers. If you have this option enabled and a GPS receiver connected, you can view the distance and bearing to other transceivers from which you have received a position.

To access GPS information:

- ❑ Press **9** to see the GPS screen.



To view distance and bearing to another transceiver:

- ❑ Go to an Address List or Call Log entry containing a GPS position of the other station.

The transceiver calculates the distance to the other transceiver and its bearing from true north with respect to your current location.

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Appendix D—Transceiver specifications

Table 5: NGT Transceiver specifications

Item	Specification	
Frequency range	Transmit:	1.6 to 30 MHz
	Receive:	250 kHz to 30 MHz
Channel capacity	NGT *AR*, *SR*, *AR Voice*:	400 channels
	NGT *VR*:	20 channels
Operating modes	Single sideband (J3E) USB and LSB or switched USB/LSB, AM H3E (optional)	
Sensitivity	Frequency: 0.25 to 30 MHz	RF amp off: 1.25 µV PD, –105 dBm
	Frequency: 1.6 to 30 MHz	RF amp on: 0.12 µV PD, –125 dBm
	For 10 dB SINAD with greater than 50 mW audio output	
Transmitted power	NGT *SR*, *VR*:	125 W PEP
	NGT *AR*, *AR Voice*:	100 W PEP
Environment	Ambient temperature:	–30 to 60°C
	Relative humidity:	95% non-condensing
	Derate upper ambient temperature by 1°C per 330 m (360 yd) above sea level	

Table 5: NGT Transceiver specifications

Item	Specification	
Size, weight and sealing	2010/2011 RF Unit (excluding vehicle mounting frame)	
	Size:	210 mm W × 270 mm D × 65 mm H (8.4 in W × 10.8 in D × 2.6 in H)
	Weight:	3.3 kg (7.3 lb)
	Sealing:	IP52
	2020 Handset	
	Size:	65 mm W × 35 mm D × 130 mm H (2.6 in W × 1.4 in D × 5.2 in H)
	Weight:	0.3 kg (0.7 lb)
	Sealing:	IP41
	2030 Junction Box (NGT *AR* and *SR* Transceivers only)	
	Size:	135 mm W × 106 mm D × 38 mm H (5.4 in W × 4.3 in D × 1.5 in H)
	Weight:	0.4 kg (0.9 lb)
	Sealing:	IP41
	Handset and speaker connector (NGT *AR Voice* and *VR* Transceivers only)	
	Size:	42 mm W × 55 mm D × 22 mm H (1.7 in W × 2.2 in D × 0.9 in H)
	Sealing:	IP41

Appendix E—HF radio transmission

The HF band is the range of frequencies between 3 and 30 MHz. HF transceivers usually cover a frequency range of 1.6 to 30 MHz.

Codan HF transceivers transmit on single sidebands. This reduces the power required to send HF signals and increases the number of channels available within the HF spectrum.

HF transceivers are primarily used for long-range communication where distances of 3000 km (1800 mi) and more are possible. Obstructions such as buildings and mountains have little effect on long-range communication. HF radio can cover such large distances because of the way the transmitted radio signal propagates.

HF radio waves propagate in three ways simultaneously:

- ground wave
- direct wave
- sky wave

Ground wave

The ground wave travels near the ground for short distances, typically up to 100 km (60 mi) over land and 300 km (190 mi) over sea. The distance covered depends upon the operating frequency, transmission power, and type of terrain.

Direct wave

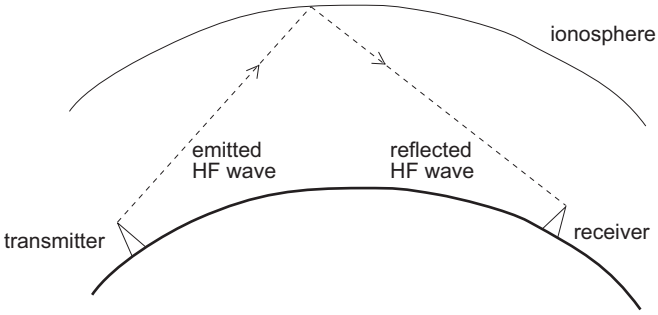
The direct wave travels in a direct line-of-sight from the transmitter to the receiver.

Sky wave

The sky wave is the most important form of HF propagation. The radio wave is transmitted toward the sky and is reflected by the ionosphere to a distant receiver on earth.

The reflective properties of the ionosphere change throughout the day, from season to season, and yearly.

Figure 7: The reflective properties of the ionosphere



Frequency, distance and time of day

The extent to which a radio wave is reflected depends on the frequency that is used. If the frequency is too low, the signal is absorbed by the ionosphere. If the frequency is too high, the signal passes straight through the ionosphere. Within the HF band, low frequencies are generally considered to be in the range of 2 to 10 MHz. High frequencies are above 10 MHz.

A frequency chosen for daytime transmission may not necessarily be suitable for night-time use. During the day, the layers of the ionosphere are thick. The layers absorb lower frequencies and reflect higher frequencies. At night, the ionosphere becomes very thin. The low frequencies that were absorbed during the day are reflected, and the high frequencies that were reflected during the day pass straight through.

Summer HF communications usually operate on higher frequencies than those used in winter over the same distance.

Solar activity varies over an 11 year cycle. Higher frequencies need to be used during periods of peak activity.

It is important to remember that you may need to change the frequency you are using to achieve the best communication. The general rules of thumb for HF communication are:

- the higher the sun, the higher the frequency
- the further the distance, the higher the frequency

Channels and modes

A channel is a name that is given to a frequency or a pair of frequencies, e.g. ‘Channel 1’, ‘4500’ and ‘Headquarters’. The frequencies may be any frequencies within the HF range.

Each channel has one or more modes associated with it. Each mode indicates a sideband that can be used with the channel, such as USB or LSB. When you make a call you need to specify the channel *and* the mode you want to use.

Table 6 shows examples of channels and the information associated with them.

Table 6: Examples of channels and modes

Channel	Receive frequency (kHz)	Transmit frequency (kHz)	Modes
Channel 1	10600	10600	LSB, USB
4500	4500	–	AM
Headquarters	22758	23000	USB

Networks and scanning

A network is two or more stations that use the same frequencies and call system to communicate. The frequencies are allocated by a government authority and enable the network to maintain HF communication throughout the day and night.

The call system is the method the network uses to make and receive calls. For example, in networks that use the Codan Selcall or Open Selcall call system to make calls, the user enters the address of the station they want to call, then selects the channel/mode on which to make the call. In networks that use the ALE/CALM call system, the transceiver selects the best channel/mode for the call.

The transceiver can be set to scan the channel/modes used by your network to detect incoming calls. It is recommended that when you are not using the transceiver to communicate you switch scanning on. This ensures that you can receive calls from stations in your network.

Etiquette for the use of HF radio

There is a standard procedure for communicating over HF radio. Before you begin transmitting, switch off scanning, select a channel, then press PTT on the handset to initiate tuning of the antenna. Listen to the channel that you are going to use and ensure that there is no voice or data communication taking place. You may need to wait until the channel is clear or select another channel.

When you first establish communication with another station it is customary to state their call sign and then your own using the phonetic alphabet (see Table 7 on page 67). For example:

‘Alpha Bravo One, this is Alpha Bravo Two. Do you receive me? Over.’

In this example your call sign is AB2 and you are calling a station with the call sign AB1. A call sign is a group of letters and numbers issued by a government authority to identify a station. The phonetic alphabet is used to ensure that your call sign is understood.

The word ‘over’ is used to signify the end of your transmission. The transceiver may be set up to transmit a short beep when you release the PTT button on the handset. When your conversation with the other party is finished, the party that speaks last should say ‘out’.

Swearing or foul language should not be used—heavy penalties can apply.

Keep communication as short as possible.

Table 7: The phonetic alphabet

Letter	**Word**	**Letter**	**Word**
A	Alpha	N	November
B	Bravo	O	Oscar
C	Charlie	P	Papa
D	Delta	Q	Quebec
E	Echo	R	Romeo
F	Foxtrot	S	Sierra
G	Golf	T	Tango
H	Hotel	U	Uniform
I	India	V	Victor
J	Juliet	W	Whiskey
K	Kilo	X	X-ray
L	Lima	Y	Yankee
M	Mike	Z	Zulu

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Standards and icons

The following standards and icons are used in this guide:

This typeface	Means...
Italic	a cross-reference or text requiring emphasis
Bold	a menu option in the transceiver

This icon	Means...
❑	a step within a task
NOTE	the text provided next to this icon may be of interest to you
CAUTION	proceed with caution as your actions may lead to loss of data, privacy or signal quality
WARNING	your actions may cause harm to yourself or the equipment

Acronyms and abbreviations

This term	Means...
ALE	automatic link establishment
AM	amplitude modulation
BER	bit error rate
CALM	Codan automated link management
CW	carrier wave
DC	direct current
DSP	digital signal processor
ETSI	European Telecommunications Standards Institute
FCC	Federal Communications Commission
GPIO	general purpose input/output
GPS	global positioning system
HF	high frequency
ICNIRP	International Commission on Non-Ionizing Radiation Protection
ID	identification
IF	intermediate frequency
LBT	listen before transmit
LCD	liquid crystal display
LED	light emitting diode
LQA	link quality analysis
LSB	lower sideband
NSP	NGT system programmer

This term	Means...
PA	power amplifier
PC	personal computer
PTT	press-to-talk
R&TTE	radio and telecommunications terminal equipment
RF	radio frequency
RFDS	Royal Flying Doctor Service
Rx	receive
SB	sideband
SINAD	(signal + noise + distortion)-to-(noise + distortion) ratio
tcvr	transceiver
Tx	transmit
USB	upper sideband
V	firmware/software version

Glossary

This term	Means...
active line	The line below the title of a list on the handset screen. Items in the active line are selected by pressing ✔.
address	The HF transceiver equivalent of a telephone number. Your station self address is used by other stations to call you, and it is sent when you make calls to identify you as the caller. It is sometimes referred to as an ID, a station ID, or a self ID.
automatic tuning antenna	An antenna designed for use with multichannel transceivers. It uses a microcontrolled stepper motor to give continuous tuning over the operating frequency range of the antenna.
call detect time	The length of time during scanning that the transceiver pauses on each channel in order to detect an incoming call. It is the inverse of the scan rate.
channel	Frequencies programmed in the transceiver to transmit and receive signals on air.
Channel Test call	A call that enables you to test the quality of a channel in a Codan Selcall or Open Selcall network.
control cable	A cable connecting two items of equipment that allows control information to be passed between the equipment.
Emergency call	A call that enables you to trigger an emergency alarm at a specific station then speak to an operator there.

This term	Means...
fixed base station	A transceiver that is permanently installed and cannot be moved without significant effort. It consists of a transceiver, a transceiver supply, an antenna, control and accessory devices, ancillary equipment, and appropriate connecting cables.
frequency	The number of cycles per second of a radio wave, usually expressed in kilohertz.
Get Position call	A call that gets the GPS position of a specific station.
Get Status call	A call that gets diagnostic or configuration information about the transceiver at a specific station.
handset	A hand-held device that is used to control the functions of a transceiver. It consists of a microphone, PTT button, display and keypad.
hot key	A key on the handset or desk console that is pre-programmed with a macro that enables you to perform a task quickly.
junction box	The unit in a transceiver to which a handset, RF unit, speaker and related devices are connected. The junction box receives the instructions that a user enters through the handset and sends these instructions to the relevant devices. In an NGT *AR Voice* or *VR* Transceiver, the junction box is not required; the handset and speaker connect directly to the handset and speaker connector. In this case, all instructions are processed by the RF unit.

This term	Means...
listen before transmit	If enabled, the automatic process that the transceiver uses to detect whether or not there is traffic on a channel and, when necessary, select another channel or inform the user that the channel is busy.
macro	A short set of instructions to automate a task you perform with the transceiver. When a macro is assigned to a key, the key becomes a hot key.
Message call	A call that enables you to send a message to a specific station.
mobile station	A station that is usually mounted in a vehicle or is portable and easily transportable. It consists of a transceiver, a power supply, an antenna, control and accessory devices, ancillary equipment, and appropriate connecting cables.
mode	A type of reception or transmission you can use with a channel, comprising a sideband and an IF filter.
network	Two or more stations that use the same frequencies and call system to communicate.
Phone call	A call that enables you to connect to a public telephone network.
PTT button	Press-to-talk button, located on the left side of the handset. This button enables you to communicate during voice calls, switch mute off, cancel voice calls prior to the point where voice can be transmitted, cancel calls where data is being transmitted, and exit out of editable screens without saving changes.

This term	Means...
revertive	A signal sent by a station in response to a call.
RFDS Emgcy call	A call that enables you to contact the RFDS (NGT *AR* and *AR Voice* Transceivers only).
RF unit	The device in a transceiver that modulates audio signals onto radio frequencies that can be transmitted on air, and that demodulates the radio frequencies it receives into audio signals.
Selective call	A call that enables you to contact a specific station, then speak to an operator.
Send Position call	A call that sends your GPS position to a specific station.
sideband	A band of frequencies that is above or below a modulated carrier frequency.
station	A point of communication consisting of a transceiver, a power supply, an antenna, ancillary equipment, and appropriate connecting cables.
transceiver	An RF unit, handset, speaker, and appropriate connecting cables. The NGT *AR* and *SR* Transceivers also include a junction box.

Units

NOTE Imperial dimensions are in United States Customary Units.

Measurement	Unit	Abbreviation
Length	metre (inch/feet/yard/ mile)	m (in/ft/yd/mi)
Frequency	hertz	Hz
Time	second	s
	hour	h
Voltage	volt	V
Weight	gram (pound)	g (lb)

Unit multipliers

NOTE Units are expressed in accordance with ISO 1000:1992 ‘SI units and recommendations for the use of their multiples and of certain other units’.

Unit	Name	Multiplier
M	mega	1000000
k	kilo	1000
m	milli	0.001

About this issue

This is the sixth issue of the NGT Transceiver Getting Started Guide. This guide describes V4.3 firmware, which includes the distance and bearing capability with the GPS option, and the Open Selcall call system.

The NGT *VR Mobile* Transceiver (with RF Unit 2011 and no junction box) is now called the NGT *VR* Transceiver. The previous NGT *VR* Transceiver (with RF Unit 2010 and Junction Box 2030) is no longer available.

Associated documents

This guide is one of a series of documents associated with the NGT Transceiver. The other documents are:

- NGT Transceiver Reference Manual (Codan part number 15-04126-EN) supplied on the CD inside the back cover of this guide
- NGT Transceiver System Technical Service Manual (Codan part number 15-02063-EN)
- Declaration of Conformity for the NGT *AR* Transceiver (Codan part number 19-40130)
- Declaration of Conformity for the NGT *SR* Transceiver (Codan part number 19-40121)
- Declaration of Conformity for the NGT *AR Voice* Transceiver (Codan part number 19-40123)
- Declaration of Conformity for the NGT *VR* Transceiver (Codan part number 19-40122)
- Declaration of Conformity for the 3020 Transceiver Supply (Codan part number 19-40127)

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